

Cutting the Cable: Receiving Broadcast Television

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Michael LoVerme Memorial Foundation
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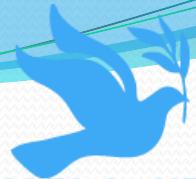
Today's Agenda

- 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/>



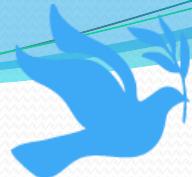
Analog Television

- 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
 - 2019 – Recycle your Analog TV at Staples or Best Buy



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 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)



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 (still)
 - No broadcast available – only Direct TV, Dish, and Xfinity
 - Ultra HD Blu-ray players (around \$200)
 - Redbox is starting to roll-out 4K Ultra HD Blu-ray movies in its kiosks
 - 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





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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



Antennas

- Indoor
- Outdoor
- Amplified
- Small
- Medium
- Large
- Directional
- Multi-Directional
- In Tewksbury you will need a small outdoor, multi-directional antenna or an amplified indoor 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.



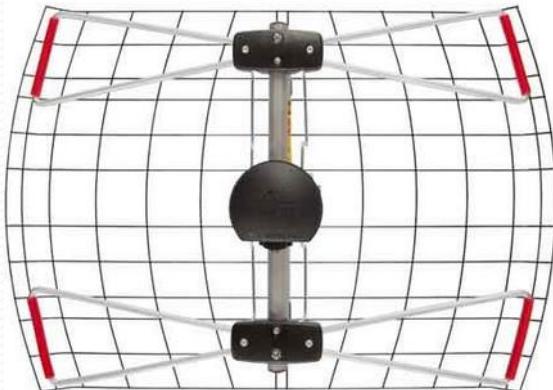
40 miles
Amplified
\$33.



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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



Broadcast Stations in our Area

**Demo of Available Broadcast Stations
Station List Handout**



FCC Repack

- In March of 2016, the Federal Communications Commission (FCC) started an auction designed to repurpose television airwaves for new uses by wireless companies.
- At the conclusion of the auction in March of 2017, the FCC announced that nearly 1,000 local television stations must move to new frequencies between 2018-2020.
- Stations are assigned to a particular timeframe, or phase, to complete their frequency moves (see below for phase schedule).
- This only impacts viewers who receive their local stations using an antenna - Cable and Satellite service customers are not impacted.

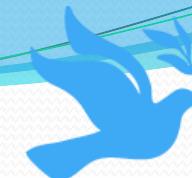


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FCC Repack – Transition Schedule

Phase	Testing Period Start Date	Phase Completion Date
0		9/13/2018
1	9/14/2018	11/30/2018
2	12/1/2018	4/12/2019
3	4/13/2019	6/21/2019
4	6/22/2019	8/2/2019
5	8/3/2019	9/6/2019
6	9/7/2019	10/18/2019
7	10/19/2019	1/17/2020
8	1/18/2020	3/13/2020
9	3/14/2020	5/1/2020
10	5/2/2020	7/3/2020

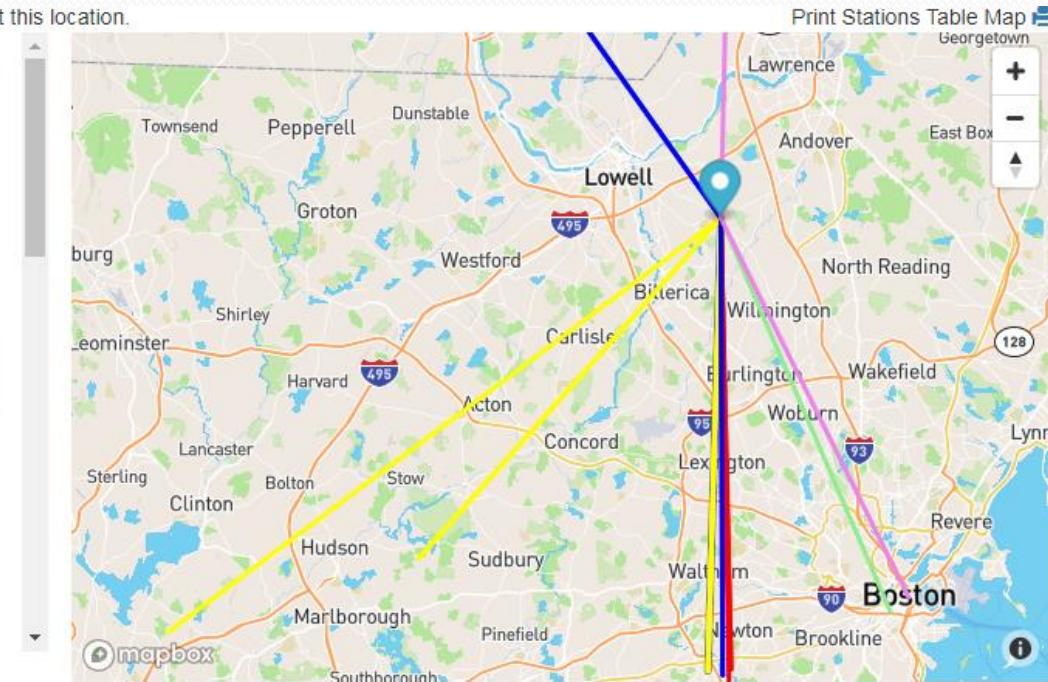
Helpful Websites



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 Up to 50 channels from 20 over-the-air stations may be received at this location.

Stations	Antenna	FCC Repack
WUTF-DT 27.1 UNI RF Channel: 29 31 miles at 248°		 Yellow 
WFXZ-CD 24.1 FOX RF Channel: 19 20 miles at 196°		 Yellow 
WCVB-DT 5.1 ABC RF Channel: 20 20 miles at 196°		 Yellow 
WBZ-DT 4.1 CBS RF Channel: 30 20 miles at 196°		 Yellow 
WGBH-DT 2.1 PBS RF Channel: 19 20 miles at 196°		 Yellow 
WUNI-DT 66.1 UNI RF Channel: 27 21 miles at 236°		 Yellow 
WGBX-DT 44.1 PBS RF Channel: 43 20 miles at 196°		 Yellow 

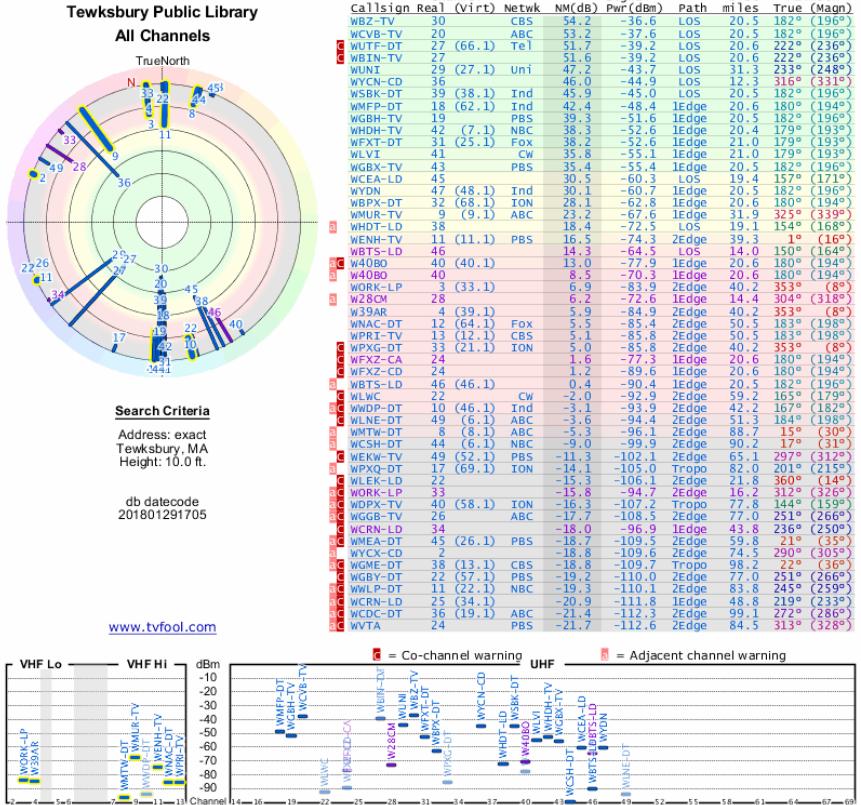


www.antennaweb.org



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Helpful Websites



www.tvfool.com



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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

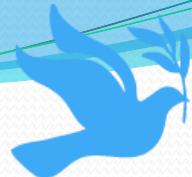
25
(31)

[WFXT](#)



ID: "FOX 25"
City: Boston, MA
Owner: Fox Television Stations
Web Site: <http://www.myfoxboston.com/>
Station Info: Digital Full-Power - 780 kW

www.stationindex.com/tv/markets/boston



Helpful Websites

9 Boston, Massachusetts							30				
Display Channel	Physical Channel	Station	City	State	Expand/Contract All Print All						
Display Channel	Physical Channel	Video	Audio	Call Sign	Network/Programming	Nickname	Notes	Print			
2	19	WGBH-TV	BOSTON	MA	  	    PBS					
4	30	WBZ-TV	BOSTON	MA	 	   CBS					
5	20	WCVB-TV	BOSTON	MA	 	    ABC					
6	38	WHDT-LD	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	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	 						

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



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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

NETFLIX

hulu™

huluPLUS

amazon *Prime*

vudu™

sling
TELEVISION



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Questions?