

Cutting the Cable: Receiving Broadcast Television

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Michael LoVerme Memorial Foundation
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Today's Agenda



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- About the Michael LoVerme Memorial Foundation
- Where to find this presentation
- Analog Television
- The Digital Transition
- Types of Digital Televisions
- How to Receive DTV
- Digital TV Stations available in our area
- Helpful Websites
- Beyond Over-the-Air – Streaming Services
- Questions

About the Michael LoVerme Memorial Foundation



<https://mlmf.org/>



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Where to find this presentation:

<https://mlmf.org/events/workshops/>

It should also be available on the Amherst Library website:

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



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Analog Television

- Analog Television 1941 – 2009
 - 1920 – 1940: Many companies competing for the standard
 - B & W 1941 (525 line standard)
 - Color 1965 (color network programming readily available)
 - 1972 sales of Color TVs passed sales of B&W TVs
 - 1989 B&W TVs are no longer sold
 - 2015 – difficult to GIVE AWAY an Analog TV
 - 2018 – Recycle your Analog TV at Staples or Best Buy



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The Digital Transition - 2009

- Why did we convert to Digital Television?
 - “Digital television transmission more efficiently uses the available bandwidth and can easily integrate other digital services.” (Wikipedia)
 - This allows more content to be transmitted in the same spectrum
 - It also allows some of the spectrum to be used for other purposes – mostly cellular telephone services and emergency response networks



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Types of Digital Televisions

- Standard Definition (SD)
 - Analog screen size (480i) with 4:3 Aspect Ratio
- High Definition (HDTV)
 - Widescreen 16:9 Aspect Ratio
 - 720p aka “HD”
 - 1280 x 720 pixels = 0.9 megapixels
 - Progressive scan (Broadcast)
 - 1080p and 1080i aka “Full HD”
 - 1920 x 1080 pixels = 2.1 megapixels
 - 1080i Interlaced scan (Broadcast)
 - 1080p Progressive scan (Blu-Ray Disc)



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Types of Digital Televisions

- High Definition (HDTV) (continued)
 - 4K aka “Ultra HD”
 - $3840 \times 2160 = 8.3$ megapixels
 - 2160p Progressive Scan
 - 10-bit color depth (as opposed to 8-bit depth for all other HDs)
 - Displays over 1 billion colors (as opposed to 16 million for all other HDs)
 - Limited 4K content available (2015)
 - Upscaling HD content to “near” 4K quality



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What do I need to receive DTV?

- You will need:
 - A Digital Television OR an Analog Television AND a Digital Converter Box
 - An Antenna designed to receive broadcast DTV frequencies
 - An interconnecting cable



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What if I only have an Analog TV?

- Two choices:
 - Buy a Digital Television
 - Advantage – HDTV
 - Disadvantage – Higher cost > \$150
 - Buy a Digital Converter Box
 - Advantage – Cheap < \$40
 - Disadvantage – can only display Standard Definition Television
 - 4:3 aspect ratio





How to Receive Broadcast Television

- Connect an antenna to your Digital TV or converter box via coaxial cable (RG6). Keep cable as short as possible.
- If using a Digital TV select the “Digital” mode from the input source menu. (You may have to switch from “Cable” to “Antenna” in the setup menu.)
- If using a converter box the unit will power up in the digital mode (the only mode it has)
- Find the “Channel Learn” (Auto-Program) function and start it
 - The tuner will then check every digital channel for signals. If it finds a signal it will save that channel.
 - This can take up to half an hour if there are many channels available



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Antennas

- Indoor
- Outdoor
- Amplified
- Small
- Medium
- Large
- Directional
- Multi-Directional
- In Amherst you will need a large outdoor, multidirectional or directional antenna to get all the Boston stations. You should not need an amplified outdoor antenna.



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Antennas

- Indoor



Local
10 miles
\$11.



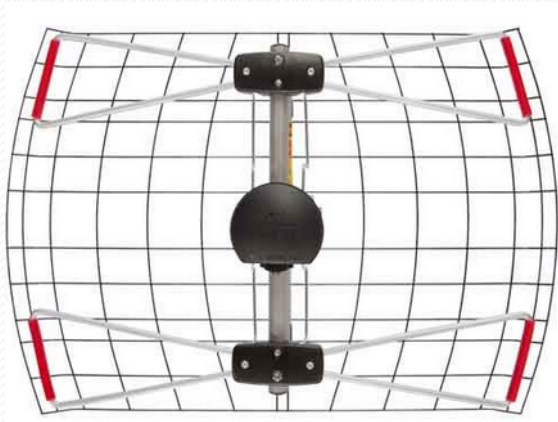
40 miles
Amplified
\$33.



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Antennas

- Outdoor



50 mile range
\$ 55.



60 mile range
\$ 60.



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Antennas

- Outdoor



125 mile range
360° rotation
\$ 50.



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Broadcast Stations in our Area

- Major Networks:
 - CBS
 - NBC
 - ABC
 - FOX
 - PBS



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Broadcast Stations in our Area

- Lesser Networks:
 - Ion
 - MeTV
 - ThisTV
 - The CW
 - Univision (Spanish)
 - Telemundo (Spanish)
- Truly Independent Stations



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Broadcast Stations in our Area

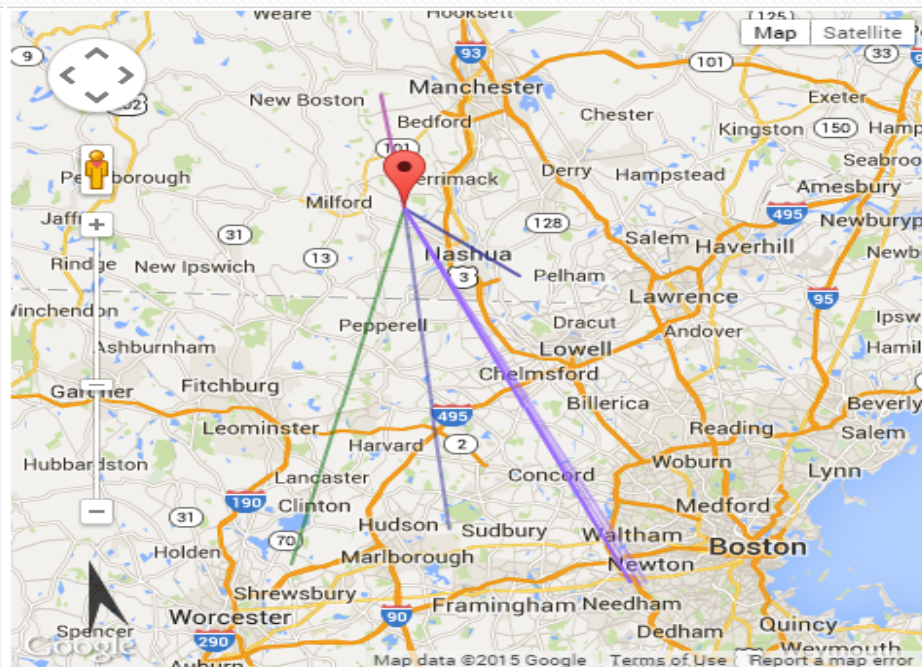
Demo of Available Broadcast Stations
Station List Handout

Helpful Websites



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Stations	Antenna
WUNI-DT 27.1 UNI RF Channel: 29 35 miles at 193°	 Green
WMUR-DT 9.1 ABC RF Channel: 9 11 miles at 351°	 Red
WBIN-DT 50.1 IND RF Channel: 35 10 miles at 128°	 Blue
WUTF-DT 66.1 TFA RF Channel: 27 31 miles at 174°	 Blue
WYCN-CD 36 FMN RF Channel: 36 10 miles at 128°	 Blue
WBZ-DT 4.1 CBS RF Channel: 30 39 miles at 155°	 Violet
WCVB-DT 5.1 ABC RF Channel: 20 39 miles at 155°	 Violet
WGBH-DT 2.1 PBS RF Channel: 19 39 miles at 155°	 Violet
WGBX-DT 44.1 PBS RF Channel: 43 39 miles at 155°	 Violet



www.antennaweb.org

Helpful Websites

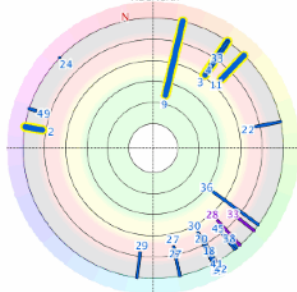


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Amherst Public Library

All Channels

TrueNorth



Search Criteria

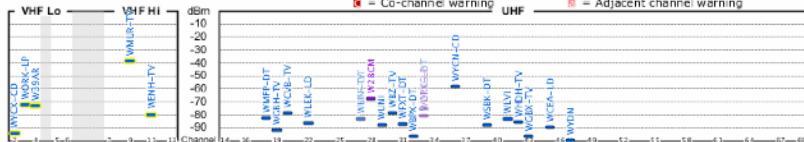
Address: exact
Amherst, NH

db datecode
201801291705

www.tvfool.com

Call	Channel	Real	Net	Signal	Dist	Az	Mult
sign	(Virt)	(db)	(db)	Path	ances	True	(Mag)
WJRH-TV	9 (9.1)	ABC	52.2	-38.6	LOS	8.5	131° (27°)
WYCH-CD	36		33.0	-57.8	1edge	14.8	126° (141°)
W0RH-LP	3 (33.1)		18.6	-72.3	2edge	27.2	33° (49°)
W3AR	4 (39.1)		18.1	-72.7	2edge	27.2	33° (49°)
WPRG-DT	33 (21.1)	ION	15.9	-74.9	2edge	27.2	33° (49°)
W0Z-TV	30	CBS	12.4	-78.4	1edge	43.0	152° (167°)
WCVB-TV	20	ABC	12.2	-78.6	1edge	43.0	152° (167°)
W2CH	28		11.7	-67.2	1edge	12.8	138° (153°)
WENH-TV	11 (11.1)	PRS	11.2	-79.7	1edge	30.3	44° (59°)
W0FP-DT	18 (62.1)	Ind	8.6	-82.3	2edge	43.5	152° (166°)
WLV	41	CW	2.8	-83.0	2edge	43.5	151° (165°)
W0TF-DT	25 (66.1)	Te	7.5	-83.4	2edge	33.7	168° (183°)
W0IN-TV	27		7.4	-83.4	2edge	33.7	168° (183°)
W0DH-TV	42 (7.1)	NBC	5.1	-85.8	2edge	43.4	151° (165°)
W0EK-D	22		4.4	-86.1	2edge	20.8	79° (93°)
W0XT-DT	31 (25.1)	Fox	3.7	-87.1	2edge	43.9	151° (166°)
W0BK-DT	39 (38.1)	Ind	3.1	-87.8	1edge	43.0	152° (167°)
NUN	29 (27.1)	Uni	2.8	-88.1	2edge	36.6	187° (201°)
W0EA-LD	45		1.3	-89.5	1edge	45.3	141° (156°)
W0BH-TV	19	PBS	-1.1	-91.9	2edge	43.0	152° (167°)
W0RK-LP	33		-2.0	-80.8	2edge	10.8	129° (144°)
W0CK-CD	2		-3.6	-94.2	2edge	50.1	279° (294°)
W0BX-TV	43	PRS	-5.3	-96.2	2edge	43.0	152° (167°)
W0PX-DT	32 (68.1)	ION	-5.9	-96.7	2edge	43.5	152° (166°)
W0DN	47 (48.1)	Ind	-8.9	-99.7	2edge	43.0	152° (167°)
W0TT-LD	38		-11.5	-104.3	2edge	45.3	140° (154°)
W0K-TV	49 (52.1)	PBS	-14.4	-105.2	2edge	39.3	288° (302°)
W0TA	24	PBS	-19.8	-110.6	2edge	37.5	314° (328°)
W0NE-DT	25 (31.1)	NBC	-20.2	-111.1	2edge	37.5	314° (328°)
W0PX-TV	40 (58.1)	ION	-23.1	-113.9	Tropo	104.3	141° (155°)
W0TW-DT	8 (8.1)	ABC	-23.5	-114.4	Tropo	80.7	32° (47°)
W0SH-DT	44 (46.1)	NBC	-24.4	-115.2	Tropo	82.8	34° (48°)
W0TD	40 (40.1)		-25.1	-115.9	2edge	43.5	152° (166°)
W0GR	6 (6.1)	CBS	-27.0	-117.9	2edge	122.3	263° (277°)
W0GE-DT	38 (13.1)	CBS	-28.7	-119.6	Tropo	93.0	28° (52°)
W0TD	40		-29.5	-108.4	2edge	43.5	152° (166°)
W0TZ-DT	14 (5.1)	NBC	-31.2	-122.1	Tropo	129.3	333° (347°)
W0DP-DT	10 (46.1)	Ind	-31.9	-122.8	Tropo	65.9	153° (167°)
W0AX-TV	20	CBS	-32.2	-123.1	Tropo	129.3	333° (347°)
W0TF-DT	9 (28.1)	PBS	-32.2	-123.0	2edge	92.3	307° (321°)
W0TS-LD	46		-33.2	-112.0	2edge	40.5	137° (151°)
W0DQ-D	28		-33.3	-124.1	2edge	37.9	314° (328°)
W0NY-DT	13 (22.1)	ABC	-34.1	-125.0	2edge	129.3	333° (347°)
W0SE	36	CBS	-34.2	-125.0	Tropo	96.3	219° (234°)
W0LK	22	CW	-35.1	-125.9	Tropo	83.0	154° (169°)
W0PX-LP	33 (33.1)		-37.2	-128.2	Tropo	104.2	141° (155°)
W0RY-DT	22 (38.1)	PRS	-38.2	-128.9	Tropo	67.2	231° (245°)
W0EA-DT	45 (26.1)	PRS	-38.1	-128.9	2edge	56.5	47° (61°)
W0AC-DT	12 (64.1)	Fox	-38.2	-129.0	Tropo	70.3	165° (180°)
W0AT-TV	13 (12.1)	CBS	-38.7	-129.6	Tropo	70.3	165° (180°)
W0GR-TV	76	ARC	-39.0	-129.9	Tropo	67.5	231° (245°)







www.tvfool.com



Helpful Websites






































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Boston			
2 (19)	WGBH		<p>ID: "GBH 2" City: Boston, MA Owner: WGBH Educational Foundation Web Site: http://www.wgbh.org/ Station Info: Digital Educational Full-Power - 700 kW</p>
4 (30)	WBZ		<p>ID: "CBS 4" City: Boston, MA Owner: CBS Corporation Web Site: http://boston.cbslocal.com/ Station Info: Digital Full-Power - 825 kW</p>
5 (20)	WCVB		<p>City: Boston, MA Owner: Hearst Television Web Site: http://www.thebostonchannel.com/ Station Info: Digital Full-Power - 625 kW</p>
7	WHDH		<p>ID: "7 NBC" City: Boston, MA Owner: Sunbeam Television Web Site: http://www.whdh.com/ Station Info: Digital Full-Power - 29.7 kW Subchannels: 8.1 WHDH/NBC, 8.2 This TV</p>
9	WMUR		<p>City: Manchester, NH Owner: Hearst Television Web Site: http://www.wmur.com/ Station Info: Digital Full-Power - 6.5 kW Subchannels: 9.1 WMUR/ABC, 9.2 MeTV</p>
25 (31)	WFXT		<p>ID: "FOX 25" City: Boston, MA Owner: Fox Television Stations Web Site: http://www.myfoxboston.com/ Station Info: Digital Full-Power - 780 kW</p>

www.stationindex.com/tv/markets/

Helpful Websites

2		Boston, Massachusetts				30	
Display Channel	Physical Channel(s)	Station	City	State	Expand/Contract All Print All		
2	19	WGBH-TV	BOSTON	MA		 	    PBS
4	30	WBZ-TV	BOSTON	MA			   CBS
5	20	WCVB-TV	BOSTON	MA			   ABC
6	38	WHDH-TV	BOSTON	MA			
7	42	WHDH	BOSTON	MA			   NBC
9	9	WMUR-TV	MANCHESTER	NH			   ABC
Display Channel	Physical Channel	Video	Audio	Call Sign	Network/Programming	Nickname	Notes
09-1	9.1	1080i	DD5.1	 WMUR	ABC	"WMUR 9"	
09-2	9.2	480i	DD2.0	WMUR Me	Me-TV		
Technical Data and Screensaps							
Historical, Ownership, Transition, and Translator Data							
11	11	WENH-TV	DURHAM	NH			    PBS
13	36	WYCN-CD	NASHUA	NH			

www.rabbitears.info/market.php

Helpful Websites



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WGBH-TV MA BOSTON USA (Digital)

Licensee: WGBH EDUCATIONAL FOUNDATION
Service Designation: **DT** Digital television station
Transmit Channel: **19** 500 - 506 MHz **Licensed**
Virtual Channel: **2** (viewer sees this channel number)

Network affiliation: PBS

File No.: BLEDT-20021219AAM Facility ID number: 72099
CDBS Application ID No.: 621102

42° 18' 37.00" N Latitude Site in Canadian Border Zone
71° 14' 14.00" W Longitude (NAD 27)

Polarization: Horizontal (H)

Effective Radiated Power (ERP):	700.	kw ERP
Antenna Height Above Average Terrain:	374.	meters HAAT -- Calculate HAAT
Antenna Height Above Mean Sea Level:	417.	meters AMSL
Antenna Height Above Ground Level:	370.	meters AGL

TV Zone: 1

Non-Directional	Antenna ID No.: 33022	Pattern Rotation: 0.0
Antenna Make: HAR	Antenna Model: TAD24UDA-5/60	

Additional Individual Tower Information from the Antenna Structure Registration database.
(Use the Registration Number link for detailed information.)

ASRN	Site Elevation Above Ground (meters)	Overall Height Above Mean Sea Level (meters)	Overall Height Above Mean Sea Level (meters)	NAD 83 Tower Coordinates				Convert to NAD 27
				Latitude		Longitude		
1003433	46.6	395.1	441.7	N 42° 18'	37.0"	W 71° 14'	12.0"	To NAD27

transition.fcc.gov/fcc-bin/tvq?call=WGBH

Coming up Next: Beyond Over-the-Air



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- Network Websites carry most programming for streaming the day after they air for free
- Netflix
- Hulu
- Amazon Prime
- Sling TV from Dish
- Many others





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Questions?