

# ***Headquarters U.S. Air Force***

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*Integrity - Service - Excellence*

## **Global Positioning System (GPS) Status**



**CGSIC States and Local  
Government Subcommittee  
Baltimore, MD  
6 Jun 2014**

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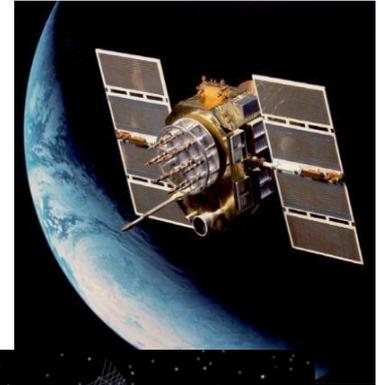
**Lt Col Jermaine Brinson  
HQ USAF/A3SO**



# GPS Constellation Status

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- **31 Operational Satellites**
  - **6 Block IIA**
  - **12 Block IIR**
  - **7 Block IIR-M**
  - **6 Block IIF (IIF-6 launched on 16 May)**
    - **6 more IIF satellites in the pipeline**
  - **Additional residuals on-orbit**
  - **Continuously assessing constellation health to determine launch need**

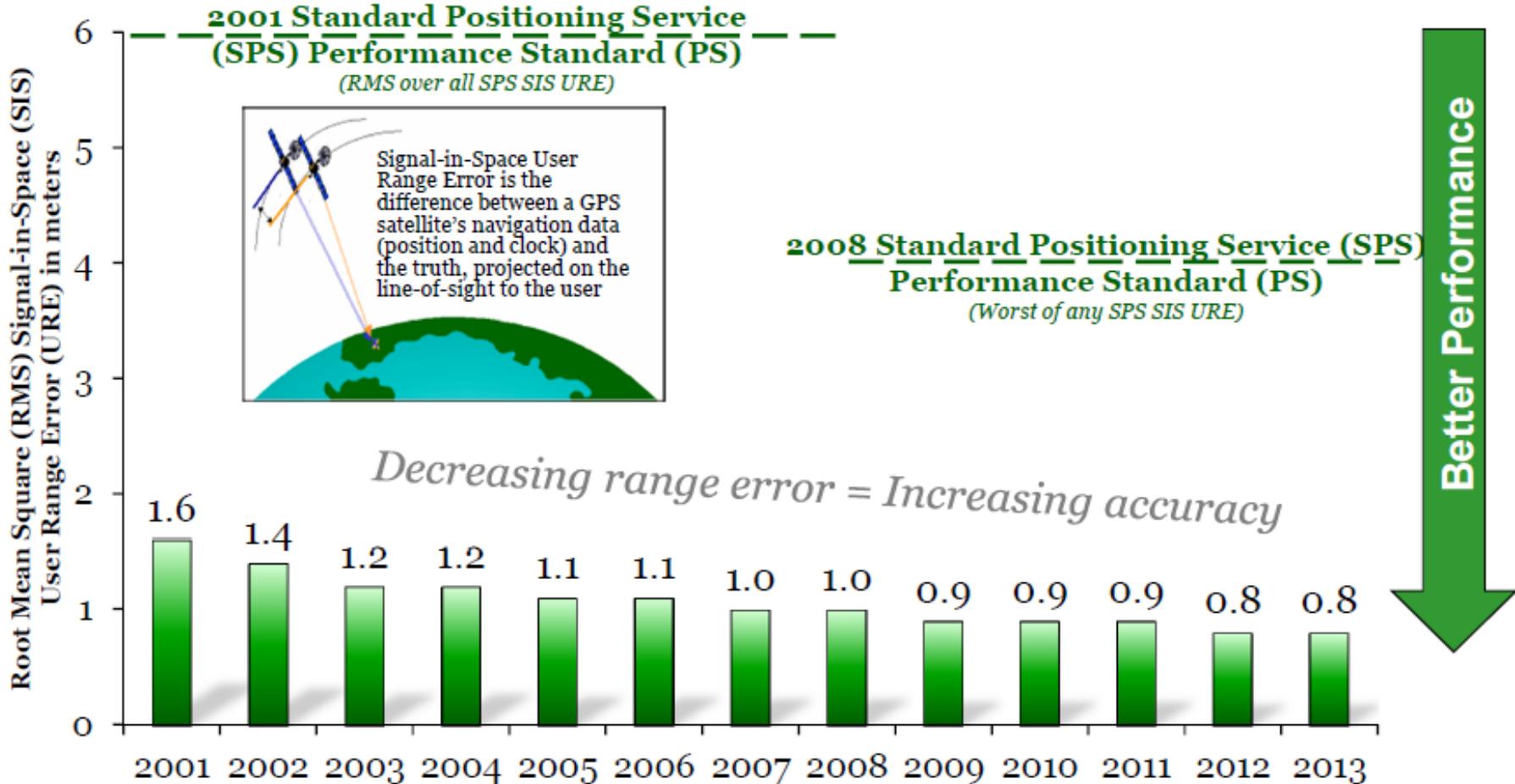


*Constellation is Robust*



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# GPS Standard Positioning Service Signal-in-Space Performance



**Global GPS service performance commitment met continuously since December 1993**



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# GPS Modernization

## Legacy GPS IIA/IIR

- Single Frequency (L1)
- Coarse acquisition (C/A) code
- Y-Code (L1Y & L2Y)

## GPS IIR-M

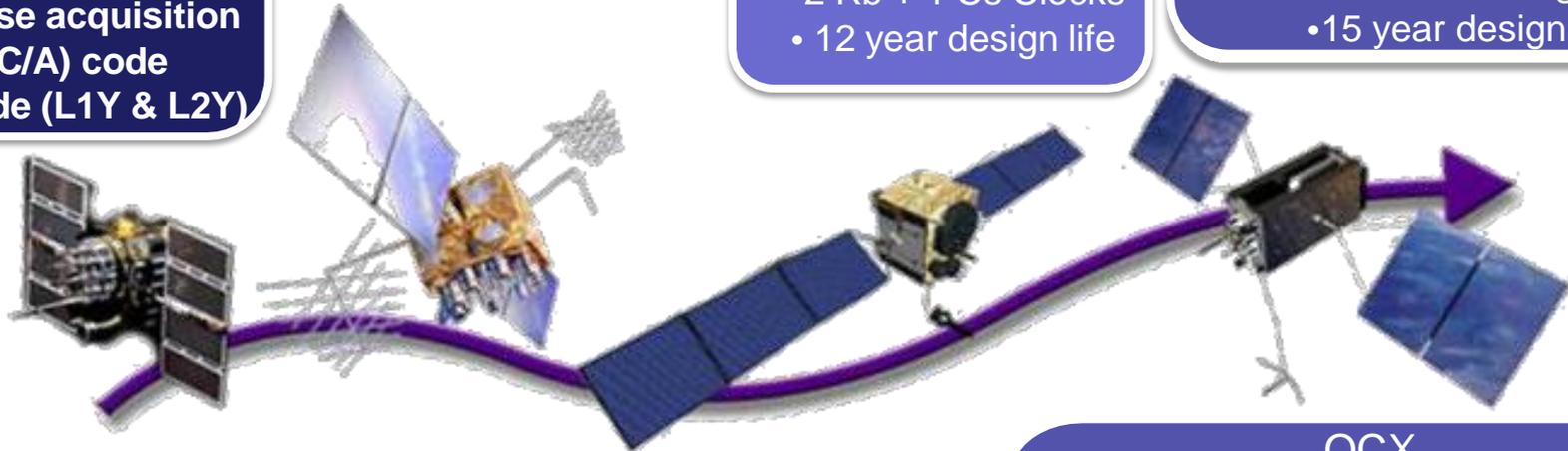
- 2<sup>nd</sup> Civil Signal (L2C)
- M-Code (L1M & L2M)

## GPS IIF

- 3<sup>rd</sup> civil signal (L5)
- 2 Rb + 1 Cs Clocks
- 12 year design life

## GPS III

- 4<sup>th</sup> civil signal (L1C)
- 4x better User Range Error than IIF
- Increased availability
- Increased integrity
- 15 year design life



## Legacy OCS

- Mainframe system
  - Command & Control
- Signal monitoring

## AEP

- Distributed architecture
- Increased signal monitoring
  - Security
  - Accuracy
- Launch and disposal ops

## OCX

- Fly legacy constellation
- Launch, checkout, and fly GPS III
- Control & monitor modernized signals
- Upgraded information assurance
  - Capability on-ramps

*Increasing system capabilities – Increasing user Benefit*



- Full-time broadcast of Civil Navigation (CNAV) message-populated L2C & L5 signals on IIR-M & IIF satellites since Apr 14
  - Provide signal diversity and robustness for dual-frequency users
  - Facilitate development of compatible user equipment
- Phased execution
  - Apr 2014: Initial broadcast; uploads ~2x/week
  - Dec 2014: Daily uploads; comparable accuracy with legacy signals
  - Pre-operational status until OCX Block I
    - L5 signal set 'unhealthy'; may be set healthy based upon greater experience with the broadcast and implementation of signal monitoring
    - Both L2C & L5 “should be employed at the users' own risk; not used for safety-of-life or other critical purposes”

**Pre-Operational CNAV Broadcast since Apr 2014**



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# Summary

- Constellation is robust, but aging; Next IIF launch planned for Aug 2014
- System performance commitments continuously met since 1993; Accuracy exceeds published standards
- GPS modernization for military and civil users underway



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