The different types of satellite constellation designs are,

1. Global positioning system
2. Global star
3. Iridium satellite constellation
4. GLONASS star etc.

1. Global Positioning System

GPS abbreviates global positioning system which contains 24 to 32 Medium Earth Orbit (MEO) satellites in its constallation. It was developed by defense department of United States of America.

GPS is defined as the process of determining the position of a point with reference to its latitude, longitude, elevation etc. from the known point of fixed baseline. It is also called Navstar i.e., Navigation Satellite Timing and Ranging.

The simplified schematic of GPS system is shown in figure (1).

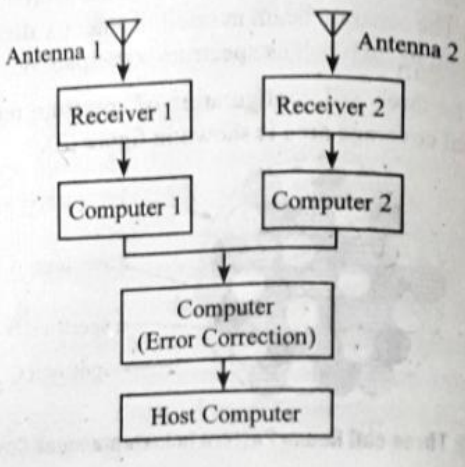

Figure (1): GPS System

Antennas 1 and 2 receives the information and then forwards to the receivers 1 and 2. The receivers output is fed to the respective computers where error-detection is carried. The error signal is produced from the comparison of relative strengths of the received signal. This information is then analyzed by host computer to give the location of position.

There are three major segments in GPS. They are,

(i) The control segment

(ii) The space segment

(iii) The user segment.

(i) The Control Segment

The control segment consists of three monitoring stations to serve as uplink transmitter and 100 monitoring stations to serve as master control stations. It is used to launch, maintain and monitor all GPS satellites.

(ii) The Space Segment

The space segment consists of 24 NAVASTAR satellites (in which 21 are operational and 3 are in-orbit spares) arranged in 6 orbital planes inclined at 55° with equator. The satellites orbit at 20000 km of altitude at 12-hour rotation period. They are used for self-monitoring and data processing based on on-board computer and atomic clocks present in it.

(iii) **The User Segment**

The user segment comprises earth based GPS receivers that decodes the timing signals from four satellites at a time. It gives the distance, latitude, elevation, longitude and time of the position point.