



The Minuteman Repeater Association

A non-profit organization providing communications infrastructure and volunteers for community and emergency events.



The Minuteman

Volume 48, Number 5

May 2019

Annual Meeting & Elections

Wednesday, 15 May 7:30 PM

Introduction to Hotspots

David Hornbaker, N1DCH

New England Sci-Tech Inc.

16 Tech Circle Natick MA (see page 10) Talkin: 147.27



Radio digital hotspots are a low power UHF (or VHF) transceiver (0.7 mw), modem, and computer that provides local RF access to reflectors on the internet. David will discuss hotspots, their setup, and use. Hotspots are available today supporting DStar, DMR, YSF, NXDN, and P25 plus cross mode operation (YSF to DMR, YSF to NXDN, YSF to P25, DMR to YSF and DMR to NXDN). David will show how to build and setup hotspots supporting DStar, DMR and explore cross mode use (DMR to YSF and DMR to NXDN). The emphasis will be on Raspberry PI based hotspots using MMDVM boards and Pi-Star.

David's interest in radio began when he was a kid and hung around the shack of his uncle Myron Hornbaker, WOGFU (SK), Fowler, Kansas. He got his First-Class Radiotelephone License in 1975 (now, General Radiotelephone Operator License). He was employed by a local telephone company as an installer of IMTS telephones in automobiles. Later, he went to work for Wichita, Kansas television station KAKE-TV as a master control operator.

David has worked in the computer industry for over 40 years. He owns and is president of DCH Consulting Services, an Information Technology company. He is a graduate of University Massachusetts Lowell.

MMRA Officer Nominations:

- ♦ N1DCH David Hornbaker – President
- ♦ WA1MDD John Spencer – Vice President
- ♦ K1KWP Kevin Paetzold – Treasurer
- ♦ KC1LAE Jason Peardon – Secretary
- ♦ KC1JUO Charles Miller – Clerk
- ♦ K1IW Bob DeMattia – Director → 2021
- ♦ WA1NVC Roger Colson – Director → 2021

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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. 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 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	To Hub 2
MMRA Voice Repeaters						
10m	Marlboro East	29.680	131.8	W1MRA	PTL	PTL
6m	Marlboro East	53.810	71.9	W1BRI	PTL	PTL
Rmt receive Marlboro West: PL=100						
2m	Brookline	145.160	na	K1MRA	D-Star	
	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
	Boston	146.820		K1BOS	FTL	PTL
	Remote receive in Brookline Boston: PL = 127.3					
Marlborough	147.270	146.2	W1MRA	PTL	PTL	
1½m	Marlborough	223.940	103.5	W1MRA	PTL	FTL
	Quincy	224.400		N1KUG	PTL	FTL
	Weston	224.700		N1NOM	PTL	FTL
	??????	224.880		?????	PTL	FTL
70cm	Lowell	442.250	88.5	K1LVF	FTL	PTL: 446.775
	Weston *	442.700		KG1H	Network Hub 2 (PTL to Hub 1)	
	North Reading	446.775		W1DYJ	FTL	PTL
	Marlborough	448.225	na	W1MRA	D-Star	
	Hopkington	449.575	88.5	W1BRI	PTL	PTL
	Marlborough *	449.925		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					
	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 IRLP 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)

President's Corner ~ David Hornbaker , N1DCH

Greetings to all MMRA members!

Spring has arrived!

The final version of the new **Control Operator Guide** is now posted on the website (<https://mmra.org/MMRACOPolicy-March2019.pdf>). I urge all members to read the policy.

The MMRA website has moved to a new host service provider. The new website is faster and more secure than the old site. **Thanks to Bob, K1IW** for his work in getting the new site up and running.

As you may know, the 223.940 repeater has moved from Hopkinton to Marlborough West. Unfortunately, the 220 antenna at that site is in bad shape and the repeater has had to be taken off the air due to high SWR. The funds for the new antenna have been approved and Bob, K1IW is working to schedule a tower climber to do the install.

Elections are this month! I urge everyone to attend the meeting which is in Natick on May 15th and vote. Good news! We have a full slate of candidates and no one will be doing double duty in the coming year.

Presentations are an integral part of our membership meetings and are about an hour in length. What would you like to see presented in the coming year, which begins in September? **Please send suggestions to the board (contact@mmra.org).**

I look forward to seeing you in Natick on May 15, and hearing you on the TIOS Net, which is every Tuesday at 8:00 PM.

73, David Hornbaker, N1DCH

The Amateur's Code

The Radio Amateur is:

CONSIDERATE...never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL...offers loyalty, encouragement and support to other amateurs, local clubs, and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE...with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY...slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

BALANCED...radio is an avocation, never interfering with duties owed to family, job, school or community.

PATRIOTIC...station and skill always ready for service to country and community.

Paul M. Segal, W9EEA, 1928

March 2019 Membership Meeting

FT8: Not a Prefix, a Powerful New Mode ~ Larry Banks, W1DYJ

These are a selection of the slides from the Membership Meeting talk in March.

The full slide set is available at: <https://www.qsl.net/w1dyj/#OP>.

W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

FT8

Not a Prefix:

A Powerful New Mode

FT/E Juan de Nova & Europa Is
 FT/G Glorioso Is
 FT/I Tromelin Is
 FT/J Cocos Is
 FT/K Christmas Is
 FT/L Kermadec Is
 FT/M Amsterdam
 FT/SZ Amsterdam & St. Paul Is

Larry Banks, W1DYJ
 First licensed: 1962 (K11VFX)
 W1DYJ since 1966 - Amateur Extra
 10 Matthews Way Harpswell ME 04936
 33 Blueberry Hill Road Woburn MA 01801




W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

FT8 Agenda

- Intro to WSJT-X / FT8
- HW Setup
- SW Setup
- JTAAlert
- Reporting Sites
- W1DYJ experience



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

WSJT ~ Weak Signal Joe Taylor

Joe Taylor, K1JT, is a retired Princeton professor and a Nobel Prize in Physics; (discovered a new type of pulsar)

The original version was introduced ~ 2001

WSJT is a computer program for amateur VHF/UHF communication using state-of-the-art digital techniques. It can help you to make contacts using fraction-of-a-second signals reflected from meteor trails, as well as steady signals more than 15 dB below the threshold of audibility. Distinct protocols or "modes" are provided for different types of propagation:

JTWS	For meteor scatter.
FSK441	For meteor scatter.
FSK255	For meteor scatter.
ISCAT	Optimized for meteor and ionospheric scatter on 8 meters.
JTWS	Optimized for meteor and ionospheric scatter on 8 meters. [2002]
JTWS	For Earth-Moon-Earth (EME), "moonbounce" and weak troposcatter. [2005]
JTWS	Designed for EME on microwave bands.
CW	For EME using timed, computer-generated transmissions.
Echo	For testing echoes of your own signal from the Moon.



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

WSJT-X "experimental" Aug 2017 v2.0.1 Feb 2019

Adds

JT9 [optimized for the LF, MF, and HF bands]
 QRA64 [EME]
 MSK144 [Meteor Scatter on the VHF bands]
 WSPR [Weak Signal Propagation reporter, probing potential propagation paths]

FT8 Targeted multi-hop sporadic E propagation on 6m and possibly higher VHF bands... shorter T/R period than JT65 or JT9 due to the sometimes very short openings.

The popularity of FT8 on HF is largely a happy accident in that it fulfilled a latent frustration of many potential users of WSJT-X with the slow rate of QSOs using 1 minute T/R periods.

Email: 1/10/19, Bill Somerville, G4WVS



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

What is FT8? Technically

Named for:
 Steven Frank: K9AN & Joe Taylor: K1JT


8-frequency shift keying format
 15 Second T/R timing
 Tone spacing: 6.25 Hz
 50 Hz bandwidth
 77 bit word + 14 bit CRC
 → 2⁷⁷ = 151,115,727,451,828,848,638,272
 (about 1.5 x 10²³) possible messages.



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

What is FT8? Operationally

- Designed for **WEAK SIGNAL** Qs
- Absolute minimum QSO info
- Maximum of 13 free form characters
- Very structured syntax
- Both ends must use the same WSJT syntax



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge


FT8 Sensitivity

Typical S/N (BW = 2500 Hz):

SSB	+10 dB
CW	+/- 0 → -10 dB
	-15 (best radio/ears)
FT8	-21 dB
WSPR	-31 dB

More sensitive than CW!

From Joe Taylor, K1JT



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

FT8 is Controversial!

(Disruptive Technology)
 Part 97: advance the communication and technical skills of radio

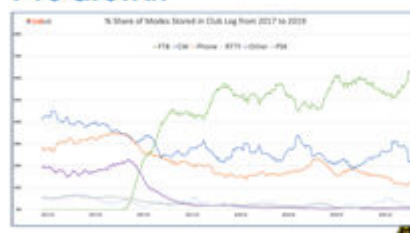

FT8 → RTTY
 is like
 CW → Spark
 or
 SSB → AM

In fact, in some contests it is "replacing" CW, SSB, & RTTY



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

FT8 Growth


W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

FT8 HW Setup

Essentially the same as PSK31 or AFSK RTTY

Transmitting
 → NO processing, ALC -0, NO equalization

Receiving
 → NO noise reduction, FLAT response, full SSB BW
 → Let the WSJT-X software do it's thing



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

FT8 SW Setup

Read the Fine Manual

RTFM!

You WILL NOT operate FT8 effectively if you don't.

I'm only covering a small portion of the application.

Windows Clock → Meinberg NTP



W1DYJ - Larry Banks www.qsl.net/w1dyj TECHNICAL BASICS: W1DYJ © Challenge

FT8 GUI




From the Treasurer ~ Kevin Paetzold, K1KWP

Recent Donations

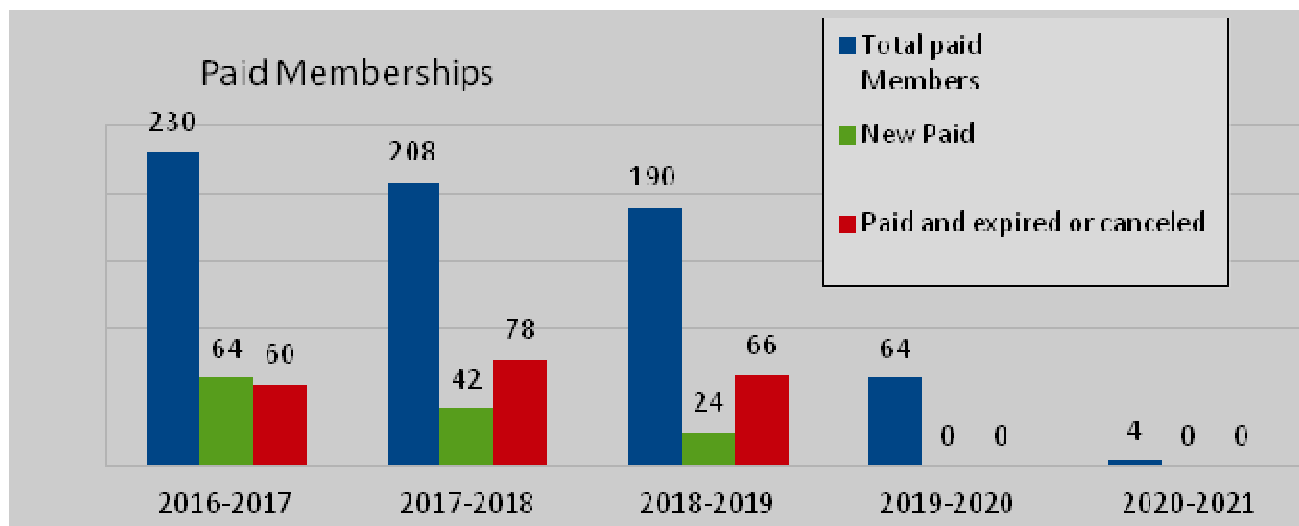
In previous newsletters we listed donations for the last couple years. To continue that acknowledgment on behalf of the MMRA board and the MMRA membership we would like to thank the individuals below for their recent donations (since the list published in the January 2019 newsletter):

KC1KVY WA1JIM K1LTD K1KJR AB1LD NE1RD WH6DSN KC1US

Membership Report/Renewals

The MMRA membership year runs from September 1 until August 31 of each year. There is a grace period for those who have not renewed from September 1 until January 1.

The chart below shows that there were 24 new members since January 1 2019. The chart below shows that 66 people did not renew for the current membership year (which started on September 1, 2019). 64 members have already renewed for the 2019-2020 membership year. Membership dues are by far the primary income source for the MMRA and your continued membership and dues are needed and appreciated.



New paid members

On behalf of the MMRA board and the MMRA membership we would like to acknowledge and welcome the individuals below who joined the MMRA since January 1:

**K1JTO K1TCK KC1KFJ KC1KTY KC1KUY KB1LBH KC1LBI KZ1CY N0LOU
N1DIE N9JBT NN1C W1BJ W1FSH W1GDK W1SHS WP4OFO**

Newly licensed Ham Members

For several years the MMRA has been offering free memberships to new hams. On behalf of the MMRA board and the MMRA membership we would like to congratulate and welcome the individuals below who recently received licenses and joined the MMRA since January 1:

**AG5SM K1ENB KC1KUZ KC1KVM KC1KVY KC1KZF KC1LAA KC1LAB
KC1LAC KC1LAD KC1LAE KC1LDZ KC1LEA KN6ARW**

17 April Business Meeting ~ Minutes

Charles Miller, KC1JUO, Clerk

Business Commenced at 18:34 at the Marlboro Library.

Present were:

- ◆ Dave Hornbaker (N1DCH) President
- ◆ John Spencer (WA1MDD) Vice President
- ◆ Kevin Paetzold (K1KWP) Treasurer
- ◆ Charles Miller (KC1JUO) Clerk
- ◆ Roger Coulson (WA1NVC) Director
- ◆ Bob DeMattia (K1IW) Director
- ◆ Clark Conti (N1NVK) Director
- ◆ Bryan Cerqua (W1BRI) Technical Director Emeritus
- ◆ Bruce Pigott (KC1US) Public Service Coordinator
- ◆ Jason Peardon (KC1LAE)
- ◆ Jeff Lehmann (N1ZZN) on the phone

Agenda - Reviewed circulated slides

Nominating committee report:

- ◆ N1DCH David Hornbaker – President
- ◆ WA1MDD John Spencer – Vice President
- ◆ K1KWP Kevin Paetzold – Treasurer
- ◆ KC1LAE Jason Peardon – Secretary
- ◆ KC1JUO Charles Miller – Clerk
- ◆ K1IW Bob DeMattia – Director → 2021
- ◆ WA1NVC Roger Colson – Director → 2021

Motion to Re-approve the annual maintenance budget for \$2500. The funds are for emergency replacement of equipment, not extending functionality

Motion to purchase the centerfold for a coverage map (\$250) for the HamXposition2019 @Boxboro: brochure

- ◆ KC1JUO volunteered to create Simple Color Coverage Map

New Web-server - Motion to approve (vote was unanimous) at \$50/year.

Discussion about PL tones North Reading & Hopkinton:

- ◆ Some people are checking into the net on Hopkinton and/or North Reading using the local PL tone instead of the linked one - knocking the repeater off the net into local mode - net script should specify stations should only use a PL of 88.5 on UHF repeaters

Other repeater discussions:

- ◆ Belmont
- ◆ Brookline
- ◆ Tone Encoder for Prudential Repeater

◆ MRE/MRW Status:

- (Motion): Fix BBY PL New board @50 (unanimous)
- (Motion) : Tri-band antenna (unanimous) \$2462
- Extended discussion related to what antenna to purchase. K1IW proposed Kreco Antenna was changed to W1BRI recommended Telewave Antenna

(Motion) : Need to paint Marlborough West and East shelters; stay consistent with other buildings (unanimous) \$100

3G / 4G - Discussion - Proactive / Go to Telo / GSM & LTE combination

- ◆ Current Freedom Pop devices \$11/mo changed to Tello (tello.com) service provider \$7/month Two additional devices to be activated for MDN and HOP before Sprint stop accepting new devices on May 1st.

Discussion: The former W1UQ 146.985 repeater in Brookline lost its site, will be semi-temporarily located in MRE shelter. The discussion included:

- ◆ Run different mode : Extend club capability (DMR?)
- ◆ How can we do something new?
- ◆ (Motion) - Plug it in and decide technical details later (majority)

Default State of Repeaters : Action Items: Publish default link configuration / Need to make sure website is accurate.

Discussion related to Hub 1 and Hub 2 configurations

Boston Marathon Discussion: Numerous anomalies identified.

Bruce is going to write May newsletter articles

Net on Sunday 19:00 Belmont Repeater - SKYWARN training?

- ◆ Belmont repeater is carrying the weekly New York SKYWARN training off the DARI network - this is confusing, repeater should be delinked during this time

MMRA Treasurer Report

Meeting Adjourned - 20:27

Tech Corner ~ Bob DeMattia, K1IW, Technical Officer

Those who have visited our website recently may have noticed it is running a bit faster. This is because we have changed to a new provider. The new provider also has secure HTTP available at no extra charge, so your password information (and the data that is sent back) is now encrypted. All of this at a cost reduction to the club of \$130 a year!

Computers are not the only thing being worked on at MMRA. The Hopkinton 440 machine recently got a controller upgrade. The Hopkinton 223.94 has been relocated to Marlborough. The antenna used for 220 at Marlborough is bad, so the board has approved its replacement. The tower climber should be arriving in late May / early June. Until then, we are keeping 223.94 off the air so that the high SWR won't damage the repeater.

On June 1st, we'll be repainting the Marlborough East shelter and replacing the wooden antenna mast. On June 8th, we'll be repainting the Marlborough West shelter. **If you are interested in helping out at either of these event, send an email to me at k1iw@mmra.org.** We have a few people, but still need a few more at each event..



The updated Hopkinton Yaesu DR1X repeater with the new SCOM 7330 controller above.

DID YOU KNOW?

The MMRA North Reading and Hopkinton UHF repeaters, 446.775 and 449.575, respectively, feature automatic selection for running unlinked or linked to the MMRA network. For a local ragchew, use a PL tone of 71.9. If you want to be on the network, use a PL tone of 88.5. The tone on the repeater transmitter will follow whichever tone you are using. If you want to hear everything on the repeater, simply leave your receiver in open mode and use a tone only on transmit. ***It is especially important to use a PL of 88.5 during the Tuesday night TIOS net!***

[Editor's note: ***Tech Corner*** is a new column that will appear from time-to-time with information of a technical nature. All of you can contribute to this column. Send your (long or short) articles/notes/observations to newsletter@mmra.org.]

Public Service Update ~ Bruce Pigott, KC1US

You may have noticed some updates to the MMRA Public Service web page. It now has a calendar with the latest repeater reservations and event information. For small events using one repeater, that will be the only notice. When more than one repeater is being used or a linking configuration is changed, a Twitter announcement will be made, which will be seen on the MMRA home page. For large events, the Yahoo group will include more details. We ask that you use other repeaters when these events are in progress.

To be informed about Public Service events run by other clubs, check the Public Service box in the Interests section on your member Profile Information. Requests for help will then be forwarded to you.

Two clubs on the North Shore have a combined calendar that can be read by clicking the link on the MMRA Public Service page. Check out the organizations that are being supported and some of the areas the events are in. Then sign up. You will see more picturesque settings by getting off major highways instead of just zipping by. Last year I participated in events from Winchedon to Gloucester, run by five different clubs.

From the Editor: Why Amateur Radio?

From time-to-time it makes sense for us to remember why the Federal Government (and the FCC) gives us all of this free spectrum to "play" ham radio. From FCC Part 97:

Subpart A—General Provisions

§97.1 Basis and purpose.

The rules and regulations in this part are designed to provide an amateur radio service having a fundamental purpose as expressed in the following principles:

- (a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.
- (b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.
- (c) Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.
- (d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.
- (e) Continuation and extension of the amateur's unique ability to enhance international goodwill.

Use of Roger Beeps ~ Bruce Pigott, KC1US

Lately some inexpensive radios that have nonstandard amateur radio features have been purchased. One of the options is a roger beep at the end of a transmission. It is the policy of the MMRA, when using the club repeaters, to disable this mode. The MMRA system uses courtesy tones to indicate reset of the transmission timer and linking status. On Baofeng radios, it is easy to turn off by going to menu item 39, and setting this feature to off, then saving the change. Other brands of radios will have similar instructions. Also check the deviation setting; it should be set to wide. Narrow is a requirement for use on commercial F.C.C. Part 90 bands, but not on the ham bands.

Upcoming MMRA Meetings

Note: Meeting locations and times are subject to change.
Consult the MMRA website for the most up-to-date information.
Teleconference numbers will be available one week before a meeting—if you wish to attend, email contact@mmra.org.

Sunday, 9 Sept ~ Boxboro! 2018 Noon

Wednesday, 19 September ~ Membership Meeting
Topic: Discovering Ham Radio through Makerspace
Location: New England Sci-Tech Inc., Natick

Wednesday, 17 October ~ Business Meeting
Location: Lancaster

Wednesday, 28 November ~ Membership Meeting
Speaker/Topic: CHIRP / HT Workshop
Location: New England Sci-Tech Inc., Natick

Wednesday, 19 December ~ Business Meeting
Location: Marlboro Library

Wednesday, 16 January ~ Membership Meeting
Speaker/Topic: Tim Duffey, K3LR, Contest University (via Skype)
Location: New England Sci-Tech Inc., Natick

Wednesday, 20 February ~ Business Meeting
Location: Teleconference

Wednesday, 20 Mar ~ Membership Meeting
Speaker: Larry Banks, W1DYJ
Topic: FT8: Not a Prefix, a Very Powerful Mode
Location: Microsoft, Burlington

Wednesday, 17 April ~ Business Meeting
Location: Marlboro Library + Teleconference

Wednesday, 15 May ~ Annual Meeting & Elections
Speaker/Topic: Dave Hornbaker, N1DCH / Intro to Hotspots
Location: New England Sci-Tech Inc., Natick

Wednesday, 19 June ~ Business Meeting
Location: New England Sci-Tech Inc., Natick+ Teleconference

MMRA Leaders

Executive Board — Officers

President	David Hornbaker	N1DCH
Vice President	John Spencer	WA1MDD
Secretary	David Hornbaker	N1DCH
Treasurer	Kevin Paetzold	K1KWP
Clerk	Charles Miller	KC1JUO

Executive Board — Directors

Director »2019	Bob DeMattia	K1IW
Director »2019	Roger Coulson	WA1NVC
Director »2020	Clark Conti	N1NVK
Director »2020	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 145.430	Ed Curley	KC1CLA
* Boston 146.820	John Mullaney	K1BOS
* Brookline 145.16	Joyce DeMattia	K1IWW
* Brookline Rcv 146.82	Bob Phinney	K5TEC
* Boston 927.0625	Rick Zach	K1RJZ
* ???????? 224.880	?????	?????
* Hopkinton 449.575	Bryan Cerqua	W1BRI
* Lowell 442.250	Vince De La Flor	K1LVF
* Marlborough 53.810, Quincy 146.670;		
	Bryan Cerqua	W1BRI
* Marlborough: 29.68, 144.390, 147.270, 223.940, 448.225, 449.925, 927.700 — all as W1MRA		
	Bill Northup	N1QPR
* Mendon 146.610	Kevin Paetzold	K1KWP
* N. Reading 146.715	Bruce Pigott	KC1US
* N. Reading 446.775	Larry Banks	W1DYJ
* Quincy 224.400	Bill Dunn	N1KUG
* Weston 146.790	Bob Evans	N1BE
* Weston 224.700	Eddie Mulhern	N1NOM
* Weston 442.700	David Wolfe	KG1H

Additional, non-Voting

* Newsletter Editor	Larry Banks	W1DYJ
* Emerg. Coord.	Kevin Paetzold	K1KWP
* Pub. Serv. Coord.	Bruce Pigott	KC1US
* VEC Liaison	Bill Wade	K1IJ
* Net Manager	Larry Banks	W1DYJ
* Web Page Editor	Bob DeMattia	K1IW
* Appointed		

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	WA1JIM	Jimmy Devaire
Week 3	KC1CLA	Ed Curley
Week 4	K1KWP	Kevin Paetzold
Week 5	KB1OQA	Tom Turner

To connect using Echolink / IRLP during the Net:

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

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

MMRA VE Sessions

Check here for the schedule:

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

Contact: Bill Wade, K1IJ 617-699-3670
Evenings 6 - 10 PM Weekends 8 AM to 10 PM.

Contacting the MMRA



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



Members: MMRA@yahoogroups.com

Officers: contact@mmra.org

Control Ops: control-ops@mmra.org



@mmraham



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

Calendar of Ham Radio Flea Markets & Gatherings

For more information: <http://mit.edu/w1gsl/Public/ne-fleas>

18 May	Brookline NH	NEARC
18 May	Goshen CT	SoBARC @FG
19 May	Cambridge MA	Flea at MIT
2 Jun	Queens NY	HOSARC @HOS
8 Jun	Windsor CT	VR+CMus
9 Jun	Bethpage NY	LIMARC @Briercl
10 Aug	St Albans VT	STARC @Elks
25 Aug	Newtown CT	CARA @TownHall

6-8 Sep HamXposition2019
@Boxboro!

7 Sep	Windsor CT	VR+CMus
28 Sep	Brookline NH	NEARC
15 Sep	Cambridge MA F	lea at MIT
6 Oct	Queens NY	HOSARC @HOS

11,12 Oct Deerfield NH
NEARfest XXVI @FG

20 Oct	Cambridge MA	Flea at MIT
26 Oct	Gails Ferry	TriCity ARC
27 Oct	Hicksville NY	LIMARC @LevitHall



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 or www.NE1AR.org.

Directions to New England Sci-Tech Inc.

16 Tech Circle

Natick MA 01760

From the north: take Rt 95 or Rt 27 or Rt 495 south to Route 30 toward Wayland. Once in Wayland, turn South on Oak Street and in 1/2 mile look for Tech Circle on your left. Follow Tech Circle to the end.

From the south: take Rt 95 or Rt 27 or Rt 495 north to Route 9 toward Natick. At the Wellesley-Natick line, turn North on Oak Street and in 1/2 mile look for Tech Circle on your right. Follow Tech Circle to the end.

From the east or west: follow either Rt 30 or Rt 9 toward Natick, turn onto Oak Street at a set of traffic lights, and in 1/2 mile look for Tech Circle. Follow Tech Circle to the end.

