

Paradigm Shift Technologies Group

**Satellite Antenna Site Surveys and Installation:
Web Site Instructions**

Using

Target: Sat.

U.S. Patent 6,526,667 B1

To

**Target Satellites locations, their antenna positions
and Insure Clear Lines of Sight, Horizon-to-
Horizon across the Clark Belt**

Site Surveys & “Targeting” Satellites - The Problem:

What satellite antenna customers want the most is the best possible reception from their antenna location.

What installers want is the easiest to install location that has clear lines of sight to the satellites needed.

In the first years of development of satellite delivered signals, customers had fewer options, the easiest thing to do was put the antenna on the roof or on a pole tall enough to get over all of the surrounding obstacles.

Many communities no longer let you do that, even if you could talk the customer into it. Plus, no one wants to climb on the roof or up a pole in bad weather to provide service. The ideal site is on the ground. Next best is on a porch or in a specially enclosed section of the roof under a skylight (so it can be accessed from inside).

Since the customer wants maximum viewing flexibility and has installed a motorized mount that can move the antenna to receive programming from satellites located from horizon to horizon, insuring clear lines of sight to the satellite becomes much more complicated.

As more and more satellites crowd the sky, hand-held targeting instruments become ineffective – you can’t get 2° accuracy and feel comfortable you’re pointing at the right satellite and avoiding obstacles.

How do you provide antenna sites that can provide clear lines of sight to all of the required satellites so that your customer has flexibility in choosing an antenna location?

Paradigm Shift Technologies Group has developed a targeting instrument and an accompanying web site that makes targeting satellites and insuring clear lines of sight to the satellite simple.

Background:

Satellite broadcasting is made possible by the fact that communications satellites are positioned in geostationary orbits (traveling at a speed in sync with the rotation of the earth) approximately 22,300 miles altitude and 1 degree north or south of either side of the equator. This allows each satellite to appear in the same relative position (azimuth and elevation) above a given ground location at all times, which in turn permits satellite antennas in a fixed ground positions to transmit and receive signals to these orbiting satellites. This band around the equator is known as the “Clark Belt”. Each satellite is designated a specific orbit “berth” at 2 degrees spacing from each other.

To prevent signal overlap from each other, satellites are “berthed” a minimum of 2 ° s apart – i.e. 89 °, 91 °, 93 °. In order to optimize picture and audio reception quality, the focal point of the antenna needs to be pointed at that exact location in the sky and the visual path (line of sight) to that satellite must be free of obstacles such as trees, telephone/cell towers and buildings.

For the antenna installer, this means knowing the azimuth and elevation of the satellites targeted relative to a specific ground location.

To calculate the proper azimuth and elevation using readily available formulas, you need the ground coordinates (latitude and longitude) of the proposed installation site and the orbit berth of the designated satellite in degrees West or East.

This is complicated by the fact that the calculated coordinates are all based on “true north”, most installers rely on a compass to know where north is and that is in error because the compass is offset from true north by the magnetic pull of the two poles. As most installers have found out, there is a difference between magnetic north and true north due to variations in the earth’s magnetic field. This “magnetic pull varies from location to location around the world.

The magnetic pull in Minneapolis is only 1.7° from true, but in Massachusetts it is 15.5°. Since the satellites are berthed 2° apart, it is easy to see why someone in Massachusetts could be having problems finding the right satellite, even if they have correct azimuth and elevation of the satellite on the Clark Belt.

To aid the antenna installer, Paradigm Shift Technologies Group has developed an Internet based software application to streamline the azimuth, elevation and magnetic variation calculations, and a targeting instrument, Target: Sat., that allows the installer to use those calculations to quickly and accurately locate the needed satellites in the sky and insure clear lines of sight before attempting an actual antenna installation. These tools save time in locating the correct satellites and maximizing signal strength, and also eliminate the need to disassemble and reinstall

antennas due to obstacles blocking part, or all, of the satellites' signals. Target: Sat. is designed so that once the first satellite has been located, the instrument is positioned on the Clark Belt so that it is simple to pan the unit back and forth stopping to view each satellite's azimuth position and insure clear lines of sight to each from horizon to horizon. In those cases where obstacles are present, Target: Sat. is the ideal tool to help you find ground locations that will qualify to install your antenna.

Here's How the System Works

The web based software application on www.paradigmshifttechnologiesgroup.org allows the user to determine the ground location, latitude and longitude and magnetic variation for his location.



Target:Sat

. A built-in compass, bubble level and side angle finders help make sure the instrument is properly oriented before applying the settings calculated by the software program.

An Azimuth Dial and Pointer lets you adjust for magnetic variation and set the correct azimuth position for viewing the satellite based on “true” north.

A Declination Slider and Angle Finder help set the correct elevation and look angle for viewing the satellite on the Clark Belt.

A viewing lens with cross-hairs on the opposite end of the azimuth pointer let you “Target” the satellite and make sure that a sufficient area around the direct line of sight to the satellite is clear of obstacles to allow for maximum signal strength.

- The azimuth pointer’s panning capability movement lets you easily move across the Clark Belt, 2° at a time, to insure clear lines of sight to the other satellites you may wish to view. The Azimuth Dial keeps track of the degrees west or east of the location you are viewing so that you can view obstacles that may block each satellite’s reception.**
- An optional laser attachment allows you to see the exact position on the ground the antenna mast will be placed.**

Without Target;Sat , the chances of landing on the wrong satellite increase due to the additional satellites orbit positions being added and at the same time those orbit slots are permitting additional space above and below the original orbit position. When viewing the elevation angle , one might mistake that he has a view to that particular satellite when in fact he does not and erects his antenna only to discover that the view was blocked by some building , mountain or other obstacle . Better to be safe with Target:Sat than regret later .Target :Sat has global accuracy .

Please view our accessories for Target;Sat on our web page , www.paradigmshifttechnologiesgroup.org and use our free Satellite locator and antenna alignment tool. This free service is provided to promote satellite viewing and its many benefits . Our partnership with www.Lyngsat.com helps provide the best means for you to fully enjoy what satellite reception can provide to you and your friends and family .