Geostationary Satellites

There are 2 kinds of manmade satellites in the heavens above: One kind of satellite ORBITS the earth once or twice a day, and the other kind is called a communications satellite and it is PARKED in a STATIONARY position 22,300 miles (35,900 km) above the equator of the STATIONARY earth.

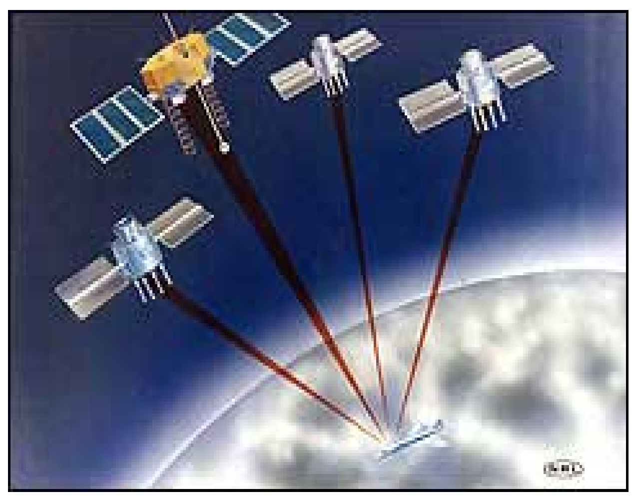
A type of the orbiting satellite includes the space shuttle and the international space station which keep a low earth orbit (LEO) to avoid the deadly Van Allen radiation belts.

The most prominent satellites in medium earth orbit (MEO) are the satellites which comprise the GLOBAL POSITIONING SYSTEM or GPS as it is called.

The Global Positioning System

The global positioning system was developed by the U.S. military and then opened to civilian use. It is used today to track planes, ships, trains, cars or literally anything that moves. Anyone can buy a receiver and track their exact location by using a GPS receiver.

GPS satellites orbit at a height of about 12,000 miles (19,300 km) and orbit the earth once every 12 hours.



About 24 GPS satellites orbit the earth every 12 hours.

These satellites are traveling around the earth at speeds of about 7,000 mph (11,200 kph). GPS satellites are powered by solar energy. They have backup batteries onboard to keep them running in the event of a solar eclipse, when there's no solar power. Small rocket boosters on each satellite keep them flying in the correct path. The satellites have a lifetime of about 10 years until all their fuel runs out.

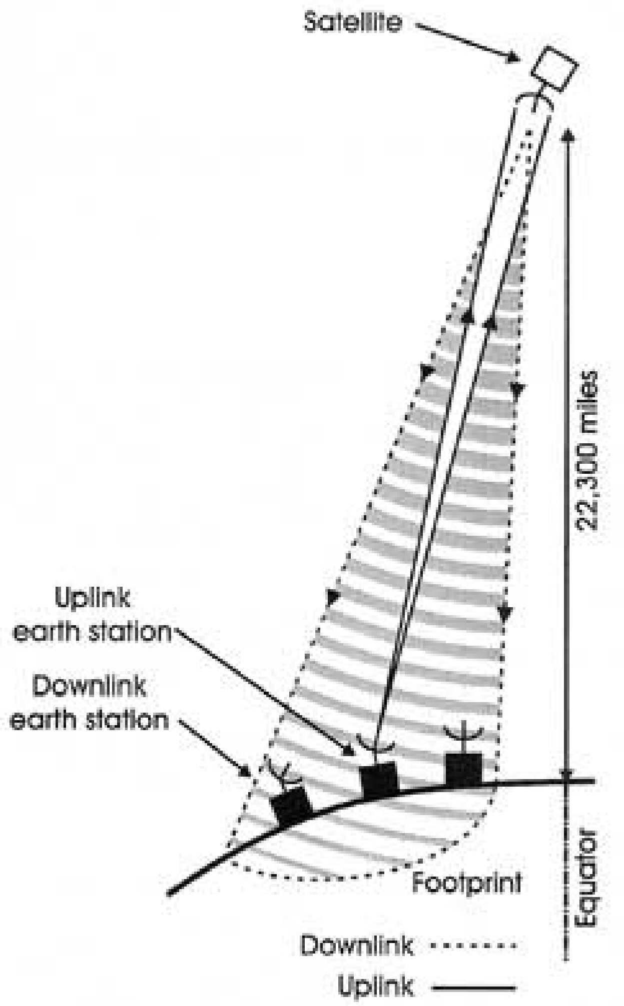
Geostationary Satellites

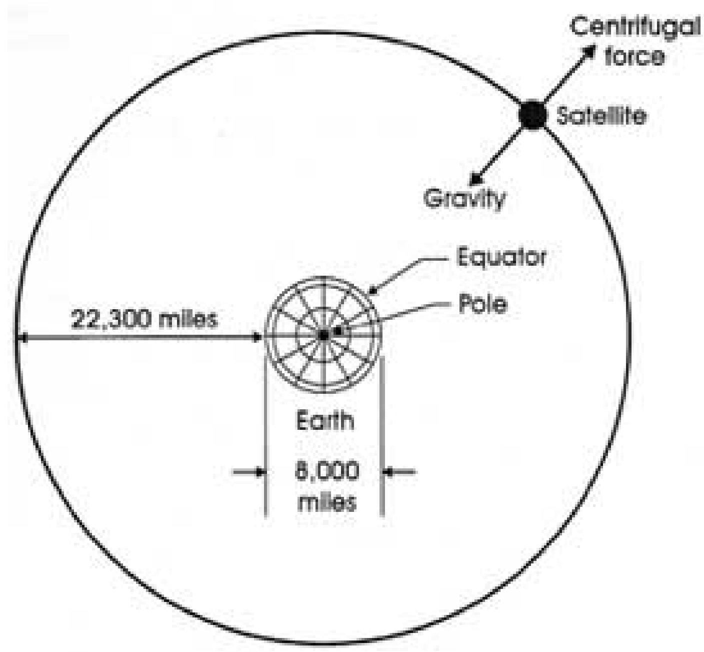
Geostationary or communications satellites are PARKED in space 22,300 miles (35,900 km) above the equator of the STATIONARY earth. Geostationary satellites are used for weather forecasting, satellite TV, satellite radio and most other types of global communications.

Communications satellite in a stationary position or *slot* high above the earth.

Satellite dish or receiver installed on a house. These dishes point to a geostationary satellite.

At exactly 22,300 miles above the equator, the force of gravity is cancelled by the centrifugal force of the rotating universe. This is the ideal spot to park a stationary satellite.





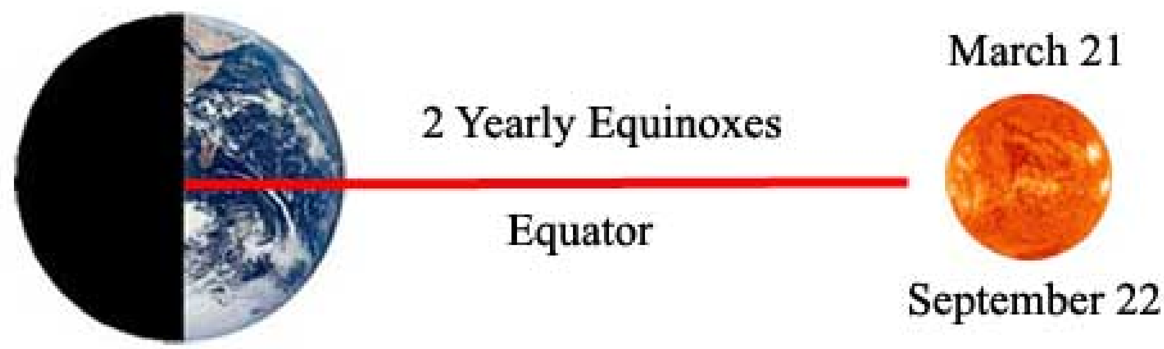
At exactly 22,000 miles (35,900 km) above the equator, the earth's force of gravity is canceled by the centrifugal force of the rotating universe. This is the ideal location to park a stationary satellite. The signal to the satellite is very, very precise and *any* movement of the satellite would cause a loss of the signal.

Sun outages affect a geostationary satellite

Geostationary satellites are fantastic means of communication except for one little problem called SUN OUTAGES. These sun outages happen during March and September when the sun passes the equator. Here is a quote from the book *Satellite Technology*:

> "The elevated temperature of the sun causes it to transmit a high-level electrical noise signal to receiving systems whenever it passes behind the satellite and comes within the beams of the receiver antennas. The increase in noise is so severe that a signal outage usually results. The length and number of the outages depends on the latitude of the earth station and the diameter of the antenna. At an average latitude of 40° in the continental United States, and a 10-meter antenna, the outages occur over 6 days with a maximum duration of 8 minutes each day. With a less directional 3-meter antenna, the outages occur over 15 days, with a maximum duration of 24 minutes."(*Satellite Technology*, p. 13).

This is obviously very embarrassing to the heliocentric people because the sun is not supposed to move. The sun *does move* however, and twice a year it is over the equator.



The sun moves across the equator twice a year giving us the vernal (spring) and fall (autumnal) equinoxes.

2 times each year the sun passes the equator as it makes it north-south spiral.

At that time, the sun lies on the celestial equator. The word equinox refers to the fact that, on this day, the night is equal to the day: each is twelve hours long. The sun is directly above the equator, so its rays fall vertically down.

Unfortunately the stationary satellites eclipses the sun and that causes electrical noise or interference to the broadcasting signals.

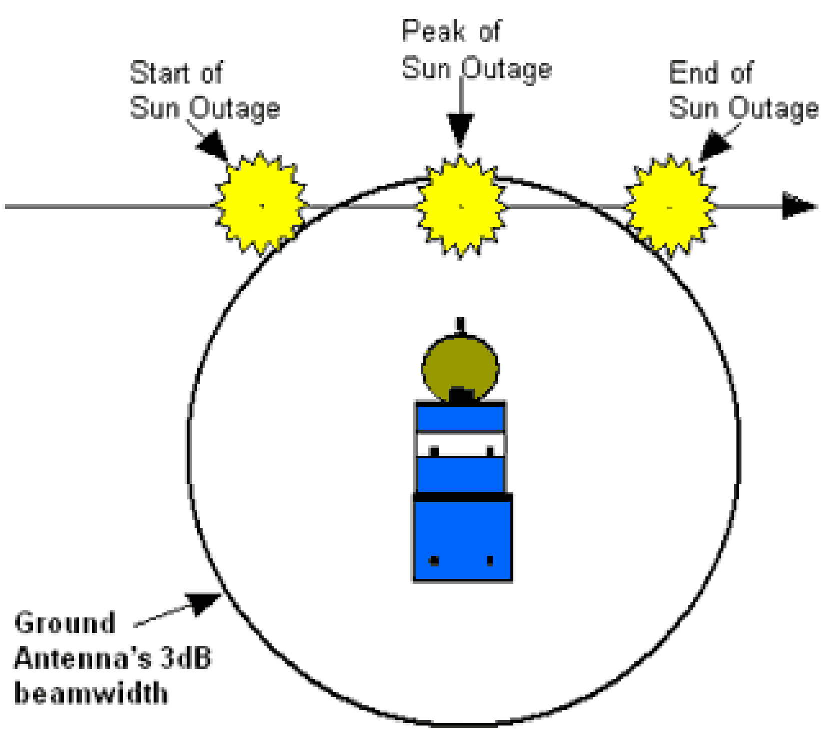
The Jesuits forgot to change the dictionary!!

Obviously the Jesuits forgot to change the definition of the word EQUINOX in the English dictionary because it *still* gives the true scientific definition of the word with the sun MOVING across the equator 2 times each year:

> "Either of the two times during a year when the sun crosses the celestial equator and when the length of day and night are approximately equal; the vernal equinox or the autumnal equinox."*(Webster's Third New International Dictionary).*

PanAmSat's Description of sun outages!!

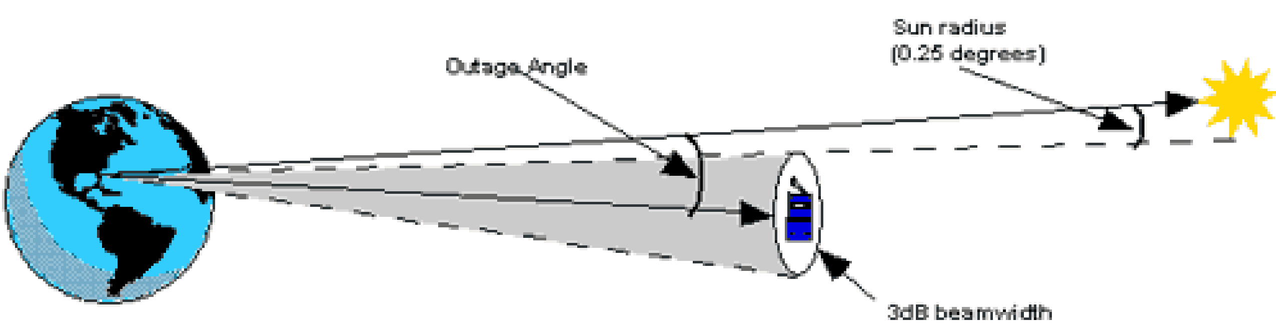
Description
PanAmSat's commercial communications satellites are geostationary, and therefore have orbits that lie near the equatorial plane. During the spring and fall equinoxes, the sun also passes close to this plane. As seen from the ground, the sun seems to pass behind the satellites once per day. During the time when both the satellite and the sun are in the ground station's field of view, the RF noise energy from the sun can overpower the signal from the satellite. It is this loss or degradation of communications traffic from the satellite that is referred to as sun fade, sun transit or sun outage (see diagram).



The duration of the sun outage depends on several things such as: the beam width or field of view of the receiving ground antenna, the apparent radius of the sun as seen from the Earth (about 0.25°), the RF energy given off by the sun, the transmitter power of the satellite, the gain and S/N performance of the ground station receive equipment, along with other factors. All this can affect whether a ground station will experience a complete loss of signal or only a tolerable degradation in signal quality. The exact point at which sun outage begins and ends is difficult to determine since it is a gradual transition. The gain of an antenna falls off sharply outside the 3dB beam width, but it does not immediately go to zero. Therefore, if the sun is just outside the antenna's beam width, it can still contribute noise and degrade system performance. This makes it difficult to define exactly what conditions constitute a sun outage.

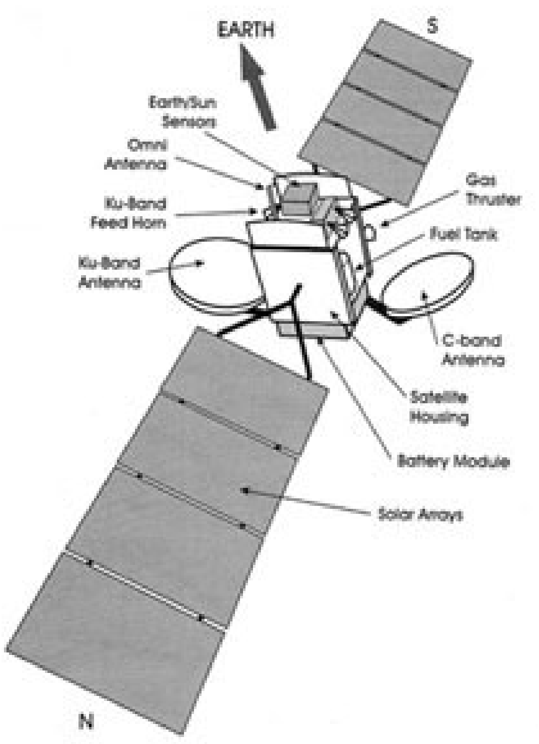
How the program works

To aid with sun outage predictions, a parameter called outage angle is defined for the ground station. Outage angle is defined as the maximum separation angle (measured from the ground station antenna) between the satellite and the sun's center, that results in a sun outage. In other words, if the separation between the satellite and sun is less than the specified outage angle, then the station is said to be experiencing a sun outage. Otherwise, the station is not experiencing a sun outage (see diagram).



Stationary satellites need very small motors to keep them in their assigned slot!!

According to the heliocentric theory, the earth is moving at about 1,000 mph at the equator. If the geostationary satellites were moving, they would have to move at a speed of about 7,000 mph to maintain a stationary orbit above a fixed point on the earth. That is about the same speed as the GPS satellites that orbit the earth twice a day. However, GPS satellites are equipped with a rocket engine to maintain *their* orbit.



Geostationary satellite diagram.
Click on image to enlarge.

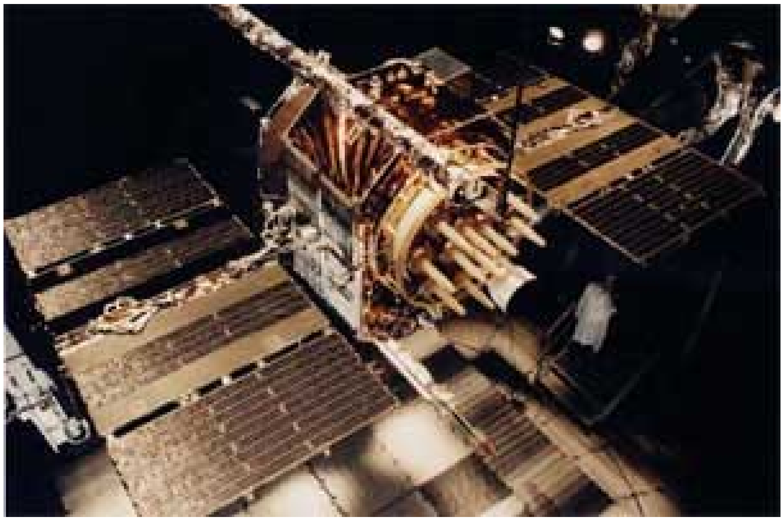


Image of a GPS satellite. Small rocket boosters on each satellite keep it flying in the correct path. The satellites have a lifetime of about 10 years until all their fuel runs out.

Vital link

PanAmSat.com

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Pattan, Bruno. *Satellite Systems: Principles and Technologies*. Van Nostrand Reinhold, New York, 1993.

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