



U.S. AIR FORCE

Global Positioning System Operations Status



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Who We Are

2d Space Operations Squadron Mission

To provide positioning, navigation, timing effects, nuclear detonation detection, and launch, anomaly resolution, disposal operations by operating and maintaining the Global Positioning System satellite constellation and dedicated ground network.

Motto

“On Time, On Target”





Who We Are

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- **2d Space Operations Squadron (Active Duty)**
 - 115 Personnel
 - Operators, Engineers, Analysts, Maintainers, Cyber Professionals
- **19th Space Operations Squadron (Reserve)**
 - Surge for Launch and Disposal Operations
 - Modernization continuity and subject matter expertise
 - Maintain certified operators in all crew positions
- **5 Crews conducting GPS operations**
 - 7 Military & 1 Civilian
 - Navigation Warfare Officer (NWO)
- **AF Technical Application Center (AFTAC), Det 46**
- **GPS User Operations Center (User Ops)**
 - User Engagement





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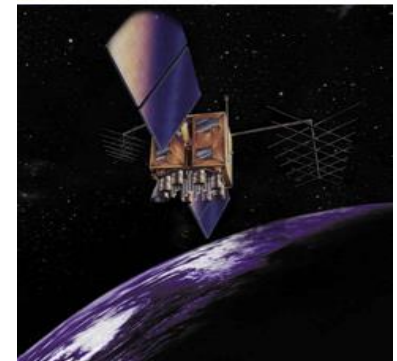
Constellation Snapshot

40 Satellites
(Baseline Constellation: 24)

- Block IIA satellites, 2 Operational, 8 Spare
- Block IIR satellites, 12 Operational
- Block IIR-M satellites, 7 Operational, 1 Spare
- Block IIF satellites, 10 Operational

- Oldest Satellite is SVN23; will be 25 Yrs Old, Nov '15

- U.S. Government continuously assessing constellation health to determine launch need
 - Newest satellite launched
 - IIF-10/SVN 72 – 15 July 2015
 - IIF-11/SVN 73 launch scheduled for 30 Oct 2015





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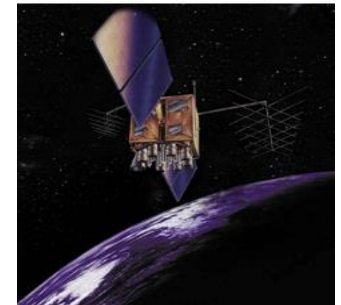
Space Segment

4 Generations of Operational Satellites

- **Block IIA - 2 Operational, 8 Residual**
 - 7.5 year design life (oldest operational satellite will be 25 yrs old in Nov)
 - Launched 1990-1997
- **Block IIR - 12 Operational**
 - 7.5 year design life
 - Launched 1997-2004
- **Block IIR-M - 7 Operational, 1 Residual**
 - 7.5 year design life
 - Launched 2005-2009
 - Added 2nd civil navigation signal (L2C)
- **Block IIF - 10 Operational**
 - 12 year design life
 - Launched 2010-present
 - Added 3rd civil navigation signal (L5)
- **Average age about 12 years**



Block IIA Satellite – Designed & Built by Rockwell International



Block IIR/IIR-M Satellite – Designed & Built by Lockheed Martin



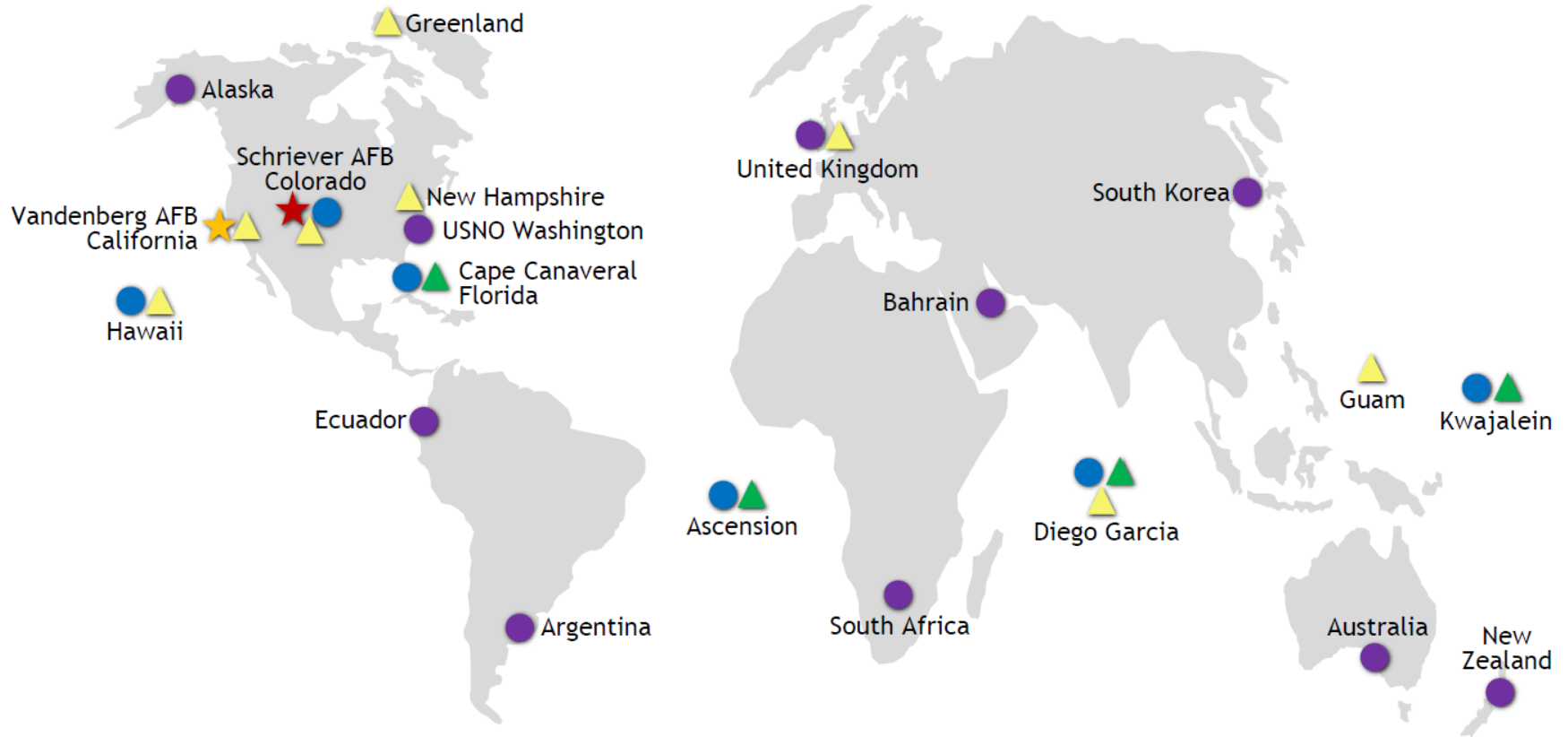
Block IIF Satellite – Designed & Built by Boeing

“Gold Standard” of Space-Based Navigation Systems Civil service performance commitment met continuously since 1993



Ground Segment

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★ Master Control Station

▲ Ground Antenna

● Air Force Monitor Station

★ Alternate Master Control Station

▲ AFSCN Remote Tracking Station

● NGA Monitor Station



- **Architecture Evolution Plan (AEP)**
 - Day-to-day command and control of up to 31 satellites
 - 4 dedicated Ground Antennas and AFSCN capability
 - 6 dedicated and 10 NGA Monitor Stations

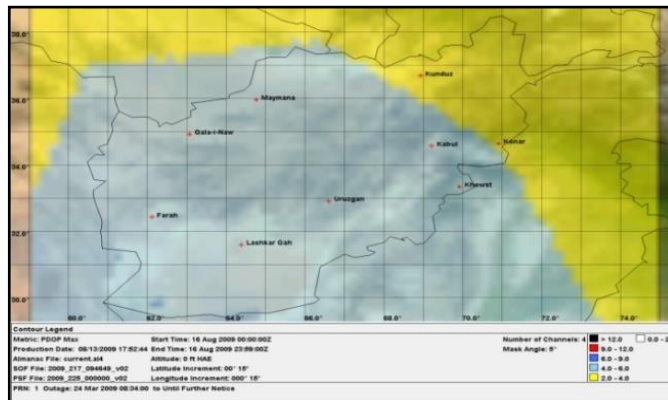
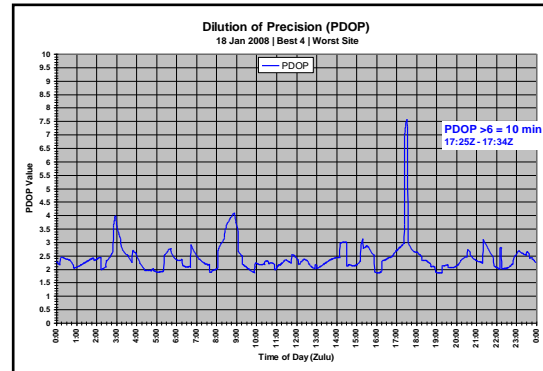
- **Launch, Anomaly Resolution, and Disposal Operations (LADO)**
 - Day-to-day command and control residual satellites using AFSCN
 - State-of-health monitoring
 - Leverage for some vehicle emergencies
 - Launch prep and initial post-launch operations
 - Satellite end of life disposal operations



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User Segment

- DoD's focal point for military GPS user issues
 - Supports warfighter mission planning
 - Supports FAA/NAVCEN user issue resolution



Military applications

- Force location
- Navigation
- Force employment
- Weapon guidance
- Satellite positioning
- Comm network timing
- Plus Many Others

Civilian applications

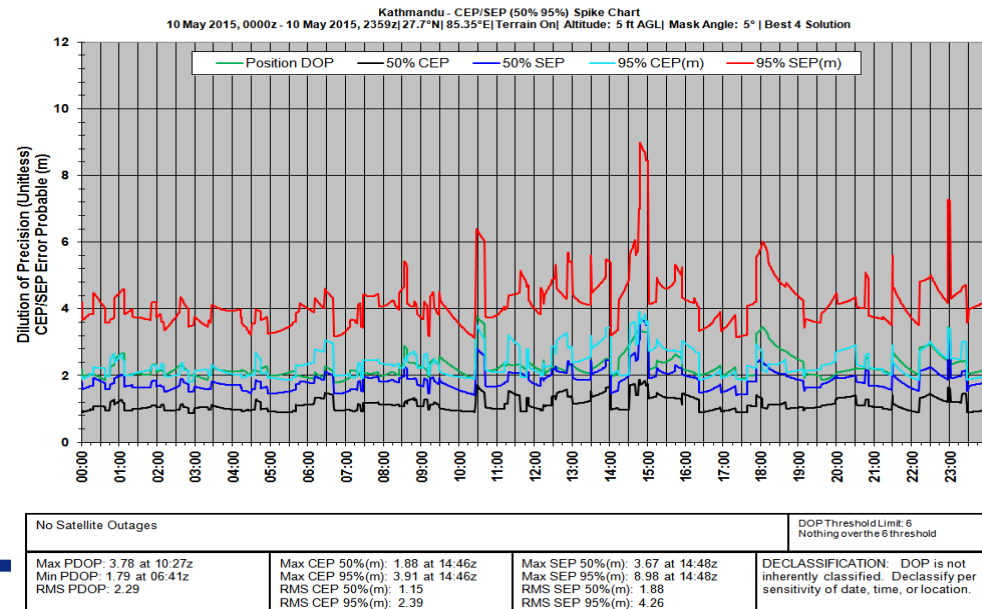
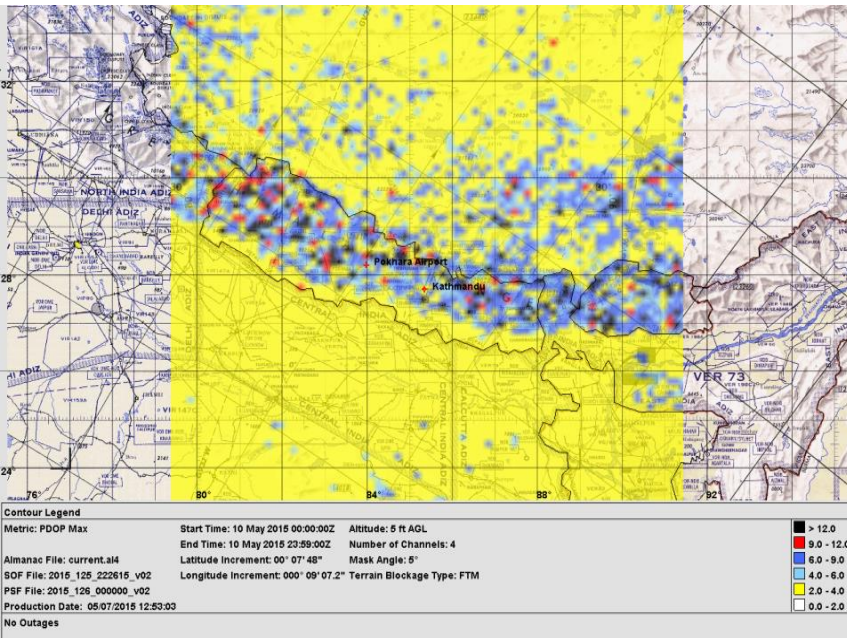
- Aviation / Civil Navigation
- Search and Rescue
- Drilling / Mining / Agriculture
- Banking/ATM Transactions
- Plus Many Others



Support for NEPAL Earthquake

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- GPS User Ops provided accuracy products to humanitarian workers
 - Products displayed accuracy and reliability of GPS signal
- Utilized in conjunction with the Humanitarian OpenStreetMap (OSM) Team
 - OSM volunteers rapidly mapped the disaster area with the aid of satellite images and GPS
 - Mapped more than 13,000 miles of new roads and 110,000 new buildings





Delivering the Best Space-Based PNT

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- ***Operating*** the gold standard in position, navigation & timing
- ***Sustaining*** capabilities for civil and military users worldwide
 - Maintain on-orbit satellites, ground systems
- ***Modernizing*** constellation with new signals and capabilities
 - New civil and military GPS signals and control capabilities
 - 3 new launches this year
- ***Leading*** the way for **GPS systems & supporting stakeholders**



Committed to Responsible Stewardship of GPS





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Questions?

2d Space Operations Squadron
"On Time, On Target"