

Cutting the Cable: Receiving Broadcast Television

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Today's Agenda



- 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/>



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



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”
 - 1280×720 pixels = 0.9 megapixels
 - Progressive scan (Broadcast)
 - 1080p and 1080i aka “Full HD”
 - 1920×1080 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



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

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





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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

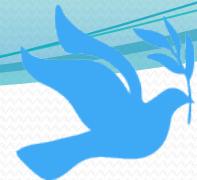
- Indoor



Local
10 miles
\$11.



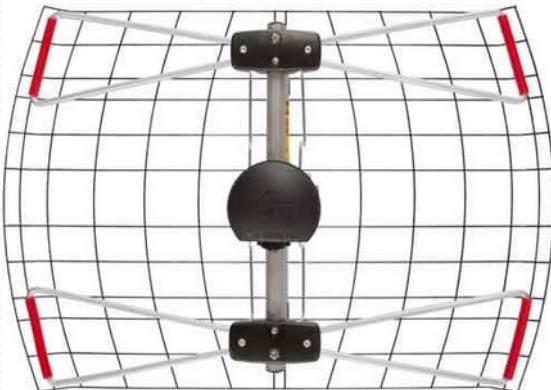
40 miles
Amplified
\$33.



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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.

Broadcast Stations in our Area

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

Broadcast Stations in our Area

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



Broadcast Stations in our Area

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Demo of Available Broadcast Stations
Station List Handout



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Helpful Websites

Stations

WUNI-DT 27.1 UNI
RF Channel: 29
35 miles at 193°



WMUR-DT 9.1 ABC
RF Channel: 9
11 miles at 351°



WBIN-DT 50.1 IND
RF Channel: 35
10 miles at 128°



WUTF-DT 66.1 TFA
RF Channel: 27
31 miles at 174°



WYCN-CD 36 FMN
RF Channel: 36
10 miles at 128°



WBZ-DT 4.1 CBS
RF Channel: 30
39 miles at 155°



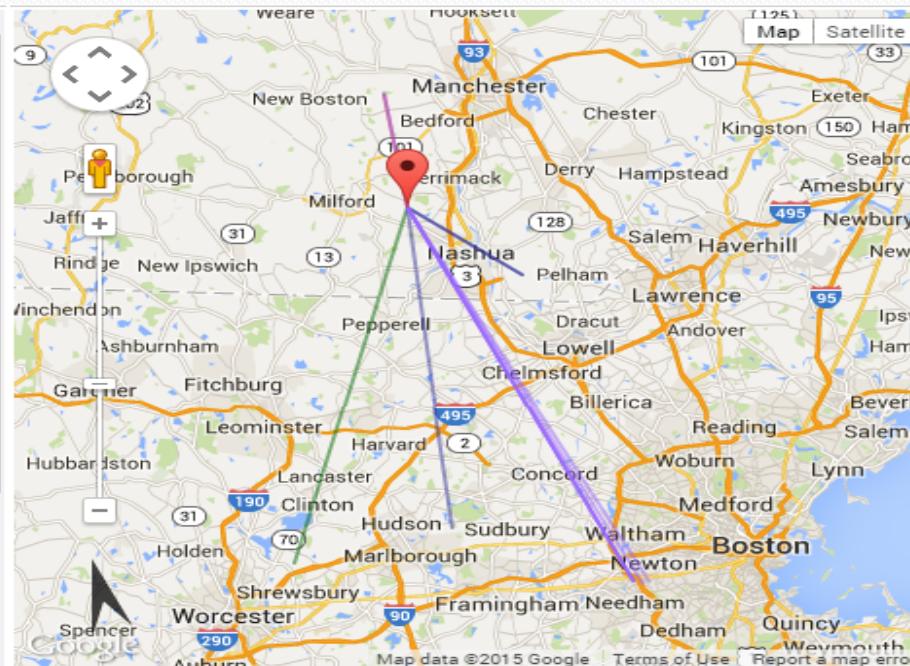
WCVB-DT 5.1 ABC
RF Channel: 20
39 miles at 155°



WGBH-DT 2.1 PBS
RF Channel: 19
39 miles at 155°



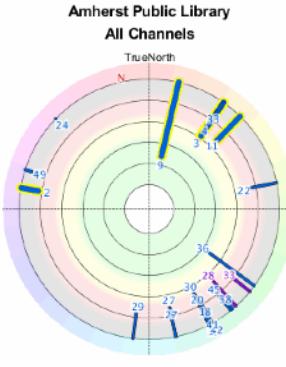
WGBX-DT 44.1 PBS
RF Channel: 43
39 miles at 155°



Helpful Websites



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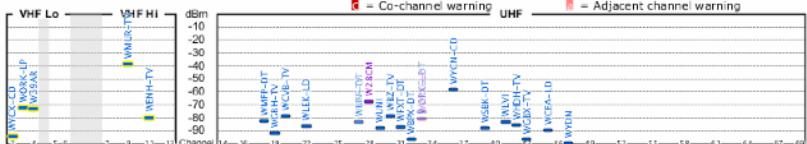
Search Criteria

Address: exact
Amherst, NH

db datecode
201801291705

www.tyfool.com

Callsign	Real	Virtual	Network	Signal		Path	Distance	Azimuth	True Name
				WV	dBm				
WNUK-TV	9	(9.1)	ABC	52.2	-38.6	L05	8.6	13°	(27°)
WVCM-TV	33	33.0	-57.8	1.6	14.8	W66	126°	(141°)	
WVCM-TV	4	(33.1)	ABC	18.6	-72.3	2.6	27.5	35°	(49°)
WVCM-TV	33	(21.1)	TON	15.9	-74.9	2.6	27.5	35°	(49°)
WBZ-TV	30	CBS	12.4	-78.4	1.6	43.0	152°	(167°)	
WCWB-TV	20	ABC	12.2	-78.6	1.6	43.0	152°	(167°)	
WZCM-TV	28		11.7	-67.2	1.6	43.0	12.8	151°	(151°)
WZCM-TV	11	(11.1)	PBS	10.7	-73.7	1.6	30.5	152°	(167°)
WZFP-TV	18	(6.2)	Ind	8.3	-83.5	2.6	43.5	152°	(167°)
WLVI	41		CW	7.8	-83.0	2.6	43.5	15.9	(166°)
WUTF-TV	27	(6.6)	TEL	7.5	-83.4	2.6	33.7	168°	(183°)
WBIN-TV	27			7.4	-83.4	2.6	33.7	168°	(183°)
WHTV-TV	42	(7.1)	NBC	5.1	-85.8	2.6	43.4	152°	(167°)
WHTV-TV	20			5.1	-85.8	2.6	43.4	152°	(167°)
WFXT-TV	31	(21.5)	Fox	3.7	-87.3	2.6	43.9	15.9	(165°)
WSBS-TV	39	(38.1)	Ind	3.1	-87.8	1.6	43.0	152°	(167°)
WNUJ	29	(27.1)	Uni	2.8	-88.1	2.6	36.6	18.5	(201°)
WCEA-LD	45		1.3	-89.5	1.6	45.3	141°	(156°)	
WGL-TV	19	PBS	-1.1	-91.6	2.6	43.0	152°	(167°)	
WGL-TV	31		-5.0	-91.6	2.6	43.0	152°	(167°)	
WNYC-TV	2		-2.6	-94.5	2.6	50.1	279°	(294°)	
WGXR-TV	43	PBS	-5.3	-96.2	2.6	43.0	15.2	(165°)	
WBPE-TV	32	(68.1)	ION	-5.9	-96.7	2.6	43.5	152°	(167°)
WYDN	47	(48.1)	Ind	-8.9	-97.7	2.6	43.0	152°	(167°)
WHDH-TV	38		-13.5	-100.3	2.6	45.3	141°	(156°)	
WJFH-TV	49	(52.1)	Ind	-10.3	-102.3	2.6	32.3	289°	(302°)
WVTA	24	PBS	-19.8	-110.6	2.6	57.5	314°	(328°)	
WNNE-TV	25	(31.1)	NBC	-20.2	-111.0	2.6	57.5	314°	(328°)
WDPX-TV	40	(58.1)	TON	-23.1	-113.9	Tropo	104.3	141°	(155°)
WMTW-TV	8	(8.1)	ABC	-23.5	-114.4	Tropo	80.7	325°	(349°)
WKTU-TV	40	(48.1)	NBC	-23.5	-114.7	Tropo	82.8	325°	(349°)
WKG-TV	40	(48.1)	Ind	-25.1	-115.9	Tropo	83.5	15.2	(165°)
WKG-TV	6	(6.1)	CBS	-27.0	-117.9	2.6	122.3	263°	(277°)
WGME-TV	38	(13.1)	CBS	-28.7	-119.6	Tropo	93.0	38°	(32°)
WQDO	40		-29.5	-108.4	2.6	43.5	152°	(167°)	
WPTZ-TV	10	(5.1)	NBC	-31.2	-122.1	Tropo	129.3	333°	(347°)
WQED-TV	10	(46.1)	Ind	-31.9	-122.8	Tropo	129.3	333°	(347°)
NCAX-TV	21	CBS	-34.1	-123.8	Tropo	129.3	333°	(347°)	
WYER-TV	9	(28.1)	PBS	-32.7	-123.6	2.6	92.7	307°	(321°)
WHTS-LD	46		-33.2	-112.0	2.6	40.5	137°	(151°)	
WSDQ-TV	22		-33.3	-124.1	2.6	57.9	314°	(328°)	
WVNV-TV	13	(22.1)	ABC	-34.1	-125.0	2.6	329.3	313°	(327°)
WJW-TV	16	CBS	-34.1	-125.0	2.6	329.3	313°	(327°)	
WLNC	22		-35.1	-125.9	2.6	83.0	15.2	(165°)	
WMPX-TV	33	(33.1)		-37.4	-128.2	2.6	104.3	141°	(155°)
WGWS-TV	22	(57.1)	PBS	-38.0	-128.9	Tropo	67.5	231°	(245°)
WMEAT-TV	45	(26.1)	PBS	-38.1	-129.9	2.6	56.5	47°	(61°)
WNAC-TV	12	(64.1)	Fox	-38.2	-129.0	Tropo	70.3	165°	(180°)
WJW-TV	12	(12.1)	CBS	-38.2	-129.0	Tropo	70.3	165°	(180°)
WFGS-TV	16		-38.6	-129.9	2.6	67.5	201°	(245°)	



www.tvfool.com

Helpful Websites



Boston

2 (19)	WGBH		ID: "GBH 2" City: Boston, MA Owner: WGBH Educational Foundation Web Site: http://www.wgbh.org/ Station Info: Digital Educational Full-Power - 700 kW
4 (30)	WBZ		ID: "CBS 4" City: Boston, MA Owner: CBS Corporation Web Site: http://boston.cbslocal.com/ Station Info: Digital Full-Power - 825 kW
5 (20)	WCVB		City: Boston, MA Owner: Hearst Television Web Site: http://www.thebostonchannel.com/ Station Info: Digital Full-Power - 625 kW
7	WHDH		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
9	WMUR		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
25 (31)	WFXT		ID: "FOX 25" City: Boston, MA Owner: Fox Television Stations Web Site: http://www.myfoxboston.com/ Station Info: Digital Full-Power - 780 kW



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Helpful Websites

Boston, Massachusetts							30	
Display Channel	Physical Channel(s)	Station	City	State	Expand/Contract All			Print All
2	19	WGBH-TV	BOSTON	MA		Mobile DTV	Update TV	PBS
4	30	WBZ-TV	BOSTON	MA				HD DAB CBS
5	20	WCVB-TV	BOSTON	MA			The MCV	HD DAB ABC
6	38	WHDT-LD	BOSTON	MA				
7	42	WHDH	BOSTON	MA		Mobile DTV		HD DAB NBC
9	9	WMUR-TV	MANCHESTER	NH			The MCV	HD DAB ABC
Display Channel	Physical Channel	Video	Audio	Call Sign	Network/Programming	Nickname	Notes	Print
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 ScreenCaps								
Historical, Ownership, Transition, and Translator Data								
11	11	WENH-TV	DURHAM	NH			PBS	
13	36	WYCN-CD	NASHUA	NH			PBS	

www.rabbitears.info/market.php



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Helpful Websites

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	Overall Height Above Ground (meters)	Overall Height Above Mean Sea Level (meters)	NAD 83 Tower Coordinates			Convert to NAD 27
1003433	46.6	395.1	441.7	N	42° 18' 37.00"	W	71° 14' 12.00" To NAD27

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

Coming up Next: Beyond Over-the-Air



- 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?