

Pictures of an Antenna

A Wire



Antenna As Viewed From Space

Here is a truly amazing picture: a wire antenna as viewed from space. The arrows mark the four sides of a loop of wire suspended between 30 and 70 feet in the air. The satellites that show the “Satellite View” on google maps are made from color dots where each dot shows about 1 yard. The wire is less than 0.1 inch in diameter. There is a white dot on the east side of the roof with a rope running off to the right (east). This white dot is an insulator that is about 3 inches across. How can a wire of that thickness be visible from about 450 miles in space? (Landsat satellites are about that high.) In fact, if the dots in a picture are about 1 yard across, how can the picture possibly show the edge of my roof?

These questions are excellent for a science class. We've all seen the detective shows where the computer guru enhances a fuzzy picture of a license plate to give the numbers, or enhances a blob of a face until we know who it is. Most of this is science fiction, but contains a germ of truth. Astronomers take pictures through earth based telescopes of very faint stars. The atmosphere smears the stars out so they are invisible in the picture. But astronomers, using properties of the atmosphere, are able to reconstruct the picture of the star that, if not exactly clear, is clearly there. Using the group of pixels around an object and properties of the atmosphere, the scientists can reconstruct what is not obviously

there.

Google can do the same with the pictures taken by the satellites. That alone is probably not enough to clarify a thin wire. The wires are shown over my lawn in deep shade. The wire is in bright sun and this light is reflected in many directions very subtly altering the atmosphere near the wire. As the satellite moves in its orbit, it takes a sequence of pictures. These can be compared to obtain higher resolution. And there may be further effects that lead the computer enhancement programs to unwittingly show my wire antenna. If you zoom in on the picture, the wire becomes less obvious. So even our brain is helping to clarify the wire by correlating nearby parts of the picture along a line. Point 1 inch resolved at 450 miles.

Amazing!