



## BEGINNER'S GUIDE TO SATELLITE TV

This guide will help prepare you when setting up a satellite dish to receive satellite TV signals. To do this, you should first have a basic knowledge of how satellite TV works. While satellite TV isn't rocket science - - - *oh wait*, they use a rocket to send the satellite into space so I guess it **IS** rocket science! In any event, we will explain it in layman's terms, so it is easy to understand. We will also include some of the terminology used in the process and explain its use.

Satellite TV signals are similar to other radio and TV signals in some ways – but *very different* in other ways. Like most transmitted signals, they originate from a transmitting source (the satellite in space), are collected by an antenna of some sort (your satellite dish), sent to your receiver for processing and then on to your TV set. That is where the similarity ends. Satellite signals are transmitted in digital “packets” of data rather than through frequency modulation of a carrier wave, i.e. FM radio, or very high frequency (VHF) waves, i.e. analog TV. Most modern cars have satellite XM radios. The “packets” of data allow mostly uninterrupted reception, even when the signal may be briefly blocked by an obstruction when moving. That is why when you drive through a tunnel, for instance, the XM radio continues to play for a few seconds, until it uses up those buffered “packets” of data. When you exit the tunnel, it takes a few seconds for the radio to re-establish a connection and download more data. This is different than FM radio, where the loss of signal is immediate, and returns quickly when you exit the tunnel.

There are numerous satellites in space for a variety of uses. To get satellite TV signals to your receiver, you must point the satellite dish directly at the one (or three to five) satellites that are used for your system. For the purpose of this guide we will focus on getting the signals for a **DirectTV HD system**, since that seems to be the most popular one used by RVers. The same principles apply to all systems.

The satellites are in an arc, over the Equator, and are identified by their latitude degree. The Earth is divided into 360 degrees of latitude segments, running North to South. See the map below -



Now, the PRIMARY satellite for DirecTV is Satellite 101. Looking at the map we can see that Latitude 100 falls directly below Texas, right in the middle of the U.S. The other two satellites needed for getting high-definition TV with DirecTV are 99 and 103, which are right next to satellite 101. This makes it simple to hit all three satellites with little difficulty.

When setting up your dish, you first want to hit your PRIMARY satellite – 101 (the middle **X**). If you were in California, you would need to aim your dish to the LEFT of due South to hit it. If you were in New York, you would need to aim to the RIGHT of due South. But that is just not accurate enough – so you will need exact coordinates. Most, but not all, DirecTV receivers have the coordinates built into their software. If you go into the MENU section of your DirecTV receiver, you should find a section that deals with SETUP and DISH SETUP – or something similar. Within that section there should be a section for DISH AIMING where you can enter the ZIP CODE of your location. When you do this, it will return the three coordinates you will need to aim your dish. The **AZIMUTH** indicates the degrees on a compass from magnetic North to which you will point your dish to hit satellite 101. The **ELEVATION** represents the degrees to which you will tilt the dish up or down to aim it at the satellite 101. The closer to the Equator you are – the *higher the ELEVATION you will use*. The **TILT** is the degrees you will turn the face of the dish on its own axis to match the arc of the satellites in the sky. So, **AZIMUTH – ELEVATION – TILT** will be coordinates you will need to get each and every time you move the dish to a new area, because you will be pointing the dish at the satellite 101 from a different spot.

If your receiver does not have the coordinates built into it, **or** if you are using a **Dish Network receiver**, I recommend using a website called [www.dishpointer.com](http://www.dishpointer.com). I have found that many of the coordinates built into the Dish Network receivers are just plain wrong, and you can waste a lot of time aiming at the wrong place.

While you are in the SETUP section of your receiver, it is important to check that you have properly selected the correct dish from the setup list. Most receivers can use several different types of dishes. SD or HD, SWM or Non-SWM, SL-3 or SL-5. So, be sure you have selected the correct one to match your actual dish. Also, if you have traveled outside your *local station area*, you might not be able to receive your local stations without contacting DirecTV. Be sure the tuner of your receiver is not set to a local station when setting up your dish, or you might receive an error message on the screen.

You can now put your receiver MENU on the SIGNAL STRENGTH test page. You want to check for SIGNAL STRENGTH – not TRANSPONDERS. When on the TRANSPONDERS page there can be a short lag time before the signal strength is displayed. On the SIGNAL STRENGTH page, there is no delay.

Now you are ready to aim your satellite dish. Armed with your dish coordinates, go out to the setup site. You should pick a site that is free of any obstructions that would block the satellite signal. Unlike regular TV signals, satellite signals will not pass through branches, buildings, mountains, etc. **YOU MUST HAVE A CLEAR SHOT AT THE SATELLITES**. Ensure that the mast upon which you mount your dish is *PERFECTLY PLUMB*. You will have difficulty hitting multiple satellites unless the mast is plumb. Mount the dish and set the **ELEVATION** using the markings on the side of the dish. I prefer to initially set the **TILT** to **90 degrees**, regardless of what the coordinates say. This makes it easier to hit the primary satellite.

Aim the dish in the correct direction of the PRIMARY satellite, using a good compass. Keep in mind that the steel of the dish can deflect the needle of the compass. Have a second person watch the SIGNAL STRENGTH bar on the TV screen and notify you when you hit a satellite. Once you hit your PRIMARY satellite, adjust the dish – left – right – up – down for maximum signal strength. Then clamp the dish down to keep it from moving.

You may now adjust the **TILT** to the recommended setting to bring in the remaining satellites.

Now, go inside and enjoy your satellite TV!