

What is GPS? How does it work? (2020)

# Global Positioning System (GPS)

The Global Positioning System (GPS) is a navigation system that allows land, sea, and airborne users to determine their exact location, velocity and time 24 hours a day, in all weather conditions, from anywhere in the world. The system provides critical capabilities to military, civil, and commercial users around the world.

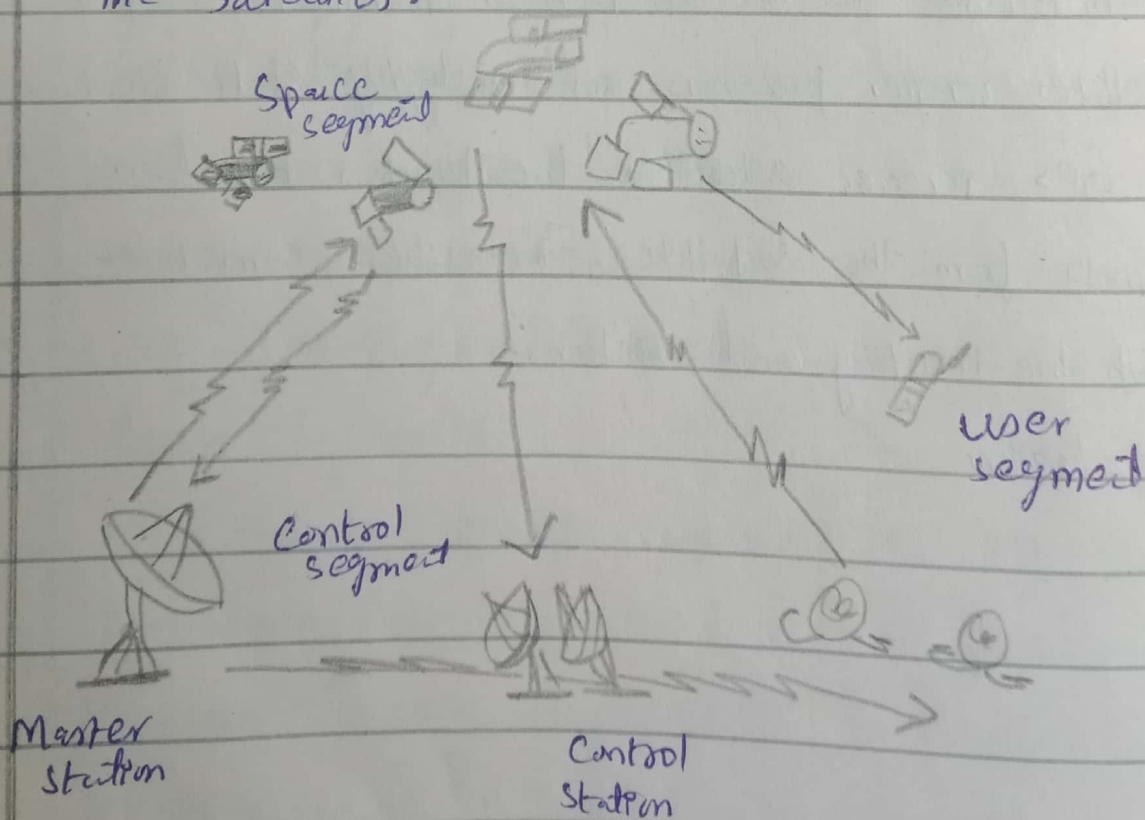
Although the GPS Project has been started by the US Defence Department in 1973 for military operations, it has not been in the mainstream until 2007.

## Working of GPS

This system consists of three segments.

- 1- Space Segment / Satellites
- 2- Control Segment
- 3- User Segment / Receivers.

Satellites orbit around the earth at different angles collecting data from all over the earth, they continuously emit radio signals. In response to the approaching signals, the portable receivers, for instance, your mobile phones become active and measure the time and location of the satellites. The distances is then measured by triangulation, ~~as~~ as three minimum satellites are always required to produce accurate signals. Meanwhile, the control systems are responsible for the proper functioning of the entire GPS by tracking, controlling, and communicating with the satellites.





What do you know about Remote Sensing Technique?  
Explain resolution and write down the names of its  
various types (2016).

## Remote Sensing

Definition: "Remote sensing is a process of measurement or acquisition of information of some property of some object or phenomena by a recording device that is not in physical or intimate contact with the object under study."

Definition according to Evelyn Lo Pruitt.

"Science and art of identifying, observing, and measuring an object without coming into direct contact with it."

## Resolution of Remote Sensing

The quality of Remote Sensing data consists of following resolution.

- 1- Spectral Resolution
- 2- Spatial Resolution
- 3- Radiometric Resolution
- 4- Temporal Resolution.

## Spatial Resolution

Spatial Resolution refers to the size of the smallest object that can be resolved on the ground. In a digital image, the resolution is limited by the pixel size, i.e. the smallest resolvable object cannot be smaller than pixel size.

## Spectral Resolution

Spectral resolution describes the ability of a sensor to define fine wavelength intervals. The finer the spectral resolution, the narrower the wavelength range for a particular channel or band.

## Radiometric Resolution

Radiometric Resolution is the capacity of the instrument to distinguish differences in light intensity or reflectance. The greater the radiometric resolution, the more accurate the sensed image will be. Radiometric resolution is routinely expressed as a bit number, typically in the range of 8 to 16 bits.

## Temporal Resolution

The ability to collect imagery of the same area of the Earth's surface at different periods of

Time is one of the most important elements for applying remote sensing data.

## Types of Remote Sensing

Remote sensing can be classified on the basis of source of energy and range of electromagnetic spectrum. Following are the types of remote sensing

### Passive Remote Sensing

Passive sensors measure reflected sunlight that was emitted from the sun.

### Active Remote Sensing

Active sensors have its own source of light or illumination and its sensor measures reflected energy.