

GPS Made Easy

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History Of GPS

GPS design is based partly on ground-based radio navigation systems developed in the early 1940's that were used in World War II. These systems were named LORAN and Decca Navigator and were focused on knowing where the enemy was so they could either attack or retreat depending on the size of the forces.

Additional inspiration for modern day GPS systems came when Sputnik was launched by the Soviet Union in 1957. A team of scientists monitored Sputnik's radio transmissions and discovered that because of the Doppler Effect, the frequency of the signal being transmitted was high as the satellite approached and lower as it moved away. The Doppler Effect is the change in frequency and wave length of a wave as it is perceived by an observer moving relative to the source of the waves.

This team of scientists that was observing Sputnik's radio transmissions soon realized that since they knew their exact location on the globe, they could pin point where the satellite was along its orbit by measuring the Doppler distortion. This was groundbreaking and very exciting for the military at the time.

The United States Navy used the first satellite navigation system called Transit. It was first successfully test in 1960 and was quite mind-boggling for everyone in the military. When the Navy tested Transit, they did so hoping for some quite specific results. Using a constellation of five satellites, they found that the system could provide a navigational fix approximately once per hour.

In 1967, the Navy developed the Timation satellite which proved the ability to place accurate clocks in space. This is a technology that the GPS system relies on. In the 1970's, the ground-based Omega Navigation System, based on signal phase comparison, became the first world-wide radio navigation system.

In February of 1978, the first experimental Block-I GPS satellite was launched into space and the development of modern-day GPS systems began. These original satellites were initially made by Rockwell International. Now, the satellites we use for GPS are manufactured by Lockheed Martin.

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In 1983, Soviet interceptor aircraft shot down a civilian airliner flight KAL 007 as it flew in restricted Soviet airspace. This heinous act killed all 269 people on board – all of whom were civilians. Shortly thereafter, President Ronald Reagan announced that the GPS system would be made available for civilian use once it was completed. Because of this horrible act on the part of the Soviets, development of the GPS system was stepped up more than it ever had been before and experimentations began in earnest.

By 1985, ten more experimental Block-I satellites had been launched into space to validate the concept of GPS and in 1989; the first modern Block-II satellite was launched. By December of 1993, the GPS system achieved initial operational capability and just a month later, a complete constellation of 24 satellites were in orbit with full operational capability declared by NAVSTAR in April of 1995.

A year after that, President Bill Clinton realized the importance of GPS to civilian users as well as military users which prompted him to issue a policy directive that declared GPS to be a dual-use system meaning civilian as well as military. He established an Interagency GPS Executive Board that was responsible for managing GPS as an asset of the United States. The previous examples going off in all directions. So instead of a series of circles, you get a series of spheres.

Advantage Of Using A Global Positioning Satellite System

The auto GPS system, or the vehicle global positioning system is a unique magnetic piece of advanced technology that makes use of a regional map fed into the electronic guide and fitted either on the dashboard of a car or under the carriage to act as a driver's navigational aid when on the road. It gives directions to the destination point and how to best reach it safely, in time and with a choice of alternate routes, landmarks to cross and distances covered besides also acting as an anti-theft device and helping the owner locate the vehicle if he's forgotten where he parked it! Now, life doesn't get better than that, does it?

Or, so you thought! Well, it just did! We modern day global citizens now have access to the best, most advanced technology for GPS systems thanks to the initial experimentation by the US military services that used the first GPS systems for tracking vehicles for the purpose of national security and later developed a prototype suitable for the general public, which would act as a driver's navigational aid based on the information it received from the satellite orbiting space. A fast developing field of communication technology, the GPS system is based on the principle of reliable information provided in flexible communication channels that are accurate and up to date, thanks to constant navigation, surveillance and data capturing provided by GIS. Conventionally known as the GPS NAVSTAR (Navigation Satellite timing and Ranging Global Positioning System), the GPS system is a satellite-based navigation, timing and positioning device that provides constant, multi-dimensional positioning round the clock to all parts of the world.

Not only is the data accurate within a range of 100 meters of navigating from the GPS system, but it also allows for exact meter level of mapping (right down to the millimeter level), which is essential for knowing geodetic positioning. This cutting-edge traveler's best tool and mate affords immense scope for application of GPS technology through the compact and magnetic box that is the receiver device for a large world community of GPS users: it works on the principle of sending a signal to space (to the satellite, which points the location of the vehicle back to the receiver) and thus providing directions to locating vehicle or destination point on a given radius/region. When a GPS system is mainly used for tracking automobiles, the purpose is limited and so is the scope of the device, which allows for the signal to be transmitted from the GPS device to a comp with a software program that will show the exact location of the vehicle on its monitor.

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Such is the craze for the convenience of a GPS system that many top auto manufacturers are offering their latest models of cars equipped with the device that has changed the way the world travels today; GPS is easy, efficient and accurate and gets one out of a blind spot sooner than a wink with a simple click of the button, especially useful in unknown terrains – or so find drivers with little time to lose and lots of ground to cover!

Global Positioning Satellite - New-age Tracking Technology

GPS stands for World Positioning orbiters and is one of the most heady advancements in bailiwick for some distinct reasons. GPS was developed by the Federate States Section of Denial for soldier like applications, but it has quickly grown to state misused personally by the mundane mortal. GPS is a follower based pilotage system that utilizes the satellites we individual dispatched into area for various uses. The corresponding satellites that furnish us with television assist, cavities assist, and hold reports can cook rail of where a vehicle is at any given group use their GPS systems to get trusty that when they are on a bungle, they are dynamic in the paw directions as the GPS has been mature to be a piloting tool that mounts directly on your car's dashboard. There are many distinct brands out today and can be an extraordinary plus when travelling.

A GPS system is also misused in new structure to path vehicles. For information, a truckage consort may set GPS systems on all of their trucks so they can prepare cross of where their trucks are at any moment. This can meliorate amend efficiency and locate deed times to within minutes. It can also better them devise fitter motion routes that can save gas and meliorate on the traveling done by the truckers.

The conclusion of GPS systems to the pandemic exoteric has brought around many assorted uses. Car dealers use GPS systems to reject thieving during try drives. Plane unquiet parents of teenagers can use a GPS group to donjon itinerary of where their vulnerable wood is and flush where they get been.

One of the major things almost new consumer GPS systems is their ability to cell a log of where the object has been previously as healthy as where it is presently. Several of these systems can also line how the soul is swing that can be greatly salutary to those nervous parents when they are discussing invulnerable and judicious swing habits with their teens.

GPS systems are also beingness utilized in law enforcement to hold cover of habitual offenders that bonk eluded law in the late. Semiprivate investigators are also using GPS systems to work extract downfield deceit spouses and acquire different fill they are work.

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In unforesightful, a GPS method is a high tool that can ameliorate people in so more distance. Protection companies start to ask observance too as they are providing discounts to insurance holders who make vehicles transistorised with GPS systems. It would be a moral melody for you to change out a GPS group and get one of your own!

How Does GPS Work?

When people talk about "a GPS," they usually mean a GPS receiver. The Global Positioning System (GPS) is actually a constellation of 27 Earth-orbiting satellites (24 in operation and three extras in case one fails). As we said in the section above, the U.S. military developed and implemented this satellite network as a military navigation system, but soon opened it up to everybody else.

Each of these 3,000- to 4,000-pound solar-powered satellites circles the globe at about 12,000 miles (19,300 km), making two complete rotations every day. The orbits are arranged so that at any time, anywhere on Earth, there are at least four satellites "visible" in the sky.

A GPS receiver's job is to locate four or more of these satellites, figure out the distance to each, and use this information to deduce its own location. This operation is based on a simple mathematical principle called trilateration. Trilateration in three-dimensional space can be a little tricky, so we'll start with an explanation of simple two-dimensional trilateration.

Imagine you are somewhere in the United States and you are TOTALLY lost -- for whatever reason, you have absolutely no clue where you are. You find a friendly local and ask, "Where am I?" He says, "You are 625 miles from Boise, Idaho." This is a nice, hard fact, but it is not particularly useful by itself. You could be anywhere on a circle around Boise that has a radius of 625 miles.

You ask somebody else where you are, and she says, "You are 690 miles from Minneapolis, Minnesota." Now you're getting somewhere. If you combine this information with the Boise information, you have two circles that intersect. You now know that you must be at one of these two intersection points, if you are 625 miles from Boise and 690 miles from Minneapolis.

If a third person tells you that you are 615 miles from Tucson, Arizona, you can eliminate one of the possibilities, because the third circle will only intersect with one of these points. You now know exactly where you are – Denver, Colorado.

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This same concept works in three-dimensional space, as well, but you're dealing with spheres instead of circles. Fundamentally, three-dimensional trilateration isn't much different from two-dimensional trilateration, but it's a little trickier to visualize. Imagine the radii from the previous examples going off in all directions. So instead of a series of circles, you get a series of spheres.

GPS Systems – Here Is How It Works!

For periods and ages, the kinfolk leisure could be defeat with enunciate and strife as dad crowd and mom proven to read a map, but those life are over with the design and body marketing of GPS systems. Today, you can establish one of the newest GPS systems in your container truck. Air prompted directions present you'll know exactly where to direct your maneuver when traveling with no problems and no hassle.

When group discourse on GPS, they are usually conversation around the GPS earphone, but GPS systems are writer than retributive the tiny immature headphone mounted on the dashboard of your car. GPS systems are a constellation of banknote digit Connection orbiting satellites - 24/7 of which are effective and 3 are utilized as back-up in pillowcase incase one of the others fails. The U.S. militaristic formed and implemented this orbiter material as an expeditionary work system, but presently opened it up to everybody else.

A piece of the 3,000- to 4,000-pound solar-powered satellites that comprise GPS systems circles the orb at nigh 12,000 miles (19,300 km), making two concluded rotations every day. The orbits are ordered so that at any case, anywhere on Globe, there are at small quatern satellites "ocular" in the sky. A GPS footballer's job is to site digit or author of these satellites, illustration out the size to each, and use this accumulation to derive its own position. This surgery is supported on a soul mathematical prescript titled trilateration.

With GPS systems, inconsistencies of atmospheric conditions pertain the qualify of the GPS signals as they flip finished the Earth's atm and ionosphere. Correcting these errors is a large repugn to rising GPS job truth with GPS systems. These effects are smallest when the star is direct disbursal and transmute majuscule for satellites closer the purview since the signalize is agonistic for a yearner quantify. Formerly the GPS systems fiduciary approximates the positioning and the positioning is familiar, a mathematical poser can be used to guess and change for these errors.

GPS systems are misused for a tracheophyte of functions the most grassroots of which is as a guidance aid. You thought in your desirable positioning and the GPS acquirer module escort you step by quantify oftentimes with enunciate prompting. GPS systems can also be victimised

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to ready belt of vehicles for a show of reasons. Transportation companies use GPS systems to ascertain their trucks and turn efficiency with feat times and routes assumed.

GPS systems are uppercase inventions that human revolutionized the length industry. They are wonderful tools to use in numerous distance.

GPS Tracking Systems: Features To Think About

Look at the GPS tracking systems that are offered throughout the web. Many of them offer the highest quality of products. Some are basic units that will tell you where you are and that is about it. Others will give you accuracy within nine feet of where you are going. Of course, most units fall in between these abilities. If you are on the market for a GPS tracking system, purchase one that has the features and the abilities that you need and that you want. Take a bit of time to research the details to get the best product on the market for your needs.

Here are some features that you may find useful in the GPS tracking system that you purchase.

- **Blue Tooth GPS:** Everything that you love about GPS with the help of Blue Tooth? It is a great combination with many advantages. You can find various kits for upgrading to this level of quality too. This is wireless GPS at its best.
- **GPS Mobile Phones:** Great for tracking children and for those that worried about not having a 911 service to contact. They help tremendously in the ability find and rescue someone that is remotely located without access. Do not forget the accessories for them too. From various phones to receivers, get quality here.
- **GPS Software:** Often, you will want to install the upgrades that will be available to your unit. The right software programs will offer this ability. Make sure to purchase a unit that allows for upgrading.
- **Mapping:** Various forms of mapping are available to help you with your needs. From the high sees to the densest forest to the skies above, you are sure to find needs for having quality mapping.
- **Waterproof and durability:** These are two important features to consider. You truly need to purchase a product that will last and that will make if it is dropped or dunked in the lake.

Having the right features on your GPS tracking unit will make all the difference in the long run. You will want to invest some time in determining which ones matter the most to you as well. Not all features have to come on the unit to make it a successful purchase. In fact, too many things can weigh it down and keeps the quality lower. Be successful in your purchase of a GPS tracking system by paying attention to the features that are offered.

Problems And Solutions

Electronics errors are one of several accuracy-degrading effects. They include ionospheric effects, ephemeris errors, satellite clock errors, multipath distortion, tropospheric effects, and numerical errors.

Inconsistencies of atmospheric conditions affect the speed of the GPS signals as they pass through the Earth's atmosphere and ionosphere. Correcting these errors is a significant challenge to improving GPS position accuracy.

These effects are smallest when the satellite is directly overhead and become greater for satellites nearer the horizon since the signal is affected for a longer time. Once the receiver's approximate location is known, a mathematical model can be used to estimate and compensate for these errors.

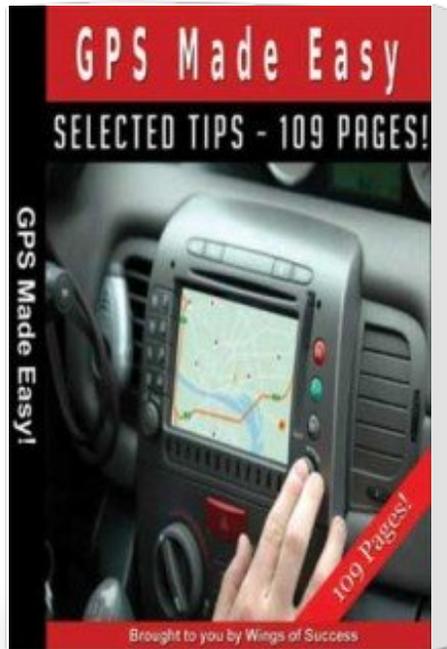
Because ionospheric delay affects the speed of microwave signals differently based on frequency – a characteristic known as dispersion – both frequency bands can be used to help reduce this error. Some military and expensive survey-grade civilian receivers compare the different delay in the frequencies to measure atmosphere dispersion and apply a more precise correction.

This can be done in civilian GPS receivers without decrypting the P(Y) signal carried on L2 by tracking the carrier wave instead of the modulated code. To do this on lower cost receivers, a new civilian code signal on L2 called L2C was added to the satellites. This new signal allows a direct comparison of the L1 and L2 signals using the coded signal instead of the carrier wave.

The effects of the ionosphere generally change slowly and can be averaged over time. The effects for any particular geographical area can be easily calculated by comparing the GPS-measured position to a known surveyed location. This correction is also valid for other receivers in the same general location.

Several systems send this information over radio or other links to allow L1 only receivers to make corrections. The data is transmitted via satellite system and transmits it on the GPS frequency using a special pseudo-random number so only one antenna and receiver is required.

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