

Towards India's own GPS

What is Global Positioning System?

A constellation of well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location.

History of GPS

- TRANSIT the 1st satellite navigation system developed by US in 1959
- Operational name of system is NAVSTAR (Navigation Satellite Timing and Ranging)
- Developed by the US Department of Defense
- Each satellite weighs approximately 1 tonne
- Completes 2 orbits around the Earth within 24 hours
- Travels at a speed of 26 Kilometer per Second
- Moving at an altitude of approximately 20,000km

Features of GPS

- 24-hour, worldwide service
- Extremely accurate, three-dimensional location information (providing latitude, longitude, and altitude readings)
- Precise timing services
- A worldwide common grid that is easily converted to any local grid
- Continuous real-time information
- Accessibility to an unlimited number of worldwide users

Indian Satellite Navigation System

GAGAN - GPS Aided GEO Augmented Navigation

- Launched on July 13, 2015
- Satellite based augmentation System (SBAS)
- Developed by ISRO and

Airports Authority of India

- Allows the Air Traffic Control to operate 50 planes in the same time frame
- Inter-operable with other International SBAS systems like US-WAAS, European EGNOS, and Japanese MSAS e.t.c
- GAGAN GEO footprint extends from Africa to Australia

IRNSS - Indian Regional Navigation Satellite System

- 1st of the seven series satellites was launched on 1 July, 2013
- Also known as Navigation with Indian Constellation (NAVIC)
- Comprises of 9 satellites – 7 in orbit and 2 on the ground as stand-by

- Three satellites in geostationary orbit and four in inclined geosynchronous orbit at an altitude of about 36000 km
- Regional coverage over India extending up to 1500 km from its boundary
- Provides two types of services :

Standard Positioning Service - for normal users with accuracy of 20m

Restricted Service - encrypted service to authorised users

Applications of IRNSS

- Terrestrial, aerial and marine navigation
- Disaster management
- Vehicle tracking and fleet management
- Integration with mobile phones, precise timing, mapping and geodetic data capture
- Scientists are using GPS to study tectonic plate movements & volcanic activities
- Visual and voice navigation for drivers
- Terrestrial navigation aid for hikers and travelers



1st handheld GPS device



1st commercial GPS Phone

1. www.isro.gov.in
2. www.wikipedia.org

3. www.astronautix.com
4. www.engineersgarage.com

5. www.space.com
6. www.spacetoday.org