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The Ultimate Guide To Choosing A TV Antenna

Published 2021-10-25 By Dennis Restauro

Many of us grew up watching over-the-air (OTA) TV with a TV antenna before Pay TV convinced us all we needed cable. Did you know you can still watch OTA TV for free? Did you also know that broadcast TV signals are in crystal clear HD? Furthermore, it's free! We can all watch local TV channels without cable. All you need is a TV antenna and a digital tuner. Don't be fooled by TV antenna manufactures. Any TV antenna will pick up over the air TV signals. The term "digital antenna" is a marketing term. An antenna from 1950 will work as long as you have a digital tuner. That antenna will even work for the new over-the-air digital TV standard ATSC 3.0.

The majority of you already have a digital tuner built into your TV. Any television made after 2007 has a built-in digital tuner, as mandated by U.S. law. If your TV is older than 2007 and you aren't ready to upgrade, you can look into getting a digital converter box.

Before we continue, check if there is an antenna already on your roof. Find the cable coming off of your roof, and locate where it comes in the house. Connect that cable to your TV and scan for channels. Be aware you should ensure the antenna is properly grounded. If you don't have an antenna or need a better one, read on. Click on any of the topics below to navigate to that part of the article.

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How to Choose The Best TV Antenna

There are several TV antenna brands on the market. However, what matters isn't the brand. It's your location and direction from the towers and in which band most of your channels are broadcast. Generally, you can grab a GE Ultra Edge indoor antenna if you live in a city or the suburbs. It will provide free access to the major broadcast networks and perhaps a bit more.

If the GE antenna doesn't meet your needs, switching to a different brand of the same antenna type likely won't increase the number of channels you can receive. However, knowing when you need a directional antenna, or a VHF antenna, or amplification and which antenna suits your situation can make a world a difference.

Let's go through the steps of picking the perfect antenna for your needs.

Get a Signal Report

A signal report will provide important information about the TV signals in your area. They are easy to obtain online. The FCC has a great mapping tool to show you which stations are available in your area. It will let you know which stations have strong and weak signals in your area. It also indicates the signal band for each channel. Each channel will have a UHF, HI-V (High VHF), or LO-V (Low VHF). While this might not mean much to you, I will explain why it's crucial information required to choose a suitable antenna.

The channels are ordered by signal strength in the report, with strong signals appearing in green, moderate signals appearing in yellow, and weak signals in brown. See the image below as an example.

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Strong Moderate Weak No Signal

Incentive Auction (IA) information

Mouse over the letter for more details about that callsign.

Callsign	Network	Ch#	Band	IA
WMAR-TV	ABC	2	UHF	R
WNUV	CW	54	UHF	R
WBFF	FOX	45	UHF	R
WUTB	TBD	24	UHF	R
WMPT	PBS	22	UHF	R
WBAL-TV	NBC	11	Hi-V	R
WJZ-TV	CBS	13	Hi-V	R
WMJF-CD			UHF	R
WMPB	PBS	67	UHF	R
WMDE		36	Lo-V	
WRC-TV	NBC	4	UHF	R
WZDC-CD	TELE	44	UHF	R
WUSA	CBS	9		
WJAL	IND	68	Hi-V	
WJLA-TV	ABC	7	Hi-V	
WFDC-DT	UNIV	14	UHF	
WDCW	CW	50	UHF	
WTTG	FOX	5	UHF	
WDCA	MNT	20	UHF	
WHUT-TV	PBS	32	UHF	
WETA-TV	PBS	26	UHF	R
WPXW-TV	ION	66	UHF	R

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 Incentive Auction repacking plans.

Example of FCC TV signal report

Indoor Vs. Outdoor

An outdoor antenna will always be better at receiving TV channels than an indoor TV antenna. I always recommend going with an outdoor antenna when possible. However, you will usually pick up a TV channel with an indoor antenna as long as it has a strong signal and is in the UHF band.

I advise against blindly trusting the color-coding on the FCC website. While the website is extremely helpful, antenna performance varies with UHF and VHF channels.

UHF Vs. VHF

TV channels are split into three different bands, UHF, HI-V (High VHF), or LO-V (Low VHF). The majority of indoor TV antennas are designed to pick up UHF channels.

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ready to digital, would interfere with channels in the VHF spectrum.

Generally, I recommend using an outdoor antenna if you are dependent on receiving VHF channels. Although, there are antenna hacks like using a UHF/VHF signal joiner to combine your UHF antenna with a pair of rabbit ears for VHF channels.

Directional Vs. Omnidirectional

Directional TV antennas are antennas designed to pick up signals in the direction you point them. Omni-directional antennas are designed to pick up channels in all directions. This tradeoff is due to focusing the antenna gain. (Which is different from amplifier gain.) With a directional TV antenna, the gain is built into the TV antenna and focuses reception in the tower's direction. Omnidirectional antennas balance their gain to pick up channels in all directions. Amplifier gain applies to an already received signal which will amplify noise in that signal as well.

The Best TV Antenna for You

Now that we have a general idea about what matters when it comes to antenna reception, we can get into the best antennas to consider for given situations. If you want to know more about the concepts of signal reception, I will go a bit more in-depth on this topic later in this article.

UHF Channels with a Good Signal

If there aren't many hills and obstructions between your home and nearby TV towers, you should be okay with most Omni-Directional indoor antennas. \$20 GE Ultra Edge TV antenna is designed to pull UHF channels in that signal range and should have done the trick. If not, your house may have thick walls or other factors interfering with reception. In this case, I would treat your TV signals as "moderate" instead of strong. Antennas like the Winegard Flatwave are also good options, but you will pay a bit more where a less expensive option can get the job done.

If there are only UHF channels in your area and good signal strength, then it's hard to go wrong with an outdoor antenna. If you need to pull from towers in different directions, go with the affordable DB2e Bowtie Antenna.

UHF Channels with Moderate Signal Strength (yellow)

In these situations, I recommend an outdoor antenna. The type of antenna depends on the channel locations and how strong those signals are. If the UHF channels have moderate signal strength but are located in multiple directions, you can use an omnidirectional antenna like the ANTOP AT-415B. It's aesthetically pleasing to the eye. It's also straightforward to install and does a great job of pulling both UHF and VHF-Hi channels.

Moderate signals are harder to capture. You may need an antenna with a bit of built-in "gain." Think of gain as focusing the antenna in a given direction. If your channels are roughly in a 180-degree arc of one another, we recommend the Clearstream 4V. It's multidirectional as it casts a wide arc and even adds signal gain in the forward-facing 180-degree arc. If you need a bit more gain, you can try the Channel Master ExtremeTenna.

If you need even more gain, you can give the Antennas Direct DB8e a try. The antenna panels on this antenna can be positioned into optimal patterns based on where the TV towers. It also packs a bit more gain.

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to interference patterns varying by location. If you have issues receiving VHF-Hi channels, there are antennas designed to do a decent job with UHF and Hi-VHF channels. For an indoor antenna, I would go with the Mohu Leaf Glide. Check out my review of the Mohu Leaf Glide for more information. It does a better job pulling in those Hi-VHF channels when compared to the \$20 GE Ultra Edge TV antenna.

As for outdoor, the Antennas Direct Clearstream 2V is a good option. It pulls channels within a 70-degree arc and adds a bit of gain in that direction. While Antennas Direct considers this an indoor/outdoor antenna, it's a bit too bulky for me to consider this an indoor antenna. If you need a bit more power, then try the upgraded Clearstream 4V.

If you need a bit more antenna gain, you can try the Winegard HD7694P. It requires more precise aiming than other antennas but will pull channels at long distances in the VHF-Hi spectrum.

Channels in Lo-VHF, VHF-Hi, and UHF

Some areas of the country have digital channels in the VHF-Lo range. If all the channels you want are within 45 miles, then go with the Channel Master CM3016. For longer distance channels, I'd try the Winegard HD8200U. Another option would be to get this version of the DB8e mentioned above. It comes with a VHF kit that adds two dipole elements with a signal joiner to improve VHF reception.

Important TV Antenna Topics

Now that you know the type of antenna you will need, I wanted to point you to more information on common questions concerning over-the-air television.

Over the Air DVR – Yes, you can record from your antenna. I strongly recommend it and review several options in this guide to OTA DVRs.

More than 1 TV – There are solutions for connecting an antenna to more than 1 TV. I recommend an outdoor antenna for this in most situations, but check out the link for more information.

Grounding the Antenna – This isn't a concern for an indoor antenna. However, you want to ground an outdoor antenna. It will mitigate lightning strikes and other electrical anomalies that are possible but unlikely.

Reception – For those that don't want to read all the details and inner workings of TV antennas, I've put together a quick reference to help improve indoor antenna reception.

Antenna Installers – I've had many readers ask about antenna installers in their area. I've discovered an excellent service called Home Advisor that finds trusted home improvement professionals in your area.

Simply click [this link](#) and "antenna" in the search. You can then select "Install or Replace Antenna." Fill out the form, and Home Advisor will connect you with certified professionals in your area to do the work. If you want to get in touch with a live person to put you in touch with a local professional, you can call Home Advisor at **888-605-2759**

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Signal Loss

Signal loss comes from various sources and is measured in decibel (dB) loss. I've done my best to examine numerous studies of signal loss and put together rough estimates of the possible signal loss below. The following sources of signal loss would subtract from the NM;

TV – There is typically a dB loss associated with the TV. An estimate of 3 dB should suffice.

Cable runs – Typically, RG-6 coax is used in the US. The maximum DB loss in the highest TV frequency is about 5.6 dB per 100 ft. cable-run. Add a .5 dB loss for any un-split joint connection.

Splitters – Every split of the coax cable running from the antenna to a TV incurs the loss listed on the splitter. This is typically 3.5 dB, but to be sure, it should be listed on the splitter. You have to count every output on the splitter, whether it's used or not. I go into more detail in this post on choosing a coaxial signal splitter.

Adjacent House –An adjacent house in line with the generation of the signal and casting a shadow either on the antenna or on the exterior wall that is in the path of an indoor antenna creates a loss. Various studies show a dB loss between 10-21 dB for signals within UHF and VHF frequency. Studies also show that raising the height of an indoor antenna will lessen the loss.

Tree Shadowing – This is when a nearby tree in line with the generation of the signal casts a shadow on the antenna or on the exterior wall in line with the antenna. Studies have shown that trees have a dB loss of 0-10 dB within the UHF and VHF frequency. A TV antenna installed at a lower height can improve signal propagation since the signal can better avoid the tree canopy. In rare cases raising an antenna can degrade reception. Often in these cases, a dense tree canopy can be blamed.

Home Penetration – This only matters for an indoor antenna. Expect a loss of around 14dB for a signal to penetrate a home and reach the first-floor antenna. Installing the antenna on the 2nd or 3rd floor can significantly mitigate a portion of these losses.

Anything else with a quantifiable decibel (dB) loss – Yes, this is vague, but any nearby obstruction can cause a dB loss.

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based on its signal strength color coding from the FCC chart shown earlier in this article. We can call this estimate a “noise margin.” Generally, we can assume the following noise margin values:

- Green – we have about 45 dB to work with
- Yellow – we have about 30 dB to work with
- Orange – There is little room for error. There is less than 15 dB of noise allowable with these channels
- Red – This station isn’t coming in without a directional antenna that has signal gain built-in to focus in on the tower

Locate where your TV towers are using the FCC’s channel finder. Use this information to mount your antenna, so it’s pointed toward that tower when possible.

- Optimally it will be near the exterior wall closest to the tower. If this is the case, only subtract 14 dB for home penetration; otherwise, subtract around 34 dB to account for your house shadowing the signal.
- If there is heavy foliage that could cast a shadow on your antenna from the direction of the tower, subtract 10 dB
- If the adjacent house is in the direction of the tower and casts a shadow on the antenna, subtract another 20.

If you are left with about 12 dB or more after subtracting loss estimates, you should have enough signal to watch OTA TV. If you are below 12db, try and find a higher area to mount the antenna. This may be an upper floor or even the attic. You may want to consider the roof if possible.

If there is enough noise margin on the weakest signal, the next consideration is the antenna’s distance from the tower. An important variable when considering the distance is whether the signal frequency is VHF vs. UHF. Commercial antennas typically indicate the range at which they can capture a signal. It is a bit misleading as they usually specify the distance for Ultra High Frequency (UHF).

UHF frequency runs at a higher frequency than VHF or “Very High Frequency.” Realistically, an indoor commercial antenna will do little to pick up a VHF station that can’t be done using a pair of rabbit ears.

Typically your VHF channels should be within 15 miles, and your UHF should be within 30 miles for an indoor solution to work. This is highly dependent on how much loss the signal takes before reaching your antenna. I have seen indoor antennas work over 50 miles from the broadcast tower.

The last concept we need to consider is the direction of the tower. We may or may not need this information depending on the antenna type, but it’s essential to know if we need to troubleshoot the signal. Click on the channel in question on the FCC map tool, and it will highlight the direction to the TV tower.

Now we have everything we need to know about the signal. We can now cover the types of antennas available and their strengths and weaknesses.

Antenna Gain Vs. Amplifier Gain

This subject can be confusing as there are two types of gain regarding antennas. There is antenna gain, which we discussed earlier as being inherent to the antenna. It mainly aids you in receiving a signal from the tower and can be added

receive the signal but will mitigate noise created by splitters, cable lengths, and tuners between the antenna and your television.

More about Antenna Amplifiers

Passive vs. Active Antennas – An active TV antenna is an antenna that has a powered signal amplifier. This is opposed to a passive TV antenna, which is without signal amplification. Active antennas will not affect the antenna’s ability to pick up a signal.

However, it will boost a signal that reaches your antenna to overcome noise in the line, splitters, and TV tuner. This “boost” is given in terms of a dB gain. Please note that an amplifier also adds noise that will impact the gain of the amplifier.

This doesn’t mean every antenna needs an amplifier. Strong signals that are boosted can overload the tuner causing the channel to not display on the TV. (Overload in this instance doesn’t mean “blow up.” The tuner will be fine)

There are also instances where an amplifier will provide no real benefit. For example, let’s assume all the channels received hit the antenna with 30 dB of noise margin to spare. That’s already plenty to overcome most coaxial runs to the TV, hence no need for an amplifier.

This brings up another critical point. Clean up your coaxial runs. Older antenna and cable TV installations used RG-59 coaxial cable. That has almost double the dB loss of the RG-6 used in modern TV antenna installations.

If using splitters, be sure they are rated at least 5-1000mhz. Remember that signal strength is divided by the number of outputs on the splitter, whether they are used or not. A splitter causes a 3.5 dB connection loss on each output.

Types of TV Antennas

Before wrapping this up, I wanted to give a high-level overview of various antenna types. It’s important to understand that directional antennas will have a better range. Still, for typical indoor and outdoor home antennas, I would stick with the ease and convenience of an omnidirectional antenna if at all possible.

Modern Omnidirectional Antennas

Flat– This is the aesthetically pleasing antenna pictured below. They are easy on the eyes. They work well with UHF signals.

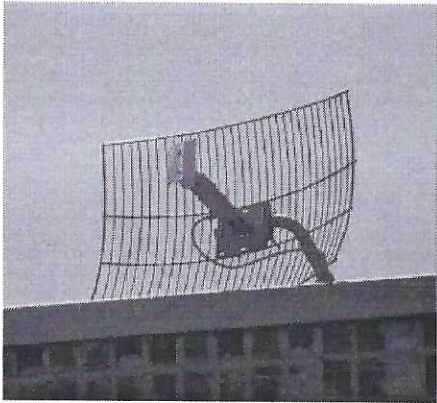


Stylish- Companies like Mohu have introduced aesthetically pleasing indoor antennas like the Mohu Curve. I've used it myself, and it's one of my favorite indoor TV antennas. For a stylish outdoor antenna that does an excellent job in the UHF and VHF spectrum, I recommend the Mohu Sky pictured below. It's the antenna we use, and we love it. It's available on Mohu's website.

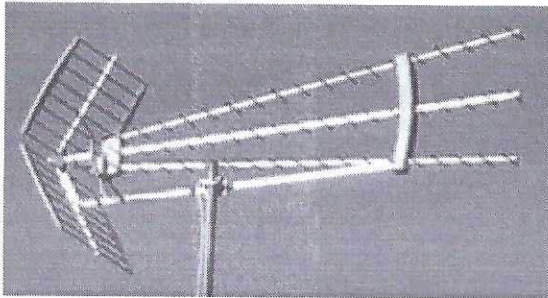


Directional Antennas

Grid Antenna – These antennae are intended to direct the antenna gain to a beam typically not exceeding 25 degrees wide. These are perfect for those areas where TV towers tend to be in one direction.



that aren't in the direction you are aiming.



Older Omnidirectional Antennas

These antennas still work fine for stations near your house. If you live in a metro area with lots of signals close by, you could give one of these dinosaurs a shot.

Loop – A loop is an omnidirectional antenna and is shown in the picture below. This antenna also contains a pair of rabbit ears. The loop is mainly designed to pick up UHF.



Dipole Antenna – For TV antennas, these omnidirectional antennas are typically referred to as “rabbit ears.” They work for local VFH signals, but not much else.



Bow Tie – The bow tie antenna is pictured below. It’s omnidirectional and can pull VHF and UHF. The bow tie underperforms on UHF compared to the loop antenna and doesn’t hold up to rabbit ears for VHF.

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Need More Information?

If this article didn't answer your specific question, head over to our **Home Page**! It will guide you to affordable internet providers, streaming services to meet your needs, information on antennas, and many more tools and resources to help you save money on TV and Internet access.

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PICTORIAL EXAMPLES OF THE
COMMON ANTENNA TYPES

INDOOR: E.G. LEAF
RABBIT EARS, ETC.

OUTDOOR
E.G ROOF MOUNT
ATTIC MOUNT
POLE MOUNT





Roll over image to zoom in



Roll over image to zoom in



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ANTENNA AMPLIFIER

PURCHASE AN INDOOR ANTENNA
THAT INCLUDES AN AMPLIFIER

FOR AN EXISTING SYSTEM OR A NEW
ANTENNA THAT DIDN'T INCLUDE ONE
YOU NEED TO PURCHASE AN
AFTERMARKET ONE

THE AMPLIFIER ENSURES YOU
RECEIVE THE STRONGEST SIGNAL
GIVEN YOUR SYSTEM SET-UP



HOW TO CONNECT BASIC SYSTEM

Install Antenna

Outdoors. e.g. on the roof

Indoors. e.g. in the attic or in window

Aim in direction of station towers

Securely fasten as recommended by manufacturer

USE ANY ANTENNA AIMING(POINTING)
APP YOU CHOOSE TO DOWNLOAD

E.G. ANTENNA POINT

THIS ALLOWS YOU TO POINT YOUR
ANTENNA TOWARDS THE BROADCAST
TOWERS AVAILABLE IN YOUR AREA
LOCATED BY THE APP



CONNECTING THE ANTENNA TO THE TV

THE APPROPRIATE LENGTH OF
COAXIAL CABLE IS ATTACHED FROM
THE ANTENNA TO THE BACK OF THE
TV, OR FROM A CABLE SPLITTER TO
OTHER TV'S IF YOU ARE SETTING UP
MORE THAN ONE TV



COAX CABLE CONNECTORS

Along with the [many types of coax cables](#) there are to pick from, there is also an assortment of different **coax connectors**. When selecting a connector, you need to make sure you select one rated for the cable you are assembling. The back end of the connector that attaches to the coax cable needs to be the right size for installation. If the connector is too small, it will not fit. If it is too big, the connector will not secure properly and can be pulled off or even just fall off.



The type of connector you need will be determined by the equipment used with the coax cable. A television coax connection, for example, uses an F-type connector as the industry standard. Not every connector can be used with every type of coax cable, but all types of coax cables do support multiple types of connectors.

Every connector comes in two versions, **male** and **female**. A male connector will have a pin in the center while a female connector has a hole. If you are using an RP (Reverse Polarity) connector, this is switched. Male RP will have the hole while female RP has the pin. The term "reverse polarity" refers to the fact that the hole and pin are switched. They do not change the polarity of the signal going through the cable.

RP connectors were originally implemented by the FCC to try to stop members of the public from using antennas and other equipment to boost their Wi-Fi signals, in violation of federal law. This worked for a few years but now RP connectors are just as available on the open market as their conventional counterparts.

F-TYPE

F-type connectors are the type of connector seen on the backs of televisions. These connectors are most commonly used on RG59, RG6, and RG11 cable, although there are other options. They can be used for antenna, cable, and satellite television as well as cable modems.

	Male	Female
F Diameter: 0.438"		

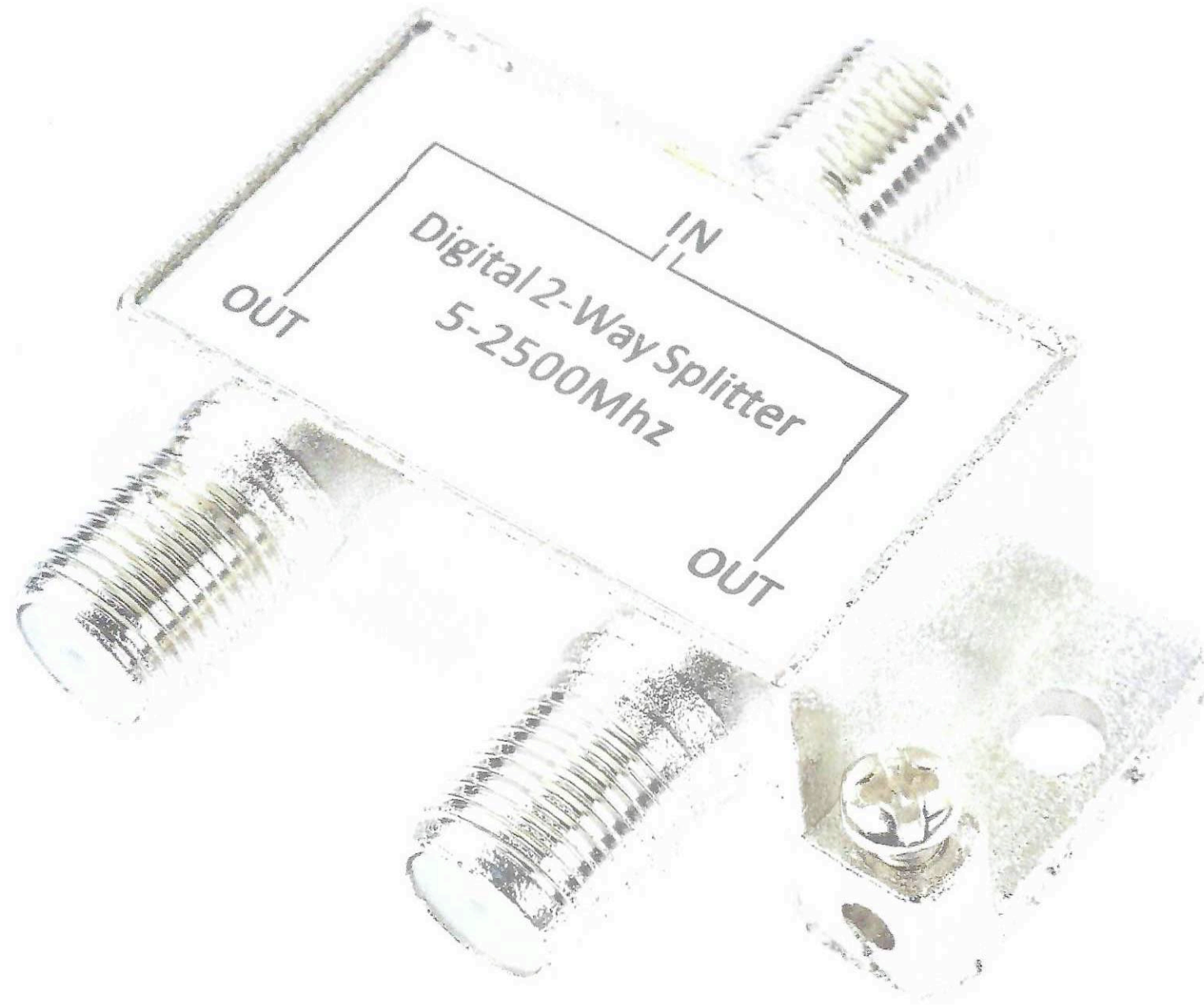


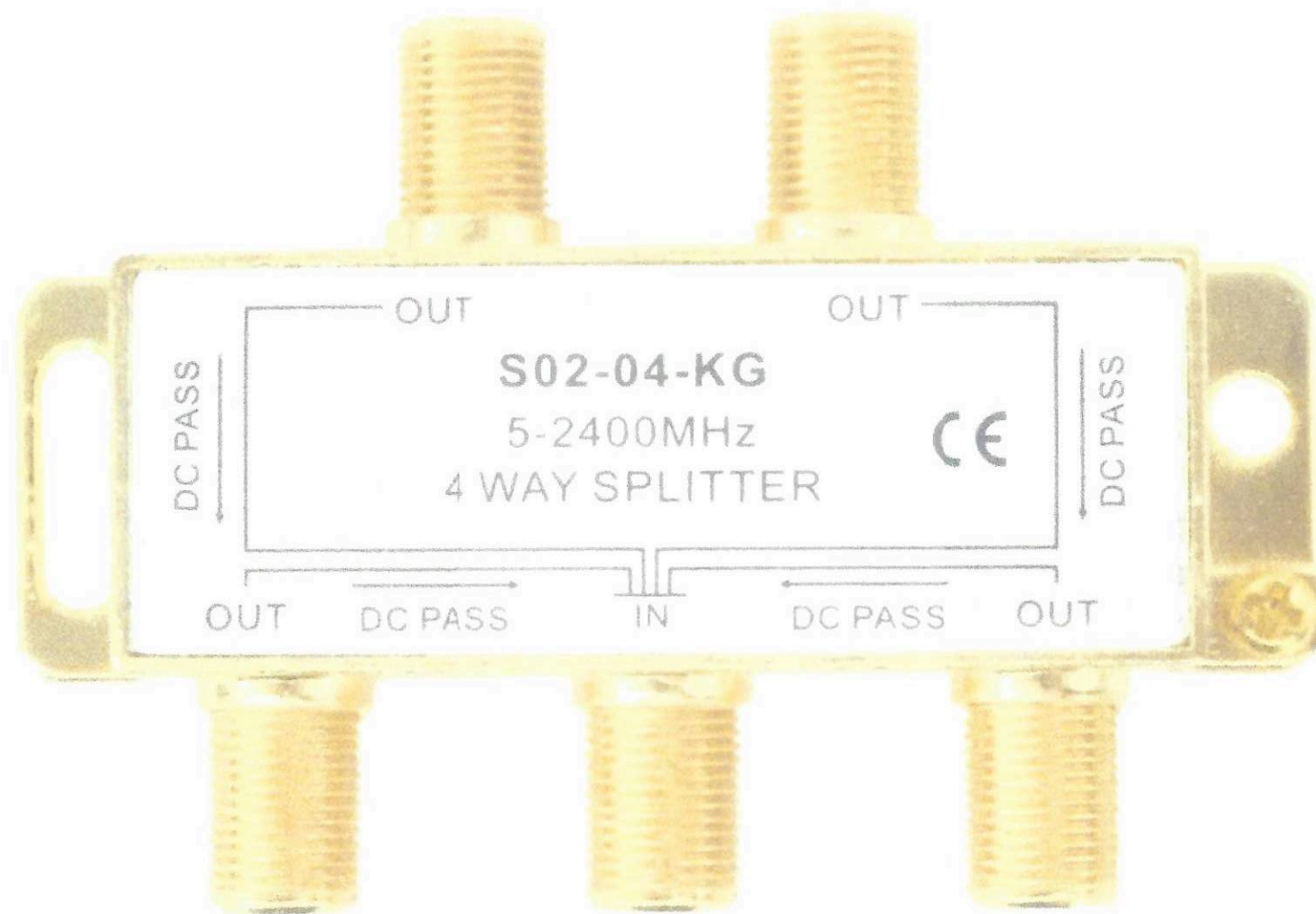


TV SPLITTERS ALLOW YOU TO
CONNECT MORE THAN A SINGLE TV
TO YOUR ANTENNA

THE MAIN CABLE FROM THE ANTENNA
IS CONNECTED TO THE INPUT, AND
ANY NUMBER OF OUTPUT CABLES
CAN BE USED

IF CABLING TO MORE THAN ONE TV A
SIGNAL AMPLIFIER IS RECOMMENDED
AS NEEDED









Questions to Ask Before Cutting

How much TV do you watch

How much do you pay

What programming do you prefer

How do you want to watch TV, i.e what device/devices do you
want to use

When and where and how many users

PRIMARY COSTS ON CORD CUTTING

TV (SMART TV)
ANTENNA
CONNECTIONS
INSTALLATION

SECONDARY COSTS OF CORD CUTTING

INTERNET SERVICE
OTA RECORDING DEVICE (OPTIONAL)
STREAMING DEVICE(S)
SUBSCRIPTION SERVICE(S)

TV PURCHASE (NEW)	\$200 AND UP
ANTENNA	\$ 15 AND UP
INSTALL	\$ 75 AND UP
INTERNET SERVICE	\$ 50 AND UP
OTA DEVICE	\$ 100 AND UP
STREAMING DEVICE	\$ 30 AND UP
SUBSCRIPTION SERVICE(S)	\$ 5 AND UP

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www.amazon.com.

search antennas

www.fcc.com

antennas/ types/etc

antenna-theory.com

OTA Recorders:

HD Homerun.

www.silicondust.com

Tablo

www.tablotv.com

Streaming Devices:

Tivo 4k Stream

www.tivo.com

Roku Express 4K

www.roku.com

Firestick 4k

www.amazon.com

Apple TV

www.apple.com tv

Nvidia Stream

www.nvidia.com

Chromecast

www.google.com

chrome cast ultra 4k

Sideload:

Do a web search typing

1. Side loading

2. How to side load