January Membership Meeting ~ Wednesday, 18 January, 7 PM
12V Power for Emergency Power Use
Greg Troxel, N1DAM

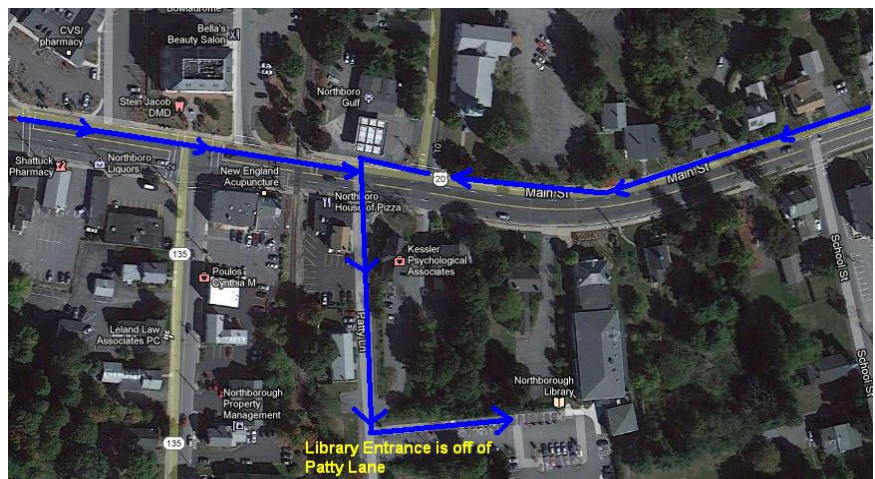*Location:* **Northborough Public Library**   *Talkin: 147.27*

Greg Troxel, N1DAM, will give a presentation about 12V lead-acid batteries and (off-grid) solar power for emergency use for Amateur Radio. The talk will cover testing batteries (and why you should not trust batteries you have not tested), types of solar charge controllers, metering, power distribution and connectors, and system sizing. Greg will describe his experience with powering his station entirely off-grid since February 2013. The talk is aimed at those who have hooked a 12V power supply up to a 12V radio, but have not really contemplated extended operation without utility power.

Greg joined the MIT UHF Repeater Association in the first week or so of his freshman year at MIT and remained involved through gradual school. He obtained his first Amateur license (and current call) early in 1984, sitting for the exam at the Customhouse building in Boston with an actual FCC examiner. He bought a pair of 33 Ah batteries at the MIT flea around 1990, and has had backup power in various states of functionality ever since. Besides occasional operation on HF, local repeaters, and 2m simplex, he has recently operated Field Day both solo (1B) and with PART (3A). He still needs to get around to building a Pixie kit bought at Boxborough in 2012. Professionally, Greg is a researcher in networking at the organization formerly known as Bolt, Beranek and Newman. Besides Amateur Radio, Greg has volunteered for the town of Stow about light pollution issues and perambulation of town bounds, and is active in NetBSD and OpenStreetMap.

Directions to the Northborough Free Library

Directions from I-495:

- From I-495, take Exit 24B which is Rt. 20 West toward Northborough.

- Follow Rt. 20 West about 3.5 miles, into the center of Northborough.

- Opposite the Gulf Station on the right, turn left into Patty Lane.

- The Northborough Free Library parking lot will be on the left.

LIBRARY PARKING: Patty Lane is right across from the Gulf station. Follow Patty Lane to the library parking lot.

The red brick building next to the library has a tempting driveway, being right next to the library, but it is private property. Please respect the owners' property, and use the library lot. Additional parking is available on the corner of Hudson and Pierce, or at Town Hall.

Traffic exiting Patty Lane should stay to far right, even for left turns, to avoid traffic turning in. The lane closest to the pizza shop is for INCOMING traffic ONLY from Rt. 20 eastbound.

Table of Contents

About the Minuteman Repeater Association

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 (usually) on the 3rd Wednesday of 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 which can be sent 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.

Email to the club leadership should be sent to contact@mmra.org. The MMRA maintains a web site at: http://www.mmra.org/

An email distribution list for club members named "MMRA" is at: http://groups.yahoo.com/

You can also follow us on twitter @mmraham and like us on Facebook: https://www.facebook.com/mmraham.

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. Measures are being taken to make audio recordings of repeater activity.

Repeater and Frequency Information

Band	XMTR Location	Freq	PL	Call	Linking To Hub 1	Linking To Hub 2
MMRA Voice Repeaters						
10m	Marlborough	29.680	131.8	W1MRA	PTL	PTL
6m	Marlborough *Remote receive in Hopkinton PLin = 173.8*	53.810	71.9	W1BRI	PTL	PTL
2m	Brookline	145.160	na	K1MRA	D-Star	
	Belmont	145.430		KC1CLA	PTL	FTL: DARI
	Mendon	146.610		K1KWP	FTL	PTL
	Quincy	146.670	146.2	W1BRI	PTL	PTL
	North Reading	146.715		KC1US	PTL	PTL
	Weston	146.790		N1BE	PTL	PTL
	Boston *Remote receive in Brookline Boston: PL = 127.3*	146.820		K1BOS	FTL	PTL
	Marlborough	147.270	146.2	W1MRA	PTL	PTL
1¼m	Hopkinton	223.940		KB1LOY	PTL	FTL
	Quincy	224.400	103.5	N1KUG	PTL	FTL
	Weston	224.700		N1NOM	PTL	FTL
	Marlborough	224.880		W1MRA	PTL	FTL
70cm	Lowell	442.250		K1LVF	FTL	PTL: 446.775
	Weston *	442.700	88.5	KG1H	Network Hub 2 (PTL to Hub 1)	
	North Reading	446.775		W1DYJ	FTL	PTL
	Marlborough	448.225	na	W1MRA	D-Star	
	Marlborough	449.575		W1BRI	PTL	PTL
	Marlborough *	449.925	88.5	W1MRA	Network Hub 1	
33cm	Boston *	927.0625		K1RJZ	PTL	PTL
	Marlborough * *PL out = 131.8*	927.700	D244	W1MRA	PTL	PTL
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; Connected to 220 Reflector 9124 on Tuesdays					
	927.0625: IRLP 4977			Normally linked to the NE900 Reflector, 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)

November Membership Meeting
Linux in the Hamshack
Andy Stewart, KB1OIQ

Andy presented his "Andy's Ham Radio Linux." This is free software to both make our hobby more fun and operating easier.

Andy has been running Linux user groups since 1997, and taught Linux classes for several years in Chelmsford. He created his Linux package in 2011 as a way to give back to both the ham and Linux communities.

Andy is President of the Police Amateur Radio Team (PART) in Westford, holds an amateur extra license, and is also an ARRL Assistant Section Manager for EMA. He has a master's degree in electrical engineering from WPI, and by day works as a digital logic verification engineer.

Note that these are only a few of his slides. The slides with screen shots will not show up at this size. However you can request the full slide deck from Andy at kb1oiq@arrl.net.

Linux® in Your Ham Shack

Andy Stewart
KB1OIQ
November 16, 2016

Presented to the
Minuteman Repeater Association

kubuntu

Andy's Ham Radio Linux

- ISO file freely available
  - Ubuntu Linux 14.04.* Remix
  - Create Live DVD and boot it for test drive
  - Create a bootable USB thumb drive
  - Install it on the hard drive
- Download from SourceForge
  - Andy's Ham Radio Linux
  - Search for "KB1OIQ" on SourceForge
  - Software is GPL or similarly free license

kubuntu

Target Computer

- Older computer (but newer works, too!)

- Bare minimum requirements
  - 1-2 GB of memory
  - Network for hard drive installation
  - 1GHz x86 processor (more for SDR)
  - 8-10 GB for hard drive install

kubuntu

Initial Desktop

kubuntu

Desktop

- Icewm
  - Light on system resources
  - Virtual desktops
  - Easy customization, many themes available
- Menus
  - Customized for amateur radio use
- Toolbar
  - Menu, quickly start apps, status monitors, clock

kubuntu

System Software Highlights

- Wicd Network Manager (wired and wireless)
- Midori Browser (lightweight, no proprietary Flash)
- Ubiquity hard drive installation program
- live-usb-install – create a bootable thumb drive
- Shutdown/reboot by menu
- Graphical file manager, PDF viewer, text editor
- PulseAudio sound and utilities
- xosview system monitor
- Smart package manager

kubuntu

November Membership Meeting, continued
Linux in the Hamshack ~ Andy Stewart, KB1OIQ

Documentation

- Programs have their own documentation
  - Search the Internet for the program's website
- Docs specific to this software collection:
  - Menu->Documentation->
    - RELEASE_NOTES
    - CHANGES (from release to release)
    - Icewm docs
  - See also files in this directory:
    /usr/local/share/doc/Andy_Ham_Radio_Linux

kubuntu

Ham Radio Software Summary

- Logging: cqrlog, xlog, TQSL (for LoTW)
- APRS: Xastir, soundmodem, direwolf
- Digital modes: Fldigi and friends (NBEMS)
  - Qsstv, wsjt(-x), Echolink client
- CW: xcwcp, qrq, cwwav (text to CW)
- Antenna analysis:
  - Xnec2c, Fl_Moxgen, aa-analyzer
- Satellite: Gpredict, Fox 1A telemetry decoder

kubuntu

More Ham Radio Software

- EDA Software
  - gschem – schematic capture
  - pcb – board layout
  - Spice and GUI with waveform viewer (gwave)
- SDR
  - gqrx – sdr radio receiver used with USB dongle
  - Gnuradio companion
- FreeDV / Codec2
- Pskmail client and server

kubuntu

Digital Modes

Fldigi – W1HKJ and friends

Supports a large(!) number of digital modes
Keyboard to keyboard communications
BPSK-31, RTTY, Hellschreiber, and more!
ARQ file transfers (auto repeat request)
NBEMS – Narrow Band Emergency Messaging System
Great support! Yahoo Group: linuxham
Fldigi, fllog, flmsg, flrig, flarq, flwrap, flwkey

kubuntu

FreeDV

- Free Digital Voice
- Originally written in response to proprietary D-Star
- Codec2: David (VK5DGR) Rowe
- FreeDV: Mel (K0PFX) Whitten
- Digitally encoded voice for HF transmission
  - 1600 bits/sec, 1.1khz bandwidth, 14.236 MHz
  - Requires 2 soundcards
  - Very actively developed: now down to 700 bits/sec(!!)
- Linux, Windoze, and Apple versions are available

kubuntu

Software Created by KB1OIQ

- Fl_MoxGen
- aa-analyzer
- Micro-Fox Config GPL
- TinyTrak3 Config GPL
- Perl scripts for Wordsworth
- All are freely available on SourceForge

kubuntu

Companies to Thank #1

- RigExpert Ukraine Ltd.
- KB1OIQ asked for information to retrieve data from the device
- They said YES!
  - Info is posted on RigExpert website.
- Many thanks to Denis Nechitailov!!!
- aa-analyzer.pl was created
- Works on many/most/all(?) AA-xxx analyzers
- Download from Sourceforge.net

kubuntu

Companies to Thank #2

- Byonics, LLC in Chandler, AZ
- MicroFox 15 and TinyTrak3
- Many thanks to Allen Lord and Byon Garrabrant!
- Download from Sourceforge.net

kubuntu

You can request the full slide deck from Andy at kb1oiq@arrl.net.

December Business Meeting

James Lee, Clerk pro tem, N1DDK

The meeting was called to order at 7:06 pm by president Dave Wolfe at New England Air Gun at 188 Central Street Hudson, MA in the Cafeteria.

Preset were: N1DDK, W1BRI, N1NVK, KG1H, WA1NVC, and K1IW.

Birthday wishes were given to K1KWP in his absence. Out of kindness for those present, we did not sing Happy Birthday.

The treasures report was reviewed. Historical trends of club fund levels were discussed. Clark moved, Bob seconded to accept treasures report. It was unanimously approved.

Helix cables were discussed. 2 helix cables are sold. It was discussed to re-list them in the spring when people will be more interesting.

Repeater upgrades were discussed.

Bob makes a motion for annual costs of internet access for control and maintenance at $50/site for one year for up to 3 sites. Clark seconds, passed unanimously.

Bob makes a motion to spend $100 each at MRE and Lowell for remote access equipment. Dave seconds. Passed unanimously.

Bob makes a motion for $500 for a SCOM controller for Weston. Dave seconds. Passed unanimously.

James discussed progress on pi Ptr project.

Dave discussed adding affiliate (Clay Center) club meetings on our web site to be listed as upcoming events.

Free membership for new hams was discussed, The idea of a new member program director was discussed. Dave made a motion to continue the program of free membership to new hams. Bob seconded. Passed unanimously.

May meeting was discussed to the too close to Dayton. Moved to May 24th.

Discussed increasing membership and visibility of the MMRA. Ideas included having a short article every now and then to other clubs in our area and the ARRL. Sending a short email blurb to expired members about upcoming events (shorter than the news letter).

Suggested an article about adding low cost internet control to repeater sites to send out to other clubs.

Brian suggesting reversing the 6m tx and rx sites and many potential experiments were discussed.

The location was discussed. We liked it.

Dave closed the meeting at 9:15 pm.

**Next MMRA Business Meeting:
Wednesday 16 Feb, 7PM**

Location: New England Airgun in Hudson

Massachusetts State Police Communications History

Tom Turner, KB1OQA

Law Enforcement Radio Communications for the Massachusetts State Police began in 1929. An Amplitude Modulation or AM frequency of 1.666 Kilohertz operating in the Medium-Wave Band provided one-way Dispatching for State Police Patrolmen, now known as Troopers. The first radio-equipped motorcycle was placed in service in 1936. A small number of two-way radio units were placed on this frequency in the early 1940's. Shortwave *Morse Code* Stations were located at SP Framingham and SP Northampton. These facilities, staffed with trained operators, were used for communication(s) between States.

The original AM Medium-Wave equipment was replaced in 1941 by radios operating on Frequency Modulation, or FM, on 35.78 Megahertz and 35.90 MHz, based on a Proposal received from MIT. A Study prepared by the MITRE Corporation of Bedford, MA in the late 1960's and early 1970's recommended that a change be made to a Statewide 460 MHz system in an effort to eliminate inadequacies found in the Low-Band Frequency Spectrum. However, it was decided to remain on the low band, utilizing frequencies in the 42 MHz portion of that spectrum. They were: 42.44, 42.34, 42.40, 42.50, 42,54, 42.46, 44,74, and 44.90 Mhz. In the mid-1980's, 150 MHz Very High Frequency (VHF) portable radios and vehicular repeaters were purchased which operated on 159.42 MHz. The merger of the Capitol Police, MDC Police, Registry of Motor Vehicles Police, and State Police took place on July 1, 1992. Each agency had a separate radio system on various frequencies. The MDC's 800 Mhz operations began in 1980.

After Consolidation, it was determined the best course of action for the new Department of State Police was to build out the MDC's existing 800 MHz system, as it offered increased coverage and technological capabilities. Troop-B in Western Massachusetts has been upgraded from older analog to newer digital technology. Broadcasts to and from Troopers can now be clearly received with fewer "Dead Spots" that result in loss of radio signals, posing a safety hazard.

Tom, KB1OQA, is a volunteer at the **Massachusetts State Police Museum and Learning Center** and a member of its Board of Directors. He is also one of MMRA's Net Controls. This information is excerpted from MSP's 150th anniversary book.

Upcoming MMRA Meetings

Saturday, 11 Sept ~ Membership Meeting
Introduction to MMRA & Door Prize Drawing
At the Boxboro! 2016 ARRL Convention
Holiday Inn, Boxborough

Wed, 19 Oct ~ Business Meeting
Location: Stratus, Maynard

Wednesday, 16 Nov ~ Membership Meeting
Topic—Linux in the Hamshack,
Andy Stewart, KB1OIQ
Location—Holiday Inn, Boxborough

Wed, 21 Dec ~ Business Meeting
Location: New England Airgun in Hudson

Wednesday, 18 Jan ~ Membership Meeting
Topic—12V Power for Emergency Power Use in Ham Stations
Greg Troxel, N1DAM
Location—Northborough Free Library

Wed, 15 Feb ~ Business Meeting
Location: New England Airgun in Hudson

Wednesday, 15 Mar ~ Membership Meeting
Topic—TBD
Location—TBD

Wed, 19 April ~ Business Meeting
Location: Stratus, Maynard

Wednesday, 24 May ~ Membership Meeting
Topic—TBD
Location—TBD

Wed, 21 June ~ Business Meeting
Location: Stratus, Maynard

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	WA1JIM	Jimmy Devaire
Week 2	W1DYJ	Larry Banks
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 Leaders
Officers

President	David Wolfe	KG1H
Vice President	Mike Neilsen	W1MPN
Secretary	John McGovern	W1JMC
Treasurer	Kevin Paetzold	K1KWP
Clerk	Bob Evans	N1BE
* Technical Officer	Bryan Cerqua	W1BRI

Board of Directors

Director »2017	Steve Schwarm	W3EVE
Director »2017	Roger Coulson	WA1NVC
Director »2018	Clark Conti	N1NVK
Director »2018	James Lee	N1DDK
Director »2017	Bob DeMattia	K1IW

Repeater Trustees

* Belmont 145.430	Ed Curley	KC1CLA
* Boston 927.0625	Rick Zach	K1RJZ
* Boston 146.820	John Mullaney	K1BOS
* Brookline 145.160	Joyce DeMattia	N1QPH
* Brookline 146.820 Rcvr	Bob Phinney	K5TEC
* Hopkinton 223.940	James Cahill	KB1LOY
* 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, 224.880, 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 224.40	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.	David Wolfe	KG1H
* VEC Liaison	Bill Wade	K1IJ
* Net Manager	Larry Banks	W1DYJ
* Web Page Editor	Bob DeMattia	K1IW

* Appointed

MMRA VE Sessions
Third Saturday
9 AM at the Marlboro Public Library

Contact: Bill Wade, K1IJ   781-891-9079
Evenings 6 - 10 PM   Weekends 8 AM to 10 PM.
Accredited by the ARRL VEC

January Membership Meeting ~ Wednesday, 18 January, 7 PM
12V Power for Emergency Power Use
Greg Troxel, N1DAM

Northborough Public Library

Calendar of Ham Radio Flea Markets
For more information: http://mit.edu/w1gsl/Public/ne-fleas

21 Jan	Whitman MA	WARC 9AM@KoC Rt18
4 Feb	Springfield VT	CVFMA @VFW
4 Feb	Windsor CT	VR+C Mus 115 Pierson LN
Feb	Marlboro MA	AARC 9@MidSchool
25 Feb	Chocorua NH	WMARC @Runnels Hall
25 Feb	S Burlington VT	RAoNV @HI
25 Feb	Augusta ME	AARA @Club Calumet
26 Feb	Hicksville NY	LIMARC @LevitHall
5 Mar	Nashua NH	NEARC RadioXLVIII
11 Mar	Chicopee MA	MtTomARA @Castle
19 Mar	Southington CT	SARA @HS
31 Mar-1 Apr	Lewiston ME	AARC ME Conv @Ramada
8 Apr	Hampton NH	PCARC @Masonic
8 Apr	LaSalle PQ	MARC @RC Legion
8 Apr	Windsor CT	VR+C Mus 115 Pierson LN
15 Apr	S Portland ME	PAWA @AmLegion
16 Apr	Cambridge MA	Flea at MIT
22 Apr	Gales Ferry CT	RASON @FireCo
5-6 May	Deerfield NH	NEARFest XXI @FG
13 May	E Greenbush NY	EGARA @FireCo
21 May	Cambridge MA	Flea at MIT
3 Jun	Brookline NH	NEARC Antique@EvntC
10 Jun	Windsor CT	VR+C Mus 115 Pierson LN
27 Aug	Adams MA	NoBARC @BoweFld
8,10 Sep	Boxboro MA	FEMARA NE Conv
13-14 Oct	Deerfield NH	NEARFest XXII @FG
15 Oct	Cambridge MA	Flea at MIT
28 Oct	Gales Ferry CT	TCARC @FireCo

THE MINUTEMAN REPEATER ASSOCIATION

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

Email: contact@mmra.org

WE'RE ON THE WEB
HTTP://WWW.MMRA.ORG/