GPS OCX Update

14 October 2010
**System Overview**

**Service Oriented Architecture**

**Provides Enhanced Capabilities**
- Plan and execute NAVWAR mission
- Additional signals: L5, L1C, L2C*, M-Code
- C2 and Navigation for GPS IIA, IIR, IIR-M, IIF and IIIA
- Robust IA counters emerging cyber-threats
- Improved accuracy inherent in design
- Integrity & Continuity using FAA-Certified WAAS Algorithms
- Operator Automation

**Supports Future Capabilities**
- Flexible architecture to accommodate new functional capabilities, evolving CONOPS and additional automation
- Internal SOA enables new GIG / Net Centric Interfaces
- Re-programmable M-Code Receiver
- PSICA infrastructure in Block 1 lays foundation for future integrity requirements

*New signal in Block 1*
OCX Will Modernize GPS

- **GPS control stations**
  - New Master Control Station (MCS) hardware at Schriever AFB
  - New Alternate MCS hardware at Vandenberg AFB
  - Test and training simulators
  - New advanced ground antennas

- **GPS remote sites**
  - Upgrade of existing ground antennas
  - Addition of modernized monitor station receiver element
  - Upgrade receivers for new signals

- **New architecture with the following functionality**
  - Robust Information Assurance
  - TT&C and NAV for on-orbit SVs and for new SV’s
  - Full modernization – SAASM, M-Code
  - New Civil signal monitor & control: L1 C/A, L1C, L2C, L5
  - Service Oriented Architecture enables net-centricity and Global Information Grid connectivity
  - Early support to Effects Based Ops: Flex Power, Over the Air Re-keying
  - Evolved GPS support to Effects Based Ops: Spot Beam, Crosslink C2

OCX Blocks 1.0 and 2.0

Future OCX Blocks
OCX Graceful Growth Path to Full CDD Requirements

OCX Block 4.0 (future)
- Support GPS IIF SVs, to include:
  - Navwar spot beam
  - Flexible payload
  - Integrity monitoring

OCX Block 3.0 (future)
- Support GPS IIF SVs, to include:
  - Directional crosslink antennas
  - High-speed Uplink/Downlink

OCX Block 2.0
- Monitor & Control L5 & Galileo-compatible L1C
- Monitor & Control M-Code
- GNOC for NAVWAR Ops...

OCX Block 1.0
- Mission ops (all SVs)
- Launch, Early Orbit, Anomaly, Disposal Ops (all SVs)
- Monitor & Control L2C
- 5-10 dB incr in regional power
- GIG Infrastructure
- Integrity architecture

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UNCLASSIFIED -- GPS OCX
## OCX Summary Schedule

<table>
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<tr>
<th>Block 1.0</th>
<th>FY09</th>
<th>FY10</th>
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<td>Jun</td>
<td>Apr</td>
<td>May</td>
<td>Feb</td>
<td>Aug</td>
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| Block 2.0 | |
| L1C, L-5 and M-Code |
| CDR | SRT/FQT | DD250 | RTO |
| Jul | Jun | Mar | Sep | MSB | MSC |

**Time Now**
## OCX Phase B Program Milestone Status

<table>
<thead>
<tr>
<th>OCX Milestone</th>
<th>Baseline</th>
<th>Forecast</th>
<th>Actual</th>
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* Moved to accommodate GPSW’s schedule

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<tr>
<th>Complete</th>
<th>Forecast On Schedule</th>
<th>Forecast Late to Baseline, Potential Impacts</th>
<th>Forecast Late to Baseline, Impacts Likely</th>
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Closing on Enterprise Integration

- Systems Integration Demonstration Plans Resynchronized
  - Successfully redefined and re-aligned the OCX/GPS IIIA demonstration plan to address the 18-month schedule gap
- OCX/GPS IIIA Requirements Baseline Established
  - Established OCX PDR baseline consistent with GPS IIIA CDR baseline
  - Successful dry run of the state vector phase 1 demonstration
- Working Site Integration and Transition Planning Upfront to Ensure Seamless Transition from AEP/LADO and each Subsequent Delivery
  - Transition requirements built into the architecture and deployment strategy
  - Completed multiple facilities site surveys and analysis
  - Created OCX-OCS ICD
- Developed GPS IIIA Launch and Checkout Approach
  - Enables early GPS IIIA launch with minimal impact to the OCX baseline
  - Significantly reduces OCX/GPS IIIA integration risk
  - Provides long term sustainment capability
Summary

- OCX is responsive to today’s system requirements while maintaining a vision and path to future system capabilities

- OCX is off to a solid start and on-track to delivery Block 1 on time

- Enterprise integration is resynchronized and requirement’s baselines established

- Upfront site integration and transition planning significantly reduces the risk of backward compatibility and seamless transition