



# FACT SHEET

## U.S. Air Force Fact Sheet GPS IIF

### MISSION

Deliver sustained, reliable GPS capabilities to America's warfighters, our allies and civil users. GPS provides positioning, navigation and timing service to civil and military users worldwide.

### BACKGROUND

In 1996, the GPS IIF contract was awarded to The Boeing Company for the development and production of 33 space vehicles. In 2000, the Air Force modified the contract to increase satellite capabilities and reduce the number of SV's delivered to twelve. On May 27, 2010, the first GPS IIF satellite was launched from Cape Canaveral Air Force Station, Fla.



GPS IIF

### DESCRIPTION

GPS IIF SV's continue to modernize the GPS constellation while bringing new capabilities to both military and civilian users. GPS IIF SV's will bring into service the dedicated civil signal (L5) as part of the modernization effort that began with GPS IIR-M. GPS IIF also brings improved accuracy, greater security and anti-jam capabilities over previous blocks while maintaining baseline legacy GPS performance.

#### · *Development and Production Contract*

Development of modernized GPS IIF is complete  
Delivering 12 space vehicles  
Develop Ground Control System

#### · *Mission Support*

Provide on-site vehicle launch processing and launch support at Cape Canaveral Air Force Station  
Monitor on-orbit GPS IIF satellites from Schriever Air Force Base  
Support 2nd Space Operations Squadron in day-to-day control and maintenance  
Provide expertise in resolving anomalies/out-of-family conditions

### CAPABILITIES

· Next Generation of GPS satellites  
Legacy signals: L1 C/A, L1/2 P(Y)  
Dedicated civilian signals: L5I, L5Q  
Multiple civil/military signals: L1M, L2M, L2C  
Improved anti-jam  
Improved accuracy

## **GENERAL CHARACTERISTICS**

- Orbit: Six orbit planes at 55 degree inclination
- Altitude: 10,898 nautical miles
- Design life: 12 years
- On-orbit weight: 3,230 lb
- Size: 98 in wide, 80 in deep, 88 in high
- Position accuracy: 1.5 meters, with daily updates from the control segment
- Electrical Power Subsystem
  - Solar array: 3-Panel Improved Triple Junction GaAs Solar Arrays, 1900 watt capacity
  - Battery system: NiH2, rechargeable
- Attitude Determination and Control
  - Zero momentum, 3-axis stabilized, Earth-oriented, Sun-nadir pointing
  - Attitude reference control: Static Earth sensor, Sun sensor, reaction wheels/magnetic coils
- Propulsion Subsystem
  - Propellant: Monopropellant N2H4
  - Propellant capacity: 320 lbs
  - Thrusters: Twelve 1.0-lb REAs and four 5.0-lb REAs
- Navigation Payload
  - Two Rubidium clocks & one Cesium clock, radiation-hardened design, high stability timing
  - RH32 central processor, ADA HOL, integral baseband processor, full message encoding and processing, real-time Kalman filter
  - Improved Crosslink performance with Narrow Band Crystal filter
- Structure and Thermal
  - Structure: Six aluminum honeycomb panels mounted to a central aluminum core
  - Thermal control: Blankets, thermal coatings, radiators and electrically controlled heaters
- Tracking, Telemetry and Command
  - S-band, SGLS transponder Security architecture: Encrypted data links, redundant RH32 control processor, centralized command decoding and telemetry communications

*PRIME CONTRACTOR: The Boeing Company*