

GPS, which stands for Global Positioning System, is a radio 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, anywhere in the world. The capabilities of today's system render other well-known navigation and positioning technologies—namely the magnetic compass, the sextant, the chronometer, and radio-based devices—impractical and obsolete. GPS is used to support a broad range of military, commercial, and consumer applications.

What is GPS?

GPS (Global Positioning System) is a satellite-based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth's surface. It is used by a wide variety of users, from hikers and fishermen to military and commercial users.

How does GPS work?

- GPS consists of three main components: a constellation of satellites in orbit, a ground control system, and a user receiver. The satellites broadcast signals that are received by the receiver, which then calculates the user's position based on the time delay of the signals.
- The ground control system monitors the satellites and adjusts their orbits and clocks to ensure accuracy. It also provides the user with the necessary data to calculate their position.
- The user receiver receives signals from the satellites and calculates their position based on the time delay of the signals. This process is known as trilateration.
- GPS receivers can also provide information on the user's velocity and time. This is done by measuring the Doppler shift of the signals and by comparing the receiver's clock to the satellite's clock.

[24 GPS satellites](#) (21 active, 3 spare) are in orbit at 10,600 miles above the earth. The satellites are spaced so that from any point on earth, four satellites will be above the horizon. Each satellite contains a computer, an atomic clock, and a radio. With an understanding of its own orbit and the clock, the satellite continually broadcasts its changing position and time.

(Once a day, each satellite checks its own sense of time and position with a ground station and makes any minor correction.) On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position - longitude and latitude - to, for most receivers, within a few meters.

If the receiver is also equipped with a display screen that shows a map, the position can be shown on the map. If a fourth satellite can be received, the receiver/computer can figure out the altitude as well as the geographic position. If you are moving, your receiver may also be able to calculate your speed and direction of travel and give you estimated times of arrival to specified destinations. Some specialized GPS receivers can also store data for use in Geographic Information Systems (GIS) and map making.

The GPS is owned and operated by the U.S. Department of Defense but is available for general use around the world.

- 21 GPS satellites and three spare satellites are in orbit at 10,600 miles above the Earth. The satellites are spaced so that from any point on Earth, four satellites will be above the horizon.
- Each satellite contains a computer, an atomic clock, and a radio. With an understanding of its own orbit and the clock, it continually broadcasts its changing position and time. (Once a day, each satellite checks its own sense of time and position with a ground station and makes any minor correction.)
- On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position - longitude and latitude - to, for most receivers, within 100 meters.
- If the receiver is also equipped with a display screen that shows a map, the position can be shown on the map.
- If a fourth satellite can be received, the receiver/computer can figure out the altitude as well as the geographic position.
- If you are moving, your receiver may also be able to calculate your speed and direction of travel and give you estimated times of arrival to specified destinations.

- **What is GPS?**

The Global Positioning System (GPS) is a worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations.

- GPS uses these "man-made stars" as reference points to calculate positions accurate to a matter of meters. In fact, with advanced forms of GPS you can make measurements to better than a centimeter!
- In a sense it's like giving every square meter on the planet a unique address.
- GPS receivers have been miniaturized to just a few integrated circuits and so are becoming very economical. And that makes the technology accessible to virtually everyone.
- These days GPS is finding its way into cars, boats, planes, construction equipment, movie making gear, farm machinery, even laptop computers.
- Soon GPS will become almost as basic as the telephone. Indeed, at Trimble, we think it just may become a universal utility.

How it works

Satellites are reference points for locations on earth



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- 2) wZbwU m`v†UjvBU wiwmf Kivi ci wiwWs wb†eb|
- 3) Accuracy 10wgUvi ev Zvi Kg n†j wiwWs wb†eb|
- 4) wiwWs wU †Kvb bvg w`†q ev Waypoint wnmv†e †mf Ki†eb|