

Global navigation system - lab report example

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Global Navigation System

Global Navigation System In past different means and measures have been used to keep track of things and people . All those means were less effective and more tedious in nature. Mid 20th century gave us concept of something that is more effective, less tiresome and that technology is called Global Navigation System or Global Positioning System . Global Positioning System has made the task of tracking and monitoring possible and has enabled all those things which were not possible in past. Formally known as NAVSTAR (Navigation Satellite and Timing and Ranging). G. P. S is a Satellite based Navigation and Routing technique that helps locating the target to highest degree of accuracy. The system works on radio frequency . Main features of G. P. S include location determination, velocity, and time of both static bodies as well as those that are in motion (1). The idea of a global setup for navigation and monitoring was conceived in around 1960s when feasibility studies were conducted for this purpose, and in late 1970s the setup was run practically. For first few years the operations were limited to military use and defense purposes while last decade of 20th century gave rise to commercial use of G. P. S. There are two more competitive forces in competition with NAVSTAR in this field, one run and administered by Russia called GLONASS, while Europeans have Galileo in place. The annual costs incurred in the working and maintenance of G. P. S is around one billion dollars annually. Global Navigation system can help determining two things to nearly exact proximity. The coordinates in form of longitude, latitude, and height while Time in terms of Universal Standard times (2). G. P. S is run and administered by United States Air force and has a massive setup behind it, a

total of 24 constellation satellites are in place for performing twenty four hours tasks operation. The satellites rotate once every twelve hours and are at a height of 9 thousand miles from the earth and each of these satellites travel at speed of 11 thousand miles per hour . Each satellite weighs around 17 thousand pounds and is on average 17 feet tall in height. The G. P. S based satellites transmits signals to the equipment installed at the ground, at receiver end, each satellite gives us data that contains the position and timing information . The timing issues are handled by the atomic clocks that work on global scale for keeping a standardized timing all over the world. The coordinates measurement is done in alignment with World Geodetic System WG S 84 coordinate system. The G. P. S setup consists of mainly three components, namely control segment, space segment and the user segment . The control segment consists of the antennas, and the user segment consists of receivers and processors . The accuracy of G. P. S devices depends on the type of equipment receiving the data, slight variation can be expected with small hand held devices up to 10 to 20 meters. However, advanced methods like Differential G. P. S helps improving the efficiency in results . For commercial use two signals are generated L1, and L2, which operates in the frequency range of 1575. 42 MHz in the Ultra High Frequency spectrum. In modern times G. P. S is used in almost all activities of life. This includes the use for military purposes and civilian use in prime. So much so, at times the people acquainted from the court case on parole are traced through global navigation system . In case of Military, G. P. S is used in radars, missile systems, fighter planes, on foot soldiers during the war. In commercial field G. P. S finds large number of uses, G. P. S can be largely found in the cars these days, in commercial aero planes, they find <https://assignbuster.com/global-navigation-system-lab-report-example/>

large users in the field of agriculture, where places are less accessible, these navigation means can help reaching out all those areas. Global Navigation systems are of large use in disaster situations, floods, tornados, tsunamis, earthquakes, parts of land that are disconnected from rest of the area can be accessed and people stranded can be easily rescued by locating their position through G. P. S . Through use of Aerial means, the ground situation can be determined and further strategy can be analyzed . Weather predictions are made possible through the satellites that are out in the open. And hence weather forecasts advancements can be attributed to the use of satellite advancements and navigation setups. G. P. S finds large application in the field of engineering; it has space for software engineering, the aerospace engineers, and hardware engineering. It is a known fact that every technology has its uses and abuses and global navigation system like all other inventions can be exploited in few cases, its use in some cases can be termed as privacy violation because it can make its way through the garages of any area in any part of the world. Factors like G. P. S data editing, signal spoofing and alias creation of signal can be a weakness in terms of its use for different purposes. Breach in privacy violations can be taken as serious offence by different organizations and individuals, however all the data so collected mostly remains safe in the hands of administrators. Lack of Cryptographic protection of all the data collected is considered as a weakness in the overall system . Further admissibility of G. P. S data in the court of law is another subject of consideration. Another serious issue concerning the proper use of global positioning systems is the monitoring and sky touring of the defense installations of various countries, along with other important places. These all count as vulnerabilities of the incumbent,

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special mechanism must be devised in order to overcome these issues and make G. P. S a total safe and secure technological means that cannot be used in any destructive way. In military use, the global navigation systems are used against the enemy in identifying and tracing the important positions of the enemy's strategic places. Bibliography: (1). El-Rabbany, A. (2002). Introduction to GPS: The Global Positioning System. Boston, MA: Artech House. (2). McNamara, Joel. (2004). GPS For Dummies174. Wiley. (3). Pace, S., Frost, G., Lachow, I., Frelinger, D., Fossum, D., & RAND CORP SANTA MONICA CA. (1995). The Global Positioning System: Assessing National Policies. Ft. Belvoir: Defense Technical Information Center. (4). GPS Basics, Introduction to the system. Switzerland. by Jean-Marie_Zogg_ (5). Finz, S. & Taylor, M. (2004). Peterson tracking device called flawed, Defense wants GPS evidence shut out of trial. San Francisco Chronicle. Retrieved October 4, 2007,