U.S. AIR FORCE

GLOBAL POSITIONING SYSTEM STATUS

CGSIC

24 August 2011

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Overview

- Who We Are
- Constellation Snapshot
- Space Segment
- Ground Segment
- User Segment

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Who We Are

- **2 SOPS**
  - 127 Personnel
- **5 Crews conducting GPS operations**
  - 7 Military
  - 1 Civilian
  - Navigation Warfare Officer (NWO) on-call
- **GPS User Operations Center (GPSOC)**
- **AF Technical Application Center (AFTAC) Det 46**
- **19 SOPS reserve squadron partner with 2 SOPS**
  - Fully integrated into 2 SOPS mission
  - Maintain certified operators in all crew positions
  - Modernization efforts (GPS IIF, OCX, and GPS III)

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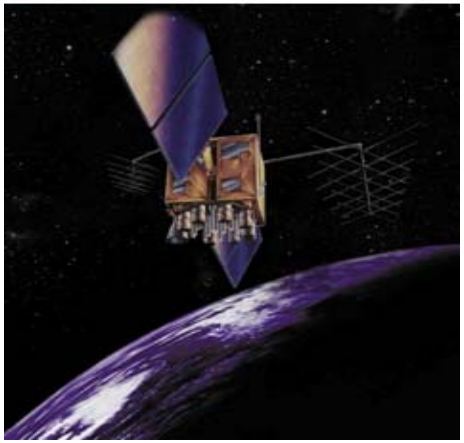
Constellation Snapshot

30 Operational Satellites
(Baseline Constellation: 24)

- **10 Block IIA satellites operational**
- **12 Block IIR satellites operational**
- **7 Block IIR-M satellites operational**
- **1 Block IIF satellite operational**
- **U.S. Government continuously assessing constellation health to determine launch need**
  - **Newest satellites launched**
    - IIR-21 (M)/SVN 50 -- 17 August 2009
    - IIF-1/SVN 62 -- 27 May 2010
    - IIF-2/SVN 63 -- 16 July 2011
- **Global GPS civil service performance commitment met continuously since 1993**



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Space Segment
SVN63, SVN49, and SVN30

- **IIF SV-2 (SVN 63) launched 16 July 2011 under SMC/GP Satellite Control Authority (SCA)**
  - Agreement signed between 50th SW/CC and SMC/GP laying out the roles and responsibilities during the On-Orbit Checkout (OOC) period
  - SMC/GP retained SCA during OOC
    - 2/19 SOPS operators perform commanding under SMC/GP direction
  - 50th SW/CC obtained SCA after OOC completion
  - L5, L2C, M-Code, and Flex Power
- **SVN 49 currently an on-orbit spare**
  - Vehicle placed in residual status due to well-documented multipath anomaly
  - 50 SW and SMC/GP continue mitigation efforts
- **SVN 30 decommissioning**
  - Vehicle was taken off air following clock instability in May 11
  - Removed from broadcast almanac on 20 Jul 11 to accommodate SVN 63
  - Vehicle was launched in Sept 1996

Ground Segment

- **Architectural Evolution Plan (AEP)**
  - Day-to-Day C2 of 32 Satellites
  - 4 Dedicated Ground Antennas and AFSCN Capability
  - 6 Dedicated and 10 NGA Monitor Stations
  - Operating on version 5.6:
    - Brings SAASM capability on-line
    - Adds Nav Warfare Operator (NWO) position
    - Flex Power Testing
- **Launch, Anomaly and Disposal Operations (LADO)**
  - Day-to-Day C2 of 4 Residual SVs (SVNs 30, 32, 37, and 49)
  - AFSCN capability only
  - Leverage for some vehicle emergencies
  - Launch prep and initial post launch operations

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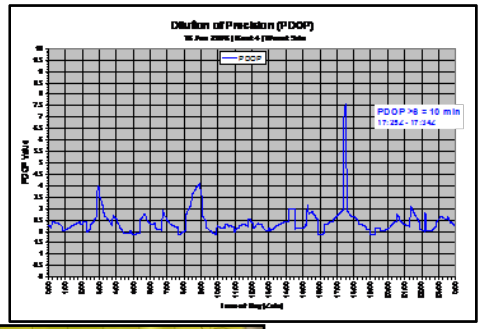
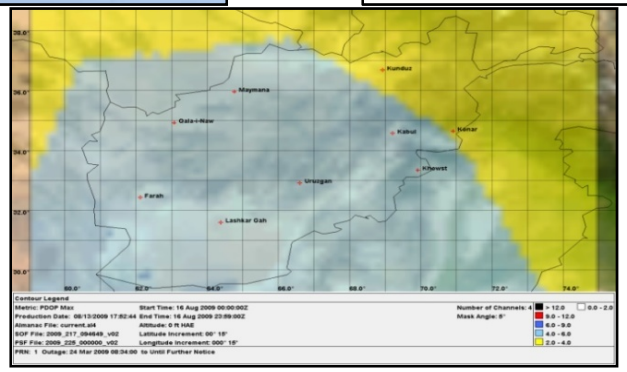
User Segment
GPSOC Mission

- **DoD's focal point for operational issues concerning military use of GPS**
  - Constellation Ops
  - User Ops
- **DoD's interface to military and civil community**
  - 24/7 support -- 911 for GPS user emergencies
  - Solving global GPS user's toughest challenges





Military applications

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

Civilian applications

- **Aviation / Civil Navigation**
- **Space Shuttle**
- **Search and Rescue**
- **Geodetic Measurements**
- **Drilling / Mining / Agriculture**
- **Commercial**
- **Plus Many Others**

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User Segment
L2C and L5 Signals

- **Second civil signal "L2C"**
  - Designed to meet commercial needs
  - Provides dual-frequency users with a more robust, coded signal to aid in ionospheric correction
  - All 7 IIR (M) satellites and IIF-1 are broadcasting a developmental L2C signal now

- **Third civil signal "L5"**
  - Designed to meet demanding requirements for transportation safety-of-life and is available to all users
  - Uses highly protected Aeronautical Radio Navigation Service (ARNS) band
  - SVN 62 broadcasting a developmental L5
- **Once L2C/L5 are online, USG will not support semi-codeless access to military GPS signals (~2020)**

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User Segment
Expandable 24

- **Optimize GPS assets to improve operational effectiveness for global users & terrain challenged environments**
  - Increase the number of vehicles over head for better access/coverage
- **Consistent with the current Standard Positioning Service Performance Standard**
  - Adjust position of satellites in 3 of 6 orbital planes
  - Provides better GLOBAL coverage
  - Coordinated with international community
- **Completion date: 15 Jun 2011**

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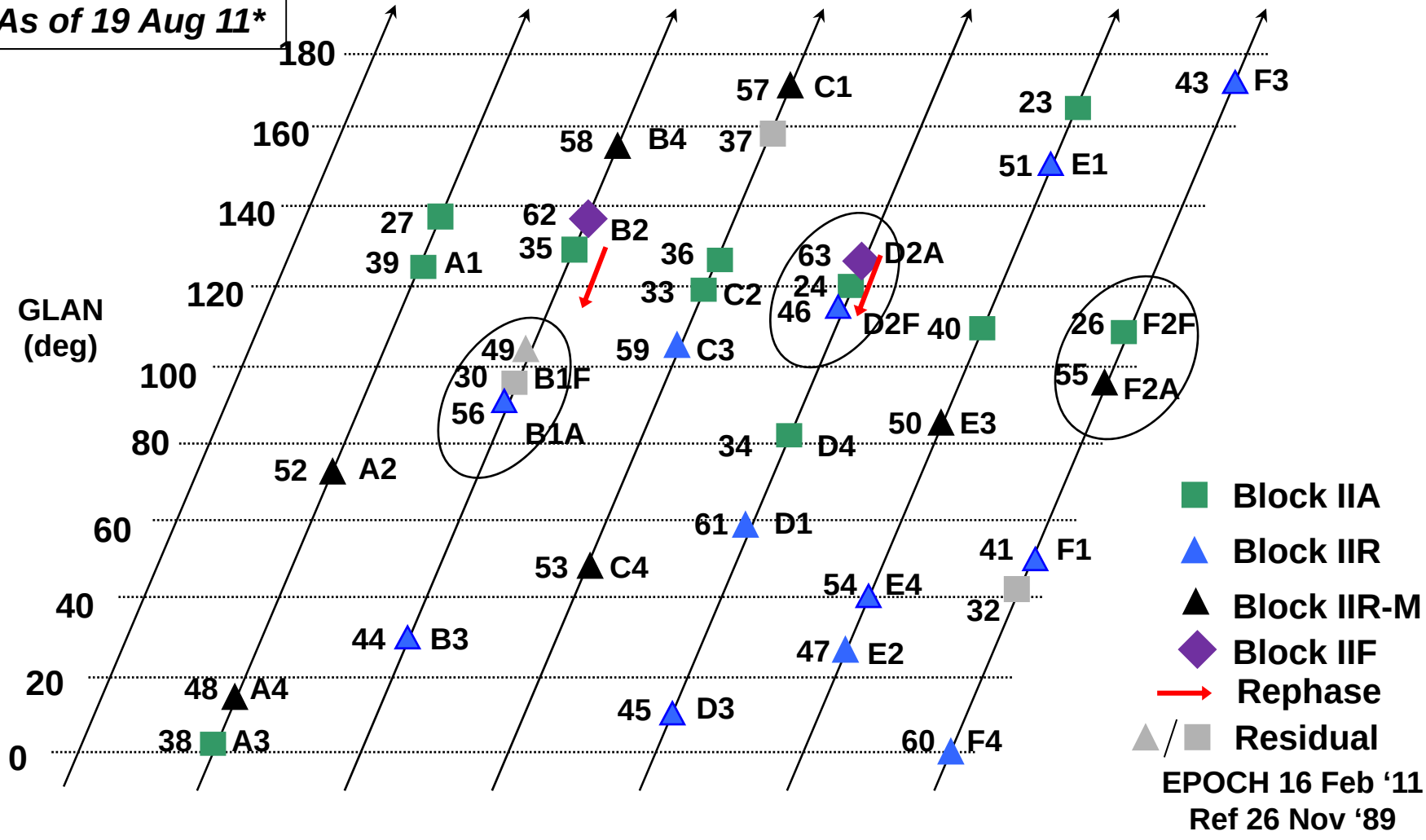
User Segment
Expandable 24 (cont.)

As of 19 Aug 11



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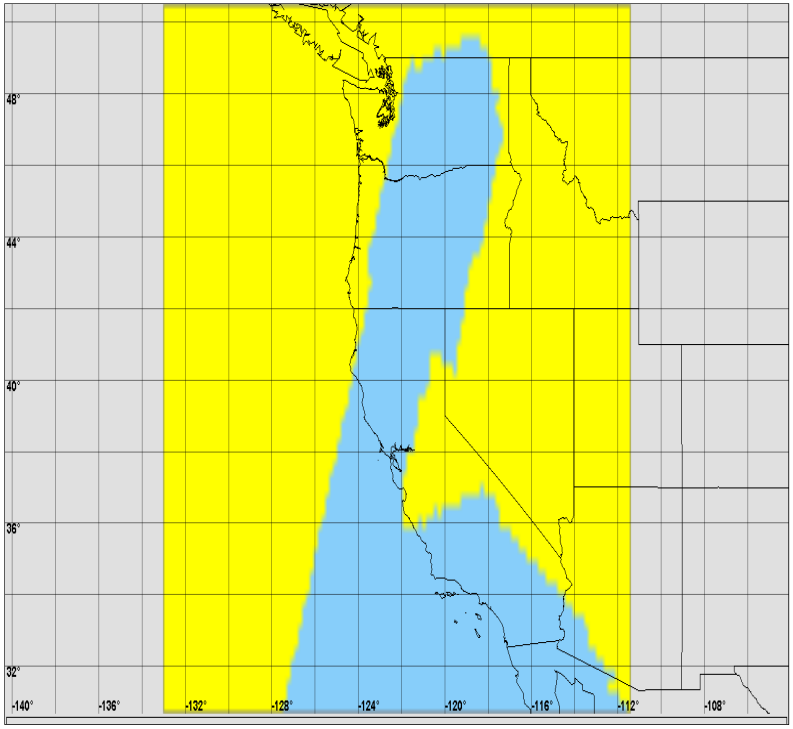
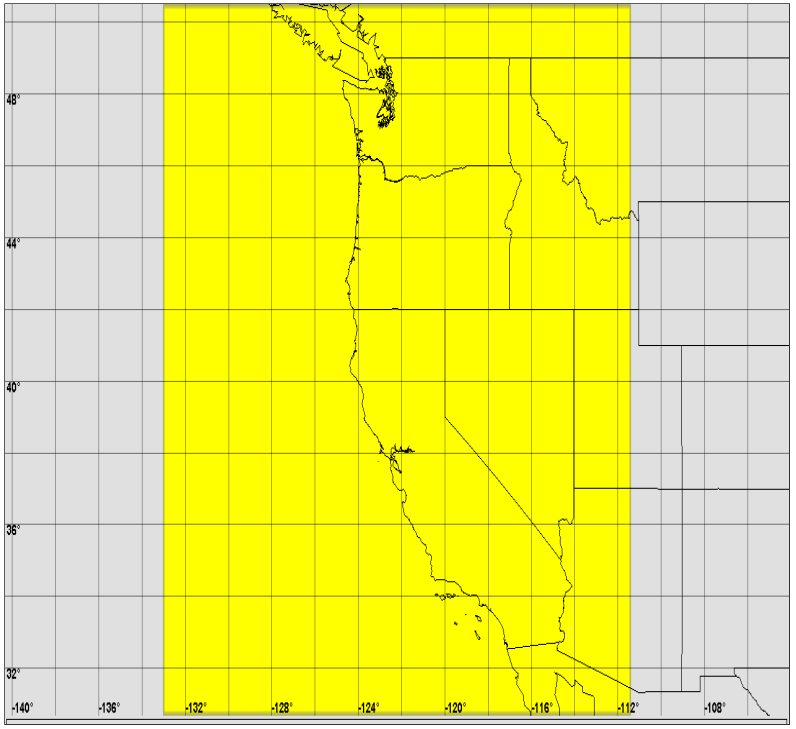
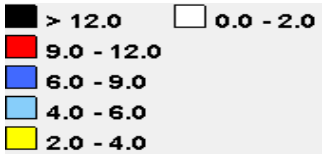
Expandable 24
Benefits on Western Seaboard

Before Expandable 24 Constellation



Expandable 24 Constellation





Lighter Colors = Less Positional Error

Delivering the Best Space-based PNT

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- *Sustaining* capabilities for civil and military users worldwide
  - Maintain ground systems/on-orbit satellites, launch new satellites
  - Fielding GPS enhancements
- *Modernizing* constellation with new signals and capabilities
  - New civil and military GPS signals and control capabilities
  - Continuing work with international GNSS community
  - Maintains Backward Compatibility
- *Managing* GPS systems and supporting stakeholders

Committed to responsible stewardship of GPS as a global utility