

A guide to PBS HDTV viewing for the Roanoke area

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Introduction

Blue Ridge PBS (WBRA) broadcasts in HDTV from Poor Mountain, about 9 miles Southwest of Salem Virginia in Roanoke County. This white paper is to assist viewers with setting up HDTVs for free over the air broadcasts from our station.

Because HDTV signals are broadcast with data like computers, bad data results in blocking, bad audio, or no picture and sound at all. Sometimes the picture is perfect one day and gone the next because the received signal became weak which is known as the cliff effect. This has enormous consequences when tuning in a station. You cannot optimize your antenna very well only looking at the picture because there won't be any picture until you have a good enough signal. Setting up HDTV reception is not difficult but requires some knowledge for success which I will share with you here.

HDTV channel assignment for Blue Ridge PBS (WBRA)

HDTV channels can be broadcast in the VHF (Very High Frequency) or UHF (Ultra High Frequency) bands. WBRA broadcasts on VHF channel 3. All the other broadcasters in the Roanoke/Lynchburg market broadcast in the high VHF or UHF band. This has no impact on the quality of the signal but is very important to choosing the right antenna. Many antennas sold today are UHF only, or high VHF/UHF and won't receive the low VHF channel we broadcast on. Antenna manufactures have done this to reduce cost and size but create serious reception problems for those trying to receive a low VHF channel like ours.

There is another important feature about HDTV channels that you may not be aware of. Because our HDTV signal is digital, we can tell the TV or converter box to display a different channel number than the actual frequency channel we broadcast on. For example, WBRA broadcasts on VHF frequency channel 3, but we tell your TV and converter box to display 15.1 so it is easy to associate our digital channel to our old analog channel. We also broadcast additional channels on 15.2 SWVPTV, 15.3 KIDs, and 15.4 Create. These extra channels are not broadcast in high definition because there is not sufficient room in the allowed frequency spectrum but they are all digital and still produce good quality.

You must first receive a good signal from the station before the digital channel number will appear on the receiver. Once the HDTV or set top box picks up our signal, it will be displayed as 15.1 through 15.4. Channel 3, our native broadcast channel, will never be displayed on your set.

Antennas

As you know by now, you must have a VHF/UHF antenna to pick up all the stations in the Roanoke/Lynchburg market. If your antenna does not have the VHF part, you will not receive Blue Ridge PBS (WBRA). Furthermore, some sellers advertise that their antennas pick up VHF and UHF but in actuality, they only pick up VHF high band (channels 7 – 13), not low band VHF (channels 2 – 6). If they show a frequency response in the specifications, it must go down to 60 Mhz to receive our channel 3 broadcast. Channel 3 is a little below the FM radio band.

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A general rule is; the higher the antenna gain, the larger it will be, and the more directional it will be, and the better it will pick up signals farther from the transmitter. However, it becomes more important to carefully point the antenna towards the towers or the high gain will not help you because the antenna is also more directional. If you are near the towers (under 10 miles) a simpler, lower gain antenna, will likely work better than a more expensive high gain unit.

Something you should know about radio waves and indoor antennas

Your home is filled with radio waves of various frequencies for various services. These very weak signals bounce and reflect off the metal surfaces in your home and neighborhood. As these signals bounce around, they create hot spots and null spots which vary depending on frequency and physics. The trick in successfully setting up an antenna is finding the sweet spot where the signals are strongest. This may not be on top your television receiver and the sweet spots and null spots may be a little different for different channels. If you are having trouble getting a good signal for all the stations, don't hesitate to experiment by trying different locations. Outdoor antennas work much better because they are outside your home and not affected by wiring and building construction materials. Antennas mounted in the attic are the next best location, with indoor antennas being the least desirable antenna location.

Indoor antennas are often amplified and need to be plugged into a wall outlet for power to work. These are the best performing because the amplifier increases the weak signal found in the home. The VHF element of these antennas are most often rabbit ears (two extending rods that pull out). These elements must be extended and you will usually get better response if they are somewhat horizontal.

Setting up your HDTV

Connect the antenna to the HDTV input terminals. Once your antenna is connected, be sure to plug in the power if it is an amplified unit. Also turn it on if there is an on/off switch. Amplified antennas will not work without power. Next, point the antenna in the general direction of the tower sites (see map below for guidance). Turn on your television and use the remote control to select auto setup (see device instructions as needed). The HDTV television will seek out each station with a good signal and map them with the HDTV channel number. Once the auto programming is complete, you will be ready to watch your favorite programs.

What if some HDTV channels are missing?

Often some stations do not come in on the first attempt. This means that your antenna needs to be adjusted or you may need a better antenna. Refer to your sets operating instructions for specifics but here is the basic method you can use that should help:

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Select one of the over-the-air HDTV channels you are successfully receiving. Now go to the menu and under setup, turn on the signal strength indicator (most but no all sets have this feature). Some sets have a button labeled signal or meter which you can press without using the menu. The display should show a bar representing signal strength from poor to good or weak to strong or 0 to 100. Start rotating the antenna to increase the signal strength. You should also try changing the position and location to find the "sweet spot". It may be higher, lower, or several feet one way or another. Once you achieve the strongest picture possible, go back and select auto setup. The digital television or converter box should now find all the stations located near the channel you used to peak the signal. If you are using an attic or roof top antenna, someone will have to observe the signal strength and communicate this to the person turning the antenna until you have the best signal. An antenna rotor allows you to position the antenna from inside you home making this easier. If you still can't receive all the local stations I have listed, try another station you can get and repeat this procedure. If it still does not work for all stations, you will likely need a better antenna or a better location for the antenna.

If you have strange problems with your HDTV

I have heard about many strange problems from viewers concerning their HDTVs. These sets are sophisticated and have built in microprocessors (computers) inside. If you run into a strange problem with your HDTV that you can't figure out, we recommend that you turn it off and unplug from the wall for 10 minutes. Then plug the set back into the wall outlet, turn it on, and go to the menu and re-scan your channels just like you did when you first purchased the set. This will cause the set to reload the software and clear out any corrupt operating parameters frequently correcting many problems.

I hope you find these instructions helpful and that it allows you to enjoy all your favorite programming on your new digital television or set top box with the best ever pictures and sound. If you have the internet you can find a great deal of information available at the sites:

Antenna Web - A useful website that allows you to type your address and provides distances, directions, and signal levels available.

<https://www.antennaweb.org/Address>

Rabbit Ears - Another website to provides a lot of interesting tools. More technical than Antenna Web.

<http://www.rabbitears.info/>

TV Fool - Another locator tool that you can use to search by address to find distances and locations to the transmitters available in your area.

<http://tvfool.com/>

FCC DTV reception maps

<https://www.fcc.gov/media/engineering/dtvmaps>

My email address, if you have further questions, is dullmer@blueridgepbs.org

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The antennas listed below will pick up Blue Ridge PBS channel 3 and the other UHF stations in the Roanoke area:

Great antennas

1. Winegard HD8200U 65 mile range outdoor all band antenna, \$144.99, Home Depot or Amazon
2. Channel Master CM-3018 60 mile range outdoor all band antenna, \$95.00 Walmart, Amazon, Home Depot
3. Terk HDTV AZ \$58.10 indoor antenna, Walmart

Good antennas

4. Channel Master CM-3016 45 mile range outdoor all band antenna, \$53.32, Home Depot
5. Boost Waves WA-2802 outdoor antenna \$35.00 Amazon
6. RCA ANT1275F \$29.99 indoor antenna, Best Buy
7. RCA ANT310Z \$24.98 indoor antenna, Home Depot

Please note, if you use your antenna to feed multiple TVs, you will need a higher gain more expensive antenna and/or amplifier at the antenna to overcome the losses of splitters. A two way splitter cuts the signal in half for each set, a three way reduces signal to 1/3, a four way reduces signal to 1/4th. Amplifiers work best at the antenna so the amplified signal is cleanest to overcome losses in the down lead and splitters. Outdoor antennas are always better than indoor antennas for strong reception although many people have good success in their homes with indoor antennas in the Roanoke Valley. Keep your packaging in good order so you can return the antenna if it does not work well in your particular situation.

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Roanoke Area Map and predicted signal level from FCC web site:

<https://www.fcc.gov/media/engineering/dtvmaps>

TV Stations Coverage

Signal Legends

Strong	Moderate	Weak	No Signal

Callsign	Network	Virtual Channel	Band
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Click on callsign for detail

	WSLS	NBC	10-1	UHF
	WDBJ	CBS	7-1	UHF
	WFXR	FOX	27-1	UHF
	WPXR	ION	38-1	UHF
	WBRA	PBS	15-1	Lo-V

Network: PBS [x]

Channel: 15 (RF 3)

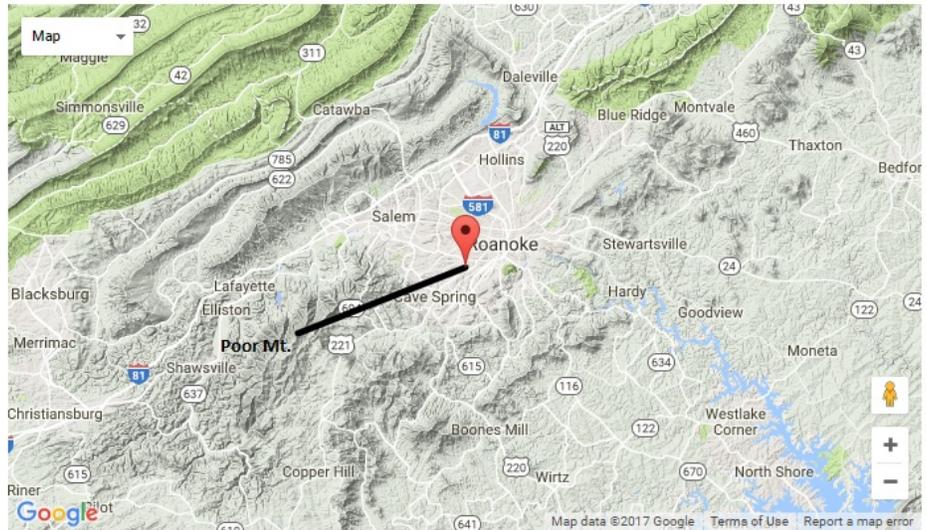
Receive Power: -28 dBm

Compass Direction to Tower:

W (256)

Gain/Loss Map

	WWCW	FOX	21-1	UHF
	WSET	ABC	13-1	Hi-V
	WEFC	unknown	24-1	UHF
	WVPT	PBS	51-1	Hi-V
	WVNS	CBS	59-1	Hi-V



Please note:

These predictions are based on a terrain-sensitive propagation model resembling but not identical to the propagation model used when calculating service and interference contours for licensed broadcast television stations. Actual signal strength may vary based on a variety of factors, including, but not limited to, building construction, neighboring buildings and trees, weather, and specific reception hardware. Your signal strength may be significantly lower in extremely hilly areas. Click on a callsign for details about that station's digital upgrade plans.