

UNITED STATES SPACE FORCE

SPACE OPERATIONS COMMAND

FACT SHEET

GLOBAL POSITIONING SYSTEM

MISSION:

The Global Positioning System (GPS) is a constellation of orbiting satellites that provides position, navigation, and timing data to military and civilian users globally. The system is operated and controlled by Delta 8, located at Schriever Space Force Base, Colo.

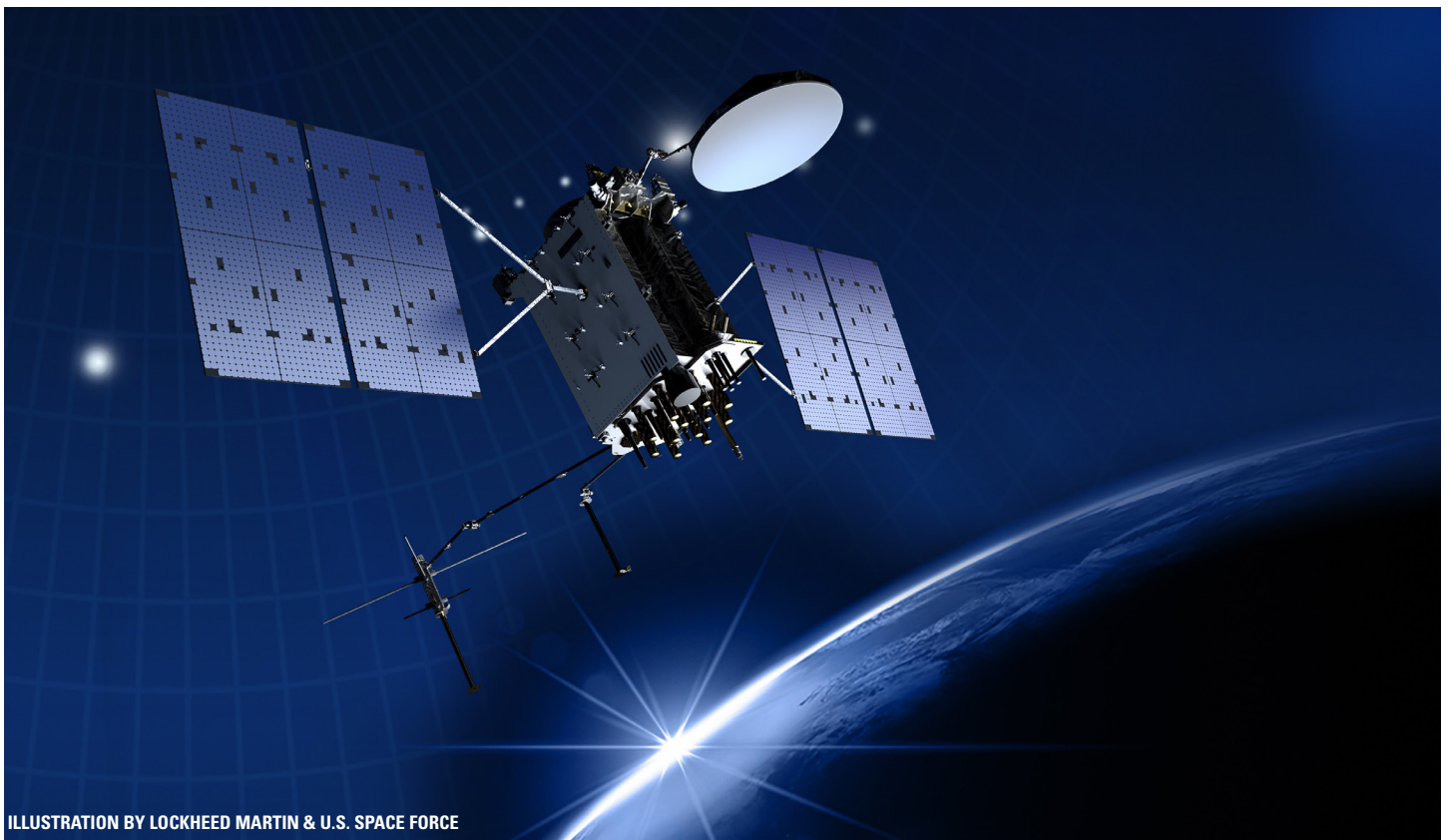


ILLUSTRATION BY LOCKHEED MARTIN & U.S. SPACE FORCE

PROVIDES 24/7/365 NAVIGATION SERVICES INCLUDING:

- **Primary Function:** Positioning, navigation, timing and velocity information worldwide
- **Weight:** Block IIR/M, 4,480 pounds (2,217 kilograms); Block IIF, 3,758 pounds (1,705 kilograms); Block III vehicles 1-10, 5,003 pounds (2,269 kilograms)
- **Date of First Launch:** 1978
- **Date Constellation Operational:** April 1995 (at Full Operational Capacity (FOC))



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BACKGROUND

The GPS Master Control Station (MCS), operated by Delta 8 at Schriever SFB, is responsible for monitoring and controlling the GPS satellite constellation. The GPS-dedicated ground system consists of six U.S. Space Force dedicated monitor stations (MS) and four ground antennas (GA) located around the world. The MSs use GPS receivers to passively track the navigation signals on all satellites. In 2007, GPS added 10 more shared monitor stations (part of the National Geospatial-Intelligence Agency – NGA network of monitor stations) increasing the overall accuracy of the system to all users. Information from the MSs is processed at the MCS to update the satellites' navigation messages to include commanding (telemetry).

The GPS Program Office is working to enhance many of the capabilities provided by the current satellites and user equipment. In April 2014, the pre-operational broadcast of navigation messages began for additional civil signals (L2C and L5). Additionally, the next generation of satellites will provide increased signal accuracy and reliability to operate through a contested environment. Applications such as mapping, aerial refueling and rendezvous, geodetic surveys, and search and rescue operations will benefit from these enhancements.

GPS capabilities were put to the test during the U.S. involvement in Operations Desert Shield and Desert Storm. Allied troops relied heavily on GPS to navigate the featureless Arabian Desert. During operations Enduring Freedom, Noble Eagle and Iraqi Freedom, GPS contributions increased significantly. During Operation Iraqi Freedom, the GPS satellite constellation allowed the delivery of 5,500 GPS-guided Joint Direct Attack Munitions with pinpoint precision that reduced collateral damage. This was almost one-fourth of the total bombs and missiles coalition forces released against Iraqi targets. GPS continues to fill a crucial role in air, ground and sea operations guiding countless service members and equipment to ensure they are on time and on target.

The U.S. Space Force's Space and Space Systems Command at Los Angeles AFB, Calif., acts as the executive agent for the Department of Defense for acquiring GPS satellites and user equipment.

Navigation Information Service - The U.S. Coast Guard operates and maintains the Navigation Information Service for civilian GPS users. It can be reached at (703) 313-5900, 24 hours a day, 365 days a year.

FEATURES

GPS satellites orbit the earth every 12 hours, emitting continuous navigation signals. With the proper equipment, users can receive at least four satellite signals to calculate time, location and velocity. The signals are so accurate, time can be figured to within a millionth of a second, velocity within a fraction of a mile per hour and location to within 100 feet. Receivers have been developed for use in spacecraft, aircraft, ships, land vehicles, and precision-guided munitions, as well as for hand carrying.

GPS provides 24/7/365 navigation services including:

- Extremely accurate, three-dimensional location information (latitude, longitude and altitude), velocity (speed and direction), and precise time
- A worldwide common grid that is easily converted to any local grid system
- Passive all-weather operations
- Continuous real-time information
- Support to an unlimited number of users and areas

The GPS constellation is nominally designed and operated, consists of six orbital planes, with a minimum of four satellites per plane.

GPS satellites are launched from Cape Canaveral Space Force Station, Fla., into nearly circular 11,000-mile altitude orbits. While circling the earth, the systems transmit signals on two different L-band frequencies. The design life of a GPS satellite ranges between 7.5 to 15 years.

For more information please visit <https://www.spoc.spaceforce.mil>
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