CONSUMER ADVISORY:
PROPER USE OF INDOOR ANTENNAS
FOR OVER-THE-AIR TELEVISION RECEPTION

This nation's shift to digital television broadcasting on June 12, 2009, provided increased benefits for over-the-air television viewers. Free, over-the-air digital broadcasting provides consumers with the opportunity to receive digital quality programming from local television broadcasters without monthly fees. By connecting an antenna to either a digital television (DTV) or a digital-to-analog converter box with an analog television, many consumers now have access to a wide array of digital quality programming options. In addition, consumers can see new digital multi-cast channels offered by local television broadcasters. Consumers with high definition (HD) TV sets are able to receive programs in HD – the highest quality format.

To receive these digital signals, many viewers will wish to use an indoor antenna, as they did with analog TV service. The following information provides helpful guidance for receiving digital television service with an indoor antenna.

Getting started: I cannot receive any DTV stations over the air.

If you are not receiving any channels, your antenna-TV system may not be set up properly. If this is the case, follow the installation instructions contained on the websites below or the instructions accompanying your antenna and digital TV set or digital-to-analog converter box.

Federal Communications Commission: http://www.dtv.gov/ (At this website, click on the callsign of the desired station to see the actual "RF" channel being used.)

DTV Answers: http://www.dtvanswers.com/

National Association of Broadcasters/Consumer Electronics Association Antenna Web: www.antennaweb.org.

If you do not have web access you can call the Federal Communications Commission (FCC) at 1-888 –CALL-FCC (voice) or 1-888-TELL-FCC (TTY) or call your local TV station for assistance.

Which channels are local TV stations using?

All “full power” TV stations operate with only digital signals and only on a channel between 2 and 51. In most areas, there are some TV stations operating on VHF channels (2-13) and some on UHF channels (14-51).

There are also “low power” TV stations and some of them continue to operate with analog signals and some continue to operate on channels 52-69.

All digital TV sets and digital-to-analog converter boxes are designed to receive all of these channels.

Note that if you use the digital-to-analog converter box that was eligible for the $40 government coupon, it is designed to receive digital signals and convert them to analog signals so you can watch them on your analog TV. These boxes are not able to receive analog signals, although many models can pass analog signals through directly to the analog TV for reception. If you do not have this “analog pass-through” feature, you would have to disconnect the converter box and connect the antenna directly to the TV set or use a "splitter" to receive a low power station that is still operating with analog signals. This situation is not common, but if you need more information, it is explained in detail on the FCC website: http://www.fcc.gov/cgb/consumerfacts/converterbox-analog-digital.html.

Make sure you know the actual channel numbers for all of the TV stations in your area.

In most cases, your digital television set or digital-to-analog converter box is able to “scan” for all the stations in your market. If you are having trouble receiving all stations after several re-scans, you may be able to receive a missing station by inputting the channel number manually, if this feature is available on your TV or converter box. However, you will need to know the actual “transmission” channel that is being broadcast.

The channel number that appears on your DTV receiver for a station (its “brand” channel) and the actual “transmission” channel it transmits on may not be the same. For example, “Fox Five” or “NBC Four” may not be the same as the actual VHF or UHF channel number that the station is transmitting on. Your DTV television set or digital-to-analog converter box translates the “transmission channel” to the “brand” channel that is displayed on your set. You need to know the actual “transmission” channel for the stations you are trying to receive if you need to input a channel manually.

The actual “transmission” channels for stations in your area can be found on the FCC’s website at http://www.fcc.gov/mb/engineering/maps/. Type in your address and you will be directed to a screen that lists the stations in your vicinity. A station’s actual “transmission” channel can also be found using the industry-sponsored antenna selection website: www.antennaweb.org. If you do not have

Internet access, call your local television station or call the FCC at **1-888-CALL-FCC (voice) or 1-888-TELL-FCC (TTY).**

Do I need an indoor or outdoor antenna?

Generally, if you live within 15 miles of a broadcast tower, you may be able to use an indoor antenna. If you are farther away, you may need to use an outdoor antenna.

If you used an indoor antenna to receive analog TV signals, you should first try that same antenna to receive digital TV signals. If, however, you are having problems receiving signals with your old indoor antenna, you may need to replace it.

The guidance below is intended to help you get the best reception from your indoor antenna and, if you are still having reception problems, to provide you with information on what to look for in selecting a replacement antenna.

How can I adjust my antenna to receive more stations?

If you have lost reception from one or more VHF channels (2-13) after June 12, 2009, make sure you are using an antenna that receives both the VHF channels (2-13) and UHF channels (14-51) in your area. Most antenna manufacturers display this information on the box or inside packaging materials. If you no longer have these materials, you can check the manufacturer's website for information about the antenna.

TIP: If your antenna looks like "rabbit ears," this is an antenna designed to receive VHF channels. If you also have an antenna in the shape of a bow tie or a circle, this antenna is designed to receive UHF signals.

If you have a VHF/UHF antenna but continue to have reception problems, try the following steps.

Move the antenna away from the TV set and other electronic devices; place it near a window.

If your antenna is on or near the TV set, and you are experiencing reception problems, try moving the antenna to another place in the room. Placing the antenna near a window often works well, especially if the window faces in the direction of the broadcast tower.

It is not a good idea to place the antenna on or near the TV set. Sometimes electronic interference from the TV set can be picked up by the antenna. For example, low level electrical noise from some LCD and plasma displays can interfere with reception and be more severe for reception of VHF signals. Consumers who place antennas directly behind the TV have experienced

reception problems, especially if the antenna is placed between the TV set and a wall.

In addition, other electrical devices, such as indoor lighting (especially fluorescent light transformers and lighting on dimmers), computers, optical disc players and digital video recorders, VCR and DVD players, modems, electronic game systems, audio equipment, motors, blenders, and power tools may interfere with indoor reception, especially for VHF channels 2-13. So be sure your antenna is not near any of these devices.

Regardless of the type of antenna you have, experimentation is often required to find an optimal location and orientation. With indoor antennas, you may find that an antenna may not receive all available channels at one location or orientation.

TIP: Experiment with different positions, moving away from the antenna after each adjustment and allowing enough time for the converter or tuner to decode and lock onto the signal. You may need to rescan your DTV receiver or manually enter the desired channel.

Adjust the "rabbit ear" antennas to different lengths to receive VHF channels 2-13.

Start by telescoping the rabbit ear antennas out about two-thirds of the way. This will often allow you to receive most VHF channels. Generally, you should extend the antennas out all the way to receive VHF channel 2 and push them in to receive VHF channel 13. The remaining channels will be found somewhere in between. Also try changing the angle at which the rabbit ears are positioned.

Sometimes you need to aim the antenna to receive TV signals.

If you have a directional antenna such as the traditional rabbit ears, aiming the antenna is very important. You may need to re-position your antenna to receive different channels. In such cases, you may need to manually enter the desired channel number to add any channels the DTV receiver did not detect in the initial scan.

TIP: When re-positioning the antenna, move it slowly to give the DTV receiver time to lock in the signal.

Flat panel antennas may also need adjusting.

Flat panel antennas are generally omni-directional and do not need aiming. However, some of these antennas work best when the antenna is lying flat, and some work best when placed vertically or are wall-mounted. After re-positioning your antenna, rescan your DTV receiver.

Also, check the packaging materials and make sure that your flat panel antenna is designed to receive all the VHF and UHF television channels that stations operate on in your area.

The wire from the antenna to the TV set can affect reception.

In most cases indoor antennas have permanently attached connecting wires. If you want to extend your antenna wire to move the antenna further away from the TV, make sure you purchase quality "RG6" wire. Also be sure to remove excess wire length, as longer wires may result in signal loss. For example, if you have 50 feet of wire, do not leave 40 feet coiled up behind the TV set. Trim excess length once you have found a location that works.

What other factors affect TV reception?

The reception performance of an indoor antenna can vary based on factors such as the design of the antenna, its location within your home, the materials with which your home is constructed, the antenna's proximity to other electronic equipment, the presence of furniture and appliances and so on.

Most consumers find that the indoor antennas they used for analog TV reception also work well for digital TV reception. However, this is not always the case, particularly if your old analog picture was poor on some channels.

What should I look for when purchasing an indoor antenna?

Many factors can affect whether an indoor antenna will work for your unique situation. The information provided here is intended to help you choose the proper antenna and to provide help in getting the best performance from it. Due to many factors that affect broadcast signals, unfortunately, there may not be a solution for all situations.

First, make sure you have an antenna that can receive all TV frequencies. Some antennas may only receive UHF or VHF signals, but not both. Make sure your antenna is designed to receive all of the VHF and UHF channels that stations use in your area. Most antenna manufacturers display this information on the box or inside packaging materials.

Some indoor antennas are designed to receive only UHF TV channels 14 and higher. These antennas may not be able to receive the VHF channels (2-13) that stations may use in your area.

Some combination UHF/VHF antennas are designed to receive only channels 7 and higher. If there is a station in your area operating on VHF channels 2-6, this antenna may not be able to receive these stations.

TIP: Even if the antenna is labeled as a "digital," "HDTV" or "DTV" antenna, it does not necessarily mean it can receive all DTV channels. **Look for a label that tells you the channels that can be received by the antenna you are purchasing.** Also check the manufacturer's website or ask the store's sales associate.

What does an indoor VHF antenna or UHF antenna look like?

The basic model of VHF antenna is the traditional rabbit ears, which has telescoping arms. Basic UHF antennas often look like a loop or bowtie. If you see both of these features, your antenna is likely able to receive both UHF and VHF TV channels.

Some newly designed antennas do not have the traditional rabbit ears for VHF reception or the loop for UHF reception. For example, some new antennas look like a flat panel or a horizontal "Christmas tree." It is important to check the reception capability of these antennas (on the packaging or store/website display) to see if they can receive all of the UHF and VHF stations broadcasting in your area.

What special features should I look for when buying an indoor antenna?

Receiving Capability

An important factor in purchasing an indoor antenna is the ability of the antenna to receive or "pick-up" signals. In technical terms, this is called antenna "gain." Inadequate gain on some channels may make it difficult or impossible to receive those broadcast signals. The Consumer Electronics Association has adopted recommended specifications for antenna receiving capability. Antennas meeting or exceeding these specifications will display this logo:

Do I need an amplified indoor antenna?

Not necessarily. In some cases, especially on VHF channels, amplification can make reception worse by raising the level of background signals and interference from other electrical devices in your home.

If you live close to a broadcast tower, amplified antennas can overload your DTV receiver or converter box, effectively blocking reception. If you have an amplified indoor antenna and cannot receive some VHF channels (2-13), try turning off (or bypassing) the amplifier if it has an "on/off" (or "in/out") switch. If you cannot turn

off the amplifier without removing the power, try using your old rabbit ears or purchasing an inexpensive non-amplified VHF antenna.

If you live 15 miles or more from a broadcast tower, an amplified UHF antenna may help to receive UHF channels (14-51).

TIP: Some amplified antennas may amplify both UHF and VHF channels, while others only amplify either UHF or VHF. Read the packaging materials carefully.

Directional vs. multi-directional antennas

Directional Antennas: Directional antennas are designed to receive signals from only one direction at a time. This helps improve reception in the direction in which the antenna is pointed. In order to properly aim a directional antenna, it's important to know where the broadcast tower is located in relation to your home. Broadcast tower locations can be found on the websites listed above or from your local TV stations.

The most common type of VHF directional antennas is traditional rabbit ears, although other antenna styles may be directional such as those shaped like a wing or requiring rotation. These antennas may also have UHF loops or other designs like bowties or Christmas trees to receive UHF signals.

Fully extended rabbit ears will be the best configuration for lower channels, such as channel 2, and partially extended is best for higher channels like 13. To receive the higher VHF channels, 7-13, experiment using the antenna partially extended (about 15 inches). Rabbit ears are typically the best solution for channels 2 through 6.

The advantage of directional antennas is they may be able to receive weaker signals than multi-directional (omni-directional) antennas, especially for VHF channels. The disadvantage of directional antennas is that they may require frequent adjustments to receive different channels, and the adjustments may require you to rescan your DTV receiver repeatedly.

Multi or Omni-Directional Antennas: These antennas are designed to receive signals simultaneously from all directions. The most common type is flat and rectangular in shape. They may require minor adjustments. The advantage of these antennas is that once they are adjusted to receive available signals, they will not require future adjustment or rescanning of your DTV receiver.

The disadvantage of these types of antennas is they may not receive weaker signals that rabbit ears or a similar type of directional antenna might receive.

Many of these antennas are designed to work either horizontally or vertically. Inside your home, one orientation may be better than another orientation. If you

are having difficulty receiving signals in one orientation, try switching the antenna and rescanning your DTV receiver.

Do I need a special FM "filter" or "trap" with my antenna?

In some markets, digital TV signals may receive unintended interference from FM radio stations. This interference may cause problems for consumers in receiving one or more VHF channels (2-13), and particularly channel 6.

Some indoor antennas are equipped with a "filter" or "trap" to reduce this interference. This may be an important feature if you are having reception problems with VHF channels, especially channel 6. Separate FM filters are typically available through electronics retailers. If the packaging materials for your antenna state it can receive FM signals, then it may not have an FM filter, and may be susceptible to picking up interference from FM radio stations, especially on TV channel 6..

There are restrictions that prevent me from having an outdoor antenna on my home. What can I do?

The FCC has a rule called the "Over-The-Air Reception Devices" (OTARD) rule. If you have a home or apartment where you can install an outdoor antenna (such as on a balcony, patio, or the roof of a single family home), the local governmental and nongovernmental authorities are generally not allowed to stop you from installing an antenna. For more information, please refer to the FCC's OTARD fact sheet at http://www.fcc.gov/mb/facts/otard.html.

I do not have internet access. How can I get all this information?

You can contact the FCC at 1-888-CALL-FCC (voice) or 1-888-TELL-FCC (TTY) for assistance in getting information that is available from its website.