Our most used blog with explanations and troubleshooting for Over The Air TV Reception Issues:
https://www.tablotv.com/blog/getting-technical-over-air-tv-reception/

Getting Technical with Over-the-Air TV Reception (AKA: Why Can’t I Watch This Channel?)

An excellent Over-the-Air TV signal is critical to enjoying free live HDTV with Tablo. In previous blog posts, we’ve covered the basics of getting great OTA TV reception including TV antenna selection, OTA signal availability, potential broadcast signal obstructions and TV antenna positioning.

However, there are some far more technical considerations when we talk about OTA TV signal quality. These technical considerations include signal-to-noise ratio, the digital cliff effect, tuner overdriving, and signal interference – all of which can mean the difference between a great cord cutting TV viewing experience and a less than perfect one.

Signal-to-Noise Ratio (or SNR)

Signal-to-noise ratio (abbreviated SNR or S/N) is a measure used in science and engineering circles that compares the level of a desired signal to the level of background noise.

Digital TV tuners (like those in your TV and in your Tablo DVR) will generally process signals from about -50 dBm (strong) to about -80 dBm (weak).
If your available channel signal falls within the green portion of the graph above, your Tablo DVR should be able to receive, stream and record the channel. But, as digital signals are either ON or OFF, Tablo’s channel scan process may not discover a channel during a channel scan if it’s outside of, or bordering on this range.

An in-line antenna amplifier can boost a marginal signal into the normal range, but since amplifiers boost noise as well as signal, it may not improve and can sometimes even worsen the quality of the signal overall. If this occurs, you may be able to see the channel during a scan, but breakups in the signal or an overwhelming amount of noise can cause buffering on live streams and/or recordings to fail.

**The Digital Cliff Effect**

As we just mentioned, digital signals like Over-the-Air TV are either ON or OFF. The digital cliff effect describes the sudden loss of digital signal reception. Unlike analog signals, which would gradually fade when signal strength decreased (some of you may remember ‘snowy’ TV reception) a digital signal provides a picture that’s either perfect or non-existent at the receiving end.
If your TV signal is weak to begin with, these three variables can cause a drop in reception:

1. Interference
2. Long coaxial cable runs
3. Splitting the signal between multiple devices

Even though Tablo’s tuners are designed to filter out interference and includes an internal amplifier to mitigate signal loss from its internal splitter, the digital cliff effect may also be the reason why you’re able to view a channel on your TV but not via your Tablo DVR.

Overdriving Tuners
Speaking of tuners, it’s also possible to send an Over-the-Air TV signal to your Tablo DVR that’s TOO strong. This can result in channels not being detected during a channel scan, buffering on live streams and/or failed recordings.
Those who live particularly close to broadcast towers (within 5 miles) are most at risk of unintentionally overdriving their Tablo DVR’s tuners. Using a more powerful antenna than required or using an amplifier when it’s not needed, can also lead to the same result.

If you suspect you are overdriving your tuners, try removing any in-line amplifiers and/or switch to a less powerful antenna.

**Signal Interference**

If you think you’ve got the correct antenna AND the correct placement and you’re still not seeing a strong signal for in-range TV broadcast towers, it could be due to invisible or unknown interference. While your Tablo DVR’s tuners have specific filters built in for common sources of interference like 4G/LTE cell phone traffic and Wi-Fi signals, Over-the-Air TV can still be affected by the following sources of interference:

- **Electromagnetic or EMI interference** – caused by nearby power lines, LED lightbulbs, thunderstorms, solar flares, the Northern Lights and even household appliances like electric blankets, popcorn poppers, microwave ovens, electric dryers and water heaters

- **Multipath interference** – caused by OTA signals being reflected off of items such as airplanes, wet/icy surfaces or shiny buildings

- **Moisture** – Heavy amounts of moisture in the air in the form of heavy fog, high humidity or intense rain can also weaken signals enough to fall off the digital cliff

Of course transient/variable physical obstructions cause can cause the most interference but they may come from sources that you hadn’t considered, such as leaf growth on a tree that was bare when you put your antenna up in the fall, construction of a new building between you and the broadcast towers or even your neighbor parking a new RV in their driveway.
Signal Strength as Reported by Your Tablo DVR Channel Scan

When performing a channel scan within the settings screen of the Tablo app, Tablo’s tuner will connect with your antenna and do a quick scan of the channels it is receiving.

Tablo reports **signal strength** at the time of the scan with a series of five dots which represent an overall ‘grade’ for the signal.

(Note - Since signal strength is not reported dynamically, if you’ve switched antennas, moved your antenna or are setting up your Tablo in a new location, you should perform a fresh channel scan.)

The signal strength displayed within the Tablo app is based on calculations of two criteria:

1. Bit Error Rate (BERR) - Error rates in the incoming video broadcast which can be mitigated to a certain extent with built-in error correction.
2. Packet Error Rate (PERR) - Error rates in video packets delivered through the Tablo which will rise as the level of errors in the broadcast video go beyond the automatic error correction ability.

Channels represented by five green dots have no or very few bit errors (BERR) which means no packet errors (PERR). The video and audio will be pristine, easily streamed and recorded.

Channels represented by three orange dots show some bit and/or packet errors which will result in video glitches and potentially buffering and recording errors.
Channels represented by one red dot have a bit and packet error rate which will make the video unwatchable and will result in extreme buffering and is unlikely to generate any complete recordings.

If the error rate is higher than 50% the video will be unplayable and the channel will not be returned in the Tablo App channel scan results.

If you’re experiencing breakups in your audio or video or failed recordings on a channel that is showing as full strength, try these OTA signal troubleshooting steps on the Tablo Knowledge Base. If the video is still problematic, place a ticket with Tablo Support. By logging in to your Tablo remotely, Tablo Support can access more granular signal quality details and run a longer and more thorough channel scan to help determine why your OTA signal is not clear.

If you have any questions about anything we’ve covered in this blog, drop us a note via email, Facebook or Twitter.
Troubleshooting Reception Issues

Tablo Support - David

The most critical piece of troubleshooting video issues is first understanding how to classify the nature of the issue.

If you’re experiencing poor video quality, there could be a few reasons depending on the appearance:

- If the video is clean but stops and starts (stutters) the cause is most likely a poor Wi-Fi signal either from your router to your device (tablet, smartphone, Roku, Chromecast, Amazon Fire TV, Android TV etc.) or from the Tablo to your router if you are using Wi-Fi for the connection. Try moving to a different Wi-Fi channel, upgrade to a router that supports the 5Ghz bandwidth, try an Ethernet connection or move the router closer to the Tablo or to where you are using your device.
- If the video has an occasional breakup, a few pixels at a time or some brief buzzes in the audio, the problem is most likely HDTV reception.

There are a few changes you can make to improve your Tablo's reception:

1. Make sure the antenna is as high up as possible.
2. Try to avoid splitting the coaxial connection - there is a significant DB loss to the signal when you split the connection.
3. Reference http://www.tvfool.com/ to ensure that your antenna is pointed in correct direction.
4. Here's a link on optimal antenna placement: https://www.tablotv.com/blog/position-matters-hdtv-antenna-placement/
5. Shorten your coaxial cable; the longer the cable, the more lossy the connection will become.
6. Conduct frequent channel scans to test your changes (Settings > Edit channel lineup > Rescan)

Receiving one or two channels on your TV, but not your Tablo:
The main difference between the Tablo and a traditional TV is that the Tablo has multiple tuners - so that you can watch and record multiple shows at once.
The drawback here is a small loss in DB when the signal is split. We use amplified splitting technology to mitigate for this loss, so it’s nearly negligible. In some rare cases, you could have one channel on your TV that doesn’t appear on the Tablo.
Since digital signals don’t ‘degrade’ like analog ones do, it’s typically either “on” or “off” and the difference between the two can be quite small. This can be referred to as the ‘cliff’ function, as seen in the image below. Using the tips and tweaks above can often get your reception on the right side of the cliff.
Here is another blog post talking about obstructions that can vary on the hour/day to impact reception:
https://www.tablotv.com/blog/ota-tv-obstructions-interference-reception/

**Top Sources of Obstruction & Interference That Can Impact Your Over-the-Air TV Reception**

Savvy cord cutters know that an Over-the-Air (OTA) TV antenna is the best – and most cost-effective – way to watch your local broadcast TV stations like ABC, CBS, NBC, PBS, and FOX.

Along with your TV antenna and your location, the next critical aspect in your ability to receive free Over-the-Air TV is the presence of obstructions or sources of interference between your antenna and local broadcast towers.

Visible obstructions and/or invisible sources of interference can cause errors in the broadcast TV stream resulting in audio drop outs and/or pixilation and stuttering in the video.

And unlike the days of analog TV, a digital OTA TV picture won’t degrade slowly into ‘snow’, it will often just stop – something known as the digital cliff.

That’s why obstructions and interference can have a huge impact on the number of channels you’re able to receive and reliability of those broadcasts.

If you use an OTA DVR like Tablo, obstructions and interference can also cause your recordings to fail.

Keep reading to learn the most common sources of OTA obstructions and interference so you can avoid them when possible.

**Common Sources of Over-the-Air TV Obstruction**

In general, obstructions are visible impediments affecting the line-of-sight between your local broadcast towers and your Over-the-Air TV antenna.

Common obstructions include:
Mountains & Valleys
If your local broadcast tower is behind a mountain, or you live in a deep valley, obtaining a good OTA TV signal will be problematic as the signal’s line-of-sight will be blocked, or will pass right over your TV antenna.

Trees
Lucky enough to have a house surrounded by 100-foot century-old redwoods, or just a handful of huge maples? This can also block OTA TV reception, especially in the spring/summer when increased foliage and wind can cause breakup of Over-the-Air TV reception.

Large Buildings
If a large concrete office building sits between you and your local broadcast towers, your TV reception may also be blocked. Buildings with ‘mirrored’ exteriors can also create multipath interference as signals are ‘refracted’ or bounced off the shiny surfaces.

Your Home’s Construction Materials
Just like cell phone and satellite radio signals can’t penetrate parking garages, concrete and rebar construction or mesh stucco walls can block Over-the-Air TV signals.

Over-the-Air antennas should never be placed in basements, or in windows with metallic film, security bars, or mesh as this will obstruct signals. Those planning to install an antenna in their attic should also choose a different location if they have a radiant heat barrier.

Common Sources of Over-the-Air TV Interference
Just as visible obstructions can impact your Over-the-Air TV signal, invisible sources of interference can also affect your Over-the-Air reception.

Common sources of interference include:
Power Lines
Even if it’s not directly in front of your OTA TV antenna, overhead power lines leading to your house or high-tension lines in your backyard can reflect signals from broadcast towers, decreasing your antenna’s capacity to clearly ‘see’ the signals.

LTE Cell Towers
Traffic from nearby LTE cellular towers can also create invisible interference. Good quality TV tuners (like the ones in Tablo DVRs) and even some antennas can have some built-in LTE filtering, but the addition of LTE filter antenna accessories can also help mitigate this.

LED Lightbulbs
If your OTA TV signal gets worse at night, try turning off the lights. While newer, good quality LED lightbulbs certified by the FCC (or Industry Canada) should not cause any interference with your OTA TV signals, older or lower quality bulbs can create enough radio frequency (RF) interference to block signals.

Weather
To a lesser and far more variable degree, weather can affect your OTA TV signal – especially severe fog/rain/snow, and large temperature swings – as the signal reflects off moisture in the atmosphere.

Cutting the cord on cable using a TV antenna should be easy and cost-effective, but obstructions and interference can throw a monkey wrench into your plans.

Being aware of potential impacts to your OTA TV signal, and avoiding them when possible can ensure your cord cutting journey doesn’t become as frustrating as your monthly cable bill.
Another (recently updated for SEO) Blog that explains how location affects OTA reception:
https://www.tablotv.com/blog/how-location-impacts-your-over-air-tv-reception/

How Your Location Impacts Your Over-the-Air TV Reception

As we mentioned in our Over-the-Air (OTA) TV antenna buyer’s guide, another key factor to cord cutting success is knowing the location of your local broadcast TV towers in relation to your home.

Your local TV channels are broadcast via radio waves from huge transmitter towers located in most major cities and towns across North America.

The closer you live to these towers, the better your Over-the-Air TV reception will be, and the more you’ll be able to enjoy your Tablo OTA DVR.

Line-of-Sight & Proximity to Local Broadcast TV Towers

OTA TV signals are distributed via the concept of line-of-sight.
This means ideal TV reception occurs when your TV antenna is in close proximity to the local transmitter towers and can 'see' them with minimal or no obstructions.

As you get further away from your local TV towers, the more likely that interference, obstructions, and even the curvature of the earth will impact your ability to receive OTA TV signals.

This means ideal reception areas for antenna TV are within 35 miles of your local broadcast towers.

However, depending on your antenna equipment, placement, and other factors, you can still receive signals from towers further afield.

To find out how far away your local broadcast towers are from your home, head over to TVFool.com and enter your address and zip code for a detailed report.

In the example above (which is an address in the Chicago suburb of Aurora, IL) you’ll see that most local channels are broadcast from towers downtown, about 33 miles away.
OTA Channel Selection in Your Location

The selection of channels you can receive with a TV antenna depends on whether a broadcaster in your area distributes the signal for that channel.

For example, in California’s San Francisco Bay Area you could receive over 100 OTA TV stations, whereas if you live in the middle of the Nevada desert - near the famed Area 51 – you’re more likely to find an alien than an OTA TV signal.

However, in most cities you’ll be able to receive OTA TV signals from the main national broadcasters (NBC, CBS, ABC, FOX, and the CW in the US and in Canada CBC, CTV, CityTV, and Global.)

Those living in urban areas near the US/Canada border - like in Detroit – may be lucky enough to receive TV signals from both countries, providing a much larger channel selection.

To find out exactly what OTA TV channels are available in your area, check out our TV channel locator service.
Which HDTV channels can I get?

Most North Americans can access High Definition TV for FREE simply by plugging in an Over-The-Air (OTA) HDTV Antenna. Want to know which OTA channels are broadcast in your area? Let’s find out!

Zip Code

Street Address (optional)

See My Channels

Your actual results may vary based on the placement and quality of your antenna as well as other factors.

Canadian Residents: Simply type your address into the TV Signal Locator provided by TVFool.com, to see what you can expect to get at your home.

Liked this article?

Check out these tools and posts on Over-the-Air TV antennas, OTA signals, and reception next:

- Tablo's TV signal locator
- What Is the Best Over-the-Air TV Antenna for Cord Cutters?
- Top Sources of Obstruction & Interference That Can Impact Your Over-the-Air TV Reception
- Choosing Where to Place Your TV Antenna
- Why OTA Frequency Bands Matter for Cord Cutters with Antennas
- Getting Technical with Over-the-Air TV Reception
- Reusing Existing Infrastructure for OTA Antenna Connections
- How to Access OTA Signals from Multiple Directions