

WIRELESS TRACKING SYSTEM

The project 'Wireless Tracking System' aims to track the path by using a GPS device. The user get the right position wherever he situates in the earth. Also he get the route map from the Google site and he can choose the right way to go to. The user need to keep the GSM device with him always. Now a days the GSM devices are kept along with the vehicles. So the voyager need not to confuse with the route to be selected, because the route in the map are already named earlier.

The project is working by communicating with the satellite hosted in different places in the space with the user through a GPS device he holds. The GPS device can send and receive messages to and from the satellite. The satellite can detect the device where it is located and the altitude and longitude of the device can be send back to the GPS system. The GPS uses satellites and computers to compute positions anywhere on earth. The GPS is based on satellite ranging. That means the position on the earth is determined by measuring the distance from a group of satellites in space. The basic principle behind GPS are really simple, even though the system employs some of the most high-tech equipment ever developed. The GPS uses a trigonometric approach to calculate the positions. The user will send the data to the Google API and can retrieve the correct route map from the site. Then he can select the correct route to be voyaged. 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

Components of a GPS

The GPS is divided into three major components

- **The Control Segment**

The Control Segment consists of five monitoring stations (Colorado Springs, Ascension Island, Diego Garcia, Hawaii, and Kwajalein Island). Three of the stations (Ascension, Diego Garcia, and Kwajalein) serve as uplink installations, capable of transmitting data to the satellites, including new ephemerides (satellite positions as a function of time), clock corrections, and other broadcast message data, while Colorado Springs serves as the master control station.

The Space Segments

The satellites are arrayed in 6 orbital planes, inclined 55 degrees to the equator. They orbit at altitudes of about 12000, miles each, with orbital periods of 12 sidereal hours (i.e., determined by or from the stars), or approximately one half of the earth's periods, approximately 12 hours of 3-D position fixes. The satellites are arrayed in 6 orbital planes, inclined 55 degrees to the equator. They orbit at altitudes of about 12000, miles each, with orbital periods of 12 sidereal hours (i.e., determined by or from the stars), or approximately one half of the earth's periods, approximately 12 hours of 3-D position fixes. The next block of satellites is called Block IIR, and they will provide improved reliability and have a capacity of ranging between satellites, which will increase the orbital accuracy.

- **The User Segment**

The user segment is a total user and supplier community. The User Segment consists of all earth-based GPS receivers. Receivers vary greatly in size and complexity, though the basic design is rather simple.

The typical receiver is composed of an antenna and preamplifier, radio signal microprocessor, control and display device, data recording unit, and power supply. The GPS receiver decodes the timing signals from the 'visible' satellites (four or more) and, having calculated their distances, computes its own latitude, longitude, elevation, and time. This is a continuous process and generally the position is updated on a second-by-second basis, output to the receiver display device and, if the receiver display device and, if the receiver provides data capture capabilities, stored by the receiver-logging unit.

GPS Positioning Types

Absolute Positioning

The mode of positioning relies upon a single receiver station. It is also referred to as 'stand-alone' GPS, because, unlike differential positioning, ranging is carried out strictly between the satellite and the receiver station, not on a ground-based reference station that assists with the computation of error corrections. As a result, the positions derived in absolute mode are subject to the unmitigated errors inherent in satellite positioning.

Differential Positioning

Relative or Differential GPS carries the triangulation principles one step further, with a second receiver at a known reference point. To further facilitate determination of a point's position, relative to the known earth surface point, this configuration demands collection of an error-correcting message from the reference receiver. Differential-mode positioning relies upon an established control point. The reference station is placed on the control point, a triangulated position, the control point coordinate. This allows for a correction factor to be calculated and applied to other roving GPS units used in the same area and in the same time series.

Implementation

Map Server

The device can fetch the altitude and longitude of the position. By using this data we can collect the location from the Google Earth or any other global maps. We get the right position from the site according to the altitude and longitude. The prime purpose of map server is to place the object in the appropriate position as per identified from the device. Direct implementation of data cannot be done due to the change of X and Y coordinate in map. So the data is implemented only after manipulating it. This is done using the moulded data manipulation.

Data Manipulation

This module takes input from the map server and generates the original data. This is done by mathematical calculations in which constant such as 'Image Zoom Level', 'Coordinate Map Level', 'Fluctuating Constants', 'Error Constants' etc.

Device Communication

We have to calculate the location from a site. So the collected data is fed to the computer. The computer will fetch the map from the site. We need to read the data from the GPS device. It is by using the serial port communication. The GPS device is connected to the serial port of the system and the system is in the web. There should be a proper communication between the device and the system.

Client Software

The client software is used to check whether he selected the right path or not. If not it will inform the right path and the user can select a new path. Also the abstraction of the right map from the site is also done by the client software.