The Minuteman Repeater Association

The Minuteman

Volume 30, Issue 4 March 2001

Repeater Report by Bryan Cerqua, W1BRI

[Bryan did a **huge** amount of work since the last newsletter. **Thanks Bryan!**— Ed.]

53.81: I purchased a new tube and installed it to eliminate the temperature problem with the power coming up slowly at first key up. Previously it would take about 10 to 15 minutes for the power to come up from 20W to 150W.

Even with the new final tube installed I still could not get the rated power out of the amp. K1NZQ (Al) paid a visit and helped me troubleshoot it. Al mentioned that I should check the position of the variable capacitor for the plate coupling to see if it is at the minimum position (unmeshed). It was.

I decided to pull the amp home and try to modify it again for better tuning. I called GE and they faxed me the design specs for the plate coil and the plate-coupling coil. I re-wound both coils per spec, I had to remove another turn from the plate coil and adjust the grounding tap. Using the grid dip meter I ended up with a little more than one turn for the plate coil. The plate coupling coil swings in and out and up and down near the plate coil and acts like a variable coupling transformer. I had previously had two turns on this coil about 2 ¼" inches in diameter. Later, before getting the correct info from GE, I removed a turn from this coil, leaving only one turn. The results were even worse with one turn. After getting the design data for this coil it turns out that the new diameter is 1 ¾" with two turns. I got some nice silver plated copper wire from WA1QGU (George) for re-winding this coil.

On Saturday K1KWP (Kevin) and I re-installed the power amp. After a few minutes of setting the input drive and a little bit of tuning I quickly realized that I finally could get the specified power from this amp. Kevin had to hold me down since I was going crazy once the needle went off the scale on the bird watt meter (250W is the max for the bird slug that I used). Careful adjustment of the plate coils was required to properly dip the plate current and keep it below the maximum of 275MA. The final setting was left at 250 watts with a plate current of 230MA.

After some driving around myself and getting reports from other six meter users, I believe the repeater can be heard better than ever these days. I will visit the site in a few weeks to check the setting to see how things are behaving. It is nice to be able to hear the repeater on my commute over the line noises and other interference that we all have to put up with on six meters.

146.82: After re-installing the 53.81 tube amp K1KWP and I drove to the Weston site for some overdue cleaning. We spend a few hours and a few trips to the dumpster to toss out things like the old soda left over from the last MMRA flea market. We also cleaned up the bench in the repeater room and placed the items that were on the floor on top of the bench so the members could look and maybe make an offer on this stuff to help the club out a little. The plan is to have anyone that is interested visit the repeater room the night of the next meeting. There are plenty of neat things that I'm sure someone out there will be interested in.

146.61: The audio on the 146.61 repeater was becoming intermittent. A trip to the site was required to investigate. A small jumper was found on the channel guard pins that was not tightly gripping the pins. The jumper female pins were made smaller to better grip the male pins. When this jumper was removed the audio went away but you could still key up the repeater. So far this seems to have taken care of the problem.

449.925: The problem with the key-ups of long noise bursts were coming from the Weston 220 link radio. Since the Weston 220 receiver doesn't require a PL tone this receiver was opening up and causing the UHF link radio to transmit the open squelch noise to the hub on 444.925. I found the receiver squelch to be on the hairy edge; all that was needed was to tighten up the 220 squelch a little.

449.925 Duplexer, Preselector and Preamp changes: See separate article on pages 6 and 7.

Inside this issue:

About the Minuteman Repeater Association

The Minuteman Repeater Association (MMRA) is dedicated to Amateur Radio and public service. The MMRA has built a large system of repeaters in Eastern Massachusetts.

The MMRA meets on the 3rd Wednesday of September, November, January, March, and May. Meetings start at 7:30 PM in the Campion Center in Weston MA. Meetings are open to all interested parties. Talk-in is available on the Weston 2-meter repeater (146.82).

The Minuteman newsletter is mailed one week before each meeting. Members are encouraged to submit articles. Articles may be sent to the editor via email to n1be@arrl.net. The deadline for articles is the last Friday of the month preceding the meeting.

Each Tuesday evening at 8PM the MMRA links all the repeaters for an open net. The topic is "Technical Information and Other Stuff". Feel free to join us.

Membership in the MMRA is open to all radio amateurs. Annual dues are $25 per individual or $35 per family. The membership year starts on Sept 1st. Dues for new members are prorated for the remainder of the year. See our website for details.

Email to the club leadership should be sent to mmra@mmra.org. The MMRA web site is: http://www.mmra.org/~mmra

An email distribution list for club members has been established on:
http://www.yahoogroups.com/
— the name of the group is "MMRA".

Repeater and Frequency Information

Location	MHz	PL	Call	Note
Marlboro	53.810	71.9/173.8	W1BRI	PTL
Marlboro	146.610	146.2	N1BHI	FTL
Quincy	146.670	146.2	W1BRI	PTL
Stoneham	146.715	146.2	N1NVL	PTL
Weston	146.820	146.2	KA1AL	PTL
Hopkinton	223.940	103.5	N1BHI	FTL
Quincy	224.400	103.5	N1KUG	FTL
Weston	224.700	none	N1HBR	FTL
Stoneham	446.725	88.5	N1NVK	NA
Marlboro	449.575	88.5	N1NVL	NA
Marlboro	449.925	88.5	N1HBR	Network Hub

Marlboro	144.390	none	N1QPR-2	APRS Digipeater
Marlboro	145.030	none	KA1OUI-3	Net/ROM Digipeater
?	145.630	146.2	W1BRI	Fox Box

Notes: FTL = Full Time Linked to the Hub.
PTL = Part Time Linked (on demand).
NA = linking is Not Available.

PL: There are two 6 meter receivers with different PL's. PL is required on 2 meters to prevent interference. The code **750** will temporarily disable the PL requirement.

Using the Autopatch: Only the hub has a telephone line.
(1) Link to the hub if necessary.
(2) Then bring up the patch.

Control codes are sent to members upon receipt of dues.

MMRA Leaders

President	Clark Conti	N1NVK
Vice President	Kevin Paetzold	K1KWP
Secretary	Bill Thorpe	WA1NLR
Treasurer	Bill Northup	N1QPR
Clerk	Eddie Mulhern	N1NOM
Director	Al Kunian	KA1AL
Director	Brian Cerqua	W1BRI

Director	Wayne Foley	N1XXI
Director	Shelley Northup	N1VJE
Emergency Coordinator	Kevin Paetzold	K1KWP
Technical Director	Bryan Cerqua	W1BRI
Newsletter Editor	Bob Evans	N1BE
VEC Liaison	Bill Wade	K1IJ
Webmaster	Andy Morrison	N1BHI

Treasurer's Report (Feb 21, 2001) by Bill Northup, N1QPR

This budget summary shows the MMRA cash flow.

Income:	Budget	Actual	Difference
Dues	4250.00	3746.50	(503.50)
Misc.	0.00	0.00	0.00
Meeting Raffles	0.00	33.00	33.00
Total	**4250.00**	**3779.50**	**(470.50)**

Administration:	Budget	Actual	Balance
Newsletter	1125.00	929.73	195.27
Meetings	750.00	0.00	750.00
Pres. Acct.	0.00	0.00	0.00
Sec. Acct.	0.00	35.52	(35.52)
Treas. Acct.	10.00	16.38	(6.38)
Cookout	0.00	0.00	0.00
Insurance	915.00	520.00	395.00
P.O. Box Fee	0.00	39.00	(39.00)
Voicemail/Pager	0.00	0.00	0.00
Misc.	0.00	0.00	0.00
Total	**2800.00**	**1540.63**	**1,259.37**

Expenses:	Budget	Actual	Difference
Administration	2800.00	1540.63	1,259.37
W1BRI 53.810	0.00	196.95	(196.95)
N1BHI 146.61	100.00	215.91	(115.91)
W1BRI 146.67	200.00	167.59	32.41
N1NVL 146.715	100.00	55.00	45.00
KA1AL 146.82	200.00	218.35	(18.35)
N1BHI 223.94	0.00	0.00	0.00
N1KUG 224.40	0.00	0.00	0.00
N1HBR 224.70	0.00	0.00	0.00
N1NVK 446.725	0.00	0.00	0.00
N1NVL 449.575	0.00	0.00	0.00
N1HBR 449.925	750.00	399.62	350.38
KA1OUI 145.03	0.00	0.00	0.00
N1QPR-2 144.39	0.00	0.00	0.00
R&D/Contingency	0.00	4.60	(4.60)
Test Equipment	0.00	0.00	0.00
Field Day	0.00	0.00	0.00
Total	4150.00	2798.65	1,351.35

For Sale

MMRA has some excess radios, meters, etc. at the Weston site. Come to the next meeting if you have some interest in this equipment.

Larry, W1DYJ is selling his VHF/UHF and HF radios and upgrading to a all-bands-in-one-box transceiver. The following equipment is for sale:

- **MIRAGE A-1015G 6M brick**, two years old, 10W in 150W out, w/ GaAsFET preamp: $200.
- **KENWOOD TS-430S HF transceiver**, a great starter rig, with CW filter and microphone: $350

These radios can be seen on the "station" page on the web site:
http://www.qsl.net/w1dyj/
Larry can be reached via email to larryb@alum.mit.edu
Also, we usually hear him on the Tuesday evening MMRA net.

Your "for sale" listing can appear here.

W1 QSL Bureau by Art Holmes W1RZF

The ARRL W1 QSL Bureau has reorganized and has shifted its base of operation to central Massachusetts. Effective immediately the address of the ARRL W1 Incoming QSL Bureau has changed. The new address is: W1 Incoming QSL Bureau, YCCC, PO Box 7388, Milford, MA 01757-7388.

The ARRL provides an outgoing qsl bureau and an incoming qsl bureau for dx qsl cards. The W1 QSL Bureau handles all incoming dx qsls for the first call area. The W1 QSL bureau is very popular; we process about 400,000 dx qsls a year on a 6 week cycle. The staff of the qsl bureau is 100% volunteers. I am writing to your club because we need your assistance.

Here is how we process the qsls:

Cards are mailed from the dx country directly to our PO box.

The qsls are distributed to the initial sorters.

The initial sorters sort the qsls by the first letter in the call suffix.

The sorted qsls are returned to the bureau.

The qsls are repackaged by the first letter of the suffix and distributed to 26 final sorters.

The final sorters sort the cards to specific calls and mail them to the hams.

We need your clubs help in doing the initial sorting.

This can be a rewarding club activity, providing experienced hams with an opportunity to contribute to the service they have used for years and provides an introduction to dxing for the new ham.

If you are willing, we will ship you the cards, show you how to do it, and supply material needed as required. Give it a try. You give me a date when you would like to do it, we will agree on a number of cards and your club will be part of the W1 QSL Bureau.

We are also looking for individual hams who would like to do presorting. They would handle 2000 cards every 6 to 8 weeks.

Thanks, Art, W1RZF@QNCI.NET
508-478-2286

Fox Hunting News by Michael Ford, WZ0C

The MMRA holds foxhunts every Saturday morning beginning at 10 AM on the 146.61- repeater. The fox transmits for 30 seconds every 5 minutes on the input of the repeater, and then coordination usually takes place on the repeater between the fox transmissions. All are welcome to join, and the group usually visits a local restaurant for brunch after the last hunter has arrived at the fox's location.

The following are accounts of the past few hunts.

Feb 24: Bob, N1BE, hid on Lexington St. at the top of Loon Hill in Dracut and was able to hold the hunters at bay for over two and a half hours by using horizontal polarization and using the surrounding terrain to his advantage. The home stations' very accurate bearings helped pinpoint Bob and get the hunters in the right area very quickly. Mike, WZ0C, followed the bearings and turned into the right cul-de-sac to find Bob first.

Initial bearings: WA1NLR: 45 deg, W1DYJ: 325 deg, K1KMN: 0 deg, N1QPR: 40 deg, N1XXI: 31 deg

Fox Location: 42,39.944N 71,16.697W

Feb 10: Bill, N1QPR, and Shelley, N1VJE, hid at the end of Coslin Dr. in Southboro. Bill's weak signal sent the hunters to the 146.61 repeater site assuming he was running very low power. After they decided he wasn't there, they followed Eddie, N1NOM, down Rt. 85 since that's where he was getting good signal from. After wandering around the EMC parking lot, N1BE, located Bill and Shelley first.

Initial bearings: WA1NLR: 150 deg W1DYJ: 250 deg

Fox Location: 42,17.032N 71,33.249W

Jan 27: Dick, K1KMN, hid in a parking garage at the Sealtest plant on Sealtest Rd. in Framingham. Bill, N1QPR, used his Doppler and drove straight to Dick to be the first hunter in. This was also Gary, KD1TE's, first live hunt. Welcome Gary! Gary and Bob, N1BE, arrived shortly after Bill and Shelley.

Initial bearings: WA1NLR: 110 deg N1BE (on Nobscot Hill): 150 deg

Fox Location: 42,18.831N 71,23.540W

Jan 20: Bob, N1BE, hid inside Dicenzo Blvd. in Marlboro in a cul-de-sac at the end of Indian Lane. After passing right by Bob and missing the signal, Mike, WZ0C, eventually heard the signal in the right place and was the first to find Bob.

Initial bearings: W1DYJ: 241 deg

Fox Location: 42,20.867N 71,29.944W

Jan 13: Mike, WZ0C, hid in Framingham in the residential area by the Mass. Pike just behind Framingham Plaza, citing that he could see a McDonald's and lots of semi-trucks. Dick, K1KMN, was tempted by the strong signal he was receiving at his home and joined the hunt after giving the rest of the hunters his bearing on the fox. By coincidence, this spot was very close to a spot Dick had used before, and Dick found Mike first.

Initial bearings: WA1NLR: 110 deg K1KMN: 180 deg W1JDO: 295 deg

Fox Location: 42,18.655N 71,25.939W

Jan 6: Bob, N1BE, hid in the parking lot surrounded by Clock Tower Place [The Mill] in Maynard. Bob's signal was obscured enough by the surrounding building to make it a very hard signal to trace. Mike, WZ0C, located Bob first.

Initial bearings: W1JDO: 315 deg

Fox Location: 42,25.8N 71,27.4W

The MMRA also has an automatic "**Fox Box**" that is hidden on most weekends. The Fox Box is a green ammunition box (with the ammunition replaced by a transmitter, a battery, and some control circuitry) with a 1/4-wave antenna mounted on it. The box transmits for 30 seconds every two and a half minutes on 145.63 MHz with a PL tone of 146.2. Once you find the box, sign in on the pad of paper located in the end of the box.

Recently, Mike, WZ0C, has been hiding the box on Fridays and picking it up on Wednesdays. Announcements of the Fox Box being hidden and clues about its whereabouts are sent to the MMRA mailing list on yahoogroups. If you would like to receive the announcements but don't wish to join the list on Egroups.com, send email to wz0c@arrl.net to be added to his fox-only list.

Fox box reports:

Feb 16 - Feb 21: The Fox Box was hidden in Lincoln at a city water facility and found by Bob, N1BE, Shelley, N1VJE, and Bill, N1QPR. It was also found by the manager of that facility, who was quite curious as to its function. The next location will be more secluded to avoid being happened upon by non-hunters.

Feb 9 - Feb 14: The back driveway to the Stratus parking lot in Maynard was lair to the Fox Box this week. It was found by Bob, N1BE, and Gary, KD1TE.

Feb 2 - Feb 7: The Fox Box was hidden just off of Rt. 117 in a parking lot at some conservation land along the Sudbury River. Bob, N1BE, was the only one to find it.

Jan 26 - Jan 31: This week, the Fox Box was moved one block from its previous location to Steven's Playground, also in Marlboro. It was located at the end of the parking lot and on the opposite side of the fence. It was found by: Bill, N1QPR, Shelley, N1VJE, Gary, KD1TE, Bob, N1BE, and Eddie, N1NOM

Jan 19 - Jan 24: The Fox Box was on Sligo Hill in Marlboro by the picnic table behind the water tower. Eddie, N1NOM, was the only one to find it.

MMRA Updates

The MMRA has a new mailing address. Please send all future correspondence to:

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

Several months ago egroups was taken over by yahoo. The email distribution list for club members is now on www.yahoogroups.com.

Public Service Volunteer Opportunities in the New England Division by Ralph Swick, KD1SM

Listing public events at which Amateur Radio communications is providing a public service and for which additional volunteers from the Amateur Community are needed and welcome. Please contact the person listed to identify how you may serve and what equipment you may need to bring. **Every event listed is looking for communications volunteers.**

Date	Location	Event	Contact	Tel/Email
Apr 1	Boston MA	Multiple Sclerosis Walkathon	Bob WA1IDA	508-650-9440 wa1ida@arrl.net
Apr 16	Hopkinton MA to Boston	Boston Marathon (course)	Bob WA1IDA	508-650-9440 wa1ida@arrl.net
Apr 16	Hopkinton MA	Boston Marathon (start)	Steve K1ST	508-435-5178 k1st@arrl.net
Apr 16	Boston MA	Boston Marathon (finish)	Paul W1SEX	Paul W1SEX ptopolski@net1plus.com
Apr 29	Groton MA	Groton Road Race	Erik KA1RV	978-448-5536 erik@eggo.org
Apr 29	Boston MA	March of Dimes WalkAmerica	Bruce KC1US	781-275-3740 kc1us@cyberzone.net
May 6	Boston MA	Walk for Hunger	Bob K1IW	413-647-3060 wfh@dematttia.net

This list is published periodically as demand warrants by Stan KD1LE and Ralph KD1SM. Our usual distribution is via packet to NEBBS, via Internet mail to the arrl-nediv-list and ema-arrl distribution lists, and on the World Wide Web (see URL below). If other mailing list owners wish us to distribute via their lists, we will be happy to oblige. Permission is herewith granted to republish this list in its entirety provided credit is given to the authors and the URL below is included. Send comments, corrections, and updates to: (via packet) KD1SM@K1UGM.#EMA.MA.USA, (via Internet) KD1SM@ARRL.NET.

We make an attempt to confirm entries with the coordinator unless the information is from another published source. We very much appreciate the assistance we have been receiving from our 'scouts'; everyone is welcome to send us postings.

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

Last Meeting

MMRA member Jon Titus, KZ1G, led a fascinating discussion about early personal computers. His talk covered the days before the IBM-PC/MS-DOS era. Jon brought core memory, manuals, about a half dozen computers, etc. for all to see.

Thanks, Jon!

Wanted

Wanted: MMRA Officers. The current president and secretary are retiring after their terms. We are soliciting help from other members of the club. This is your chance to make a difference in the future of the MMRA. Those who'd like to run should contact any current MMRA officer.

449.925 Changes by Bryan Cerqua, W1BRI

Interference: There is a 444.900 repeater located in the Millbury / Worcester area that was de-sensing our input on 444.925. (Repeater output is 444.900, input is 449.900, it uses a PL tone of 100 Hz.) Currently this repeater is full time linked to a 224.480 repeater in Paxton, MA. The call-sign listed for 440.900 on the NESMC web page is WA1VVT.

I used the 444.900 repeater to contact many users on the 224.48 system and advised them of this problem. The appropriate operators are being contacted to find out just who is responsible for this 440 repeater. The 224.48 repeater is also getting keyed up by the 444.900 repeater. Most of the users thought the 444.900 repeater was not in use until I told them that I'm using it to communicate with them. At this time no action has taken place. It looks like our de-sense problems from this source have gone away.

The 444.900 output measured –70 dbm at the 444.925 receiver input. This is a fairly strong signal that can overcome users coming in on the 444.925 input. However the link radios that are used at the MMRA repeater sites have strong enough signals that are not degraded by this 444.900 MHz interference.

Tuning the 449.925 repeater duplexer: I was fortunate to be able to borrow a HP 4396 network analyzer from work for a while. I brought the network analyzer to the 449.925 site to sweep the duplexer. The initial setup was a Phelps Dodge model PD526-4 with and extra band pass cavity filter placed on the RX side of the duplexer. The insertion loss measured 5.8 db between the antenna and the RX port. The notch depths were not at a single frequency indicating an incorrect response. The TX side of the duplexer also showed some undesired response but not as bad as the RX side.

Attempting to align the duplexer at the site I noticed that cavity on the RX side near the RX output was very noisy indicating that something was wrong. I adjusted the duplexer for the time being but I would be back since I was confident that the problem would become worse at cold temperatures. We installed the duplexer without the extra band pass filter and ran it for a few days. **Thanks to N1QPR, N1VJE, and K1KWP for lending me a hand and keeping company on a cold night.**

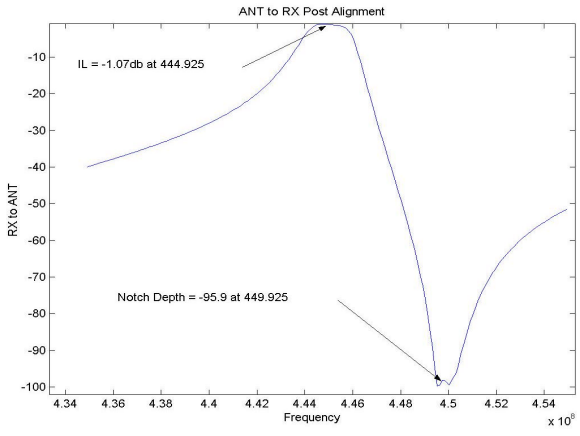
Not happy with leaving the duplexer in the current state I tracked down the model number and contacted Celwave (Now responsible for Phelps Dodge products) and had them fax me out a specification sheet and an instruction manual. It turns out that this duplexer is constructed using a dual notch type arrangement. This means that the band pass adjustment is related to the notch adjustment. This is not true for most duplexers that I've worked on in the past.

Second trip to the 449.925 site. I went up to the site on Wednesday night (1/10) to pull the duplexers out and take them home for repair. I was going to drill open the rivets to the enclosure and fix the noisy cavity but first I want to take another crack at tuning them.

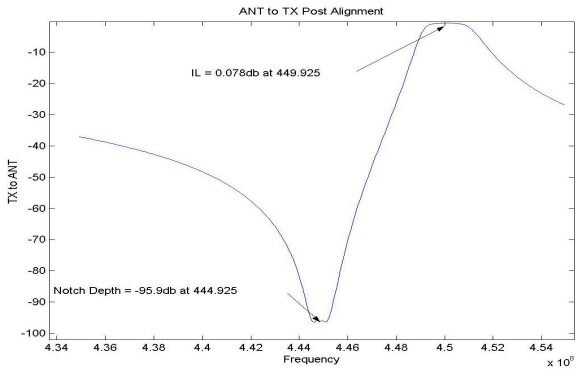
While tuning the bad cavity I noticed that the N female connector had one of its leaf springs broken away. If you look inside an N female connector you will see that it is suppose to have 4 leaf springs on all sides that grip the round pin of the inserted N male connector. These N connectors on the duplexer can't be replaced easily, they are riveted and welded into place.

I decided to see what I could do to solve this problem. After brain storming for a while I came up with the solution of using a thick walled plastic tube to snugly slide over the remaining 3 leaf spring of the female N connector. This prevented the 3 leaf springs from pushing outwards causing a possible noisy connection. I really didn't want to squeeze the 3 remaining leaf springs together with needle nose pliers since I felt that this would not grip the male pin tightly. As I was tuning the transmit side of the duplexer I noticed the same thing had happened to another N female connector so I used the same trick to fix it. Now things seemed to behave OK as I continued to tune the duplexer.

The bad cavity has a slightly bent tuning screw for the



Tuned duplexer response, Receive above, and Transmit



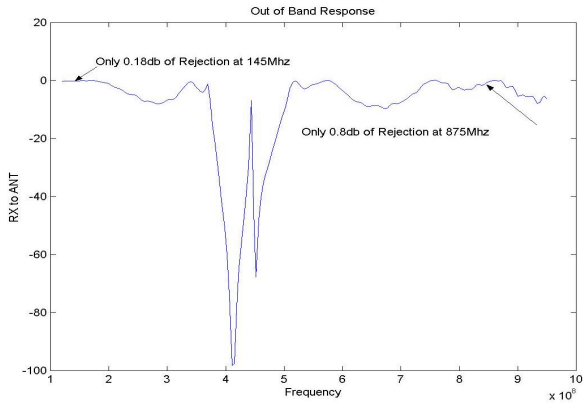
449.925 Changes (cont.)

band pass adjustment making tune-up a little more difficult than the other cavities. When the bad cavity was tightened down correctly things looked good when I tapped a little on it.

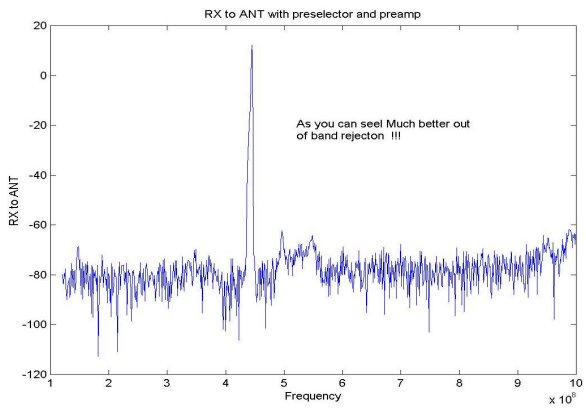
I tuned up each of the six cavities one at a time first the band pass adjustments then the notch adjustment. I centered the band pass and notch frequencies so that at temperature extreme things would not get too bad. As seen in the duplexer plots above, the notch depths are very deep (<-95 db). I had to average the response since I was near the noise floor of the network analyzer.

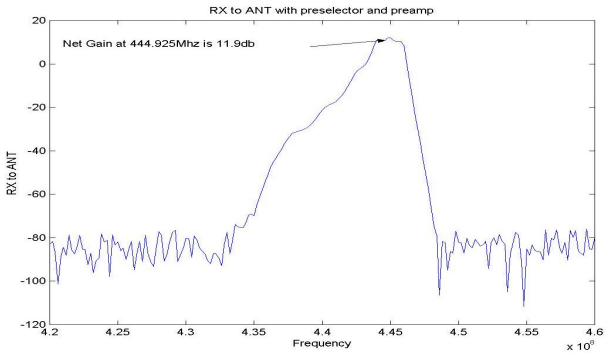
These types of duplexers provide absolutely no out-of-band rejection. I was concerned that the multitude of cell phone transmitters at the site would overload the 444.925 receiver with just the duplexer alone. I also was concerned that the 147.27 two-meter repeater co-located at the same site would overload the 444.925 receiver.

I had previously constructed a small metal enclosure with a six stage preselector followed by a Hamtronics preamp that screws directly on the RX output of the duplexer. At first I was not going to use this since I was looking for a much better preamp but I needed to have something that would prevent any overload the receiver would otherwise experience. I



Out-of-band response, above before, and below after adding preselector and preamp to 444.925 receiver.





In-band response with preselector and preamp

tried it all out on the bench at home and it looked very good. It greatly reduced the amplitude of the out of band frequencies. The net gain from the antenna port to the output of the preamp is around 12 db. See the included frequency plots for the completed duplexer alignment. **Again many thanks to N1QPR, N1VJE & K1KWP for lending a hand.**

Re-installation was done first thing Thursday morning 01/11 just 12 hours after removing the duplexers. I can toot my horn on this one. I changed the mounting of the duplexer so that it now is on top of the power supply instead of on the bottom. A small piece of wood was placed under the power supply. All the wires that were hanging loose in back of the 449.925 repeater rack were cleaned up using some tie wraps.

I connected the output of the preamp to the input on the service monitor's spectrum analyzer and checked for in- and out-of-band signals. I did not see anything in the cell phone frequencies. I watched on 444.925 and was lucky to catch 444.900 keying up; it measured –70 dbm. I then reconnected the 444.925 receiver and checked for de-sense using the IFR signal generator. I could not detect any signs of de-sense.

I stayed at the site for a while talking to some early birds and things seemed to be OK. Later Wayne N1XXI got into it pretty damn good from Blackstone. Andy N1BHI worked it all the way down 128 into Needham without much trouble. There were a few dead spots but not bad. K1KWP and N1QPR showed up and also commented on the fact that they can now hit the 440 repeater where they couldn't before.

I will be paying close attention to this repeater, listening for users getting in and also for noise problems. [Fixed by Weston 220 squelch adjustment.—Ed.]

Please note: since the 444.925 receiver is hearing very well now it will be more prone to picking up that pesky little spur we are getting on the input.

I hope more operators will enjoy using the 449.925 repeater now that it seems to be more useable. De-sense doesn't seem to be a problem any more. Maybe the 444.900 repeater owner cleaned up their transmitter. I have been able to work 449.925 from my QTH with a very weak signal.

Next Meeting — Wednesday March 21, 2001
K9HI: ARRL EMA Section Manager

At the March 21st MMRA meeting, Phil Temples, K9HI, will speak. Phil was recently elected to the post of ARRL Section Manager for Eastern MA. No stranger to the ARRL field organization, Phil also held this post for a term about 8 years ago.

Nominations for MMRA officers and board of directors positions will be held during the meeting. Please consider taking a more active role as a club leader. The survival of the MMRA depends on this kind of support by members.

There will be an opportunity to view excess equipment that the MMRA has accumulated at the Weston site. These items will be sold to free up space and raise some much needed funds.

Calendar of Ham Radio Events

Mar 17: Reading MA QRA Auction
Mar 21: **MMRA meeting.**
Mar 25: Framingham MA Flea Market
Apr 7: Londonderry NH IRS Flea Market
Apr 15: Flea at MIT
Apr 28: Nashua NH NE Antique RC
May 4-5: Hopkinton NH HossTraders Flea
May 16: **MMRA meeting:** trunking radio systems and elections.
May 20: Flea at MIT
Sept 19: **MMRA meeting.**

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

MMRA VE Sessions
3rd Saturday of each Month
9 AM at the Marlboro Public Library
Contact: Bill Wade, K1IJ
781-891-9079 Evenings 6 to 10 PM,
Weekends 8 AM to 10 PM.
Accredited by the ARRL VEC

THE MINUTEMAN REPEATER ASSOCIATION

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WE'RE ON THE WEB!
WWW.MMRA.ORG/~MMRA