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Commentary

An Overview on Global Positioning System

Steward Peter*

Department of Archaeology and Remote Sensing Laboratory, University of Siena, Siena, Italy

DESCRIPTION

The Global Positioning System (GPS) is a satellite-based navigation system made of a network of 24 satellites placed into orbit by the U.S. Department of Defence. GPS was initially intended for military usage, but in the 1980s, the government made this system available for civilian use. GPS works in any weather conditions, everywhere in the world, 24 hours a day. There is no subscription fees or setup charges for the use of GPS. The 24 satellites that made up the GPS space section are orbiting the earth approximately 12,000 miles above us. They are constantly moving, making complete orbits in less than 24 hours. These satellites are travelling at speeds of approximately 7,000 miles an hour. GPS satellites are powered by solar energy. They have backup batteries onboard to keep them running in the event of a solar eclipse, when there is no solar power.

Small rocket boosters on each satellite keep them flying in the ri ght path. Design considerations of development work on GPS commenced within the U.S. Department of Defence in 1973, the motivation being to expand an all-weather, 24-hour, global positioning system to support the positioning necessities for the military of the U.S. and its allies. The system was therefore designed to replace the large kind of navigational systems already in use and brilliant emphasis was placed on the system's reliability and survivability. The GPS system includes 3 segments. The first is space segment comprising the satellites and the transmitted signals. The control segmentis used when the ground facilities carrying out the project of satellite tracking, orbit computations, telemetry and supervision essential for the daily control of the space segment. The user segment maintains the complete spectrum of applications equipment and computational techniques that are available to the users.

Ionosphere and troposphere delays the satellite signal slows because it passes through the atmosphere. The GPS system uses a built-in model that calculates an average amount of delay to partly correct for this kind of error. Signal multipath is happened when the GPS signal is reflected off objects that which are tall buildings or large rock surfaces before it reaches the receiver. This will increase the travel time of the signal, thereby causing errors. Receiver clock errors, a receiver's built-in clock is not as accurate as the atomic clocks onboard the GPS satellites.

CONCLUSION

Therefore, it could have very slight timing errors. Orbital errors are also called as ephemeris errors, those are inaccuracies of the satellite's mentioned location. Number of satellites visible then more satellites a GPS receiver can see with the better accuracy. Buildings, terrain, electronic interference or sometimes even dense foliage can block signal reception, causing position errors or possibly no position information at all. GPS units typically will not work indoors, underwater or underground. Satellite geometry/shading refers to the relative position of the satellites at any given time. Ideal satellite geometry exists when the satellites are located at wide angles relative to each satellite. Poor geometry results when the satellites are located in a line or all together in a group.

Correspondence to: Steward Peter, Department of Archaeology and Remote Sensing Laboratory, University of Siena, Siena, Italy, E-mail: Stewardpeter@unisi.it

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