The Minuteman

Volume 24 Issue 4 March 1995

The President's Corner

More good stuff has happened since our last newsletter... For some time we have been running at reduced power output on 449.925. The amplifier took a hit, so we had to run with a mobile amp that Walter, N1HBR, loaned the club. It kept the output at a level that made it possible to work the machine. Lurking in the background has been a transmitter that Chris, N1NVL, scrounged. It's a Quintron, designed for full duty cycle operation in paging systems. This transmitter is now playing up at Slygo. We owe thanks to Bryan, KA1YQB, who installed a new channel element and aligned the transmitter for operation on the 70 centimeter band. He, Chris, Clark, N1NVK, Ed, N1NOM and Bill, N1QPR, went up one afternoon and installed the new beast on one of the colder days in February. I have been told that they had three heaters blasting to keep themselves from freezing. After they were done, a number of us were around the area checking out coverage; the machine can be heard in places where it simply used to disappear. In addition, the audio quality is vastly improved — linked repeaters sound far better because of the new transmitter.

There are yet a few wrinkles; some difficulties with duplexors have delayed getting the system operating perfectly, but those problems will have been eliminated by the time you read this. One more work party should do it, and that is scheduled soon.

So now our network hub will serve its users with improved range and audio quality...Thanks guys!

It's flea market time again; we will be out at the Westboro High School again this year — and we'll have a major vendor there. Lentini Communications is coming up from Connecticut; they usually have some pretty good deals at flea markets. At the risk of being redundant, I'll just remind you that it's on Sunday, March 19. Talk it up on the air; mention Lentini and that a walk-in VE session will be available. As usual, we can use all the help we can get, so come on up if you are free that Sunday. Helpers get free food and drink, along with an opportunity to peruse the good stuff before all the buyers come into the hall.

I want to be sure to acknowledge once again the efforts of Bryan, KA1YQB....he fixed the club doppler direction finding system. He isolated a design flaw — the chip that controls audio levels had no current limiting on its input, and had a capacitor that could discharge into the audio input when the box is powered down. The resulting current was taking out resistors in the input

(Continued on page 4)

Electromagnetic Interactions with Materials

By Dave Croll, KT1X

Part 4

Over the last three installments of this series, we have introduced the principles of electromagnetic interactions with materials, and seen how a variety of radio related phenomena can be understood using them. In this part, we will see how the interaction of electromagnetic energy with materials is used in magnetic resonance imaging.

MRI, or magnetic resonance imaging, is based on two important sets of facts and principles. The first derives from the presence and properties of water molecules in biological materials. We have already seen how moisture can effect the propagation and attenuation of electromagnetic radiation, and now we will learn how the water in biological tissues can be used to make images of these same tissues.

In the tissues of the body, such as those that make up the internal organs and muscle, water is a common molecule. On the average, about 70% of the mass of the human body is made of water. A very important fact about "biological water" is that it is not evenly distributed in the tissues of the human body.

Not only does the water content vary from tissue to tissue, but the physical properties of this water vary, depending on the other components which make up the tissue and the way in which these components, and consequently the water molecules, are

(Continued on page 2)

MARCH MEMBERSHIP MEETING

WEDNESDAY, MAR 15, 1995 - 1930 HRS

CAMPION CENTER, WESTON MA

PROGRAM:

To Be Announced

Check into Tuesday Nets

Association Update

Raffle

Silent Keys.....

WB1DQC, Peter Munroe

KO1N, Iving Geller

Electromagnetic Interactions with Materials Part 4

(Continued from page 1)

organized. The differing properties of water are important in allowing water to be used as a natural image producing agent in tissues.

The second set of principles employed in MRI are those which are used to carry out magnetic resonance measurements. Magnetic resonance phenomena are well understood in terms of the principles of electromagnetics and molecular physics. Not surprisingly, given its varied and ubiquitous nature, biological water provides the molecules used to produce the magnetic resonance effect from which the images are mathematically constructed.

The most important property of water molecules is that the hydrogen nuclei in their structure are magnetic. That is, they act as tiny magnets and can interact energetically with magnetic fields, such as those produced by either large magnets or by oscillating magnetic fields of RF. This set of magnetic effects can be manipulated to produce a magnetic resonance, which is the heart of MRI techniques.

To carry out a magnetic resonance measurement, the sample containing molecules whose nuclei are magnetic, in our case the human body, is placed in a large cavity surrounded by a magnet. When magnetic nuclei, such as those found in water molecules, are placed in a strong magnetic field, the magnetic nuclei are affected by it.

The interaction of magnetic nuclei with the external magnetic field has two effects. One of these is to separate magnetic nuclei into populations based on their energies. The second effect is that these populations interact in bulk to produce what is called a magnetization vector for the sample, i.e. for the water molecules in the tissues of the body. It is this magnetization that is used to measure the resonance effect and to construct the image.

To produce the actual resonance effect, a second magnetic field at RF frequency must be used to perturb the magnetic nuclei in the external magnetic field. This is applied by a transmitter coil near the sample. The applied RF magnetic field must be oscillating at a characteristic frequency determined by the type of magnetic nuclei in the sample and the strength of the external magnetic field. When this frequency matching condition is met, a resonant condition occurs and the magnetic molecular nuclei in the sample absorb some of the RF energy .

The absorption of the RF energy in the resonance effect causes the equilibrium between the high and low energy populations of nuclei in the sample to change. This in turn produces a change in the magnetization of the material inside the magnetic resonance imaging device.

As the resonance effect takes place, two important types of processes occur. First, the spatial orientation of the magnetization changes. Second, owing to the motions of the molecules in the

(Continued on page 4)

Fox Hunt Ends in Search for Real Interference

Our Saturday fox hunts usually focus on finding one of our pals hidden somewhere in the general coverage area of one of our repeaters. It's not that often that we get to pursue a real fox....

About 6 weeks ago the Saturday hunt ended when Bill, N1QPR, was found lurking in the northwestern part of Wayland. During the hunt, an annoying buzz plagued 449.925....Walter, N1HBR, and Andy, N1BHI, recognized it almost immediately. A couple of years ago, they had found a source of interference with the same audio signature that was bedeviling W1OJ/R (448.625) on Mount Wachusett. It was difficult to track, as it was wandering across a couple of hundred kiloHertz of spectrum, passing through the input frequency of the repeater once every ten minutes or so. This one exhibited the same characteristics.

Since they had helped Roger, W1OJ, find the source of the interference on his machine, they called him....he fired up his spectrum analyzer, hooked it up to his yagi and drew a line. He told Andy and Walter that the line went west of Hudson and a little east of Slygo Hill from his location. The two hunters saddled up and headed toward Hudson.

(Continued on page 5)

MMRA VE Sessions

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

FCC Allows Vanity Call Signs

The Federal Communications Commission has issued a report and order allowing hams to acquire what is termed a "vanity" call sign. In essence, you can now "buy" a call that is no longer in use. The report and order is printed below; the appendix which itemizes specific changes is omitted. This version would allow a Tech class licensee to buy an Extra class callsign. We don't have confirmation for certain yet, but we understand that the Commission has amended the order to keep that from happening. Since we used to be able to select old calls years ago, we suspect that attaching the term "vanity" to this program has something to do with having to pay...

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554
940374

In the Matter of	)	FCC 94-343
Amendment of the Amateur Service Rules to Implement a Vanity Call Sign System.	)	PR Docket No. 93-305

REPORT AND ORDER

Adopted: December 23, 1994 Released: February 2, 1995

By the Commission:

I. INTRODUCTION

1. On December 13, 1993, we adopted a Notice of Proposed Rule Making (Notice) in the above-captioned proceeding. In the Notice, we proposed to amend our rules to provide a system for the assignment of vanity call signs to amateur stations. This item adopts final rules implementing a vanity call sign system.

2. Each new amateur station licensed by the Commission is assigned a unique call sign. An automated process selects the call sign according to our sequential call sign system. Until recently, we have been unable to accommodate the many thousands of requests that we receive for call signs of the licensee's choice. One of our many steps in reinventing Government is to implement new licensing processing capabilities that make it practicable to grant such requests. To this end, we proposed a vanity call sign system, and asked for public comment on our proposal. We further proposed to use our increased capabilities to resume issuing new club and military recreation station, licenses. We received one hundred and five timely comments and four timely reply comments. All of the comments have been carefully considered.

3. The comments confirm the ardent desire of many amateur operators to select the call signs for their stations and their willingness to pay a fee for this service. There were, moreover, several excellent improvements to the proposed system suggested. We hereby adopt rules for a vanity call sign system, incorporating several suggestions from the commenters as discussed below.

II. DISCUSSION

Fairness

4. A major concern of the amateur service community is that the system adopted for allocation of vanity call signs be fair and equitable. Specifically, many commenters suggest using a method of priority with respect to filing applications for vanity call signs. The American Radio Relay League (ARRL) states that, in the interest of fairness and efficiency, the timing and priority in the filing of applications should be important facets of the system that we adopt. The ARRL favors giving the first priority in applying for a call sign to the former holder or, where the holder is deceased, to a close relative. Several commenters favor giving high priority to those who hold the higher classes of operator license. Other commenters favor giving priority to those who have held their licenses the longest.

5. The ARRL's suggested method is to open the system gradually through four "starting gates." Gate One would allow a previous holder to apply for that call sign or, where the holder is deceased, a close relative could apply. Gate Two would allow the 66,000 Amateur Extra Class operators, who have passed the most difficult license examinations, to apply. Gate Three would allow the 112,000 Advanced Class operators, who have passed the second most difficult license examinations, to apply. Gate Four would open the system to any licensee. A club station license trustee would also be allowed to apply for the call sign of a deceased former holder.

6. The suggestions regarding filing priority and fairness are persuasive. Given the strong interest in vanity call signs shown in the comments, it is obvious that the number of applications filed initially could be very large. We agree that a filing priority schedule would be helpful in maintaining fairness and efficiency during the initial implementation of the system, as well as ease administrative burdens on the Commission. The suggestions concerning giving the highest filing priority to former holders and close relatives of deceased holders appear to be perceived as fair by the amateur service community generally, as does the giving of high priority to those who hold the higher classes of operator license. Information on the class of operator license held by each amateur operator, moreover, resides in our licensee data base and lends itself to an automated process. Information on the length of time a person has been an amateur operator is not readily available, thus making that criterion impracticable to use as the basis of a filing priority schedule. Thus, after all amateur operators have been given an opportunity to obtain call signs that they, or deceased close relatives, formerly held, we will use operator license class as the basis for the filing priority schedule. In this regard, we are adopting the ARRL's suggested starting gates.

7. We will announce the opening of each gate by a Public Notice. The first gate will open as soon as our new FCC Form 610-V is available and our licensing facility is prepared to begin processing the applications. Gate One will open the system to the smallest group, i.e., a few thousand prior holders and close relatives of deceased prior holders. This phase will provide validation of our system procedures and alert us to any adjustments needed. We will then open the subsequent gates at such times as it is clear that the system is ready to accommodate more applications. We will also continue our sequential call sign system for new licensees and for those who do not want vanity call signs.

Assignable call signs

8. In the Notice, the system we proposed would require applicants to file a form, together with the required fee, with our fee collection contractor. The applicants would request that their station licenses be modified to show vanity call signs. We further proposed that the applicant would list on the

form a maximum of ten call signs in order of personal preference. After receiving the forms from our contractor, we would use an automated process to compare each applicant's list of preferred call signs with the list of call signs that are assignable at that time. The forms would be processed in the order they are received at the processor's work station. The first assignable call sign from the applicant's list would then be assigned to the station.

9. We requested comments on how the call signs that are already assigned could be made known to applicants so as to allow them to make prudent requests and thereby increase the probability that their requests can be granted. The ARRL states that private sector entities can easily provide applicants with lists of assignable call signs, but only after the initial surge of applications is completely processed. Until such time, even with starting gates, it foresees a very heavy demand for certain specific call signs so as to make it difficult for the applicant to determine which call signs are assignable. The ARRL suggests, therefore, that an applicant be permitted to submit a preferential list of twenty-five call signs, thus increasing the chances of requesting an assignable call sign. We agree with ARRL that increasing the number of call signs that may be requested will reduce the number of unsuccessful applicants. We will allow, therefore, applicants to list up to twenty-five call signs in order of preference.

10. The ARRL prefers that an applicant be permitted to request only those call signs that are assignable to stations in the call sign region where the licensee resides. We have carefully considered this suggestion. We have decided, however, not to impose that limitation. Otherwise, the applicant's choice of vanity call signs would be reduced to ten percent or less of the call signs that would otherwise be assignable to the station. A limitation based upon the person's place of residence, moreover, could easily be circumvented by using a mailing address in another call sign region.

11. We proposed that a call sign vacated by a licensee be made assignable immediately under the vanity call sign system. Several commenters, however, believe that a two-year period is necessary before a call sign again becomes assignable in order to avoid confusion in over-the-air station identification, to maintain accuracy in the licensee data base, and to accommodate QSL bureaus. Further, they believe that it would preclude "trafficking in licenses" where a licensee, in exchange for some type of consideration, vacates a desirable call sign so that another licensee could immediately apply for it before its assignability becomes known generally. A two-year interval would, moreover, make the assignability of vacated call signs consistent with the assignability of a deceased person's station call sign, or a licensee's expired station call sign. The comments are persuasive on this point. Therefore, the rules will reflect that a vacated call sign will not be assignable for a two-year waiting period.

Club stations

12. There was support in the comments for resumption of the issuance of new club station licenses. In the Notice, we proposed that an applicant for a vanity call sign must be a current holder of a station license. The Hill Country Radio Club (Hill) suggests that applicants for new club station licenses be able to request a vanity call sign immediately, rather than having to wait and apply after they receive licenses. Hill considers a two-step procedure ponderous and unfair to new clubs that have been precluded from obtaining club licenses for many years. The two-step process, however, is an administrative necessity because of the fee required for a vanity call sign. The application for a vanity call sign is the only amateur service application that must be filed with our fee collection contractor. Persons not already holding a club station license, therefore, must first apply for and receive a license before they can file an application with the fee collection contractor requesting that the license be modified to show a vanity call sign. However, we will begin accepting applications for club and military recreation station licenses on the date this Report and Order becomes effective. In many cases, therefore, the license trustee will be able to obtain a license document and thus will be eligible to apply for a vanity call sign for the club station when the starting gate for his or her class of operator license opens. The final gate will also allow a club station licensee trustee to apply for the call sign of a deceased former holder. The license trustee must obtain a written consent from a close relative of the deceased.

Special event stations

13. The ARRL requests that specific call signs in a unique call sign block be made assignable only to certain special event stations, and suggests the one-by-one call sign block for this purpose. The ARRL states that such specific call signs should be reserved for assignment to stations operating in conjunction with short term special events of national significance. A special event vanity call sign system may meet the needs of amateur operators for temporary operation of their stations during events that are of special significance to the amateur service community. We will, therefore, set aside the one-by-one call sign block until the matter can be addressed in a separate proceeding.

Filing procedures

14. In our Notice, we asked for comments concerning alternative ways, such as magnetic computer disks, that applicants could use to apply directly to the Commission for a vanity call sign. Several ways were suggested. One commenter suggests a procedure where applicants would file the application form by facsimile and provide a credit card number. His second suggestion is an electronic on-line filing procedure where the applicant answers a series of questions to search the Commission's data base for an assignable call sign. If the call sign is assignable, the applicant would file an application form after paying the fee by credit card. The Commission's printed acknowledgment of the transaction would constitute a temporary license. These suggestions were helpful and we will investigate these ideas for possible future use.

15. Some commenters believe that the fee charged for a vanity call sign should be charged on a one-time basis only, and that no fee should be required when the license is renewed. The ARRL believes that a one-time fee is more appropriate because the Commission's additional workload occurs at the time of the initial processing of the vanity call sign. Section 9(g) of the Communications Act of 1934, as amended, currently provides for the payment of an annual fee of $7.00 for an amateur station vanity call sign. Because the normal term of an amateur station license is ten years, a fee of $70.00 will have to be paid when requesting a new or renewed vanity call sign. At this time, under the Communications Act, we cannot provide a one-time fee for processing vanity call sign applications.

III. CONCLUSION

16. We have decided to offer a vanity call sign system to the amateur service community, in recognition of the strong sense of identity among amateur operators that is grounded in the call signs of their stations. We have also decided to resume issuing new club and military recreation station licenses. We see these actions as fundamental to our commitment to put the needs of people first in providing the services that they want. We are pleased to be able make this new system available to the amateur community. Therefore, we amend the amateur service rules to implement a vanity call sign system as set forth in the attached Appendix.

IV. ORDERING CLAUSES

17. Accordingly, IT IS ORDERED that effective March 24, 1995, Part 97 of the Commission's Rules, 47 C.F.R. Part 97, IS AMENDED as set forth in the Appendix hereto. Authority for this action is found in Section 4(i) and 303(r)of the Communications Act of 1934, as amended, 47 U.S.C. 154(i) and 303(r).

18. IT IS FURTHER ORDERED that this proceeding IS TERMINATED.

19. For further information, contact Maurice J. DePont, Wireless Telecommunications Bureau, 202-418-0690.

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton
Acting Secretary

Real Fox.....

(Continued from page 2)

With Roger (W1OJ) watching his spectrum analyzer and calling off the frequency, the DFers rolled into Hudson. As they got into the downtown area, they began to hear the buzz. It was weak and intermittently copyable, and based on Roger's line, they turned south toward Marlboro. The buzz got stronger....as they came up the hill toward the Marlboro Police Station, the signal strength was nearly full pin. Since an MMRA member is employed there, Andy and Walter began hoping that it was the source of the signal. "....we can really bust his chops on this one."

After rolling around the station a few times, attracting suspicious stares from a couple of officers, they determined that it was coming from somewhere toward the Marlboro Hospital. Keep in mind that the DFing technique being used was pure signal strength....

When they arrived in the rear parking lot of the hospital, the signal was full pin with antennas on, but undetectable without. It seemed that the source was the hospital roof. Satisfied they had narrowed it down, they decided that they had enough for one day. But being diehards, they decided on one last check from the far end of the parking lot, just to confirm signal attenuation with distance from the hospital.

It was stronger...strong enough to be heard without an antenna! "It ain't the hospital....it's gotta be one of these houses down this hill." Down that hill was through a thicket that in summer would have been impassable. Walter, being of adventurous spirit, decided to walk down through the brambles into backyards with his HT. "If some guy comes out the back door with a shotgun, Walter, just hit the dirt."

While Walter wandered, Andy drove out of the lot and down the hill. Using 2 meter simplex, the two stayed in touch. "Walter, I'm on a little side street just beyond you, and I've got it no antenna too."

"Where are you....I'm freezing my (expletive deleted) off. It's somewhere in this row of houses. I'm coming down the hill, out on the main road."

(Continued on page 6)

MMRA Puts Billboard on Information Superhighway

MMRA members (and others) are now able to find MMRA on the World Wide Web. We now have a "home" page on the Web, courtesy of Ultranet Communications, Inc. of Marlboro, who, in support of public service organizations, have made file space available to MMRA to support our page. Our thanks to them for their generosity and support.

The WWW address of the page is

http://www.ultranet.com/~mmra/mmrainfo.html

For those who do not have access to the WWW, MMRA files may be downloaded via ftp to ultranet.com in directory sub/mmra/public_asc. Do a "dir" or "ls" to see the list of files.

Our new page provides access to the following subjects:

1. List of Officers
2. List of repeaters, frequencies, offsets, PL, and patch data.
3. Current membership list.
4. Meeting schedule for the year.
5. Information on dues and prorating.
6. MMRA By-laws.
7. MMRA Operating Guide
8. MMRA Newsletter information - The Minuteman
9. List of emergency telephone numbers for towns in the metropolitan area.
10. MMRA Flea Sale information.
11. The W1GSL list of Fleamarkets for the year.

In addition, WWW links are provided to the Boston ARC page, the ARRL information page, and the Einet Galaxy Amateur Radio Page.

The MMRA WWW page was initiated and will be maintained by Frank Morrison, KB1FZ, the Club Secretary. Please send comments, suggestions, and criticisms to him via the MMRA hot-line or at e-mail address "fpm@fpm.ultranet.com".

Editor's Note: Frank, KB1FZ, put in a lot of time and effort to make this happen. We owe him a vote of thanks for getting us "on the road", so to speak.....

Don't Forget —

MMRA Flea Market
Sunday, March 19
Westboro High School

Walk-in VE Sessions will be available Courtesy of W1YRC & The Blackstone Valley ARC VE Team

For Flea Market Information, Call the MMRA Hotline:

508-489-2282

THE PUZZLE CORNER

by Frank Morrison, KB1FZ

Congratulations to Bartley Cardon, KD1KG, for sending in correct solutions to the two puzzles in the January issue. Not only were his solutions correct, they were the only ones to be received, and he is not even a member of MMRA! Is there no intellectual curiosity left in the world?

Problem #1. The RC filter transfer function is

$$G(f) = \sqrt{[1 + (2\pi fRC)^2]}$$

The 3 dB down point occurs when $G(f) = \sqrt{2}$, which gives $f = 1/(2\pi RC)$ as the frequency at this point.

Problem #2: In what time would A, B, and C together do a job, if A alone could do it in six hours more, B alone in one hour more, and C alone in twice the time? Let t be the number of hours to do the task jointly. Then A alone can do it in t + 6 hours, B alone in t + 1 hours, and C alone in 2t hours. Since the three work together in proportion to their individual capability, the time to complete the job becomes

$$1/(t+6) + 1/(t+1) + 1/(2t) = 1/t$$

This results in the quadratic equation $3t^2 + 7t - 6 = 0$, which has one positive root equal to 2/3. Hence it takes 40 minutes for the joint effort.

Looking forward to the coming summer and enjoying a cool one, here's the thought for the day: When on a picnic I was handed a freshly-opened can of beer. I started to put it down, but the ground was not level. I thought it would be wise to drink some of the beer first, in order to lower the center of gravity. Since the can is cylindrical, obviously the center of gravity is at the center of a full can and will go down as the beer level is decreased. When the can is empty, however, the center of gravity is back at the center. There must therefore be a point (level of beer in the can) at which the center of gravity is lowest. Assume that the empty can weighs 1.5 ounces. It is a perfect cylinder, and any asymmetry introduced by punching holes in the top is disregarded. The can holds 12 ounces of beer, therefore its total weight when filled is 13.5 ounces. The can is eight inches high. Determine the level of the beer at which the center of gravity is at its lowest point.

Real Fox.....

(Continued from page 5)

Just as Andy stopped to pick up Walter, a group of people walked by, staring at the truck with all the antennas. They went up the same little street Walter had just exited.

Finally it was apparent that the source was one of the houses on that same street. With antennas off they inched up the street. It split into two driveways; taking the right driveway first, they watched signal strength meters intently. "Nope....it's not getting stronger....there, it's dropping off."

So they backed out, then took the left driveway. As they approached a grey shingled house with a large recreational vehicle in the rear, the signal began peaking. "This has gotta be it. So who goes to knock on the door?"

"We'll both go...."

What could have been unpleasant, if the residents of the house had been unfriendly folks, turned out fine. "Gee, we wondered what that truck with all the antennas was doing in our driveway when we walked by you earlier...." The hunters, glad for a few moments in a warm house with friendly people, explained about TV mast pre-amps, letting them listen to the noise on an HT....the older gentleman remembered.... "You know, we have one of those things in the RV, but I don't think it's on."

The whole family, wide eyed kids and all, followed the patriarch out to the RV. He unplugged the power cord....and the buzz ceased. Walter and Andy thanked the family profusely for being so cooperative, climbed into the truck and backed out of the driveway. It had taken a little under two hours from ten miles away to find the offending pre-amp. The two exchanged high-fives....

"Yeah, We're bad..."

Don't Forget the Saturday Morning Fox Hunts_come out, barge around and have a few laughs with us!

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, and will soon have our own domain. Contact KB1FZ for questions or suggestions.

LEGISLATIVE ALERT*

The bill to put PRB-1 in the Massachusetts law books is back as H-2782. The anti-cellular tower bill that could be applied to ham radio towers is back, too, as H-1159. We need to start contacting people on Beacon Hill and letting them know that we'd like their support in passing H-2782 and blocking H-1159.

Below are the texts of the two bills. Following the bills is the current roster of the Local Affairs Committee, the gateway through which both of these bills must pass before they make it out onto the floor of the full legislature. If you see your senator or Rep in the list, you're in a well-leveraged position to influence the outcome of the Committee's decision. Please write or call to express your opinion. (Just make sure you-and the staff answering the phone-get the bill numbers straight when you call.)

Even if your senator or rep isn't on the list, go ahead and contact them now, but remember that you may have to write again later in the year to nudge your representatives in the right direction when the bills make it to the full legislature. Contact me for more information and suggestions on how to help with the cause. This is the year for our PRB-1 bill! Talk it up on the air! It's more interesting than stories about loose mic connectors.

Shawn O'Donnell, K3HI, ARRL State Government Liaison, EMASS
4 Blueberry Circle, Framingham, MA 01701
508 877 7635 (8AM-9PM)

*This notice courtesy of Phil Temples, K9HI, via Internet EMail.....

H-2782

An Act relative to Local by-laws and ordinances regulating antenna structures used by federally licensed amateur radio operators.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1.

Section 3 Chapter 40A of the General Laws, as appearing in the 1990 Official Edition, is hereby amended by adding, after the last paragraph, a new paragraph as follows:–

No zoning ordinance 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, provided, that such ordinances and by-laws reasonably 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.

H-1159

An Act regulating the siting of communication towers.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Section 3 Chapter 40A of the General Laws, as appearing in the 1992 Official Edition, is hereby amended by inserting after the word "by-law", in line 33, the words:–,except the provisions of section 9D,.

SECTION 2. Said chapter 40A is hereby further amended by inserting after section 9C the following section:–

Section 9D. No communication tower or transmitter shall be erected or operated unless it has received a special permit from the special permit granting authority of the city or town in which it is to be located.

The following criteria shall govern the issuance of such a permit:

(1) No new cell may be established if there is a technically suitable space available on an existing communications tower within the geographic area that the new cell site is to serve;
(2) All structures must meet minimum setback requirements in their district as specified by the zoning code;
(3) Fencing must be provided to secure the site. No barbed wire or razor wire fencing is to be permitted in residential areas;
(4) The facility's owner must file an annual report with the building inspector's office detailing how the facility is continuing to conform to the above standards;
(5) All obsolete or unused facilities must be removed within twelve months of cessation of operations at the site;
(6) No facility will exceed current American National Standard Institute (ANSI) standards;
(7) Additional height to existing towers would require permission from the special permitting granting authorities of that community, and
(8) All regulations will be transferred to any new owner of a tower or communications structure.

No construction of a tower shall be authorized under the provisions of section three of chapter one hundred and thirty-two A on state land without a special permit as provided above.

Local Affairs Committee:

Senate
Diane Wilkerson, chair, Boston
Robert Wetmore, Worcester, Franklin, Hampden & Hampshire
Thomas Norton, Fall River
John O'Brien, Andover, Billerica, Lawrence, Tewksbury
Robert Bernstein, Worcester
Robert Hedland, Weymouth

Contact Your Rep in support of H-2782 and opposition of H-1159!

The "generic" address is:
The Honorable Mr./Mrs./Ms. X
State House
Boston, MA 02133 617 722-2000

House
Thomas Petrolati, Ludlow, House Chair (suburbs of Springfield)
Janet O'Brien, vice chair, Hanover (20m N of Plymouth)
Philip Travis, Rehoboth (Fall River-Providence)
Emile Goguen, Fitchburg
Stephen Kulik, Worthington
Harriet Chandler, Worcester
Paul Demakis, Boston
Rachel Kaprielian, Watertown
Anthony Verga, Gloucester
Mary Jeanette Murry, Cohassett, Hingham, Hull
James Colt, Wenham

Electromagnetic Interactions.....

(Continued from page 2)

sample, the magnetization of the sample begins to relax or decay to its previous value.

This relaxation effect is determined by the motions of the water molecules as well as by the other components of the tissues. Thus, it reflects the composition and physical state of molecules in the tissues. This relaxation systematically effects the magnetization, which varies according to the specifics of the relaxation phenomenon of the water molecules.

The fact that the magnetization from the water molecules varies in terms of spatial and relaxation processes, allows an easy measurement of the resonance and subsequent relaxation processes. The changing magnetization induces an RF current in a coil placed near the sample. The intensity and fluctuation of this induced current in the receiver coil can be sampled. After being amplified, detected and processed by the MRI receiver, this response can be digitized and analyzed mathematically to characterize the resonance and related relaxation processes.

To turn this information into an image of the sample, two things are needed. One of these is contrast, or being able to tell how the composition and physical nature of the material being imaged varies. The second, is to characterize the distribution of the material in space.

In the case of MRI imaging, the contrast is provided by the intensity and relaxation properties of the water resonance effect in the sample tissues. As mentioned above, this varies in a way that characterizes the makeup and organization of different tissues.

The spatial distribution problem is a little more difficult to solve, but can be approached in two ways. One way is to employ what are called sequential point techniques, which are based on a simple fact about the resonance effect.

A well defined resonance effect is dependent on a highly uniform, or homogeneous, external magnetic field. If this condition is not met, the resonance effect will be ill defined, and will not be strongly detected. By adjusting the magnetic field during the measurement, one can focus the resonance effect spatially.

The so-called sequential point techniques utilize approaches where the application of the RF and the production of the resonance effect are modified by a variety of schemes to produce strong resonance in a selected volume element centered on a point inside the object. By measuring enough of these volume elements as a function of their position in space, one obtains an image built from a series of sequential resonance experiments.

A second approach, that of the so-called multiplex sequential line or sequential plane techniques, varies the magnetic field and RF applied to the sample to produce regions in space where the resonance effect will vary systematically. This is the equivalent of measuring simultaneously the volume elements of the object being imaged along a line or on a plane through the sample.

This multiplex approach produces a great increase in the signal to noise ratio of the resonance measurement. By taking a large number of measurements along different lines or planes through the object, one can mathematically construct a 3-D image of the object. Technically knowledgeable readers may recognize these approaches as being similar to those used in x-ray tomography or CAT scanning.

In making an MRI image, there are effects produced in the tissues by the RF used. These contribute to problems with the quality of the image and with possible deleterious effects on the patient.

In the next installment, we will look at some of these effects as an introduction to our discussion of the potential effects of RF absorption by living organisms.

BIBLIOGRAPHY

1. Chen, C-H., & Hoult, D.I., **Biomedical Magnetic Resonance Technology**, Adam Hilger IOP Publishing Ltd., 1989.

2. Ernst, R.R., Bodenhausen, G., & Wolkun, A., **Principles of Nuclear Magnetic Resonance in One and Two Dimensions**, Oxford Science Publications., 1986.

President's Corner.....

(Continued from page 1)

path, rendering the chip inoperative. Bryan designed and implemented the appropriate current limiting modification and sent a letter to the manufacturer explaining their design flaws. He also made some mods that make the box a lot easier to set up quickly for a hunt. Thanks again, Bryan.

While I'm waxing complimentary, I must further mention the efforts of Chris, N1NVL, and Bob, WA1ZJE. On a cruelly cold day, they reworked the whole grounding scheme down at Quincy. You haven't lived until you have gone up to the Quincy site on a cold day. The only warm places are in vehicles or in the repeater shelter itself. Only one problem....there's barely room in there for one skinny guy. Going there to do a job like that is indicative that hams are either dedicated to their hobby and associates, or just plain loony. Bob brought his truck, replete with welding equipment, and added ground strapping and rods to eliminate some of the problems we've been having with intermod and crunchies. All I can say about both Bob and Chris is that "....you're a better man than I am, Gunga Din."

A quick note...if you didn't look closely at the legislative alert on page 3, please do so. The provisions of H1159 are a bit scary, so let's get behind the effort to either stop it or fix it so it can't do us irreparable harm. Write to your representatives, and talk it up on the air.

See you all at the Flea Market!

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	
Weston	224.70	N1HBR/R	FTL	L	
Hopkinton	223.94	N1BHI/R	FTL	L	
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	

[FTL = Full Time Linked PTL = Part Time Linked]
[L = Patch available via link] P = Local Autopatch]

MMRA Officers:

President:	Andy Morrison, N1BHI
Vice President:	Walter Ching, N1HBR
Secretary:	Frank Morrison, KB1FZ
Treasurer:	Ian MacLennon, AF1R
Clerk:	Clark Conti, N1NVK
Directors:	Tom Qualtieri, WB1GMA
	Al Kunian, KA1AL
	Chris Conti, N1NVL
	Mike Ryan, KD1OA
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@ultranet.com

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 1994-95 Season: September 21, November 16, January 18, March 15, & May 17.

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, 1994!	Nov 9, 1994	Jan 11, 1994	Mar 8, 1994	May 10, 1994
Submission Deadline	Sept 10, 1994	Oct 26, 1994	Dec 28, 1994	Feb 22, 1994	Apr 26, 1994

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: