



U.S. AIR FORCE

GLOBAL POSITIONING SYSTEM STATUS

CGSIC

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Jennifer Grant

**Lieutenant Colonel, United States Air Force
Schriever AFB
Colorado Springs CO.**

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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

- 120 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)



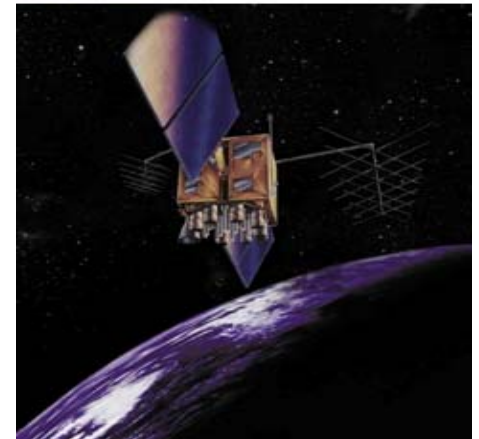


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Constellation Snapshot

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 SVN 30

- **IIF SV-2 (SVN 63) launched 16 July 2011 under SMC/GP Satellite Control Authority (SCA)**
 - Agreement signed between 50 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
 - 50 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 to accommodate SVN 63
 - Disposal plan for satellite ongoing
 - Vehicle was launched in Sept 1996



■ 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 5.7.0:
 - SAASM capability on-line
 - Navigation Warfare Operator (NWO) position
 - Flex Power

■ Launch, Anomaly and Disposal Operations (LADO)

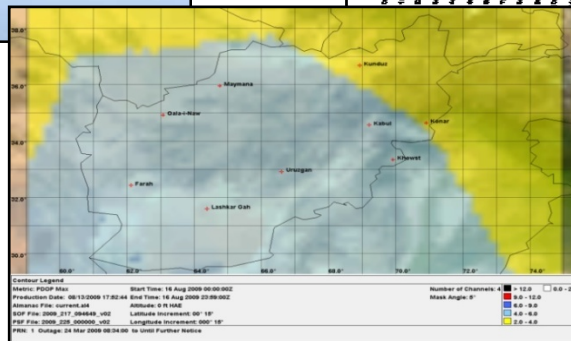
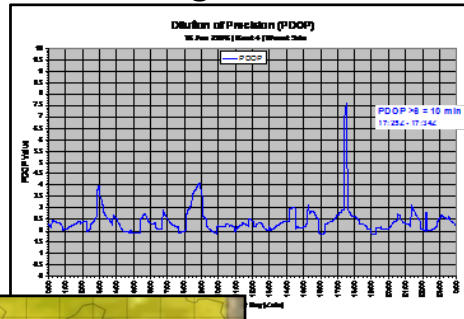
- Day-to-Day C2 of 4 Residual SVs (SVNs 30, 32, 37, and 49)
- AFSCN capability only
- Leverage for some vehicle emergencies
- Launch prep and initial post launch operations



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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 24/7 interface to military and civil community
 - 911 for DoD GPS user emergencies
 - Supports FAA/NAVCEN in resolving civil user issues



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 49 and 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**



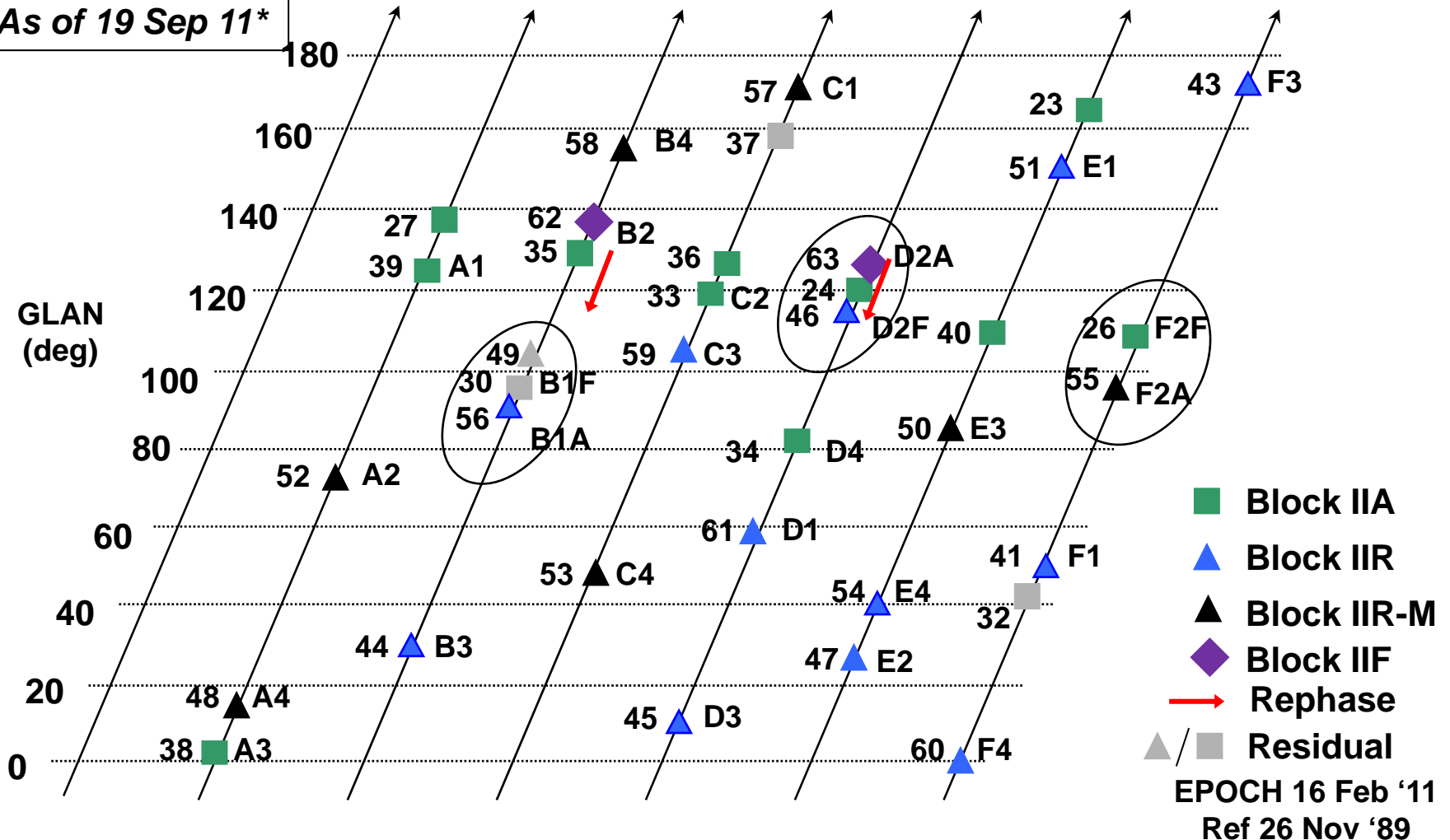
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User Segment Expandable 24 (cont.)

As of 19 Sep 11



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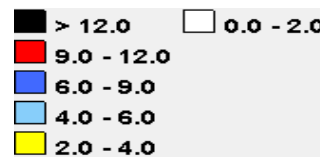
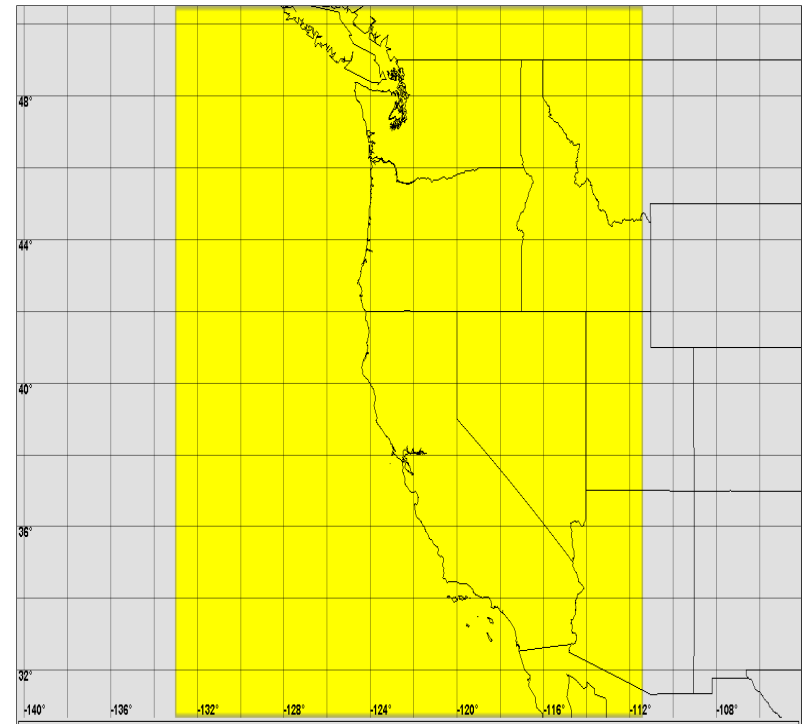
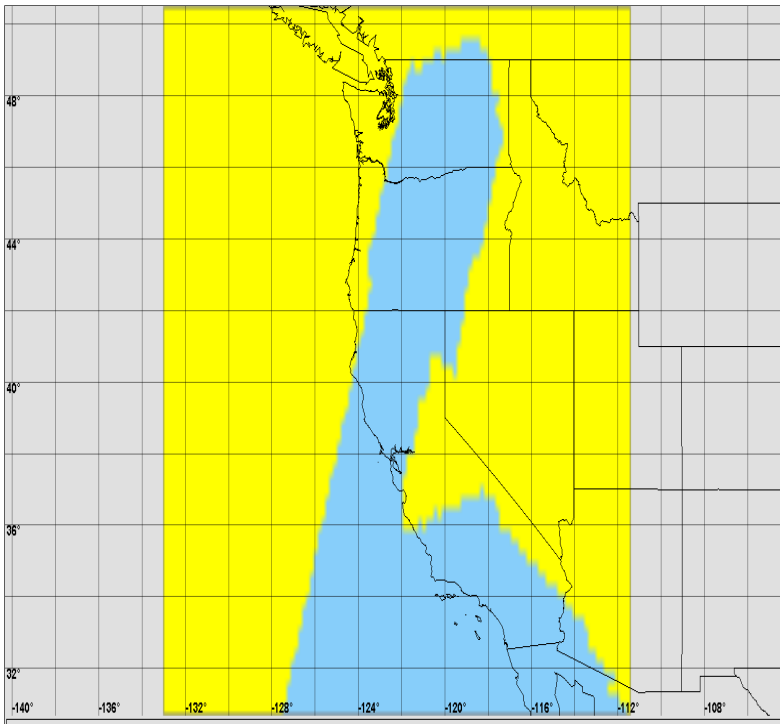


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Expandable 24 Benefits on Western Seaboard

Before Expandable 24 Constellation

Expandable 24 Constellation



Lighter Colors = Less Positional Error

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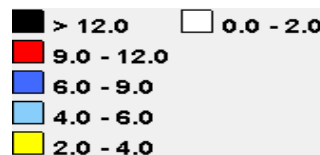
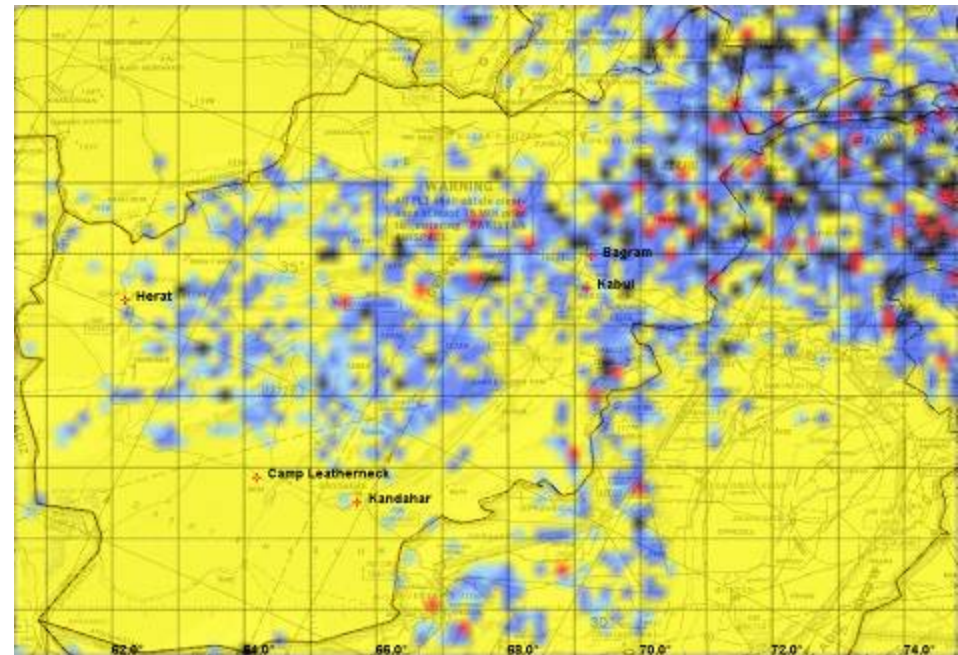
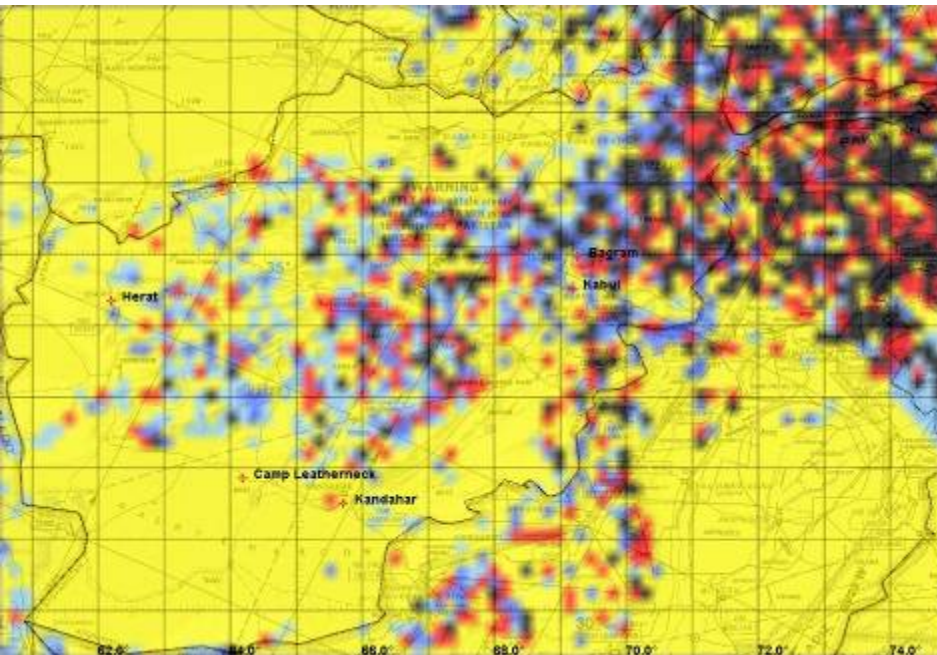


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Expandable 24 Benefits in Afghanistan

Before Expandable 24 Constellation

Expandable 24 Constellation



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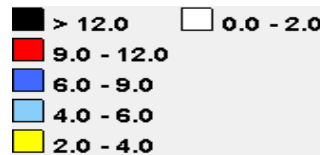
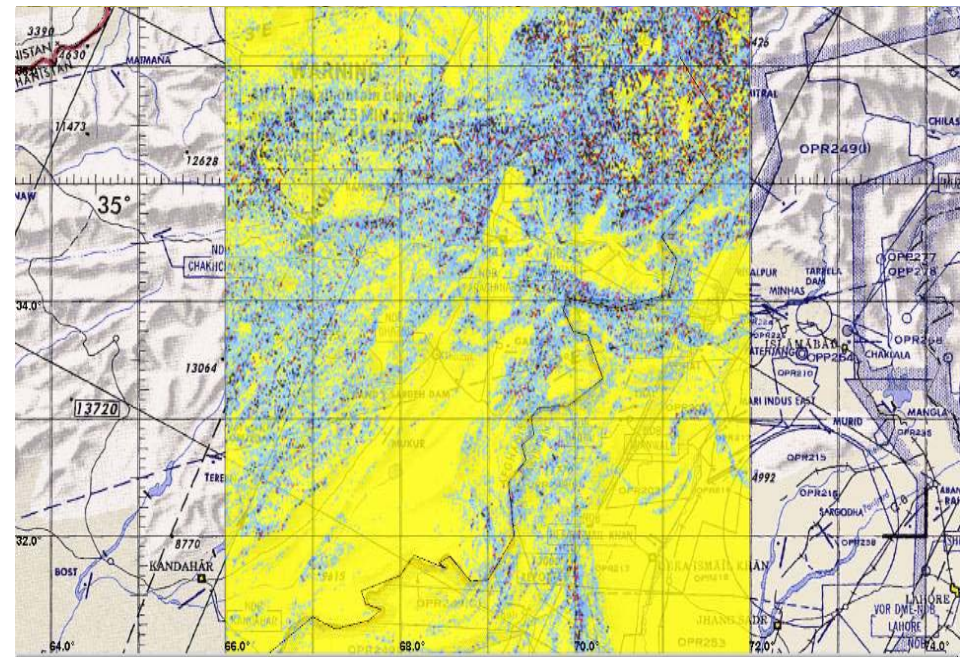
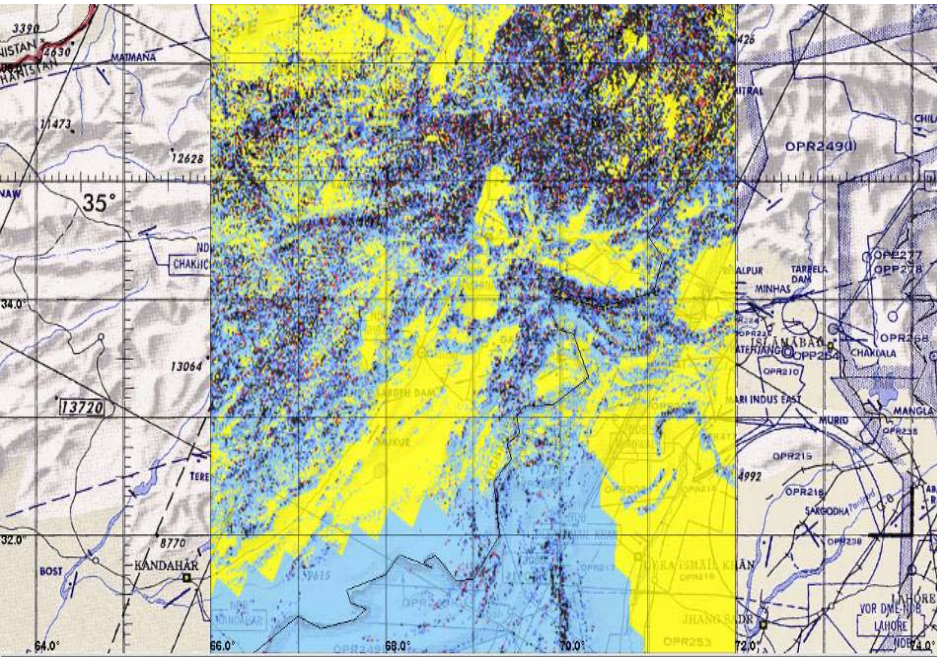


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Expandable 24 Benefits in Afghanistan

Before Expandable 24 Constellation

Expandable 24 Constellation



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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

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