



**Annual Membership Meeting ~ Wednesday, 18 May 2022 ~ 7:30—9:30 pm**  
**Amateur Radio's Emerging Role in Investigating Space Weather Near Earth**  
**Dr. Phil Erickson, W1PJE**

**Marlborough Central Fire Station, 215 Maple St (RT 85), Marlborough, MA + ZOOM**

**Directions: Page 7**

**Members: log into your account on [MMRA.ORG](http://MMRA.ORG) to obtain the Zoom info.**

**Non-members: send an email to [contact@mmra](mailto:contact@mmra) to request the Zoom info.**

Since the advent of the telegraph in the 19th century, human technologies have been steadily increasing in size and complexity. As we move forward towards a fully space faring society, successful operational use of systems that cross continents, oceans, and even space requires an increasingly sophisticated understanding of weather beyond near-ground levels, out in the coupled Sun-Earth system. These fluctuations are known as space weather. Knowledge of space weather and space climate is critical to maintaining important technological systems, and has been recently named as both a White House and Congressional priority.

However, research into space weather is not just the domain of professional observing systems. A growing number of national and international amateur-professional partnerships are now emerging that seek to use a common interest and participation in communications over long distances. These activities use information on QSOs, frequency shifts, and other data from contacts and observations across the radio spectrum. In this talk, I will provide an overview of space weather fundamentals, describe historical space weather work by hams, and will introduce the activities of the Ham Science Citizen Initiative (HamSCI) national amateur-professional partnership (<https://hamsci.org>). HamSCI's organized QSO parties and low-cost instrument development provide a scientifically unique way for the ham community to be involved in fundamental discovery within this fascinating part of our planet's atmosphere.

**Continued on Page 4**

**Membership Votes!**

Per the MMRA bylaws, this is an official notice that we will be holding four votes at our Annual Membership Meeting:

- Officer Elections
- Repeater replacement
- Service Monitor replacement
- Emergency Fund

**See Page 4 for details**

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## About the Minuteman Repeater Association

### MMRA Control Operators Responsibilities

<https://www.mmra.org/MMRACOPolicy-March2019.pdf>

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

The MMRA meets each month from September to June. Meeting times, locations, and talk-in frequency vary and are announced in this newsletter and on weekly nets. Meetings are open to all interested parties. Guest speakers and programs of general interest occur in September, November, January, March, and May. The intervening meetings are also open to all members and are for general business.

The Minuteman newsletter is emailed one week before each general interest meeting. Members are encouraged to submit articles: send to the editor at [newsletter@mmra.org](mailto:newsletter@mmra.org). The deadline for articles is the last Friday of the month preceding the meeting.

Each Tuesday evening at 8PM the MMRA links most of the repeaters for an open net. The topic is "Technical Information and Other Stuff". Join us!

Membership in the MMRA is open to all radio amateurs. Annual dues are \$25 per individual or \$35 per family. See our website for details.

Contact information is listed on the top of the last page of this newsletter.

*No part of this newsletter can be copied or posted elsewhere without prior approval from the club.*

### MMRA QRM Policy

MMRA members and all other operators are strongly encouraged to report repeater activity that does not abide by Part 97 rules or accepted amateur radio practice to the board of directors at [contact@mmra.org](mailto:contact@mmra.org) or via other means.

The most effective way (and probably the only effective way) to deal with an individual causing QRM is to NOT engage that individual on the air. Please include the time and date of any incident.

### Repeater and Frequency Information

Band	XMTR Location	Freq	PL	Call	Linking To:		
					Hub 1	Hub 2	
10m	Marlboro East	29.680	131.8	W1MRA	PTL	PTL	
			Linked to 146.79: 9am-3pm every day				
6m	Marlboro East <i>Remote receive Marlboro West: PL=100</i>	53.810	71.9	W1BRI	PTL	PTL	
2m	Brookline	145.160	na	K1MRA	D-Star (REF050C)		
	Belmont	145.430	146.2	KC1CLA	PTL	FTL: DARI	
	Mendon	146.610		K1KWP	FTL	PTL	
	Quincy	146.670		W1BRI	PTL	PTL	
	North Reading	146.715		KC1US	PTL	PTL	
	Weston	146.790		N1BE	PTL	PTL	
				Linked to 29.68: 9am-3pm every day			
	Boston	146.820	146.2	K1BOS	FTL	PTL	
	<i>Remote receive in Brookline Boston: PL = 127.3</i>						
	Billerica	147.120		W1DC	PTL	PTL	
	Marlborough	147.270		W1MRA	PTL	PTL	
1½m	Marlborough	223.940	103.5	W1MRA	PTL	PTL	
	Quincy	224.400		N1KUG	PTL	PTL	
	Weston	224.700		N1NOM	PTL	PTL	
	Burlington	224.880		KC1US	PTL	PTL	
70cm	Lowell	442.250	88.5	W1MRA	FTL	PTL: 446.775	
	Weston *	442.700		N1DCH	Network Hub 2 (PTL to Hub 1)		
	North Reading <i>System Fusion</i>	446.775	88.5 Linked 71.9 Local	W1DYJ	FTL [88.5]	PTL [88.5]	
	Marlborough	448.225	na	W1MRA	D-Star (REF050C)		
	Hopkinton <i>System Fusion</i>	449.575	88.5 Linked 71.9 Local	W1BRI	FTL [88.5]	PTL [88.5]	
	Marlborough *	449.925	88.5	W1MRA	Network Hub 1		
33cm	Boston *	927.0625	D244	K1RJZ	PTL	PTL	
	Marlborough *	927.700		W1MRA	PTL	PTL	
		PL out = 131.8					
Marlborough		144.390	none	W1MRA	APRS Digipeater		
???		145.630	146.2	W1MRA	Fox Box		
*Internet	HUB1- 449.925: IRLP node 4133 / Echolink node 4133 Connected to Echolink NEWENG2 conference (9127) for TIAOS net.						
	HUB2 - 442.700: IRLP node 4136 / Echolink node 4136 Connected to 220 Reflector 9124 on Tuesdays						
	927.0625: IRLP 4977			Normally linked to the NE900 Reflec- tor, 9125. Linked to MMRA via "NEW- ENG2" node 9127 for the TIAOS net. Normally linked together.			
	927.700: IRLP 4978						

Notes: FTL = Full Time Linked (or default state) PTL = Part Time Linked (on schedule or demand)  
Note — a repeater can be linked to only one Hub at a time.

## President's Corner ~ David Hornbaker, N1DCH

**MMRA Elections:** It is annual election time. This year we have a full slate of candidates for election as Officers and Directors. Additionally, there are three action items that require membership vote. See Annual Member Meeting Votes section for information. Your attendance (in person or via Zoom) and vote are necessary.

**In person:** Everyone is invited to attend in person this month's membership meeting at Marlborough Central Fire Station, 215 Maple St (RT 85), Marlborough [Directions](#). Meetings are a great place to meet and greet your fellow hams and to welcome our new members. Bring a friend, you do not have to be a member to attend.

**Via Zoom:** All MMRA meetings are also available via Zoom. The Zoom code is available to members on <http://www.mmra.org>. If you need assistance getting connected, check out "Joining a Zoom Meeting" section in this newsletter, or contact us at [contact@mmra.org](mailto:contact@mmra.org). If you are not a member, you can request the meeting code via email at [contact@mmra.org](mailto:contact@mmra.org).

**Guest Speaker:** Dr. Phil Erickson – W1PJE, Principal Research Scientist and Associate Director of Haystack Observatory, will be speaking on "Amateur Radio's Emerging Role in Investigating Space Weather Near Earth".

**Billerica Repeater:** The Billerica repeater – W1DC, 147.120 has been upgraded and is now fully integrated into the MMRA repeater network. Please note that the PL tone is now 146.2.

**The FoxBox returns:** Rob Evans – N1BE successfully deployed the MMRA FoxBox. Congratulations to Gary – KD1TE, Mike – K1MJC, and Pat – K1PJW who located the box.

**Volunteers needed:** MMRA is looking for members to assist with the MMRA booth at this year's HamXposition, August 26<sup>th</sup> – 28<sup>th</sup>, in Marlborough. If interested, email [contact@mmra.org](mailto:contact@mmra.org).

**VE Exams:** The May VE Session will be held on Saturday, May 21 at 9:00 AM, at City Church Marlborough in the Shoebox Building (adjacent to Kelleher Field), 72 Jefferson Street 2<sup>nd</sup> floor, Marlborough, MA 01752 [Directions](#). Walk-ins are welcome. Please remember to bring a State ID, your FRN, and if upgrading, an Official copy of your current license. For more information, contact Ron – WO1E at [ve@mmra.org](mailto:ve@mmra.org) or [wo1e@mmra.org](mailto:wo1e@mmra.org).

**Membership renewal:** All MMRA memberships expire on August 31. Please check your profile and if your membership expired in 2021 or will expire in 2022, please renew. Renewals may be done on the website, or you can mail your renewal to Minuteman Repeater Association, PO Box 669, Stow, MA 01775-0669. Please allow 7 days for us to process your renewal. Please allow 14 days for renewals that are mailed. While you're on the website (<https://www.mmra.org>) checking your expiration date, please verify your email address.

**Tuesday Net:** Join us Tuesday nights at 8:00 PM for our weekly Technical Information and Other Stuff (TiaOS) net. There will be a lively discussion on all sorts of HAM issues, including equipment, antennas, software, repeaters, and other stuff. The main purpose is to test our ability to link up the repeaters in case of an emergency or, to support an event like the Boston Marathon. You can also join via EchoLink if your radio is a little under the weather. See below for more information.

You can find out more information about how and when the repeaters are linked on the website ([https://www.mmra.org/repeaters/repeater\\_linking.html](https://www.mmra.org/repeaters/repeater_linking.html)).

Please remember to keep your profile up to date, especially if your email changes. Note that if your callsign changes, send email to [contact@mmra.org](mailto:contact@mmra.org) and we will update your callsign in the database.

## Amateur Radio's Emerging Role in Investigating Space Weather Near Earth ~ Dr. Phil Erickson, W1PJE — continued

Dr. Philip J. Erickson, W1PJE, holds a PhD from Cornell University in space physics. He is head of the Atmospheric and Geospace Sciences group, a Principal Research Scientist, and an associate director at Haystack Observatory, a multidisciplinary radio observatory operated by Massachusetts Institute of Technology (MIT). Dr. Erickson is a member of ARRL, RSGB, and TAPR, and vice president of the Nashoba Valley Amateur Radio Club. He is a steering committee member for HamSCI and is a member of the National Academy of Science, Engineering, and Medicine's Committee on Radio Frequencies, which advocates on scientific radio frequency requirements and interference protection for scientific and engineering research.

### Annual Member Meeting Votes

The following votes will be held at the beginning of the Annual Meeting:

#### Annual Elections

##### Officers standing for re-election

President: Dave Hornbaker – N1DCH  
 Vice President: John Spencer – WA1MDD  
 Secretary: Jason Peardon – W1HFP  
 Treasure: Kevin Paetzold – K1KWP  
 Directors

2022 >> 2024: Rob Evans – N1BE

2022 >> 2024: James Lee – N1DDK

##### Candidates for Clerk—vote for one

Stephen M Babbitt –KC1LPZ  
 Howard Shpegel –AC1MN

#### MMRA Equipment Recommendations

##### Weston 2m – 146.79

Approve up to \$3000 to purchase and replace the Weston 2m hub

##### Service Monitor

Approve up to \$2000 to purchase and replace our old service monitor

##### Emergency Fund

Approve up to \$3000 for use in repairing or replacing failed equipment if needed

#### Candidate for Clerk: Howard Shpegel ~ AC1MN

I passed the test for my First-Class Radiotelephone license in 1977 as it was required for my job at CBS Television. All the best techs at CBS were hams so I wanted to be one too. Life got in the way and it took 53 years for me to become one. My Extra Class License was granted on the 22 of February this year and I immediately began learning Morse code. I'm on the Field Day committee with Algonquin ARC and hope to be on the air by then making CW QSOs. For now, I plan to build all my HF equipment and have already completed my (tr)SDX radio. It might even work but until I get my antenna up, it's hard to be sure.

#### Candidate for Clerk: Stephen M Babbitt – KC1LPZ

June 2019, I earned my Technician Class License and my General ticket a month later. Using a handheld VHF/UHF transceiver I joined the Framingham Club. The following year I volunteered to be Club Secretary and assisted with updating the By-Laws. I joined 3 other Ham Radio organizations: the Algonquin Amateur Radio Club, the MMRA and the Arizona Amateur TV Network. I am a firm believer in Emerson's Law: If you want more, you must give more. With all these organizations I listen and learn before I volunteer within my capabilities. With the MMRA I was involved with a group dismantling the antennas on the roof of the Dexter Southfield School in Brookline, volunteered for Public Service with the Algonquin group and published an article on Volunteering in the FARA Circuit 11/19 Newsletter. Also, I volunteered for the annual Marlborough-Hudson Hazmat Day sponsored by Algonquin and wrote articles on the ATN published in the MMRA and FARA Newsletters to initiate interest. When I earned my Extra Class License, I became a VE. Need more on me, please go to QRZ. As Clerk, I will continue contributing to the MMRA.

## 17 March 2022 Membership Meeting

Brought to order by President **Dave, N1DCH**, at 7:30 pm at New England SciTech

**Present:** Dave, N1DCH; Bob, K1IW; Ron, WO1N; Chris, W1GBH; Bob, K5TEC; Dan, KC1NYS; Steve, KC1LPZ; Howard, AC1MN; Larry, W1DYJ

**Via ZOOM:** John, WA1MDD; Kevin, K1KWP; Rob, N1BE; Jason, W1HFP; Jonathan, W1SEV; Chris, KC1QKI; Bill, KA1MOM; Ken, KC1PFS; Ken, KC1X; Ed, KC1CLA; Mike, W1USN; Steve, N1SSR; Steve, K8ZBE; Jim, WB9SWI; Leandra, AF1R; Max, KC3OFA; Bill, N1WEN;

**Speaker: Tim, K3LR**

**Dave, N1DCH**, expressed thanks to **K5TEC** and **New England SciTech** for once again hosting our meeting.

### Agenda - Membership Votes

Purchase a new DB224 antenna for Billerica 147.120

**Moved** by Larry, W1DYJ, not to exceed \$1200

**Seconded** by Steve, KC1LPZ

**Explained** by Bob, K1IW

**Noted** by Mike, W1USN, that money left in the old Billerica club treasury should cover this

**Passed** unanimously

Purchase a spare/backup 7330 repeater controller

**Moved** by Bob, K1IW, not to exceed \$600

**Seconded** by Ron, WO1E

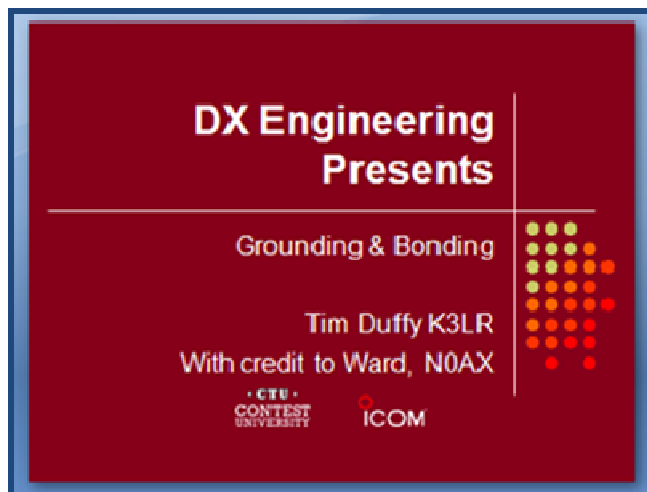
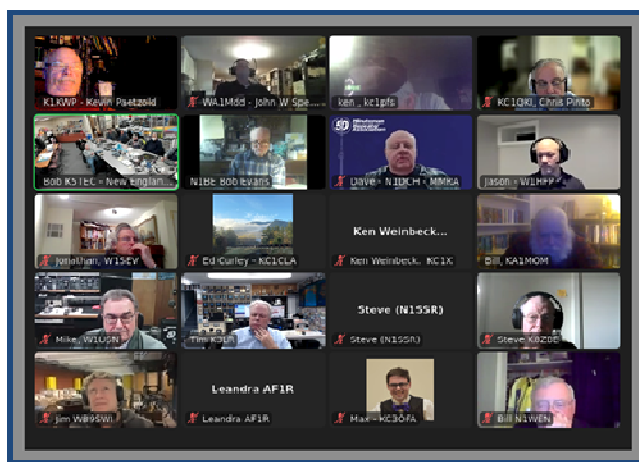
**Explained** by Bob, K1IW, that this will be used for testing purposes for repeater upgrading projects and mated with the spare Fusion repeater for temporary use if needed

**Passed** unanimously

### Agenda - The Evening's Talk

## Grounding and Bonding Tim Duffy ~ K3LR

Tim discussed the science behind grounding and bonding your station, and showed examples of what not to do. He also showed examples of proper installations and the how they are put together. Here are just a few of Tim's slides:





## 17 March 2022 Membership Meeting—continued

### Goals of the Session

- Understand "ground" and "bond"
- Appreciate the different requirements for ac safety, lightning protection, RF and audio
- Illustrate some techniques
- Show how a system approach works
- Point you at more comprehensive resources

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ICOM

### Background References

- *ARRL Handbook*, *ARRL Antenna Book*
- *Grounding and Bonding for the Radio Amateur*
- *NEC Handbook* – at your library
- *Standards and Guidelines for Communication Sites* (Motorola R56) – available online
- *Lightning Protection for the Amateur Station* (Ron Block, NR2B – Jun/Jul/Aug 2002 QST) – ARRL website
- *Power, Grounding, Bonding, and Audio for Amateur Radio and RFI, Ferrites, and Common Mode Chokes For Hams* – available at [k9yc.com/publish.htm](http://k9yc.com/publish.htm)

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### What IS "Ground" Anyway

- Fuzzy definitions:
  - "RF ground" – ain't no such thing
  - "Ground loops" – not the problem you think it is
  - "Single-point ground" – it depends...
- The Earth is NOT – a magic sink into which we can pour RF or lightning and expect it to magically and safely disappear

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### Lightning Protection

- You can't steer lightning, but...you can help lightning make "good decisions"
  - Heavy, low-impedance paths to the Earth
  - Inductance is more important than resistance
  - Paths should be *outside* your residence
  - Don't make it easy for lightning to go through your station on its way to the Earth

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### RF Management

- Everything in the station is an antenna
- Forget about an "RF ground"
- Concentrate instead on bonding
- Equalize voltage to minimize current
  - Eliminates "hot spots"
  - Reduces RFI from common-mode current
  - Reduces sensitivity to physical configuration
  - Minimizes audio "buzz" and hum

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### Ground System

- "One system to rule them all"
- All currents flow on all wires
- A single, solid ground system made of short, heavy, direct connections satisfies all of the requirements for...
  - AC Safety
  - Lightning Protection
  - RF Management & Clean Audio

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A 37 minute YouTube of Tim's talk can be found at: <https://www.youtube.com/watch?v=rRoHJbjUjj0>

## 17 March 2022 Membership Meeting—continued

*Editor's note: my favorite book about all of this >>>>>>*

### Agenda – VE Sessions

Next Session: 9:00 am March 19<sup>th</sup>

Marlborough Central Fire Station

215 Maple St (RT 85), Marlborough, MA

Contact Ron ([WO1E@mmra.org](mailto:WO1E@mmra.org)) for more information

Please tell your friends, who are interested in taking tests, that they must have photo IDs and FRNs

Copy of license required if upgrading (or Proof from ARRL, or QRZ website)

Note: Social Security numbers are no longer accepted by the FCC Everyone must have an FRN

### Agenda – Upcoming Meetings

Meetings – Third Wednesday of the month

April – Business Meeting at New England Sci-Tech & Zoom Teleconference

May – Membership Meeting

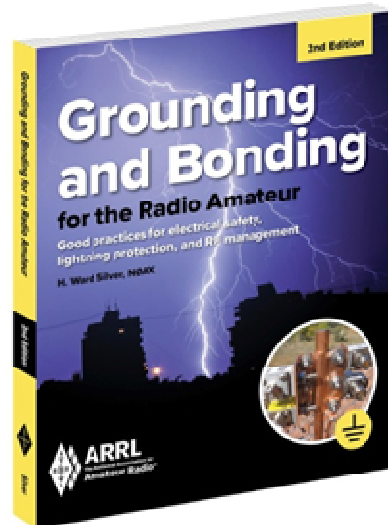
Marlborough Central Fire Station & Zoom Teleconference

Annual Elections

Special Presentation

Guest Speaker Philip Erickson, Ph.D. – W1PJE

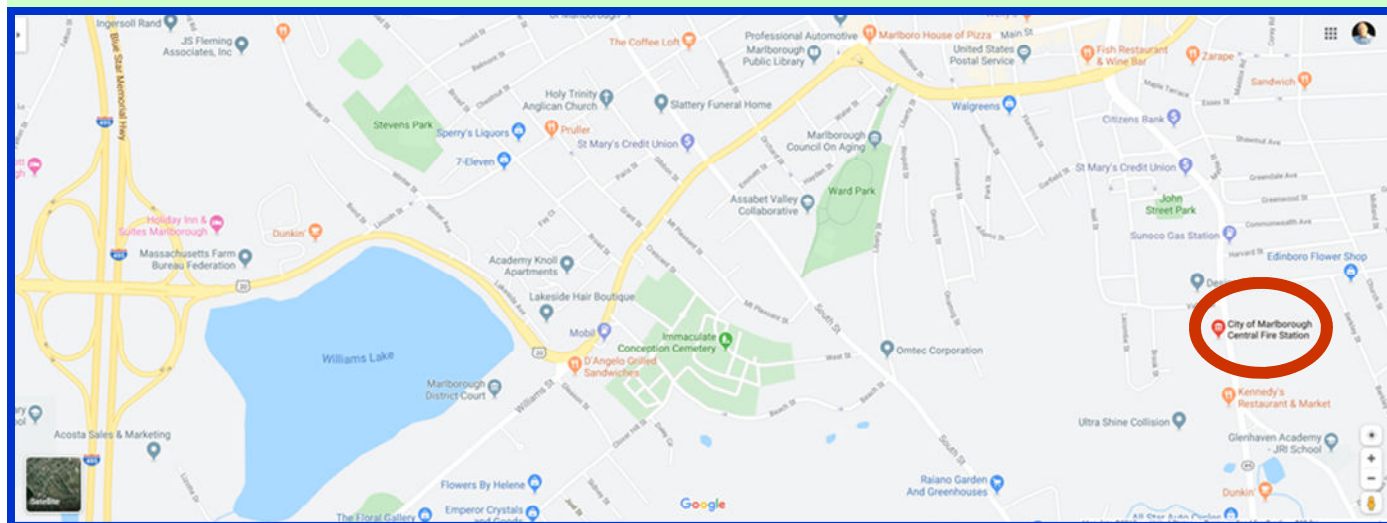
Amateur Radio's Emerging Role in Investigating Space Weather Within near-Earth space



The meeting was adjourned at 8:37 PM.

Submitted by Larry Banks, W1DYJ

**Directions to:**  
**Marlborough Central Fire Station, 215 Maple St (RT 85), Marlborough, MA**  
*Enter through the side classroom door.*



## Repeater Report ~ Bob DeMattia, K1IW

On 22 April, Mike W1USN, Bruce KC1US and I installed the new Billerica repeater, including the link radio and link antenna. This is the equipment from 1200RC that was accepted last year by the MMRA board. In addition to the old Mastr II/Kendecom which was the current 147.12 repeater at the time, 1200RC gave us a Kenwood TKR-750, Astron Power Supply, SCOM 7330 controller, and control receiver radio. MMRA has a spare Mastr II 100W power amp which I adapted to work with the Kenwood. Last winter, I built this into a repeater in my garage.

1200RC is also paying for a new DB224-E four-bay dipole antenna. This is on back order and is expected to arrive in May. When it does, we will schedule another visit to the site to replace the aging Stationmaster.



In other news, since my last update, the new Quincy repeater was installed several weeks ago. The 2m is a Kenwood NXR710 into a Henry Power amplifier, the 220 is a Spectra Engineering MX800. Both are installed into the rack that formerly held the old Marlborough 223.94 machine.

Finally, the Weston 2M power amplifier has been off and on lately. The MMRA board voted to put a motion at our May meeting to purchase replacement equipment for Weston 2m - a setup identical to the new Quincy. In the meantime, MMRA's Yaesu DR1X backup repeater has been installed in Weston.

As a side note, MMRA's service monitor has been very flaky lately. The board will also be putting a motion at our May meeting to purchase a replacement. With 23 repeaters to maintain, this is a necessary tool to have in our portfolio.

## W1DC Repeater News ~ Bruce Pigott, KC1US

Details about the equipment installed in Billerica can be found at <https://www.mmra.org/repeaters/BCA/> The system will have the same capabilities and features as other MMRA sites. The 1200 Radio Club remaining members – Mike W1USN and Mike K1TWF, are thanked for the transfer and for donations for repeater components and operation. The remaining funds have been donated to the F.E.M.A.R.A. scholarship fund.

## Treasurer's Report ~ Kevin Paetzold, K1KWP

The MMRA receives a significant amount of donations each year. On behalf of the club I would like to acknowledge and thank people below who donated since my list in the January newsletter: **AB1HO**, **W1RFF**, **KC1IUN**, and **KB1MQF**. Hopefully I did not leave anyone off (and if I did I am sorry).

***The MMRA fiscal year ends on May 31 which is 13 days after the May meeting and the elections. If there are open financial matters for the club (like for example the club owes you money) then please let me know.***

It may seem like the club has been spending significant money on the system this year. However more than \$3K of the equipment that was replaced/upgraded has been sold so far. At the time of this writing our actual funds for this fiscal year are down by 5% (about \$1600) from June 1, 2021.



## The WR1 callsign – what is it ~ Bob DeMattia, K1IW

When we installed the new Billerica repeater, Mike W1USN removed a placard from the old repeater and placed it on the new one. The placard reads “WR1APB Amateur Radio Repeater, 147.72 in, 147.12 out”. Newer hams probably don’t remember the old “WR” calls. Back in the 70’s, the FCC required a special repeater license. To obtain this license, you actually had to provide the technical details of the operation – transmitter power, etc. The license was specific to that particular system. If anything changed, you had to modify the license. If you had more than one repeater at a location, each one had to have its own callsign.

While I doubt anybody would want to go back to that, the “WR” callsigns sounded kind of nice in CW. The FCC officially ended issuing “WR”s in 1983. Current holders could use the callsign until the license expired, at which point they couldn’t renew them.

Due to an FCC glitch, a few people were able to keep their WR’s under the vanity callsign system until 2004. But aside from this exception, repeater operators had to switch to the trustee’s callsign with a “/R” at the end. At some point, I was unable to determine when, the “/R” requirement was dropped. Although many repeater groups still use the “/R” suffix, MMRA does not.

Belmont 145.43	WR1AFO
Billerica 147.12	WR1ABP
Marlborough 146.61 (now in Mendon)	WR1AAH
Marlborough 147.27	WR1AGI
Quincy 146.67	WR1AAI
Stoneham 146.715 (now in North Reading)	WR1AIW
Weston 146.82 (frequency now 146.79)	WR1ABJ

## MMRA FoxBox Deployed Again ~ Rob Evans, N1BE

The MMRA Fox Box transmits on 145.63 MHz with a 146.2 Hz PL. Transmissions repeat approx. every 165 seconds. The box was hidden where it can be heard in the towns of Hudson and Stow MA until May 2. These hams found it: Gary, KD1TE Mike, K1MJC Pat, K1PJW  
It will be hidden again...

MMRA uses the fox box to train for locating repeater interference. This is a longer distance hunt than ARDF. Therefore the transmitter power is higher and search area is larger. (Fox is on low power ~150mW this weekend -- future hunts may use 2.3W.)

Leave a note in the "mailbox" at the left end of the box to report your success.

Email me directly if you want a hint to help locate the fox.

Happy hunting, Bob—N1BE



## 16 April 2022 Business Meeting — Minutes

Brought to order by President **Dave, N1DCH**, at 7:32 pm at New England SciTech

**Present:** Dave, N1DCH; Kevin, K1KWP; Bob, K1IW; Steve, KC1LPZ; Howard, AC1MN; Larry, W1DYJ; Bob, K5TEC

**Via ZOOM:** Roger, WA1NVC; John, WA1MDD; Rob, N1BE; Eric, W1ENB; Jason, W1HFP; Steve, K8ZBE

### Agenda

#### Elections

##### The current slate is:

President: Dave Hornbaker – N1DCH

Vice President: John Spencer – WA1MDD

Secretary: Jason Peardon – W1HFP

Treasure: Kevin Paetzold – K1KWP

Clerk (*vote for one*)

Stephen M Babbitt – KC1LPZ

Howard Shpegel – AC1MN

Directors

2022 >> 2024: Rob Evans – N1BE

2022 >> 2024: James Lee – N1DDK

**Moved:** W1DYJ, to present the slate at the annual meeting in May

**Seconded:** W1HFP

**Voted:** unanimous

**Action Item:** *Steve and Howard were asked to submit a paragraph or two to the newsletter for publication before the annual meeting and election.*



#### Recent Repeater Updates – Bob, K1IW

**220:** All four MX800's are now in service at Burlington, Quincy, Weston, and Marlborough

The Burlington repeater was in very bad shape and was sent to electronic recycling

Old equipment from Marlborough was sold for pretty much what we paid for that MX800

Quincy MastrII sold for \$225. The amp, if repairable, should fetch about the same, so we will break even in Quincy too.

**Post-meeting:** Bob has repaired the power amp and it is back on eBay

Weston Henry amp sold for \$200. The receiver/transmitters should fetch another \$100 - \$200

**Post-meeting:** Bob has cleaned up these boxes and they are now on eBay

**Editor's note:** *Thanks to Bob, K1IW, for all of this work and \$\$\$ recovery!!!*

**New Quincy 2M** is in service –reports have been excellent

All other systems running normally except

North Reading –no TX PL tone

Weston –rx/txPL board is bad –frequency is around 199.2Hz, but it drifts up and down

Weston –TX PA is intermittent

New Billerica install to happen on Friday – this should make it linkable. **{Note: done}**

Main antenna is on back order and probably won't be installed until June.

MRE tree work complete: done April 4<sup>th</sup>

This is good for now, but may need additional work in about five years

## 16 April 2022 Business Meeting – Minutes, continued

### Current Repeater Status – Bob, K1IW

#### The Good – all recent technology:

HUB1, HUB2, Quincy and Billerica -Kenwood systems (c . 2015)

All 222's are now MX800's (c. 2005)

Hopkinton and North Reading UHF are Yaesu DR2X's (c. 2012)

#### The Bad

Weston 2m (c. 1985), currently has two problems, one of which has already been fixed once

#### The Ugly:

North Reading 2m, Mendon, Boston 2m, Lowell, Brookline are MastrII's (c. 1985)

Belmont is a pair of GM300's (c. 1990) and is essentially un-reparable

The antennas are on a tower that cannot be climbed safely

If they fail, we will not have a repeater at that site

### Future Planning – Bob, K1IW

*We should consider a plan for replacement of the older MastrII equipment. My (K1IW's) priority would be:*

Weston – as previously stated

North Reading – has had PA issues in the past, now has the tone issue

Boston – seems to be running OK

Mendon – OK

Lowell – Squelch is a little strange on it, but otherwise OK

Brookline – DSTAR – would be more difficult to replace

#### Discussion:

A Kenwood/Henry combination for 2M costs about \$2500 (our current "standard" configuration.)

**A New Policy:** after much discussion, we agreed that these old 2M repeaters should no longer be repaired when they fail; they need to be replaced.

We will use the "spare" repeater in the short run as a replacement

We will use the \$2500 emergency repair fund to purchase a new repeater

We will subsequently ask the membership to replenish the emergency fund. (After the meeting this was raised to \$3000.)

#### Weston 2m – 146.79

This has continuing issues with its old hardware

**Moved:** K1IW, to recommend to the annual meeting that we spend up to \$3000 to purchase and replace the Weston 2m hub

**Seconded:** KC1LPZ

**Voted:** unanimous

**Post-Meeting:** Bob installed our backup DR1X. Weston 2m is back up.

### New Repeater Business

#### Service Monitor – Bob, K1IW

Our venerable (and vulnerable) Service Monitor is on its last legs, having slowly had parts of its functionality fail over the past few years

It weighs 40 pounds and is hard to drag to our various repeater sites

It was "pre-owned" when we bought it many years ago.

New ones are much smaller, lighter, and powerful – but they can be expensive

Used ones are also available a reduced cost

**Moved:** K1IW, to recommend to the annual meeting that we spend up to \$2000 to purchase and replace our old service monitor

**Seconded:** N1BE

**Voted:** unanimous

## 16 April 2022 Business Meeting – Minutes, continued

### 10M Repeater

Given that sunspots are coming back, the interest in our 10m repeater (29.68 MHz) has recently increased

It appears to be a bit deaf, although it “talks well.” (The definition of an *alligator*...)

Current linking information:

10m is currently linked to Hub 1 during the Tuesday night TIOS Net

It is also linked during the day to Weston 2m from 9 am to 3 pm local

Before any further effort is focused on 10m, we need to assess the current situation

N1DCH and W1DYJ have stated that they will be looking into antennas for their shacks to access the repeater

No date for reporting success has been recorded

### HamXposition

August 26-28 in Marlborough

Raffle prizes

Jason, **W1HFP**, volunteered to obtain the prizes

**Moved:** N1DCH, to purchase three prizes, not to exceed \$500

**Seconded:** K1KWP

**Voted:** unanimous

Room – Better signage leading to room?

W1DYJ volunteered to approach the YCCC to partner for signs

Staffing of room – **we need people!!!**

Table in the main hall near the room might increase foot traffic

After discussion, probably not a good idea

Refreshments? – *A good idea, more thought needs be done. Is there a Hotel issue?*

Radio and Antenna for talk-in

W1DYJ volunteered a 2m mobile rig and 2m/440 “stick” antenna

K1KWP volunteered a power supply

N1DCH volunteered an antenna mast and tripod

Links to be used: 147.270, 449.925, 223.94, 53.81

Potential Flea Market Table

Does it make sense for the MMRA to purchase a table in the Flea, to promote the MMRA, and potentially sell member’s equipment: at a 20% commission???

FoxBox – should we activate the FoxBox again???

N1BE and K1KWP to collaborate

### New Business

None came before the meeting

### Newsletter

Deadline: Friday, 29 April

Email [W1DYJ@mmra.org](mailto:W1DYJ@mmra.org) or [newsletter@mmra.org](mailto:newsletter@mmra.org)

Meeting adjourned at 9:02 pm local.

Submitted by Larry Banks, W1DYJ



# Northeast HamXposition 2022

AUGUST  
26-27-28

The ARRL New England Division Convention  
The ARRL Hudson Division Convention

at the **Best Western Royal Plaza Hotel, Marlborough, Mass.**



Operate Special Event Station W1A  
Friday DXCC/Contest Dinner  
Saturday Grand Banquet  
Nashua ARC's Amateur Radio Expo  
Closing Ceremony with Door Prizes

Commercial Exhibitors  
220+ space Flea Market  
Forums  
KB6NU 1-Day Tech Course  
License Exams  
New England ARES  
NEQRP Symposium



Saturday Grand Banquet Speaker  
Kit Building Guru - Joe Eisenburg, KONEB

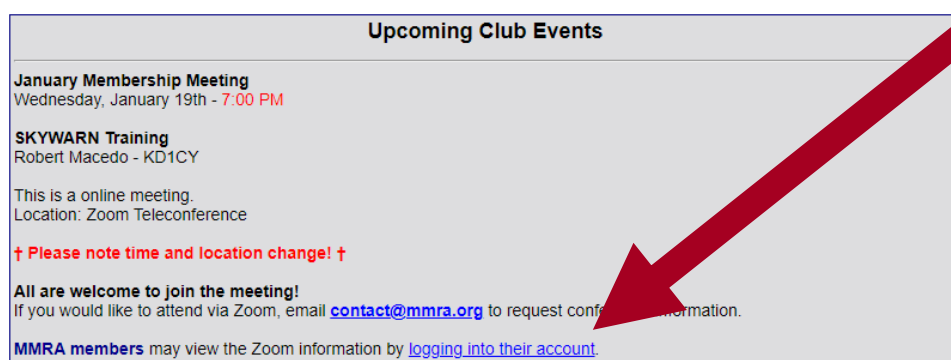
Check out [www.hamxposition.org](http://www.hamxposition.org) for the latest news  
and to purchase tickets in advance!  
general admission \$18

## Joining a Zoom meeting ~ David Hornbaker, N1DCH

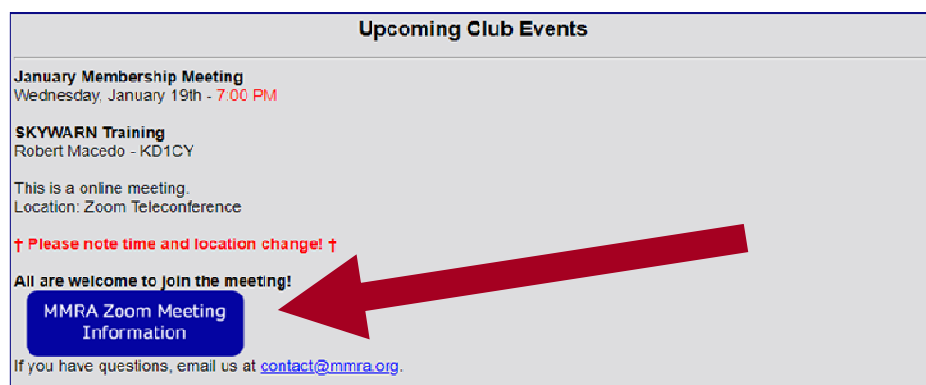
Many members have reported that they are having problems joining MMRA Zoom meetings. Here are some steps to ensure that you can join the meeting.

Install the latest Zoom client from [https://zoom.us/download#client\\_4meeting](https://zoom.us/download#client_4meeting). This link works for Windows, MacOS, and Linux. The Zoom client is also in the Apple Store <https://itunes.apple.com/us/app/id546505307> and the Google Play Store <https://play.google.com/store/apps/details?id=us.zoom.videomeetings>. Be sure to install the proper one as there are both 32 and 64 bit versions.

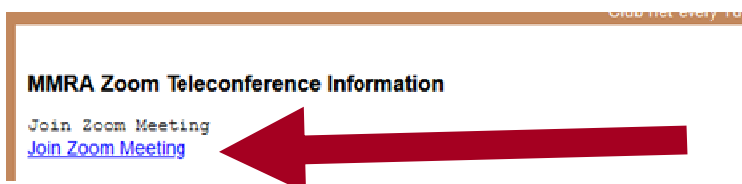
Get the meeting information from the MMRA web site. **You must be logged into the web site.** If you have issues logging into the MMRA web site please email [contact@mmra.org](mailto:contact@mmra.org). **If you are not logged in, you will see a note to log in:**



Once you login, you will see a clickable link to the meeting:



This link will open a page that has the meeting information:



The Join Zoom Meeting link on the website will open a zoom webpage for the meeting, then

(on most OS/Browsers) automatically open the meeting in the zoom client.

## Upcoming MMRA Meetings

Note: Meeting locations and times are subject to change.

Consult the MMRA website for the most up-to-date information.

**ZOOM Teleconference login info is available**

**once you log into your account on MMRA.ORG**

Non-members: if you wish to attend, email [contact@mmra.org](mailto:contact@mmra.org).

Wednesday, 18 May ~ Annual Membership/Elections Meeting ~ 7:30

Amateur Radio's Emerging Role in Investigating Space Weather Near Earth

Phil Erickson – W1PJE

Marlborough Central Fire Station + Zoom Teleconference

Wednesday, 15 June – Business Meeting ~ 7:30

Location: TBD + Zoom Teleconference

Sunday, 28 August ~ "Noonish"

@ HamXposition, Marlboro

Program: TBD

Wednesday, 21 September – Membership Meeting ~ 7:30

Location: TBD + Zoom Teleconference

Tentative Topic: Keyboard Digital — Leandra MacLennan

Wednesday, 19 October – Business Meeting ~ 7:30

Location: TBD + Zoom Teleconference

## Don't Forget! Join Us.

Every Tuesday @ 8 PM

Technical, Informational and Other Stuff Net

The MMRA's repeaters are linked Tuesday nights for the TIOS Net. Keep up with what's happening in the MMRA and ask your ham related questions.

### Net Control Operators:

Week 1	W1DYJ	Larry Banks
Week 2	KB1OQA	Tom Turner
Week 3	KC1CLA	Ed Curley
Week 4	K1KWP	Kevin Paetzold
Week 5	K1BTZ	Jonathan Traum

To connect using Echolink / IRLP during the Net:

- Echolink Conference \*NEW-ENG2\*
- IRLP node 4133

**NOTE: we need another NC to be available as a substitute. If you are interested, email [W1DYJ@mmra.org](mailto:W1DYJ@mmra.org)**

## MMRA Leaders

### Executive Board — Officers

President	Dave Hornbaker	N1DCH
Vice President	John Spencer	WA1MDD
Secretary	Jason Peardon	W1HFP
Treasurer	Kevin Paetzold	K1KWP
Clerk	OPEN	-----

### Executive Board — Directors

Director »2023	Bob DeMattia	K1IW
Director »2023	Roger Coulson	WA1NVC
Director »2022	Rob Evans	N1BE
Director »2022	James Lee	N1DDK

### Technical Officer

Technical Officer	Bob DeMattia	K1IW
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### President Emeritus

Bob DeMattia	K1IW
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### Technical Officer Emeritus

Bryan Cerqua	W1BRI
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### Repeater Trustees

* Belmont 145.43	Ed Curley	KC1CLA
* Billerica 147.12	Mike Rioux	W1USN
* Boston 146.82	John Mullaney	K1BOS
* Boston 927.0625	Rick Zach	K1RJZ
* Brookline 145.16	Joyce DeMattia	K1IWW
* Brookline Rcv 146.82	Bob Phinney	K5TEC
* Burlington 224.88	Bruce Pigott	KC1US
* Hopkinton 449.575	Bryan Cerqua	W1BRI
* Marlborough 53.81	Bryan Cerqua	W1BRI
* Marlborough: 29.68, 144.39, 147.27, 223.94, 448.225, 449.925, 927.70	Lowell 442.25 all as W1MRA	
	Bill Northup	N1QPR
* Mendon 146.61	Kevin Paetzold	K1KWP
* N. Reading 146.715	Bruce Pigott	KC1US
* N. Reading 446.775	Larry Banks	W1DYJ
* Quincy 224.40	Bill Dunn	N1KUG
* Quincy 146.67	Bryan Cerqua	W1BRI
* Weston 146.79	Rob Evans	N1BE
* Weston 224.70	Eddie Mulhern	N1NOM
* Weston 442.70	Dave Hornbaker	N1DCH

### Additional, non-Voting

* Newsletter Editor	Larry Banks	W1DYJ
* Emerg. Coord.	Kevin Paetzold	K1KWP
* Pub. Serv. Coord.	Bruce Pigott	KC1US
* VEC Liaison	Ron Rothman	WO1E
* Net Manager	Larry Banks	W1DYJ
* Web Page Editor	Bob DeMattia	K1IW
* Social Media Coordinator	Steve Umans	K8ZBE

\* Appointed



## Contacting the MMRA



Members: [mmra@groups.io](mailto:mmra@groups.io)  
*Note: This may take some time.*  
*You must be approved by the moderator.*  
 Officers: [contact@mmra.org](mailto:contact@mmra.org)  
 Control Ops: [control-ops@mmra.org](mailto:control-ops@mmra.org)



<http://www.mmra.org/>



@mmraham



<https://www.facebook.com/mmraham>

## MMRA VE SESSIONS

Check out <https://www.mmra.org/exam.html> or email [ve@mmra.org](mailto:ve@mmra.org)

**Ask your friends to become a member** Just let them know that it is not fully automated. Although they can log into the MMRA website immediately, they need to be manually processed. This could take up to a week.

If you haven't updated your MMRA profile in a while,  
now is the time!

Go to < [MMRA.ORG](http://MMRA.ORG) > and log in to do so.

Previous issues of the MMRA Newsletter are available  
at: [www.mmra.org](http://www.mmra.org) > [Newsletter Archive](#) (on the left)

## Heavy Hitters Traffic Net

This net is active on our repeaters Sunday to Friday evenings from 10—11 PM. Active repeaters are:

- 2m:** Mendon (146.61), Quincy (146.67), North Reading (146.715), Boston (146.82), and Marlborough (147.27)
- 220:** Marlborough (223.94), Quincy (224.40), Weston (224.70), and Burlington (224.88),
- 440:** Lowell (442.25), North Reading (446.775), Hopkinton (449.575), and Marlborough (449.925)



## NEW ENGLAND SCI-TECH

New England Sci-Tech Inc is a new 501(c)(3) STEM education center, amateur radio training center, and maker space located at 16 Tech Circle, Natick. It is home to New England Amateur Radio Inc (NE1AR) and the youth radio club Sci-Tech Amateur Radio Society (STARS). NE Sci-Tech welcomes memberships and donations via [www.NESciTech.org](http://www.NESciTech.org) or [www.NE1AR.org](http://www.NE1AR.org).

## Get connected on the MMRA Repeater System ~ Dave Hornbaker N1DCH

What is the best way to get connected on the MMRA repeater system? Try announcing yourself! Just say your call sign followed by "listening". If you want, you can include the last 3 digits of the repeater frequency. For example, "N1DCH listening" or maybe "N1DCH listening on 925", you may very well get a response. Try to connect by announcing yourself several times.

Most of the time, Marlborough Hub1 (449.495) is linked to the following repeaters, Boston (146.820), North Reading (446.775), Mendon (146.610), Lowell (442.250), and Hopkinton (449.575). Remember that when the repeaters are linked, you need to wait two or three seconds after you key up and before you speak. This is especially important on the TlaOS net on Tuesday when most of the repeaters are linked.

You can also link (and delink) the repeaters yourself. See the information you received when you became a member, or check the [User Control Codes](#) once you log into the MMRA web.

Try one of the non-linked repeaters too. There are Hams monitoring them as well. For more information on the repeater network and how it is linked at various times, check out [https://mmra.org/repeaters/repeater\\_linking.html](https://mmra.org/repeaters/repeater_linking.html).