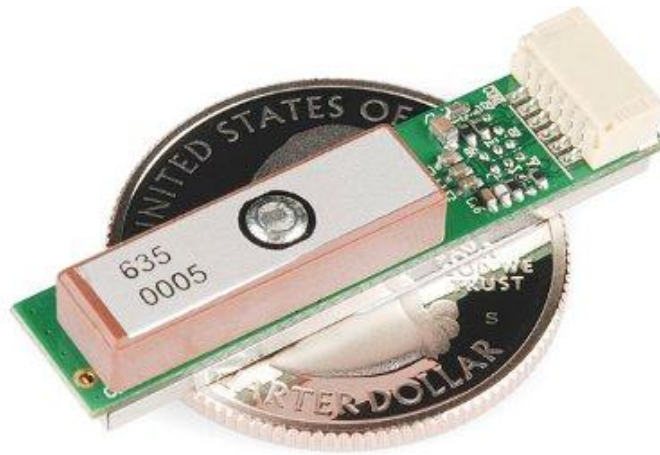


GPS BASICS

The Basics of GPS



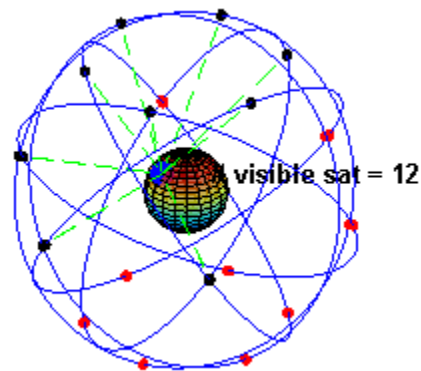
A common GPS receiver or GPS module.

You have probably used or benefitted from a GPS receiver. They are found in most smartphones, many new automobiles, and they are used to track commerce all over the globe. These tiny devices can instantaneously give your exact position and time, almost anywhere on the planet, for free! All you need is a GPS receiver, and receivers are getting less expensive and smaller every day.

Don't take these tiny, inexpensive modules for granted. There are decades of engineering that went in to giving you accurate position anytime, anywhere. Dozens of GPS satellites, all containing extremely accurate atomic clocks, have been launched since the late 70's, and launches continue to this day. The satellites continuously send data down to earth over dedicated RF frequencies. Our pocket-sized GPS receivers have tiny processors and antennas that directly receive the data sent by the satellites and compute your position and time on the fly.

How Does GPS Work

GPS receivers use a constellation of satellites and ground stations to compute position and time almost anywhere on earth.



Notice the moving point on the globe and the number of visible satellites.

At any given time, there are at least 24 active satellites orbiting over 12,000 miles above earth. The positions of the satellites are constructed in a way that the sky above your location will always contain at most 12 satellites.

The primary purpose of the 12 visible satellites is to *transmit* information back to earth over radio frequency (ranging from 1.1 to 1.5 GHz). With this information and some math, a ground based *receiver* or GPS module can calculate its position and time.

Source: <https://learn.sparkfun.com/tutorials/gps-basics>