



The WB1GOF Repeaters

	WB1GOF	146.955
	PART	D*442.450
of WESTFORD		D*145.330

Plus soon 146.450 DMR

WB1GOF Repeater Systems

WB1GOF 2m FM

Set your CTCSS encoder (and decoder, if desired) to 74.4 Hz

Use the following settings to use this repeater:

RX Freq: 146.955 MHz

TX Freq: 146.355 MHz

(standard -600 KHz offset)

WB1GOF-R Echolink Node: 380789

WB1GOF 2m D-Star

Use the following settings to use this repeater:

RX Freq: 145.330 MHz

TX Freq: 144.730 MHz

(standard -600 KHz offset)

MYCALL:

URCALL; CQCQCQ

RPT1: WB1GOF C

RPT2: WB1GOF G

WB1GOF 70cm D-Star

Use the following settings to use this repeater:

RX Freq: 442.450

TX Freq: 447.450

(standard +5MHz offset)

MYCALL:

URCALL; CQCQCQ

RPT1: WB1GOF B

RPT2: WB1GOF G

Repeaters location:

- Grid: FN42gn
- Latitude: 42°34.36.9' N (42.576062) Longitude: 71°26.33.0' W (-71.442496)
- Elevation: 557' above sea level

Repeater questions? Send an email to: repeater@wb1gof.org

A slideshow about WB1GOF repeaters is [here](#).

Join the WB1GOF D-Star users group [here](#).



- [List of Middlesex County summits](#)
- [Prospect Hill details](#)
- [Westford Conservation Prospect Hill Wildlife Sanctuary](#)
- [Prospect Hill CR Trail Map Brochure](#)
- [OpenStreetMaps](#)

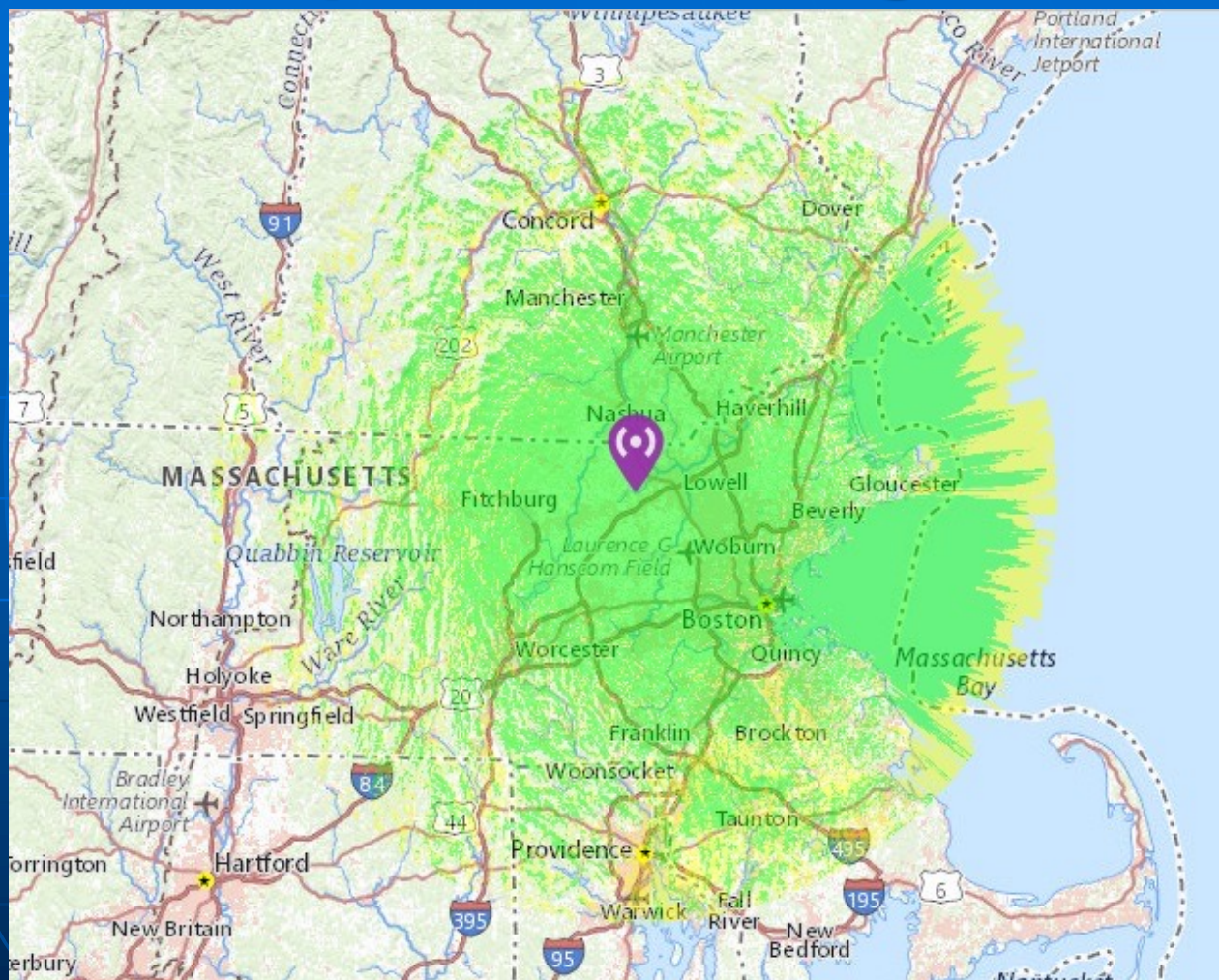
WB1GOF Site – Overall

- Town-owned water tower
 - Homeland Security site - controlled access
 - Town & Regional radio systems located there
 - WPD, WFD, Westford Highway, NEMLEC, District 6 Fire
 - Town network (***) FREE internet (***)
- AT&T cell site
 - They pay for the power and lights; communications building is theirs.
 - All design changes and updates to site require cell site owners and town approval
 - Free rent to us. Originally space leased for \$1 in 1991
 - Emergency power
 - Natural gas generator

WB1GOF Site – Overall

- Repeaters are a MEMA/RACES/Westford Emergency Management resource as well as a ham radio “community” resource
 - 146.955 is a regional (Sector 1C) EmComm repeater for MEMA/RACES
 - SkyWarn & ARES
 - Multiple Nets
 - Events: Apple Blossom, Baystate Marathon, Tour de Cure New England
- Equipment is owner’s expense to repair, replace, etc.
 - No expense to the “club”
 - Donations to Repeater Fund – financial assistance when needed
 - Phone line paid by repeater owner

955 Repeater Coverage



Nearby 955 systems

- Augusta, Maine 146.955, PL of 100.0, 146 miles away.
- Morris, CT 146.955 repeater, PL 100.0, 110 miles away
 - When band conditions are good can be heard
- Dennis, MA 146.955 repeater, PL 88.5, 86.3 miles away
 - Can often be heard underneath

Adjacent channel repeaters

- Concord, NH 146.940, PL of 114.8, 115 miles away.
- Cumberland, RI 146.940 repeater, PL 67.0, 67 miles away
- Paxton, MA 146.970 repeater, PL 114.8, 30.5 miles away
 - Biggest concern mobile operators passing thru Westford area

Old water tower with antennas



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New Water Tower



Current Water Tower antennas

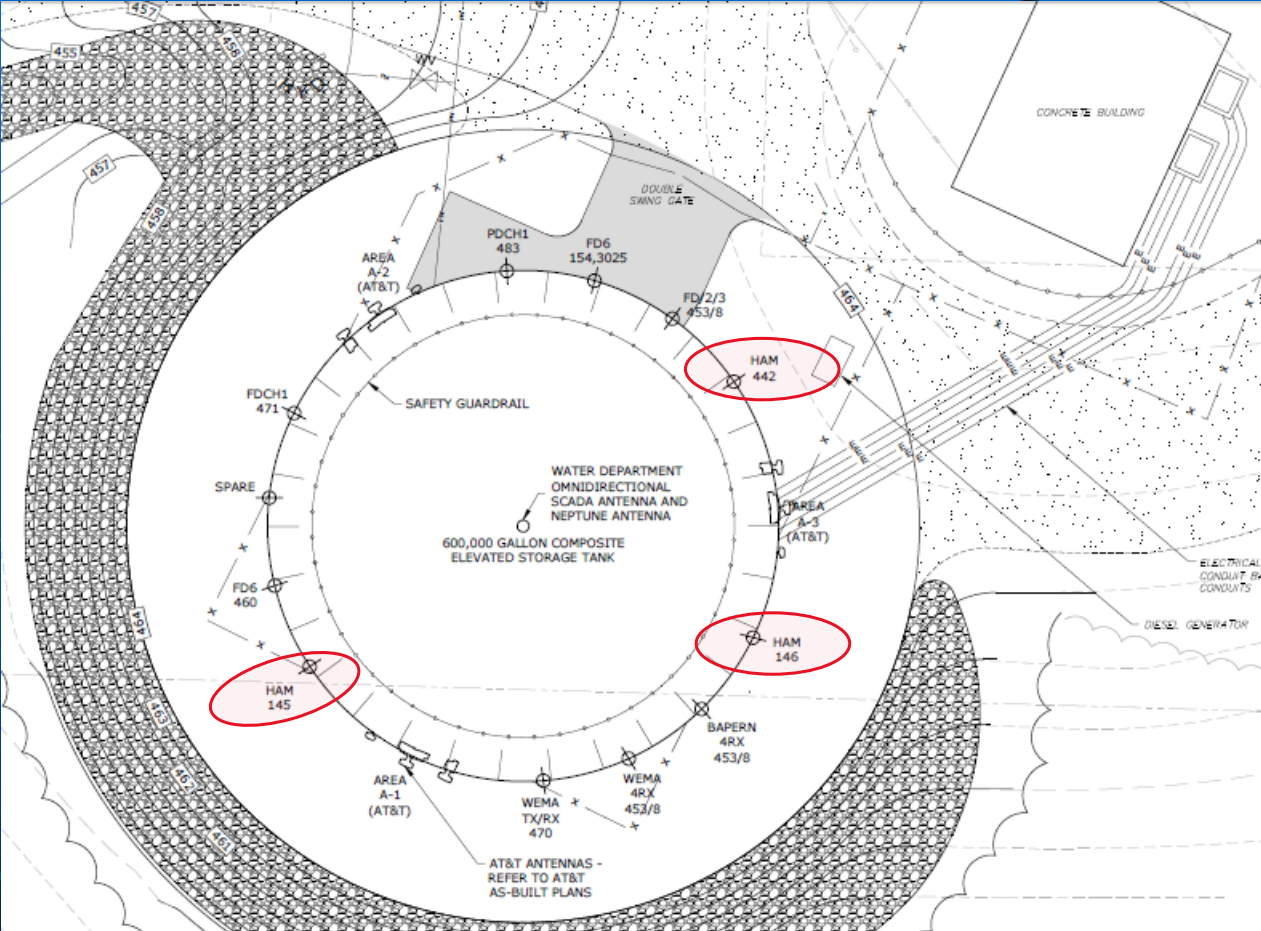


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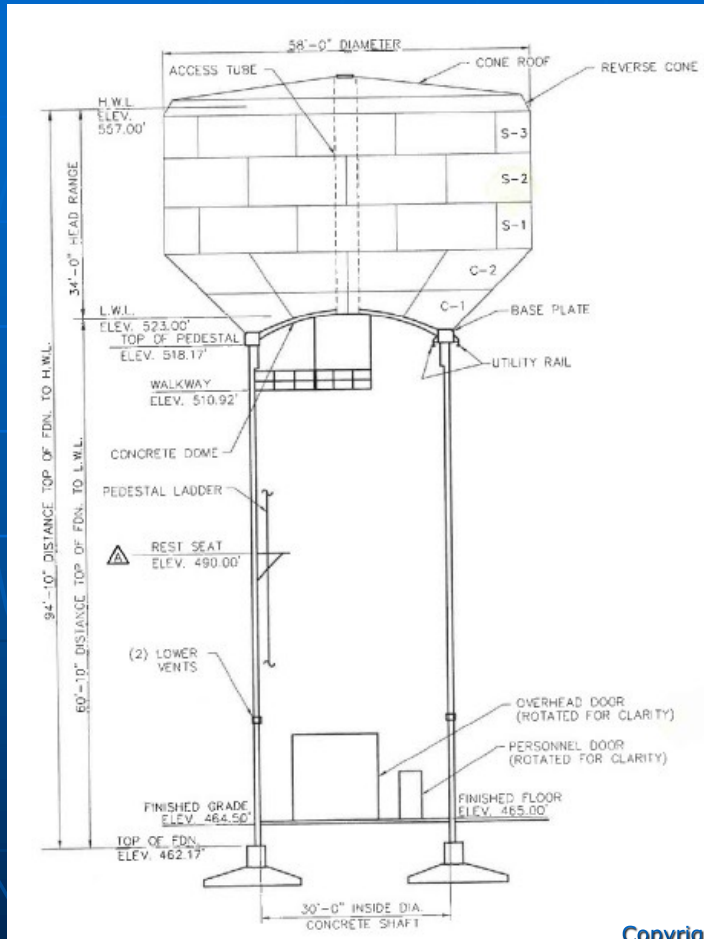
Water Tower video



Current Water Tower layout



Current Water Tower elevations



- Top of Tower 567' ASL
- Antenna tops are at 589.5' (2m) and 582.5' (440).
- Coordinates:
 - 42°34'36.9"N
 - 71°26'33.0"W
 - 42.576910-
 - 71.442496

WB1GOF Site – 146.955 Analog

- Cable Loss per 100 ft at Operating Frequency = .55 dB
- Cable Length = 130 Ft. (LDF5-50A)
- Calculated Loss = 0.7 dB
- Power into Cable = 55 Watts
- Power out of Cable = 46.7 Watts
- Gain of Antenna = 8.1 dBd
- ERP of Antenna System = 301.2 Watts

WB1GOF Site – 442.450 D-STAR

- Cable Loss per 100 ft at Operating Frequency = .817 dB
- Cable Length = 130 Ft. (LDF5-50A)
- Calculated Loss = 1.1 dB
- Power into Cable = 18 Watts
- Power out of Cable = 14.1 Watts
- Gain of Antenna = 8 dBd
- ERP of Antenna System = 88.9 Watts

WB1GOF Site – 145.330 D-STAR

- Cable Loss per 100 ft at Operating Frequency = .55 dB
- Cable Length = 130 Ft. (LDF5-50A)
- Calculated Loss = 0.7 dB
- Power into Cable = 18 Watts
- Power out of Cable = 15.3 Watts
- Gain of Antenna = 8.1 dBd
- ERP of Antenna System = 98.6 Watts

WB1GOF/R

Circa 1999
Old Cabinets
Pre D-Star

146.955 TPL power
amp (55W/at Ant)

146.955 Motorola
Mitrek

Astron Power
Supply

146.955 SCOM 7K
controller

Wacom 146.955
(4 can) Duplexer



Wacom UHF (4
can)
BPBR/Duplexer
UHF Rcvr Bandpass
Cavity (1) & Preamp

Kenwood TM-
731A X-Band link
2m/220MHz

442.450 Motorola
Mitrek

Mirage 440 Power
Amp

442.450 SCOM 7K
controller

Power Distribution

Astron Power
Supply

WB1GOF/R

As of 2012

Icom
D-Star Controller
145.330 Repeater (18w)
442.450 Repeater (18w)

Wacom UHF (4)
BPBR/Duplexer

UHF Rcvr Bandpass
Cavity (1) & Preamp

Network Router/FIOS

HP DL580 G2 (4 way)
CentOS (Linux)
D-Plus Gateway
Routing Software
Link Scheduling
User Logging
D-Star Registration



3 Open Repeaters
On the Air 24/7

21 Years of
Continuous
Public Service

146.955 TPL power
amp (55W/at Ant)

146.955 Kenwood
TKR-750 repeater

146.955 SCOM
controller & Spare

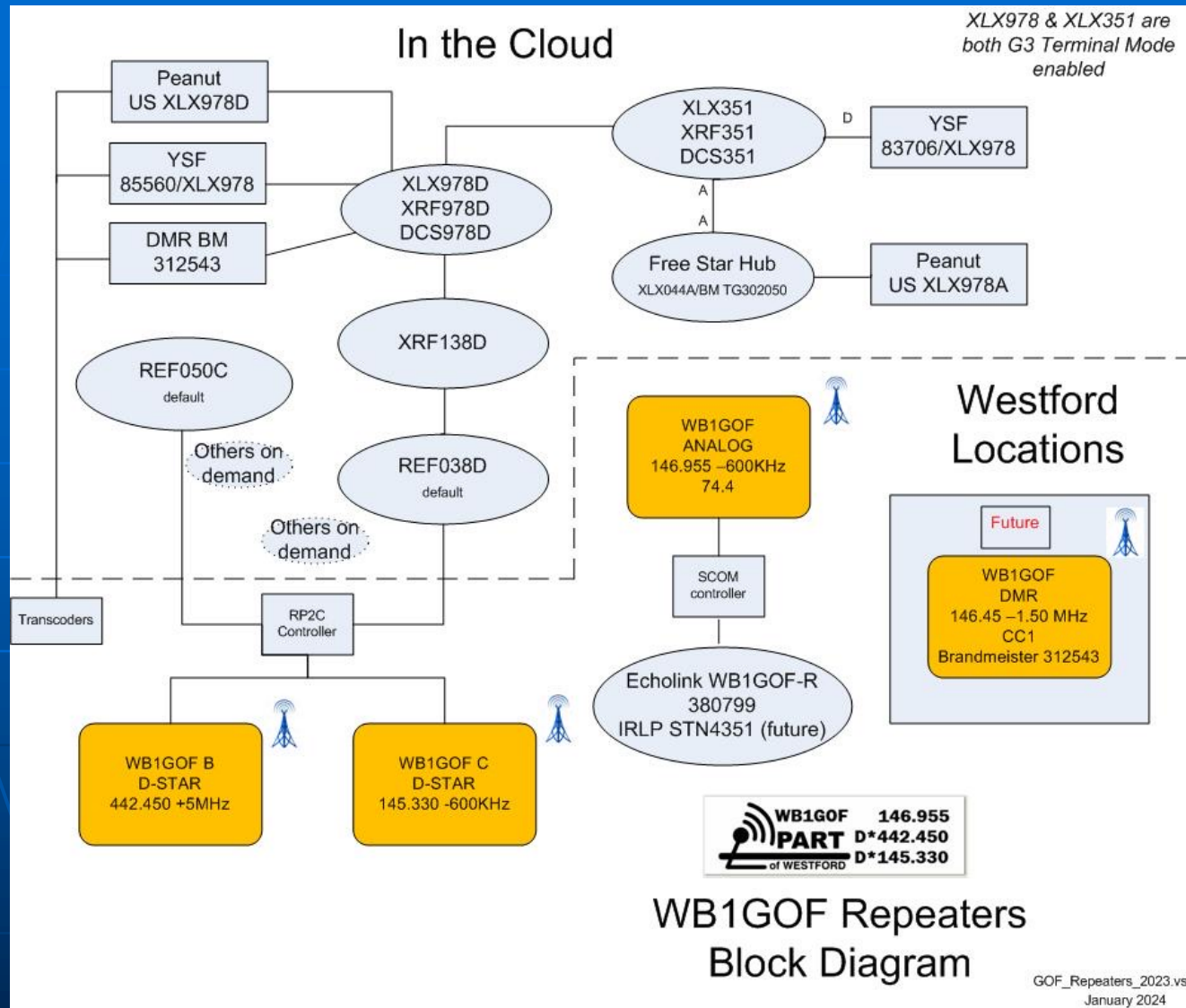
Phelps Dodge
145.330 (back)
(6) Duplexer

Wacom 146.955
(front) (4)
Duplexer

AT&T Cell Site - Prospect Hill
Westford, Ma
579 feet/AMSL

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WB1GOF repeater block



Repeater Contributors

- 442.450 Team – the repeater OWNERS
 - Ernie Bauer-N1AEW (now N4AEW), Terry Stader-KA8SCP, Bill Kent-KW1G
 - Dave-WI1R (WB1GOF callsign Trustee)
- The 955 Team
 - Ernie, Terry – repeater OWNERS
 - Dave-WI1R (WB1GOF callsign Trustee)
 - Assisting: Ron Reder-KA1KCU, Alison-KB1GMX, Art-AA1HO, Meyer-N1EQD, Barry-N1FII, Jim David-N1HZG, Don Stevens-WQ1E, and Al Hicks-KD1D

4 major phases of WB1GOF repeaters

- “Start up” phases
 - 442.450 - 1991
 - 146.955 - 1992
- Re-packaged the site - 1999
- Replace 955 repeater - 2009
- Move 442.450 to D-STAR – 2010
 - 145.330 D-STAR - 2012
- Water tower move - 2020

Repeater Background

- PART let the “owners” (all PART members) use the WB1GOF call sign
- The owners purchased all the equipment.
- Various contributors supplied significant material and manpower
- Negotiated with cell site owner and town to use Prospect Hill water tower site – Terry had liaison with players

Who does what?

- Single repeater maintainer/owner today – KA8SCP
 - periodically seek tech assist and advice with PART'ers and others
- Operationally
 - Control Operators – monitor on-the-air operations for misuse
 - Sunday Night PART Net – Rich AB1HD manages schedule
 - W1HH/BARS Wednesday night Net – Doug N1WRN manages

WB1GOF 146.955 Control Operators

Control Operators can remotely shutdown the 955 repeater

- Terry KA8SCP
 - Owner, tech and Control Op
- Dave WI1R
 - Control Op
- Gary KG1RY
 - Control Op
- George K1IG
 - Control Op

Moving forward

- Projects
- Mentee “program”
- Succession Plan



WB1G0F	146.955
PART	D*442.450
of WESTFORD	D*145.330

Repeater Projects

- PART members could assist:
 - Add new RPI-based Echolink / IRLP
 - Move Echolink out of my basement
 - Address 2m desense issues
 - 955 desensed by 145.33
 - Do “we” need to do a complete duplexer revamp?

Find a repeater mentoree (or 2 or 3)

- Repeaters
 - Analog FM - 146.955
 - Control Op
 - Assist with Hardware-RF world
 - All three digital – hardware & RF world
 - Digital D-STAR 145.33 & 442.450
 - Digital DMR 146.450
- D-STAR
 - User Registration
 - Application suite enhancements
 - C++, Java, scripts, CentOS

Develop a Succession Plan

- What happens to repeaters?
 - Who will “own” them?
 - Owner/executor to sell them off?
 - Who will manage them?
 - Which repeaters will SURVIVE?
- Any new owner
 - Will need to have a relationship with Town of Westford staff
 - Fire, EM, DPW/Water and IT
 - MEMA relationship

Repeater Links



- General Info:
<http://www.wb1gof.org/repeaters>
- Rules of Conduct:
<http://www.wb1gof.org/repeaters/repeaterrules>
- D-STAR status:
<http://www.wb1gof.org/repeaters/dstarstatus> or <https://wb1gof.dstargateway.org>

Rules of Conduct

WB1GOF Repeater Rules of Conduct

Rev:1.4

Date: 01/06/2014

The repeater owners or trustees can alter or make exceptions to these Rules of Conduct at any time, for any reason, with or without prior notice. We will make every attempt to post the Rules of Conduct in a timely manner online at the PART website, www.wb1gof.org.

Repeater Ownership Statement

The Police Amateur Radio Team (PART) of Westford Massachusetts has been assigned the FCC callsign WB1GOF. The club has appointed a Trustee of the WB1GOF callsign. PART, through its membership, has allowed the WB1GOF callsign to be used on the three amateur radio repeaters located in the Town of Westford. The three WB1GOF repeaters (including all hardware and associated components with each repeater), found on the coordinated (New England Spectrum Management Council) frequencies of 145.330 MHz, 146.955 MHz and 442.450 MHz, are owned solely by individuals who are considered the "owners". PART from time to time has provided financial support to the repeater owners. Neither PART, nor its members by virtue of their membership status, has any ownership rights to the repeaters.

Why do we need rules at all for repeater conduct or etiquette?

No one likes a bunch of arbitrary rules, but when you have a shared resource, like a wide coverage range repeater they become necessary. We tend to assume that everyone knows the generally accepted rules. But, that could be careless of us and unfair to those who want or need to have a clearer definition of our expectations and requirements. It can also create discord when repeater users offend others by unknowingly breaking some unwritten rule. Activities that may be an irritation or even a flagrant violation to one person might not be an issue at all to another. It's probably best for us to be clear about the rules we really think are important. It is not our intent to define every action allowed or disallowed but to provide the guidelines for proper etiquette and give some "breathing room" to previously established as well as new and exciting uses of the repeaters.



I kerchunked
the repeater
again today.

Just stop it.

Repeater Info

- Email interference reports to:
repeater@wb1gof.org
- Questions to:
 - Terry – ka8scp@wb1gof.org