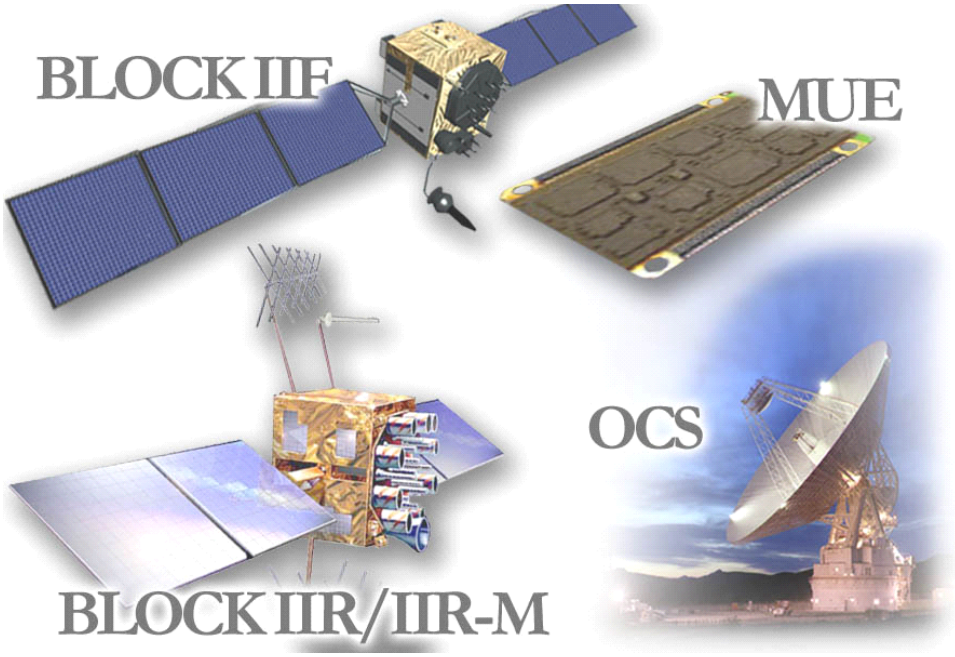
# Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-166




## NAVSTAR GPS

As of December 31, 2011

Defense Acquisition Management
Information Retrieval
(DAMIR)

## Table of Contents

## Program Information

**Designation And Nomenclature (Popular Name)**

Navstar Global Positioning System (NAVSTAR GPS)

**DoD Component**

Air Force

## Responsible Office

**Responsible Office**

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**Date Assigned** July 19, 2010

## References

## SPACE & CONTROL

**SAR Baseline (Production Estimate)**

Under Secretary of the Air Force (USecAF) Approved Acquisition Program Baseline (APB) dated February 26, 2002

**Approved APB**

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated February 9, 2007

## USER EQUIPMENT

**SAR Baseline (Production Estimate)**

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## Mission and Description

The Navstar Global Positioning System (GPS) is a space-based radio positioning, navigation, and time distribution system. GPS provides precise, continuous, all-weather, common-grid positioning, velocity, navigation, and time reference capability to civil, commercial, and military users worldwide. Military mission areas supported include: navigation and position fixing; air interdiction; close air support; special operations; strategic attack; counter-air and aerospace defense; theater and tactical command, control, communications and intelligence; precision munitions guidance; and ground/sea warfare. GPS also carries a suite of nuclear detonation detection system sensors as a secondary payload. These sensors provide worldwide, near realtime, 3-dimensional location of nuclear detonations.

The Modernized Space and Control portion reported here includes Block IIR, IIR-M, and IIF satellite capabilities and associated control segments. The Modernized User Equipment (MUE) program is currently developing two prototype M-code form factors to mature the technology and industrial base necessary to support the Military GPS User Equipment (MGUE) Program.

# Executive Summary

## GPS Space Segment

Global Positioning System (GPS) IIF satellites provide improved accuracy, greater security, anti-jam capabilities, and add the new L5 signal, a dedicated civilian safety-of-life signal, while maintaining baseline legacy GPS performance. Twelve Space Vehicles (SVs) are on contract, with SVs 1-3 awarded as Cost-Plus-Award-Fee and SVs 4-12 as Fixed-Price-Incentive-Fee. The program remains focused on mission assurance, satellite production and launch, and on-orbit sustainment. SV-1 (launched May 27, 2010) and SV-2 (launched July 16, 2011) transitioned to operations and are among the most accurate in the constellation. The remaining ten GPS IIF satellites on contract are in storage or various stages of assembly, integration and test. SV-4 and SV-5 were delivered on August 31, 2011 and December 10, 2011, respectively, placed into storage at the factory, and are ready for launch call-up. SV-6 is in Final Integrated System Test and is on schedule for a March 2012 delivery. SV-3 is set for an April 2012 delivery and will mark the closeout of the FY 2003 Cost-Plus production effort. SV-7, SV-8 and SV-9 are on-track for 2012 deliveries.

While the Cost-Plus portion of production is winding down, it's noteworthy that two upward adjustments were made to the Fixed-Price production effort. The first upward adjustment was made to maintain on-orbit operational flexibility supporting the U.S. Nuclear Detonation (NUDET) Detection System (USNDS) missions. As reported in the 2010 Selected Acquisition Report, interface compatibility issues between the SV's Navigation Data Unit (NDU) and Government provided USNDS units were identified in 2009. The Contractor-proposed solution met requirements, but limited the amount of operational flexibility to support the USNDS mission. The Government therefore pursued interface modifications to maintain operational flexibility, and redesign efforts culminated with a successful critical design review in December 2010. A second upward adjustment of $21.2M (2005 and 2006) was made on the associated Fixed-Price production Contract Line Item Numbers (CLINs) and the first unit with an improved interface was delivered in July 2011.

An investigation into a factory test anomaly determined that L1 transmitter signal power must be reduced from previous settings to maximize hardware reliability. Although the optimized L1 transmitter met Acquisition Program Baseline Threshold requirements, it represented an approximate 40% reduction in operational signal power. The program invested $4.6M and developed a hardware solution restoring L1 power for three SVs. An upward adjustment was made for $4M in 2006 for this work.

The SV-2 Cesium Frequency Standard (CFS) high voltage power supply likely suffered a corona event and is no longer usable. The investigation determined that the manufacturing weakness applied to all GPS IIF CFS units, and while the SV can meet all requirements without the CFS, the Contractor has initiated the rework of all units for SVs 3-12.

The 2010 SAR reported on two technical concerns regarding the GPS IIF Solar Arrays that were closed in 2011. The contractor identified and implemented new wire wrapping methods and inspections to reduce the technical risks to the solar arrays. They also agreed to implement these fixes on all SVs without additional cost to the Government.

The period of performance for the IIF contract ends December 31, 2012. The production CLIN on the current contract has been extended at no cost through May 2013 to complete production. The government is currently developing a follow-on contract strategy to continue Launch and On-Orbit Support services through 2017.

## LightSquared Testing

LightSquared is a telecommunications company looking to offer broadband services. LightSquared plans to deploy terrestrial service in the moblie satellite band (1525-1559MHz) directly adjacent to the GPS band. In January 2011, the Federal Communications Commission (FCC) allowed LightSquared to repurpose their spectrum from space-based communication to terrestrial based, under a conditional waiver that testing proved the planned system would not interfere with GPS devices. The terrestrial based plan fundamentally changes the environment where GPS

receivers operate. GPS operates in the 1559-1610 MHz frequency band and there is a concern that wideband receivers will experience interference in the presence of the LightSquared signal. In 2011, the Department of Defense conducted tests and simulations to characterize the interference potential.

LightSquared interference testing results (May 2011) indicated significant interference across the GPS community including Aviation, Space-Based, High Precision and Maritime applications. The nine federal departments and agencies, that comprise the National Space-Based Position Navigation and Timing (PNT) Executive Committee (EXCOM), also reviewed the testing results and confirmed the same concerns. Furthermore, on September 15, 2011 General Shelton (Commander, Air Force Space Command) testified before the House Armed Services Committee (HASC) on the LightSquared impact to GPS receivers. LightSquared proposed an alternative solution which required additional testing.

Results from these tests were briefed to the PNT Executive Steering Group (ESG) on December 14, 2011 and were provided to the Space-Based PNT EXCOM on January 13, 2012. At the conclusion of the PNT EXCOM, the Deputy Secretary of Defense and Deputy Secretary of Transportation signed out a memorandum concluding that: “LightSquared’s original and modified plans for its proposed mobile network would cause harmful interference to many GPS receivers...based on the testing and analysis, there appear to be no practical solutions or mitigations that would permit the LightSquared broadband service as proposed, to operate in the next few months or years without significantly interfering with GPS. As a result, no additional testing is warranted at this time.” The FCC announced that "the International Bureau of the Commission is proposing to (1) vacate the Conditional Waiver Order, and (2) suspend indefinitely LightSquared's Ancillary Terrestrial Component authority to an extent consistent with the National Telecommunications and Information Administration (NTIA) letter."

**GPS Control Segment**

Both operational Architectural Evolution Plan (AEP) and the Launch/Early Orbit, Anomaly Resolution and Disposal Operations (LADO) satellite command and control systems continue to perform well. The program completed the final installation of AEP V5.6 on January 19, 2011. It was followed by AEP V5.6.1B on March 16, 2011. These two releases delivered the changes needed to fly GPS IIF-2. The 50th Space Wing LADO mission control teams supported the launch (July 16, 2011), check out of the primary and secondary payloads and transition to operations (August 19, 2011).

The program also made significant progress on the next AEP upgrade (V5.8) which implements the U.S. Strategic Command (STRATCOM) Selective Availability Anti-Spoofing Module (SAASM)-capable User Equipment Operational Concept (OPSCON) changes. The program conducted five tests: an Early Integration Test (EIT) with GPS SAASM User Equipment (UE) in February 2011, two SAASM UE OPSCON confidence building tests (June and July 2011), requirement verification test (September 2011), and System Test Procedure Checkout (PCO) (December 2011). These modifications will be implemented with the release of AEP V5.8 in third quarter FY 2012.

Air Force Operational Test and Evaluation Center (AFOTEC) Det-4 conducted a SAASM Multi-Service Operational Test and Evaluation (MOT&E) from August 1-26, 2011. AFOTEC tested SAASM Over-the-Air-Distribution (OTAD) of key, Over-the-Air-Rekey (OTAR), and Supplemental Navigation (SNAV) capabilities and collected navigation performance data in several operational scenarios using current and legacy handheld receivers as well as Army Raven and laser ranging (LRAS) platforms. The final report was delivered to AFSPC in February 2012 to support the GPS Block II Electronic Protect Initial Operational Capability declaration.

The program completed fielding of a software patch that eliminated a problem reported last year with eight different SAASM receiver models. The program also worked with the 746th Test Squadron (746TS) at Holloman Air Force Base, NM, and the Space and Naval Warfare Systems Command (SPAWAR) in San Diego, CA, to improve Operational Control System (OCS)/User Equipment (UE) testing by expanding the existing government test racks with additional military UE and software so these organizations have a broader sample of fielded user equipment. SPAWAR supported the AEP V5.8 EIT, while the 746TS supported the AEP V5.8 PCO test this year. The program does not expect any issues when this new ground segment upgrade (AEP V5.8) is released.

**GPS User Equipment**

The Modernized User Equipment (MUE) effort was initiated in 2006 to demonstrate the "proof of principal" and mature the critical technologies necessary to realize modernized GPS capabilities. Rockwell Collins, L-3, and Raytheon execute contracts for the MUE efforts. The contracts have continued to mature Military-Code (M-Code) capable GPS receiver technology. The contractors began Functional Qualification Testing (FQT) of the ground based receiver card in April 2010 and completed the final Functional Quality Review (FQR) in October 2011. Independent Government testing is underway and is scheduled to conclude first quarter 2012. Preliminary test results have demonstrated a Technical Readiness Level (TRL) 6 for the Critical Technology Elements (CTEs) of M-Code Acquisition Engine, M-Code Crypto, and SAASM Crypto. The Anti-Spoof CTE is still being assessed. FQR for avionics based receiver cards was held in December 2011 with independent government testing scheduled to begin in the first quarter of 2012.

The prototype receiver cards built under this activity are currently undergoing testing and will be evaluated by an independent Technology Readiness Assessment (TRA) team. A security evaluation, receiver card characterization, integration into operational platforms, and Government testing results will form the basis for the assessment. The TRA will support Military GPS User Equipment (MGUE) Increment 1 Milestone B (planned for 2014). The MGUE Increment 1 program will leverage the technology development under the MUE program and develop two production ready status GPS receiver form factors for the joint services. An APB will be established under the upcoming MGUE Increment 1 Milestone B effort. In addition to testing prototype cards, the program continues to leverage the MUE contracts by implementing several updates to Interface Control Documents (ICDs) and fixing FQT deficiencies. This work provides further risk reduction for MGUE Increment 1.

The Office of the Secretary for Defense, Acquisition, Technology, and Logistics (OSD AT&L) approved the MGUE Increment 1 Technology Development Strategy on November 1, 2011. The program is on-track to release a Preliminary Design Review Request for Proposal in the first quarter 2012 with contract awards in second quarter. This effort realizes the benefits of the risk reduction work as two production ready GPS receiver form factors for the joint services will be developed.

There are no significant software-related issues with this program at this time.

## Threshold Breaches

### SPACE & CONTROL

| APB Breaches | | |
|---|---|---|
| **Schedule** | | ☑ |
| **Performance** | | ☐ |
| **Cost** | RDT&E | ☐ |
| | Procurement | ☐ |
| | MILCON | ☐ |
| | Acq O&M | ☐ |
| **Unit Cost** | PAUC | ☐ |
| | APUC | ☐ |

| Nunn-McCurdy Breaches | | |
|---|---|---|
| **Current UCR Baseline** | | |
| | PAUC | None |
| | APUC | None |
| **Original UCR Baseline** | | |
| | PAUC | None |
| | APUC | None |

**Explanation of Breach**

This breach was previously reported in the December 2009 SAR.

### USER EQUIPMENT

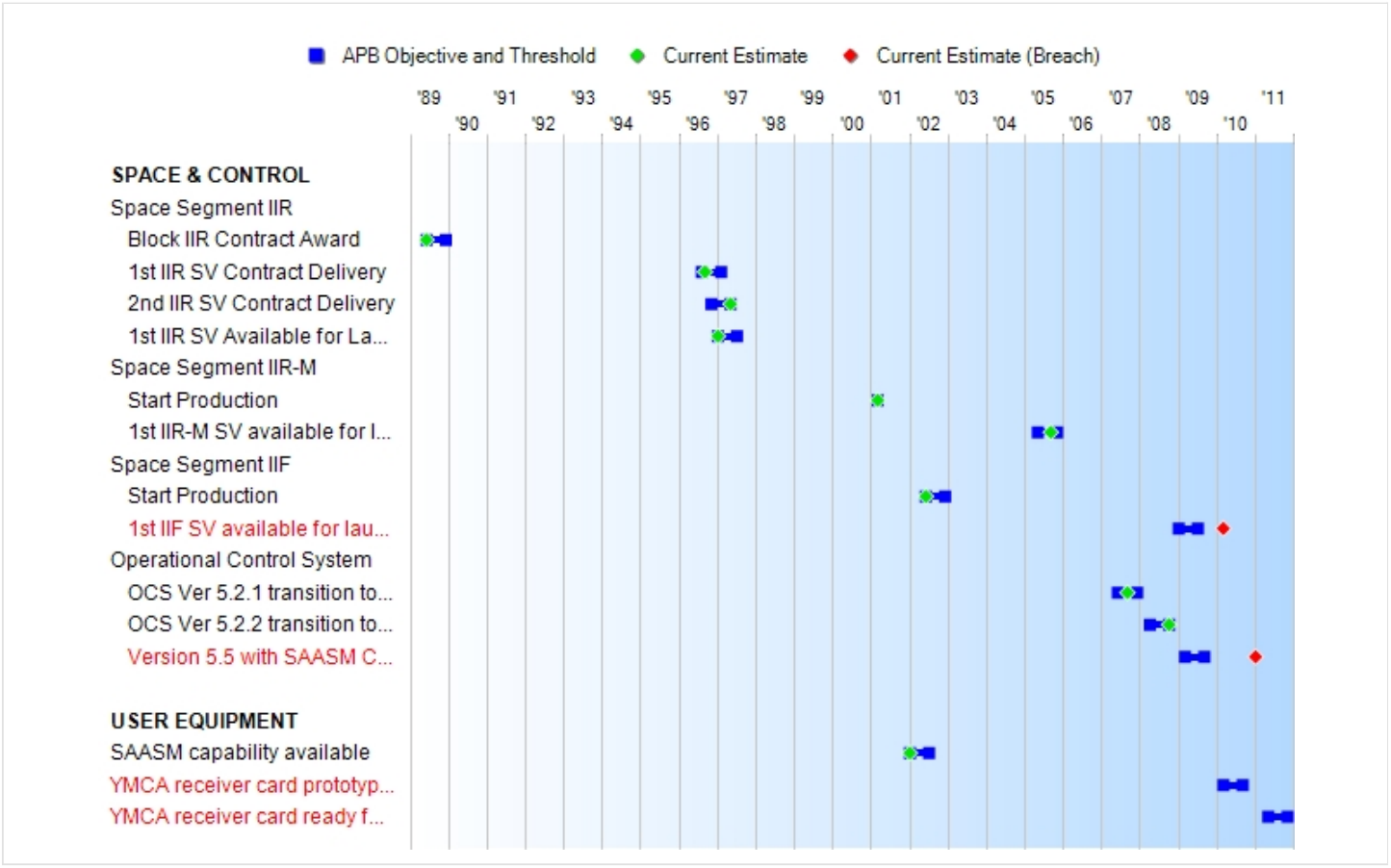
| APB Breaches | | |
|---|---|---|
| **Schedule** | | ☑ |
| **Performance** | | ☐ |
| **Cost** | RDT&E | ☐ |
| | Procurement | ☐ |
| | MILCON | ☐ |
| | Acq O&M | ☐ |
| **Unit Cost** | PAUC | ☐ |
| | APUC | ☐ |

| Nunn-McCurdy Breaches | | |
|---|---|---|
| **Current UCR Baseline** | | |
| | PAUC | None |
| | APUC | None |
| **Original UCR Baseline** | | |
| | PAUC | None |
| | APUC | None |

**Explanation of Breach**

This breach was previously reported in the December 2010 SAR.

## Schedule


APB Objective and Threshold
Current Estimate
Current Estimate (Breach)
'89
'90
'91
'92
'93
'94
'95
'96
'97
'98
'99
'00
'01
'02
'03
'04
'05
'06
'07
'08
'09
'10
'11
SPACE & CONTROL
Space Segment IIR
Block IIR Contract Award
1st IIR SV Contract Delivery
2nd IIR SV Contract Delivery
1st IIR SV Available for La...
Space Segment IIR-M
Start Production
1st IIR-M SV available for l...
Space Segment IIF
Start Production
1st IIF SV available for lau...
Operational Control System
OCS Ver 5.2.1 transition to...
OCS Ver 5.2.2 transition to...
Version 5.5 with SAASM C...
USER EQUIPMENT
SAASM capability available
YMCA receiver card prototyp...
YMCA receiver card ready f...

| SPACE & CONTROL | | | | |
|---|---|---|---|---|
| **Milestones** | **SAR Baseline Prod Est** | **Current APB Production Objective/Threshold** | | **Current Estimate** |
| Space Segment IIR | | | | |
| Block IIR Contract Award | JUN 1989 | JUN 1989 | DEC 1989 | JUN 1989 |
| 1st IIR SV Contract Delivery | AUG 1996 | AUG 1996 | FEB 1997 | SEP 1996 |
| 2nd IIR SV Contract Delivery | NOV 1996 | NOV 1996 | MAY 1997 | MAY 1997 |
| 1st IIR SV Available for Launch | JAN 1997 | JAN 1997 | JUL 1997 | JAN 1997 |
| Space Segment IIR-M | | | | |
| Start Production | MAR 2001 | MAR 2001 | MAR 2001 | MAR 2001 |
| 1st IIR-M SV available for launch | MAY 2003 | MAY 2005 | NOV 2005 | SEP 2005 |
| Space Segment IIF | | | | |
| Start Production | JUN 2002 | JUN 2002 | DEC 2002 | JUN 2002 |
| 1st IIF SV available for launch | JUN 2005 | JAN 2009 | JUL 2009 | **MAR 2010**[1] |
| Operational Control System | | | | |
| OCS Ver 5.2.1 transition to operations with Accuracy Improvement and M-Code, L2C, and L5 test capability | N/A | JUN 2007 | DEC 2007 | SEP 2007 |
| OCS Ver 5.2.2 transition to operations with OCS V5.2.1 and IIF capabilities | N/A | APR 2008 | OCT 2008 | OCT 2008 |
| Version 5.5 with SAASM Capability for IIR & IIF available for transition to operations | N/A | MAR 2009 | SEP 2009 | **JAN 2011**[1] |

[1] *APB Breach*

## Acronyms And Abbreviations

L2C - 2nd Civil Signal
L5 - 3rd Civil Signal
M-Code - Military Code
OCS - Operational Control Segment
SAASM - Selective Availability/Anti-Spoofing Module
SV - Space Vehicle
Ver - Version

## Change Explanations

None

## Memo

As reported in the 2010 SAR, the current estimate changed from February 2010 to January 2011 because a more stringent interpretation of the Archtitectural Evolution Plan (AEP) V5.5 Acquisition Program Baseline (APB) milestone definition was used and rather than declare the milestone met with the successful transition of AEP V5.5C to operations, the program office waited until the GPS IIF Modernization Force Development Evaluation (FDE) Final Results Report was received to declare the APB milestone met.

| USER EQUIPMENT | | | | |
|---|---|---|---|---|
| **Milestones** | **SAR Baseline Prod Est** | **Current APB Production Objective/Threshold** | | **Current Estimate** |
| SAASM capability available | JAN 2002 | JAN 2002 | JUL 2002 | JAN 2002 |
| YMCA receiver card prototype complete | N/A | MAR 2010 | SEP 2010 | **N/A** [1] |
| YMCA receiver card ready for delivery to platform | N/A | MAY 2011 | NOV 2011 | **N/A** [1] |

[1] *APB Breach*

## Acronyms And Abbreviations

SAASM - Selective Availability/Anti-Spoofing Module
YMCA - Y-Code/M-Code/Coarse-Acquisition

## Change Explanations

None

## Memo

As reported in the 2010 SAR, based on the recommendation of the Undersecretary of Defense for Acquisition, Technology and Logistics (AT&L) at the January 29, 2010 Annual Global Positioning System (GPS) Enterprise Review (AGER), and recorded in a May 24, 2010 memo, the Modernized User Equipment (MUE) milestones in the Navstar Acquisition Program Baseline (APB) are no longer applicable.

## Performance

| SPACE & CONTROL | | | | | |
|---|---|---|---|---|---|
| **Characteristics** | **SAR Baseline Prod Est** | **Current APB Production Objective/Threshold** | | **Demonstrated Performance** | **Current Estimate** |
| PPS System Perf | | | | | |
| Pos Accuracy | 2.1m H 4.0m V | 1.3m H 2.6m V | 17m H 35m V | TBD | 2.8m H 5.8m V |
| Time Transfer | 10nsec | 3.3ns | 40ns | TBD | 6.7ns |
| SPS System Perf | | | | | |
| Pos Accuracy | 1.0m H 4.0m V | 1.3m H 2.6m V | 17m H 35m V | TBD | 2.8m H 5.8m V |
| Time Transfer | 40nsec | 3.3ns | 40ns | TBD | 6.7ns |
| L5 Signal Power | -154dBW | -154.0dB W | -154.9dB W | TBD | -154.3dB W |
| Flexible Power | | | | | |
| Max L1 P-Code | N/A | -152.6dB W | -155.2dB W | TBD | -152.8dBW |
| Max L2 P-Code | N/A | -152.9dB W | -156.6dB W | TBD | -154.0dBW |
| L2C Signal Power | N/A | -158.5dB W | -160.0dB W | TBD | -158.0dBW |

**Requirements Source:** Space and Control - Air Force Space Command/Air Combat Command Operational Requirements Document (ORD), dated February 18, 2000.

**Acronyms And Abbreviations**

dB - decibel
dBW - Decibel Watt (Decibels relative to one Watt)
L2C - 2nd Civil Signal
L5 - 3rd Civil Signal
m H - Meters Horizontal
m V - Meters Vertical
ns/nsec - Nanoseconds
Pos - Position
PPS - Precise Positioning Service
SPS - Standard Positioning Service

**Change Explanations**

None

| USER EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| **Characteristics** | **SAR Baseline Prod Est** | **Current APB Production Objective/Threshold** | | **Demonstrated Performance** | **Current Estimate** |
| PPS System Performance | | | | | |
| Time-To-First-Fix | 1 min | 1 min | 2 min | TBD | .8 Min |
| Pos Accuracy | 2.1m H 4.0m V | 2.1m H 4.0m V | 19m H 38m V | TBD | 7.9m H 16.2m V |
| Velocity | 0.01m/s | 0.01m/s | 0.1 m/s | TBD | .01 m/s |
| Time Transfer | 10nsec | 10 ns | 44ns | TBD | 10ns |

**Requirements Source:** Modernized User Equipment (MUE) - Capability Development Document (CDD) for Military Global Positioning System (GPS) User Equiptment (UE) dated December 15, 2009.

## Acronyms And Abbreviations

m H - Meters Horizontal
m V - Meters Vertical
m/s - Meters per Second
min - Minute
ns/nsec - Nanoseconds
Pos - Position
PPS - Precise Positioning Service
sec - Second

## Change Explanations

None

## Track To Budget

## SPACE & CONTROL

| RDT&E | | | |
|---|---|---|---|
| APPN 3600 | BA 07 | PE 0305165F | (Air Force) |
| | Project 3030 | NAVSTAR GPS (Space and Control) Air Force | |

| Procurement | | | |
|---|---|---|---|
| APPN 3020 | BA 05 | PE 0305165F | (Air Force) |
| | ICN MGPS00 | NAVSTAR GPS (Space and Control) Air Force | |
| APPN 3080 | BA 03 | PE 0305165F | (Air Force) |
| | ICN 836730 | NAVSTAR GPS (Space and Control) Air Force | |
| | ICN 836790 | NAVSTAR GPS (Space and Control) Air Force | |
| APPN 3080 | BA 05 | PE 0305165F | (Air Force) |
| | ICN 861900 | NAVSTAR GPS (Space and Control) Air Force | (Shared) |

## Track To Budget

## USER EQUIPMENT

| RDT&E | | | |
|---|---|---|---|
| APPN 3600 | BA 07 | PE 0305164F | (Air Force) |
| | Project 3028 | NAVSTAR GPS (User Equipment) | |

## Cost and Funding

## Cost Summary - Total Program

**Total Acquisition Cost and Quantity - Total Program**

| | BY2000 $M | | | BY2000 $M | TY $M | | |
|---|---|---|---|---|---|---|---|
| Appropriation | SAR Baseline Prod Est | Current APB Production Objective/Threshold | | Current Estimate | SAR Baseline Prod Est | Current APB Production Objective | Current Estimate |
| RDT&E | 2319.7 | 3650.4 | -- | 3370.8 | 2430.2 | 3984.8 | 3647.7 |
| Procurement | 3493.7 | 4025.8 | -- | 4064.2 | 3565.1 | 4259.0 | 4340.1 |
| Flyaway | 3205.8 | -- | -- | 3648.3 | 3259.8 | -- | 3851.4 |
| Recurring | 2996.5 | -- | -- | 3466.7 | 3043.2 | -- | 3664.7 |
| Non Recurring | 209.3 | -- | -- | 181.6 | 216.6 | -- | 186.7 |
| Support | 287.9 | -- | -- | 415.9 | 305.3 | -- | 488.7 |
| Other Support | 254.3 | -- | -- | 410.3 | 273.5 | -- | 482.2 |
| Initial Spares | 33.6 | -- | -- | 5.6 | 31.8 | -- | 6.5 |
| MILCON | 0.0 | 0.0 | -- | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | -- | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 5813.4 | 7676.2 | N/A | 7435.0 | 5995.3 | 8243.8 | 7987.8 |

## Cost and Funding

## Cost Summary - SPACE & CONTROL

**Total Acquisition Cost and Quantity - SPACE & CONTROL**

| | BY2000 $M | | | BY2000 $M | TY $M | | |
|---|---|---|---|---|---|---|---|
| Appropriation | SAR Baseline Prod Est | Current APB Production Objective/Threshold | | Current Estimate | SAR Baseline Prod Est | Current APB Production Objective | Current Estimate |
| RDT&E | 1776.2 | 2219.1 | 2441.0 | 2142.4 | 1829.3 | 2330.2 | 2241.3 |
| Procurement | 3239.4 | 3768.6 | 4145.5 | 4064.2 | 3291.6 | 3977.8 | 4340.1 |
| Flyaway | 3205.8 | -- | -- | 3648.3 | 3259.8 | -- | 3851.4 |
| Recurring | 2996.5 | -- | -- | 3466.7 | 3043.2 | -- | 3664.7 |
| Non Recurring | 209.3 | -- | -- | 181.6 | 216.6 | -- | 186.7 |
| Support | 33.6 | -- | -- | 415.9 | 31.8 | -- | 488.7 |
| Other Support | 0.0 | -- | -- | 410.3 | 0.0 | -- | 482.2 |
| Initial Spares | 33.6 | -- | -- | 5.6 | 31.8 | -- | 6.5 |
| MILCON | 0.0 | 0.0 | -- | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | -- | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 5015.6 | 5987.7 | N/A | 6206.6 | 5120.9 | 6308.0 | 6581.4 |

| Quantity | SAR Baseline Prod Est | Current APB Production | Current Estimate |
|---|---|---|---|
| RDT&E | 0 | 0 | 0 |
| Procurement | 33 | 33 | 33 |
| Total | 33 | 33 | 33 |

## Cost Summary - USER EQUIPMENT

### Total Acquisition Cost and Quantity - USER EQUIPMENT

| | BY2000 $M | | | BY2000 $M | TY $M | | |
|---|---|---|---|---|---|---|---|
| Appropriation | SAR Baseline Prod Est | Current APB Production Objective/Threshold | | Current Estimate | SAR Baseline Prod Est | Current APB Production Objective | Current Estimate |
| RDT&E | 543.5 | 1431.3 | 1574.4 | 1228.4 | 600.9 | 1654.6 | 1406.4 |
| Procurement | 254.3 | 257.2 | 282.9 | 0.0 | 273.5 | 281.2 | 0.0 |
| Flyaway | 0.0 | -- | -- | 0.0 | 0.0 | -- | 0.0 |
| Recurring | 0.0 | -- | -- | 0.0 | 0.0 | -- | 0.0 |
| Non Recurring | 0.0 | -- | -- | 0.0 | 0.0 | -- | 0.0 |
| Support | 254.3 | -- | -- | 0.0 | 273.5 | -- | 0.0 |
| Other Support | 254.3 | -- | -- | 0.0 | 273.5 | -- | 0.0 |
| Initial Spares | 0.0 | -- | -- | 0.0 | 0.0 | -- | 0.0 |
| MILCON | 0.0 | 0.0 | -- | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | -- | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 797.8 | 1688.5 | N/A | 1228.4 | 874.4 | 1935.8 | 1406.4 |

All procurement funds (Appropriation 3010 and 3080) along with the DoD funds (Appropriation 0400) have been removed from the SAR. The User Equipment (UE) portion of the SAR only covers Modernized UE (MUE). All MUE activities are paid for from by Research Development Test & Evaluation (RDT&E) funds (Appropriation 3600) and thus we were incorrectly carrying the other funding.

| Quantity | SAR Baseline Prod Est | Current APB Production | Current Estimate |
|---|---|---|---|
| RDT&E | 0 | 0 | 0 |
| Procurement | 0 | 0 | 0 |
| Total | 0 | 0 | 0 |

## Cost and Funding

## Funding Summary - Total Program

**Appropriation and Quantity Summary - Total Program**
**FY2013 President's Budget / December 2011 SAR (TY$ M)**

| Appropriation | Prior | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 | To Complete | Total |
|---|---|---|---|---|---|---|---|---|---|
| RDT&E | 3482.1 | 121.7 | 43.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3647.7 |
| Procurement | 4054.7 | 115.3 | 66.0 | 85.5 | 15.8 | 2.4 | 0.4 | 0.0 | 4340.1 |
| MILCON | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| PB 2013 Total | 7536.8 | 237.0 | 109.9 | 85.5 | 15.8 | 2.4 | 0.4 | 0.0 | 7987.8 |
| PB 2012 Total | 7495.6 | 197.2 | 84.3 | 81.4 | 11.0 | 0.4 | 0.0 | 0.0 | 7869.9 |
| Delta | 41.2 | 39.8 | 25.6 | 4.1 | 4.8 | 2.0 | 0.4 | 0.0 | 117.9 |

## Cost and Funding

## Funding Summary - SPACE & CONTROL

**Appropriation and Quantity Summary - SPACE & CONTROL**
**FY2013 President's Budget / December 2011 SAR (TY$ M)**

| Appropriation | Prior | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 | To Complete | Total |
|---|---|---|---|---|---|---|---|---|---|
| RDT&E | 2209.3 | 17.7 | 14.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2241.3 |
| Procurement | 4054.7 | 115.3 | 66.0 | 85.5 | 15.8 | 2.4 | 0.4 | 0.0 | 4340.1 |
| MILCON | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| PB 2013 Total | 6264.0 | 133.0 | 80.3 | 85.5 | 15.8 | 2.4 | 0.4 | 0.0 | 6581.4 |
| PB 2012 Total | 6212.7 | 93.2 | 84.3 | 81.4 | 11.0 | 0.4 | 0.0 | 0.0 | 6483.0 |
| Delta | 51.3 | 39.8 | -4.0 | 4.1 | 4.8 | 2.0 | 0.4 | 0.0 | 98.4 |

| Quantity | Undistributed | Prior | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 | To Complete | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Development | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Production | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| PB 2013 Total | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| PB 2012 Total | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| Delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Funding Summary - USER EQUIPMENT

**Appropriation and Quantity Summary - USER EQUIPMENT**
**FY2013 President's Budget / December 2011 SAR (TY$ M)**

| Appropriation | Prior | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 | To Complete | Total |
|---|---|---|---|---|---|---|---|---|---|
| RDT&E | 1272.8 | 104.0 | 29.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1406.4 |
| Procurement | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| MILCON | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Acq O&M | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| PB 2013 Total | 1272.8 | 104.0 | 29.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1406.4 |
| PB 2012 Total | 1282.9 | 104.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1386.9 |
| Delta | -10.1 | 0.0 | 29.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19.5 |

| Quantity | Undistributed | Prior | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017 | To Complete | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Development | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Production | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PB 2013 Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PB 2012 Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Delta | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Cost and Funding

## Annual Funding By Appropriation - SPACE & CONTROL

**Annual Funding TY$ - SPACE & CONTROL**
**3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway TY $M | Non End Item Recurring Flyaway TY $M | Non Recurring Flyaway TY $M | Total Flyaway TY $M | Total Support TY $M | Total Program TY $M |
|---|---|---|---|---|---|---|---|
| 1986 | -- | -- | -- | -- | -- | -- | 1.2 |
| 1987 | -- | -- | -- | -- | -- | -- | 12.8 |
| 1988 | -- | -- | -- | -- | -- | -- | 13.8 |
| 1989 | -- | -- | -- | -- | -- | -- | 34.0 |
| 1990 | -- | -- | -- | -- | -- | -- | 22.2 |
| 1991 | -- | -- | -- | -- | -- | -- | 35.1 |
| 1992 | -- | -- | -- | -- | -- | -- | 36.2 |
| 1993 | -- | -- | -- | -- | -- | -- | 46.6 |
| 1994 | -- | -- | -- | -- | -- | -- | 24.1 |
| 1995 | -- | -- | -- | -- | -- | -- | 35.2 |
| 1996 | -- | -- | -- | -- | -- | -- | 43.2 |
| 1997 | -- | -- | -- | -- | -- | -- | 84.3 |
| 1998 | -- | -- | -- | -- | -- | -- | 96.7 |
| 1999 | -- | -- | -- | -- | -- | -- | 100.9 |
| 2000 | -- | -- | -- | -- | -- | -- | 93.2 |
| 2001 | -- | -- | -- | -- | -- | -- | 183.4 |
| 2002 | -- | -- | -- | -- | -- | -- | 183.6 |
| 2003 | -- | -- | -- | -- | -- | -- | 286.2 |
| 2004 | -- | -- | -- | -- | -- | -- | 132.5 |
| 2005 | -- | -- | -- | -- | -- | -- | 128.3 |
| 2006 | -- | -- | -- | -- | -- | -- | 174.5 |
| 2007 | -- | -- | -- | -- | -- | -- | 160.6 |
| 2008 | -- | -- | -- | -- | -- | -- | 110.2 |
| 2009 | -- | -- | -- | -- | -- | -- | 86.6 |
| 2010 | -- | -- | -- | -- | -- | -- | 50.5 |
| 2011 | -- | -- | -- | -- | -- | -- | 33.4 |
| 2012 | -- | -- | -- | -- | -- | -- | 17.7 |
| 2013 | -- | -- | -- | -- | -- | -- | 14.3 |
| **Subtotal** | **--** | **--** | **--** | **--** | **--** | **--** | **2241.3** |

**Annual Funding BY$ - SPACE & CONTROL**
**3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway BY 2000 $M | Non End Item Recurring Flyaway BY 2000 $M | Non Recurring Flyaway BY 2000 $M | Total Flyaway BY 2000 $M | Total Support BY 2000 $M | Total Program BY 2000 $M |
|---|---|---|---|---|---|---|---|
| 1986 | -- | -- | -- | -- | -- | -- | 1.7 |
| 1987 | -- | -- | -- | -- | -- | -- | 16.9 |
| 1988 | -- | -- | -- | -- | -- | -- | 17.8 |
| 1989 | -- | -- | -- | -- | -- | -- | 41.8 |
| 1990 | -- | -- | -- | -- | -- | -- | 26.5 |
| 1991 | -- | -- | -- | -- | -- | -- | 40.4 |
| 1992 | -- | -- | -- | -- | -- | -- | 40.4 |
| 1993 | -- | -- | -- | -- | -- | -- | 51.0 |
| 1994 | -- | -- | -- | -- | -- | -- | 25.9 |
| 1995 | -- | -- | -- | -- | -- | -- | 37.2 |
| 1996 | -- | -- | -- | -- | -- | -- | 44.8 |
| 1997 | -- | -- | -- | -- | -- | -- | 86.3 |
| 1998 | -- | -- | -- | -- | -- | -- | 98.3 |
| 1999 | -- | -- | -- | -- | -- | -- | 101.5 |
| 2000 | -- | -- | -- | -- | -- | -- | 92.4 |
| 2001 | -- | -- | -- | -- | -- | -- | 179.3 |
| 2002 | -- | -- | -- | -- | -- | -- | 177.6 |
| 2003 | -- | -- | -- | -- | -- | -- | 273.1 |
| 2004 | -- | -- | -- | -- | -- | -- | 123.4 |
| 2005 | -- | -- | -- | -- | -- | -- | 116.5 |
| 2006 | -- | -- | -- | -- | -- | -- | 153.8 |
| 2007 | -- | -- | -- | -- | -- | -- | 137.9 |
| 2008 | -- | -- | -- | -- | -- | -- | 92.7 |
| 2009 | -- | -- | -- | -- | -- | -- | 71.9 |
| 2010 | -- | -- | -- | -- | -- | -- | 41.4 |
| 2011 | -- | -- | -- | -- | -- | -- | 26.8 |
| 2012 | -- | -- | -- | -- | -- | -- | 14.0 |
| 2013 | -- | -- | -- | -- | -- | -- | 11.1 |
| **Subtotal** | **--** | **--** | **--** | **--** | **--** | **--** | **2142.4** |

**Annual Funding TY$ - SPACE & CONTROL**
**3020 | Procurement | Missile Procurement, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway TY $M | Non End Item Recurring Flyaway TY $M | Non Recurring Flyaway TY $M | Total Flyaway TY $M | Total Support TY $M | Total Program TY $M |
|---|---|---|---|---|---|---|---|
| 1991 | -- | 79.8 | -- | 7.9 | 87.7 | -- | 87.7 |
| 1992 | 4 | 155.3 | -- | 7.7 | 163.0 | -- | 163.0 |
| 1993 | 4 | 151.9 | -- | 8.7 | 160.6 | -- | 160.6 |
| 1994 | 4 | 160.4 | -- | 7.9 | 168.3 | -- | 168.3 |
| 1995 | 5 | 198.8 | -- | 8.8 | 207.6 | -- | 207.6 |
| 1996 | 4 | 136.7 | -- | 8.3 | 145.0 | -- | 145.0 |
| 1997 | 3 | 179.1 | -- | 9.1 | 188.2 | -- | 188.2 |
| 1998 | 3 | 168.7 | -- | 9.0 | 177.7 | -- | 177.7 |
| 1999 | -- | 69.5 | -- | 10.9 | 80.4 | -- | 80.4 |
| 2000 | -- | 105.9 | -- | 13.5 | 119.4 | -- | 119.4 |
| 2001 | -- | 152.1 | -- | 13.5 | 165.6 | -- | 165.6 |
| 2002 | -- | 138.6 | -- | 11.9 | 150.5 | -- | 150.5 |
| 2003 | -- | 270.8 | -- | 13.4 | 284.2 | -- | 284.2 |
| 2004 | -- | 322.8 | -- | 13.6 | 336.4 | -- | 336.4 |
| 2005 | 3 | 352.5 | -- | 13.8 | 366.3 | -- | 366.3 |
| 2006 | 3 | 357.5 | -- | 14.3 | 371.8 | -- | 371.8 |
| 2007 | -- | 91.1 | -- | 14.4 | 105.5 | -- | 105.5 |
| 2008 | -- | 126.8 | 68.7 | -- | 195.5 | 32.0 | 227.5 |
| 2009 | -- | 80.0 | 21.1 | -- | 101.1 | 41.0 | 142.1 |
| 2010 | -- | 82.4 | 49.5 | -- | 131.9 | 27.3 | 159.2 |
| 2011 | -- | -- | 26.5 | -- | 26.5 | 37.7 | 64.2 |
| 2012 | -- | 40.0 | 27.8 | -- | 67.8 | 39.9 | 107.7 |
| 2013 | -- | -- | 21.7 | -- | 21.7 | 36.5 | 58.2 |
| 2014 | -- | -- | 28.4 | -- | 28.4 | 49.2 | 77.6 |
| 2015 | -- | -- | 0.3 | -- | 0.3 | 7.0 | 7.3 |
| **Subtotal** | **33** | **3420.7** | **244.0** | **186.7** | **3851.4** | **270.6** | **4122.0** |

**Annual Funding BY$ - SPACE & CONTROL**
**3020 | Procurement | Missile Procurement, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway BY 2000 $M | Non End Item Recurring Flyaway BY 2000 $M | Non Recurring Flyaway BY 2000 $M | Total Flyaway BY 2000 $M | Total Support BY 2000 $M | Total Program BY 2000 $M |
|---|---|---|---|---|---|---|---|
| 1991 | -- | 88.4 | -- | 8.8 | 97.2 | -- | 97.2 |
| 1992 | 4 | 170.0 | -- | 8.4 | 178.4 | -- | 178.4 |
| 1993 | 4 | 163.0 | -- | 9.3 | 172.3 | -- | 172.3 |
| 1994 | 4 | 168.7 | -- | 8.3 | 177.0 | -- | 177.0 |
| 1995 | 5 | 207.2 | -- | 9.1 | 216.3 | -- | 216.3 |
| 1996 | 4 | 140.6 | -- | 8.5 | 149.1 | -- | 149.1 |
| 1997 | 3 | 181.6 | -- | 9.3 | 190.9 | -- | 190.9 |
| 1998 | 3 | 169.5 | -- | 9.0 | 178.5 | -- | 178.5 |
| 1999 | -- | 68.9 | -- | 10.9 | 79.8 | -- | 79.8 |
| 2000 | -- | 103.9 | -- | 13.2 | 117.1 | -- | 117.1 |
| 2001 | -- | 147.6 | -- | 13.1 | 160.7 | -- | 160.7 |
| 2002 | -- | 132.3 | -- | 11.3 | 143.6 | -- | 143.6 |
| 2003 | -- | 255.5 | -- | 12.6 | 268.1 | -- | 268.1 |
| 2004 | -- | 298.0 | -- | 12.6 | 310.6 | -- | 310.6 |
| 2005 | 3 | 316.4 | -- | 12.4 | 328.8 | -- | 328.8 |
| 2006 | 3 | 311.9 | -- | 12.5 | 324.4 | -- | 324.4 |
| 2007 | -- | 77.5 | -- | 12.3 | 89.8 | -- | 89.8 |
| 2008 | -- | 106.0 | 57.4 | -- | 163.4 | 26.7 | 190.1 |
| 2009 | -- | 65.9 | 17.4 | -- | 83.3 | 33.8 | 117.1 |
| 2010 | -- | 66.7 | 40.0 | -- | 106.7 | 22.1 | 128.8 |
| 2011 | -- | -- | 21.1 | -- | 21.1 | 29.9 | 51.0 |
| 2012 | -- | 31.2 | 21.7 | -- | 52.9 | 31.2 | 84.1 |
| 2013 | -- | -- | 16.7 | -- | 16.7 | 28.0 | 44.7 |
| 2014 | -- | -- | 21.4 | -- | 21.4 | 37.2 | 58.6 |
| 2015 | -- | -- | 0.2 | -- | 0.2 | 5.2 | 5.4 |
| **Subtotal** | **33** | **3270.8** | **195.9** | **181.6** | **3648.3** | **214.1** | **3862.4** |

**Cost Quantity Information - SPACE & CONTROL**
**3020 | Procurement | Missile Procurement, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway (Aligned with Quantity) BY 2000 $M |
|---|---|---|
| 1991 | -- | -- |
| 1992 | 4 | 178.6 |
| 1993 | 4 | 178.6 |
| 1994 | 4 | 178.6 |
| 1995 | 5 | 223.4 |
| 1996 | 4 | 178.6 |
| 1997 | 3 | 583.2 |
| 1998 | 3 | 583.2 |
| 1999 | -- | -- |
| 2000 | -- | -- |
| 2001 | -- | -- |
| 2002 | -- | -- |
| 2003 | -- | -- |
| 2004 | -- | -- |
| 2005 | 3 | 583.3 |
| 2006 | 3 | 583.3 |
| 2007 | -- | -- |
| 2008 | -- | -- |
| 2009 | -- | -- |
| 2010 | -- | -- |
| 2011 | -- | -- |
| 2012 | -- | -- |
| 2013 | -- | -- |
| 2014 | -- | -- |
| 2015 | -- | -- |
| **Subtotal** | **33** | **3270.8** |

**Annual Funding TY$ - SPACE & CONTROL**
**3080 | Procurement | Other Procurement, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway TY $M | Non End Item Recurring Flyaway TY $M | Non Recurring Flyaway TY $M | Total Flyaway TY $M | Total Support TY $M | Total Program TY $M |
|---|---|---|---|---|---|---|---|
| 1987 | -- | -- | -- | -- | -- | 2.6 | 2.6 |
| 1988 | -- | -- | -- | -- | -- | 8.3 | 8.3 |
| 1989 | -- | -- | -- | -- | -- | -- | -- |
| 1990 | -- | -- | -- | -- | -- | -- | -- |
| 1991 | -- | -- | -- | -- | -- | -- | -- |
| 1992 | -- | -- | -- | -- | -- | -- | -- |
| 1993 | -- | -- | -- | -- | -- | 5.5 | 5.5 |
| 1994 | -- | -- | -- | -- | -- | 4.2 | 4.2 |
| 1995 | -- | -- | -- | -- | -- | 4.9 | 4.9 |
| 1996 | -- | -- | -- | -- | -- | 6.7 | 6.7 |
| 1997 | -- | -- | -- | -- | -- | 10.6 | 10.6 |
| 1998 | -- | -- | -- | -- | -- | 9.2 | 9.2 |
| 1999 | -- | -- | -- | -- | -- | 6.4 | 6.4 |
| 2000 | -- | -- | -- | -- | -- | 6.6 | 6.6 |
| 2001 | -- | -- | -- | -- | -- | 14.7 | 14.7 |
| 2002 | -- | -- | -- | -- | -- | 10.3 | 10.3 |
| 2003 | -- | -- | -- | -- | -- | 20.0 | 20.0 |
| 2004 | -- | -- | -- | -- | -- | 13.4 | 13.4 |
| 2005 | -- | -- | -- | -- | -- | 7.8 | 7.8 |
| 2006 | -- | -- | -- | -- | -- | 13.5 | 13.5 |
| 2007 | -- | -- | -- | -- | -- | 10.3 | 10.3 |
| 2008 | -- | -- | -- | -- | -- | 8.0 | 8.0 |
| 2009 | -- | -- | -- | -- | -- | 5.3 | 5.3 |
| 2010 | -- | -- | -- | -- | -- | 7.5 | 7.5 |
| 2011 | -- | -- | -- | -- | -- | 7.7 | 7.7 |
| 2012 | -- | -- | -- | -- | -- | 7.6 | 7.6 |
| 2013 | -- | -- | -- | -- | -- | 7.8 | 7.8 |
| 2014 | -- | -- | -- | -- | -- | 7.9 | 7.9 |
| 2015 | -- | -- | -- | -- | -- | 8.5 | 8.5 |
| 2016 | -- | -- | -- | -- | -- | 2.4 | 2.4 |
| 2017 | -- | -- | -- | -- | -- | 0.4 | 0.4 |
| **Subtotal** | **--** | **--** | **--** | **--** | **--** | **218.1** | **218.1** |

**Annual Funding BY$ - SPACE & CONTROL**
**3080 | Procurement | Other Procurement, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway BY 2000 $M | Non End Item Recurring Flyaway BY 2000 $M | Non Recurring Flyaway BY 2000 $M | Total Flyaway BY 2000 $M | Total Support BY 2000 $M | Total Program BY 2000 $M |
|---|---|---|---|---|---|---|---|
| 1987 | -- | -- | -- | -- | -- | 3.3 | 3.3 |
| 1988 | -- | -- | -- | -- | -- | 10.2 | 10.2 |
| 1989 | -- | -- | -- | -- | -- | -- | -- |
| 1990 | -- | -- | -- | -- | -- | -- | -- |
| 1991 | -- | -- | -- | -- | -- | -- | -- |
| 1992 | -- | -- | -- | -- | -- | -- | -- |
| 1993 | -- | -- | -- | -- | -- | 5.9 | 5.9 |
| 1994 | -- | -- | -- | -- | -- | 4.4 | 4.4 |
| 1995 | -- | -- | -- | -- | -- | 5.1 | 5.1 |
| 1996 | -- | -- | -- | -- | -- | 6.9 | 6.9 |
| 1997 | -- | -- | -- | -- | -- | 10.7 | 10.7 |
| 1998 | -- | -- | -- | -- | -- | 9.2 | 9.2 |
| 1999 | -- | -- | -- | -- | -- | 6.3 | 6.3 |
| 2000 | -- | -- | -- | -- | -- | 6.4 | 6.4 |
| 2001 | -- | -- | -- | -- | -- | 14.1 | 14.1 |
| 2002 | -- | -- | -- | -- | -- | 9.7 | 9.7 |
| 2003 | -- | -- | -- | -- | -- | 19.1 | 19.1 |
| 2004 | -- | -- | -- | -- | -- | 12.5 | 12.5 |
| 2005 | -- | -- | -- | -- | -- | 7.1 | 7.1 |
| 2006 | -- | -- | -- | -- | -- | 11.9 | 11.9 |
| 2007 | -- | -- | -- | -- | -- | 8.9 | 8.9 |
| 2008 | -- | -- | -- | -- | -- | 6.7 | 6.7 |
| 2009 | -- | -- | -- | -- | -- | 4.4 | 4.4 |
| 2010 | -- | -- | -- | -- | -- | 6.2 | 6.2 |
| 2011 | -- | -- | -- | -- | -- | 6.2 | 6.2 |
| 2012 | -- | -- | -- | -- | -- | 6.0 | 6.0 |
| 2013 | -- | -- | -- | -- | -- | 6.1 | 6.1 |
| 2014 | -- | -- | -- | -- | -- | 6.0 | 6.0 |
| 2015 | -- | -- | -- | -- | -- | 6.4 | 6.4 |
| 2016 | -- | -- | -- | -- | -- | 1.8 | 1.8 |
| 2017 | -- | -- | -- | -- | -- | 0.3 | 0.3 |
| **Subtotal** | **--** | **--** | **--** | **--** | **--** | **201.8** | **201.8** |

## Annual Funding By Appropriation - USER EQUIPMENT

**Annual Funding TY$ - USER EQUIPMENT**
**3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway TY $M | Non End Item Recurring Flyaway TY $M | Non Recurring Flyaway TY $M | Total Flyaway TY $M | Total Support TY $M | Total Program TY $M |
|---|---|---|---|---|---|---|---|
| 1994 | -- | -- | -- | -- | -- | -- | 1.1 |
| 1995 | -- | -- | -- | -- | -- | -- | 1.5 |
| 1996 | -- | -- | -- | -- | -- | -- | 9.3 |
| 1997 | -- | -- | -- | -- | -- | -- | 24.2 |
| 1998 | -- | -- | -- | -- | -- | -- | 34.2 |
| 1999 | -- | -- | -- | -- | -- | -- | 36.1 |
| 2000 | -- | -- | -- | -- | -- | -- | 32.2 |
| 2001 | -- | -- | -- | -- | -- | -- | 41.4 |
| 2002 | -- | -- | -- | -- | -- | -- | 36.4 |
| 2003 | -- | -- | -- | -- | -- | -- | 67.5 |
| 2004 | -- | -- | -- | -- | -- | -- | 92.1 |
| 2005 | -- | -- | -- | -- | -- | -- | 91.0 |
| 2006 | -- | -- | -- | -- | -- | -- | 111.7 |
| 2007 | -- | -- | -- | -- | -- | -- | 130.3 |
| 2008 | -- | -- | -- | -- | -- | -- | 154.6 |
| 2009 | -- | -- | -- | -- | -- | -- | 121.8 |
| 2010 | -- | -- | -- | -- | -- | -- | 131.6 |
| 2011 | -- | -- | -- | -- | -- | -- | 155.8 |
| 2012 | -- | -- | -- | -- | -- | -- | 104.0 |
| 2013 | -- | -- | -- | -- | -- | -- | 29.6 |
| **Subtotal** | **--** | **--** | **--** | **--** | **--** | **--** | **1406.4** |

**Annual Funding BY$ - USER EQUIPMENT**
**3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force**

| Fiscal Year | Quantity | End Item Recurring Flyaway BY 2000 $M | Non End Item Recurring Flyaway BY 2000 $M | Non Recurring Flyaway BY 2000 $M | Total Flyaway BY 2000 $M | Total Support BY 2000 $M | Total Program BY 2000 $M |
|---|---|---|---|---|---|---|---|
| 1994 | -- | -- | -- | -- | -- | -- | 1.2 |
| 1995 | -- | -- | -- | -- | -- | -- | 1.6 |
| 1996 | -- | -- | -- | -- | -- | -- | 9.6 |
| 1997 | -- | -- | -- | -- | -- | -- | 24.8 |
| 1998 | -- | -- | -- | -- | -- | -- | 34.8 |
| 1999 | -- | -- | -- | -- | -- | -- | 36.3 |
| 2000 | -- | -- | -- | -- | -- | -- | 31.9 |
| 2001 | -- | -- | -- | -- | -- | -- | 40.5 |
| 2002 | -- | -- | -- | -- | -- | -- | 35.2 |
| 2003 | -- | -- | -- | -- | -- | -- | 64.4 |
| 2004 | -- | -- | -- | -- | -- | -- | 85.7 |
| 2005 | -- | -- | -- | -- | -- | -- | 82.6 |
| 2006 | -- | -- | -- | -- | -- | -- | 98.4 |
| 2007 | -- | -- | -- | -- | -- | -- | 111.9 |
| 2008 | -- | -- | -- | -- | -- | -- | 130.1 |
| 2009 | -- | -- | -- | -- | -- | -- | 101.2 |
| 2010 | -- | -- | -- | -- | -- | -- | 107.9 |
| 2011 | -- | -- | -- | -- | -- | -- | 125.2 |
| 2012 | -- | -- | -- | -- | -- | -- | 82.1 |
| 2013 | -- | -- | -- | -- | -- | -- | 23.0 |
| **Subtotal** | **--** | **--** | **--** | **--** | **--** | **--** | **1228.4** |

## Low Rate Initial Production

## SPACE & CONTROL

Low Rate Initial Production (LRIP) is not applicable for the Space and Control program.

## Low Rate Initial Production

## USER EQUIPMENT

Low Rate Initial Production (LRIP) is not applicable for the User Equipment program.

## Foreign Military Sales

## SPACE & CONTROL

None

## Foreign Military Sales

## USER EQUIPMENT

None

## Nuclear Cost

**SPACE & CONTROL**
None

**USER EQUIPMENT**
None

## Unit Cost

## SPACE & CONTROL

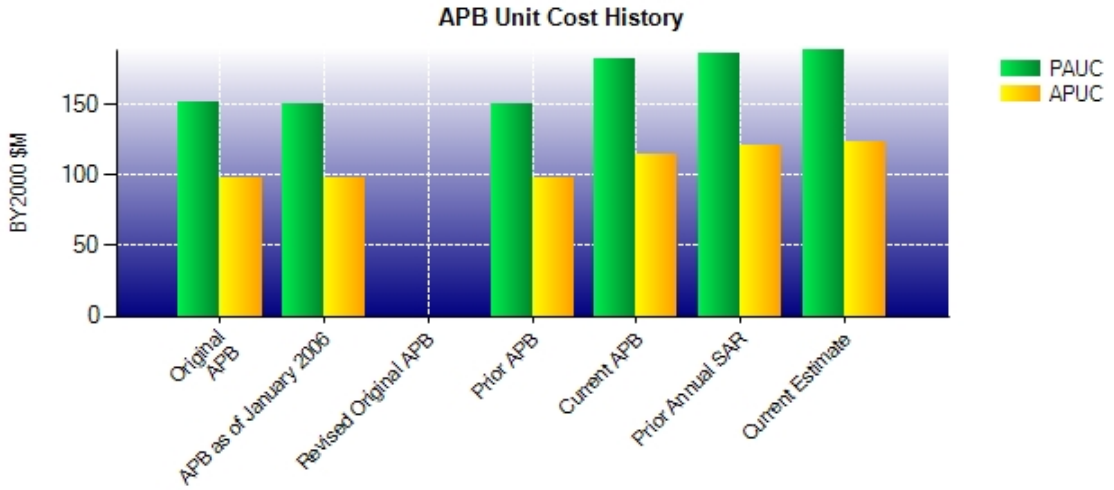
## Unit Cost Report

| Unit Cost | BY2000 $M Current UCR Baseline (FEB 2007 APB) | BY2000 $M Current Estimate (DEC 2011 SAR) | BY % Change |
|---|---|---|---|
| Program Acquisition Unit Cost (PAUC) | | | |
| Cost | 5987.7 | 6206.6 | |
| Quantity | 33 | 33 | |
| Unit Cost | 181.445 | 188.079 | +3.66 |
| Average Procurement Unit Cost (APUC) | | | |
| Cost | 3768.6 | 4064.2 | |
| Quantity | 33 | 33 | |
| Unit Cost | 114.200 | 123.158 | +7.84 |

| Unit Cost | BY2000 $M Original UCR Baseline (FEB 2002 APB) | BY2000 $M Current Estimate (DEC 2011 SAR) | BY % Change |
|---|---|---|---|
| Program Acquisition Unit Cost (PAUC) | | | |
| Cost | 5015.6 | 6206.6 | |
| Quantity | 33 | 33 | |
| Unit Cost | 151.988 | 188.079 | +23.75 |
| Average Procurement Unit Cost (APUC) | | | |
| Cost | 3239.4 | 4064.2 | |
| Quantity | 33 | 33 | |
| Unit Cost | 98.164 | 123.158 | +25.46 |

## SPACE & CONTROL

## Unit Cost History




| | | BY2000 $M | | TY $M | |
|---|---|---|---|---|---|
| | Date | PAUC | APUC | PAUC | APUC |
| **Original APB** | FEB 2002 | 151.988 | 98.164 | 155.179 | 99.745 |
| **APB as of January 2006** | FEB 2003 | 150.500 | 97.811 | 154.914 | 101.105 |
| **Revised Original APB** | N/A | N/A | N/A | N/A | N/A |
| **Prior APB** | FEB 2003 | 150.500 | 97.811 | 154.914 | 101.105 |
| **Current APB** | FEB 2007 | 181.445 | 114.200 | 191.152 | 120.539 |
| **Prior Annual SAR** | DEC 2010 | 185.864 | 120.864 | 196.455 | 128.476 |
| **Current Estimate** | DEC 2011 | 188.079 | 123.158 | 199.436 | 131.518 |

**SAR Unit Cost History**

**Current SAR Baseline to Current Estimate (TY $M)**

| Initial PAUC Prod Est | Changes | | | | | | | | PAUC Current Est |
|---|---|---|---|---|---|---|---|---|---|
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 155.179 | 0.970 | -0.071 | 0.252 | 13.209 | 16.473 | 0.000 | 13.424 | 44.257 | 199.436 |

### Current SAR Baseline to Current Estimate (TY $M)

| Initial APUC Prod Est | Changes | | | | | | | | APUC Current Est |
|---|---|---|---|---|---|---|---|---|---|
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 99.745 | 0.676 | -0.070 | 0.252 | 2.815 | 14.355 | 0.000 | 13.745 | 31.773 | 131.518 |

### SAR Baseline History

| Item/Event | SAR Planning Estimate (PE) | SAR Development Estimate (DE) | SAR Production Estimate (PdE) | Current Estimate |
|---|---|---|---|---|
| Milestone I | N/A | N/A | N/A | N/A |
| Milestone II | N/A | N/A | N/A | N/A |
| Milestone III | N/A | N/A | JUN 1989 | JUN 1989 |
| IOC | N/A | N/A | N/A | N/A |
| Total Cost (TY $M) | N/A | N/A | 5120.9 | 6581.4 |
| Total Quantity | N/A | N/A | 33 | 33 |
| Prog. Acq. Unit Cost (PAUC) | N/A | N/A | 155.179 | 199.436 |

IOC - Initial Operational Capability (IOC) for military and civil codes (L2C) capabilities will be declared when there are sufficient GPS Block IIR-M and IIF SVs on orbit to provide at least one SV in view on a global basis at all times. Multiservice Operational Test and Evaluation (MOT&E) to support this IOC will be conducted consistent with the Test and Evaluation Master Plan (TEMP). Milestone III represents the Block IIR Contract Award milestone.

## USER EQUIPMENT

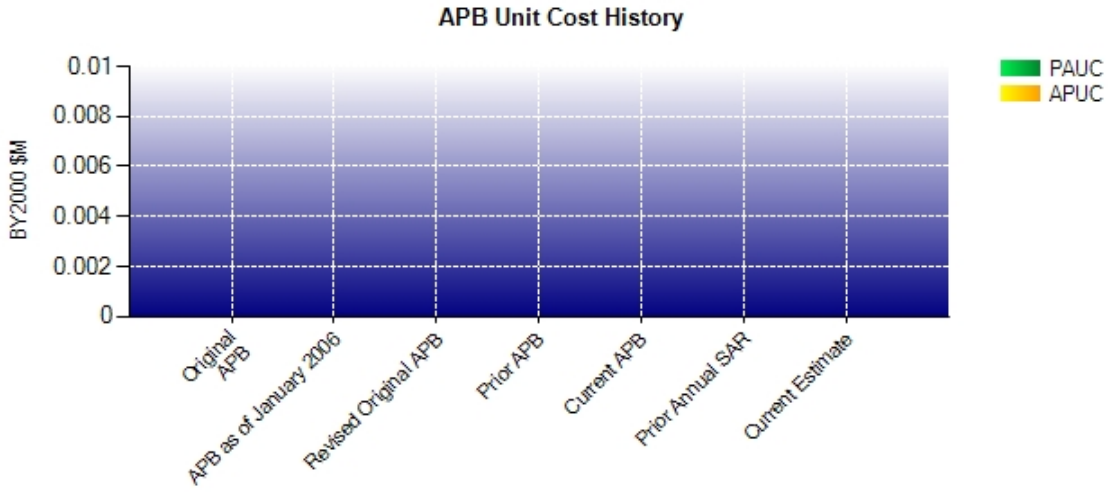
## Unit Cost Report

| Unit Cost | BY2000 $M Current UCR Baseline (FEB 2007 APB) | BY2000 $M Current Estimate (DEC 2011 SAR) | BY % Change |
|---|---|---|---|
| Program Acquisition Unit Cost (PAUC) | | | |
| Cost | 1688.5 | 1228.4 | |
| Quantity | 0 | 0 | |
| Unit Cost | -- | -- | -- |
| Average Procurement Unit Cost (APUC) | | | |
| Cost | 257.2 | 0.0 | |
| Quantity | 0 | 0 | |
| Unit Cost | -- | -- | -- |

| Unit Cost | BY2000 $M Original UCR Baseline (FEB 2002 APB) | BY2000 $M Current Estimate (DEC 2011 SAR) | BY % Change |
|---|---|---|---|
| Program Acquisition Unit Cost (PAUC) | | | |
| Cost | 797.8 | 1228.4 | |
| Quantity | 0 | 0 | |
| Unit Cost | -- | -- | -- |
| Average Procurement Unit Cost (APUC) | | | |
| Cost | 254.3 | 0.0 | |
| Quantity | 0 | 0 | |
| Unit Cost | -- | -- | -- |

## USER EQUIPMENT

## Unit Cost History




| | | BY2000 $M | | TY $M | |
|---|---|---|---|---|---|
| | Date | PAUC | APUC | PAUC | APUC |
| **Original APB** | FEB 2002 | N/A | N/A | N/A | N/A |
| **APB as of January 2006** | FEB 2003 | N/A | N/A | N/A | N/A |
| **Revised Original APB** | N/A | N/A | N/A | N/A | N/A |
| **Prior APB** | FEB 2003 | N/A | N/A | N/A | N/A |
| **Current APB** | FEB 2007 | N/A | N/A | N/A | N/A |
| **Prior Annual SAR** | DEC 2010 | N/A | N/A | N/A | N/A |
| **Current Estimate** | DEC 2011 | N/A | N/A | N/A | N/A |

**SAR Unit Cost History**

**Current SAR Baseline to Current Estimate (TY $M)**

| Initial PAUC Prod Est | Changes | | | | | | | | PAUC Current Est |
|---|---|---|---|---|---|---|---|---|---|
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

### Current SAR Baseline to Current Estimate (TY $M)

| Initial APUC Prod Est | Changes | | | | | | | | APUC Current Est |
|---|---|---|---|---|---|---|---|---|---|
| | Econ | Qty | Sch | Eng | Est | Oth | Spt | Total | |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

### SAR Baseline History

| Item/Event | SAR Planning Estimate (PE) | SAR Development Estimate (DE) | SAR Production Estimate (PdE) | Current Estimate |
|---|---|---|---|---|
| Milestone I | N/A | N/A | N/A | N/A |
| Milestone II | N/A | N/A | N/A | N/A |
| Milestone III | N/A | N/A | N/A | N/A |
| IOC | N/A | N/A | JAN 2002 | JAN 2002 |
| Total Cost (TY $M) | N/A | 874.4 | 874.4 | 1406.4 |
| Total Quantity | N/A | N/A | 0 | 0 |
| Prog. Acq. Unit Cost (PAUC) | N/A | N/A | N/A | N/A |

## Cost Variance

## SPACE & CONTROL

## Cost Variance Summary

| Summary Then Year $M | | | | |
|---|---|---|---|---|
| | RDT&E | Proc | MILCON | Total |
| SAR Baseline (Prod Est) | 1829.3 | 3291.6 | -- | 5120.9 |
| Previous Changes | | | | |
| Economic | +8.6 | +17.1 | -- | +25.7 |
| Quantity | -- | -2.3 | -- | -2.3 |
| Schedule | -- | +8.3 | -- | +8.3 |
| Engineering | +343.0 | +92.4 | -- | +435.4 |
| Estimating | +73.0 | +407.3 | -- | +480.3 |
| Other | -- | -- | -- | -- |
| Support | -10.6 | +425.3 | -- | +414.7 |
| Subtotal | +414.0 | +948.1 | -- | +1362.1 |
| Current Changes | | | | |
| Economic | +1.1 | +5.2 | -- | +6.3 |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | -- | +0.5 | -- | +0.5 |
| Estimating | -3.1 | +66.4 | -- | +63.3 |
| Other | -- | -- | -- | -- |
| Support | -- | +28.3 | -- | +28.3 |
| Subtotal | -2.0 | +100.4 | -- | +98.4 |
| Total Changes | +412.0 | +1048.5 | -- | +1460.5 |
| CE - Cost Variance | 2241.3 | 4340.1 | -- | 6581.4 |
| CE - Cost & Funding | 2241.3 | 4340.1 | -- | 6581.4 |

| Summary Base Year 2000 $M | | | | |
|---|---|---|---|---|
| | RDT&E | Proc | MILCON | Total |
| SAR Baseline (Prod Est) | 1776.2 | 3239.4 | -- | 5015.6 |
| Previous Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | -- | +20.0 | -- | +20.0 |
| Schedule | -- | -- | -- | -- |
| Engineering | +320.7 | +71.2 | -- | +391.9 |
| Estimating | +58.5 | +297.0 | -- | +355.5 |
| Other | -- | -- | -- | -- |
| Support | -10.4 | +360.9 | -- | +350.5 |
| Subtotal | +368.8 | +749.1 | -- | +1117.9 |
| Current Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | -- | +0.4 | -- | +0.4 |
| Estimating | -2.6 | +53.9 | -- | +51.3 |
| Other | -- | -- | -- | -- |
| Support | -- | +21.4 | -- | +21.4 |
| Subtotal | -2.6 | +75.7 | -- | +73.1 |
| Total Changes | +366.2 | +824.8 | -- | +1191.0 |
| CE - Cost Variance | 2142.4 | 4064.2 | -- | 6206.6 |
| CE - Cost & Funding | 2142.4 | 4064.2 | -- | 6206.6 |

Previous Estimate: December 2010

| RDT&E | $M | |
|---|---|---|
| **Current Change Explanations** | **Base Year** | **Then Year** |
| Revised escalation indices. (Economic) | N/A | +1.1 |
| Adjustment for current and prior escalation. (Estimating) | -0.8 | -0.9 |
| Decrease due to Program Management Administration (PMA) efficiencies, Federally Funded Research and Development Center allocations, and non-pay non-fuel reduction. (Estimating) | -1.8 | -2.2 |
| RDT&E Subtotal | -2.6 | -2.0 |

| Procurement | $M | |
|---|---|---|
| **Current Change Explanations** | **Base Year** | **Then Year** |
| Revised escalation indices. (Economic) | N/A | +5.2 |
| Adjustment for current and prior escalation. (Estimating) | -1.4 | -1.8 |
| Realigned funds due to higher Air Force priorities. (Estimating) | -0.1 | -0.2 |
| Increase in FY 2009 - FY 2010 to cover Block IIF SV1-3 contract cost growth and Mission Assurance. (Estimating) | +42.5 | +52.4 |
| Increase in procurement funds for Block IIF production support. (Estimating) | +30.1 | +38.6 |
| Realignment in classification of procurement funds from Flyaway to Support. (Estimating) | -17.3 | -22.7 |
| Other procurement funds adjustment. (Estimating) | +0.1 | +0.1 |
| Increase for Block IIF L1 transmitter fixes due to design issues. (Engineering) | +0.4 | +0.5 |
| Adjustment for current and prior escalation. (Support) | -1.2 | -1.5 |
| Increase to extend the Operational Control System. (Support) | +13.3 | +17.5 |
| Increase for spares for the Operational Control System. (Support) | +0.3 | +0.4 |
| Realignment in classification of procurement funds from Flyaway to Support (+$22.7M) with a reduction in Program Management Administration (-$10.8M). (Support) | +9.0 | +11.9 |
| Procurement Subtotal | +75.7 | +100.4 |

## USER EQUIPMENT

## Cost Variance Summary

| Summary Then Year $M | | | | |
|---|---|---|---|---|
| | RDT&E | Proc | MILCON | Total |
| SAR Baseline (Prod Est) | 600.9 | 273.5 | -- | 874.4 |
| Previous Changes | | | | |
| Economic | -5.7 | +0.2 | -- | -5.5 |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | +277.8 | -- | -- | +277.8 |
| Estimating | +513.9 | +0.4 | -- | +514.3 |
| Other | -- | -- | -- | -- |
| Support | -- | -274.1 | -- | -274.1 |
| Subtotal | +786.0 | -273.5 | -- | +512.5 |
| Current Changes | | | | |
| Economic | +3.8 | -- | -- | +3.8 |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | +29.6 | -- | -- | +29.6 |
| Estimating | -13.9 | -- | -- | -13.9 |
| Other | -- | -- | -- | -- |
| Support | -- | -- | -- | -- |
| Subtotal | +19.5 | -- | -- | +19.5 |
| Total Changes | +805.5 | -273.5 | -- | +532.0 |
| CE - Cost Variance | 1406.4 | -- | -- | 1406.4 |
| CE - Cost & Funding | 1406.4 | -- | -- | 1406.4 |

| Summary Base Year 2000 $M | | | | |
|---|---|---|---|---|
| | RDT&E | Proc | MILCON | Total |
| SAR Baseline (Prod Est) | 543.5 | 254.3 | -- | 797.8 |
| Previous Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | +251.6 | -- | -- | +251.6 |
| Estimating | +421.5 | -- | -- | +421.5 |
| Other | -- | -- | -- | -- |
| Support | -- | -254.3 | -- | -254.3 |
| Subtotal | +673.1 | -254.3 | -- | +418.8 |
| Current Changes | | | | |
| Economic | -- | -- | -- | -- |
| Quantity | -- | -- | -- | -- |
| Schedule | -- | -- | -- | -- |
| Engineering | +23.0 | -- | -- | +23.0 |
| Estimating | -11.2 | -- | -- | -11.2 |
| Other | -- | -- | -- | -- |
| Support | -- | -- | -- | -- |
| Subtotal | +11.8 | -- | -- | +11.8 |
| Total Changes | +684.9 | -254.3 | -- | +430.6 |
| CE - Cost Variance | 1228.4 | -- | -- | 1228.4 |
| CE - Cost & Funding | 1228.4 | -- | -- | 1228.4 |

Previous Estimate: December 2010

| RDT&E | $M | |
|---|---|---|
| **Current Change Explanations** | **Base Year** | **Then Year** |
| Revised escalation indices. (Economic) | N/A | +3.8 |
| Adjustment for current and prior escalation. (Estimating) | -3.1 | -3.8 |
| Decrease of direct mission support efforts to reflect actuals. (Estimating) | -8.1 | -10.1 |
| Increase to support Modernized User Equipment (MUE) risk reduction for Preliminary Design Reviews. (Engineering) | +23.0 | +29.6 |
| RDT&E Subtotal | +11.8 | +19.5 |

## Contracts

| Appropriation: RDT&E | |
|---|---|
| Contract Name | **GPS IIF Space Production Lot 1** |
| Contractor | The Boeing Company |
| Contractor Location | 2201 Seal Beach Blvd.<br>Seal Beach, CA 90740 |
| Contract Number, Type | F04701-96-C-0025/3, CPAF |
| Award Date | April 22, 1996 |
| Definitization Date | April 22, 1996 |

| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
|---|---|---|---|---|---|---|---|
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 157.6 | N/A | 3 | 194.7 | N/A | 3 | 683.9 | 702.0 |

| Variance | Cost Variance | Schedule Variance |
|---|---|---|
| Cumulative Variances To Date | -235.9 | -4.3 |
| Previous Cumulative Variances | -211.5 | -9.1 |
| Net Change | -24.4 | +4.8 |

**Cost And Schedule Variance Explanations**

The unfavorable net change in the cost variance is due to multiple technical issues to include solar arrays wiring harnesses, Crosslink Transponder Data Unit (CTDU), atomic clocks, L5 transmitter, L2 circulator, Radio Frequency (RF) cabling, and Reaction Wheel Assemblies (RWAs). Additional cost variance contributors were extended assembly, integration and test of Space Vehicle (SV) 2 and SV-3, SV-2 support for improved Systems Test Equipment (STE) performance, costs to Eagle Pitcher for delayed activation of the batteries in the spacecraft sub-systems, customized mandatory Root Cause and Corrective Action (RCCA) training, and program wide management and functional support costs from the extension of the SV 1-3 production schedule well beyond baselined completion.

The favorable net change in the schedule variance is due to credit being taken for previously scheduled tasks for delivery, integration, and launch. Schedule variance always approaches zero as a contract closes out.

**Contract Comments**

The difference between the initial contract price target and the current contract price target is due to the GPS IIF satellite modernization contract rebaseline. This baseline implemented the direction given in the Acquisition Decision Memorandum dated May 2000. The current contract price is comprised of the baseline settlement funding adjustments for the actual work performed under the orginal baseline plus the final negotiated price for three modernized GPS IIF satellites (SV 1-3).

The contract information above pertains to the Block IIF Modernization 3020 Cost Plus Award Fee Production efforts for the first three space vehicles.

In December 2007, Boeing notified the government of their intention to implement an Over Target Baseline (OTB) for SV1-3 production. With the government's concurrence, the "partial" OTB (for schedule only) was implemented in January 2008. This $47.6M adjustment to schedule variance brought the Program Adjustment total to $262.4M.

The new Budget at Completion (BAC) value after the March 2008 replan was $434M which fully budgeted the contractor's estimate to complete. The new program management baseline was validated with an Integrated Baseline Review (IBR) in June 2008, although the government remained concerned about the schedule and allocation of management reserve due to additional schedule erosion that was reported after December 2007.

Since the June 2008 IBR, Boeing has submitted quarterly Estimate at Completion (EAC) increases and the Government has updated its independent EAC to account for these changes. As of December 2011, the contractor is reporting an EAC of $683.9M against a negotiated cost of $172.3M The Government has maintained the Program Manager (PM) EAC at $702M.

**Appropriation: Procurement**

| | |
|---|---|
| Contract Name | **GPS IIF Sat Production SVs 4-6** |
| Contractor | The Boeing Company |
| Contractor Location | Seal Beach, CA 90740 |
| Contract Number, Type | F04701-96-C-0025/4, FPIF |
| Award Date | April 22, 1996 |
| Definitization Date | September 05, 2003 |

| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
|---|---|---|---|---|---|---|---|
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 145.8 | 169.1 | 3 | 151.0 | 171.7 | 3 | 151.0 | 171.7 |

**Cost And Schedule Variance Explanations**

Cost and Schedule variance reporting is not required on this FPIF contract.

**Contract Comments**

The difference between the initial contract price target and the current contract price target is due to changes in spacecraft configuration and design. Technical anomalies found during unit and system level testing drove upgrades in unit hardware to preserve mission assurance.

The Government is responsible for 70% of any costs over the Target cost (and the contractor pays 30%) up to the ceiling price.

**Appropriation: Procurement**

| | |
|---|---|
| Contract Name | **GPS IIF Sat Production SVs 7-9** |
| Contractor | The Boeing Company |
| Contractor Location | Seal Beach, CA 90740 |
| Contract Number, Type | F04701-96-C-0025/5, FPIF |
| Award Date | April 22, 1996 |
| Definitization Date | October 31, 2003 |

| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
|---|---|---|---|---|---|---|---|
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 174.3 | 192.2 | 3 | 188.5 | 209.8 | 3 | 188.5 | 209.8 |

**Cost And Schedule Variance Explanations**

Cost and Schedule variance reporting is not required on this FPIF contract.

**Contract Comments**

The difference between the initial contract price target and the current contract price target is due to changes in spacecraft configuration and design. Technical anomalies found during unit and system level testing drove upgrades in unit hardware to preserve mission assurance.

The Government is responsible for 70% of any costs over the Target cost (and the contractor pays 30%) up to the ceiling price.

**Appropriation: Procurement**

| | |
|---|---|
| Contract Name | **GPS IIF Sat Production SVs 10-12** |
| Contractor | The Boeing Company |
| Contractor Location | Seal Beach, CA 90740 |
| Contract Number, Type | F04701-96-C-0025/6, FPIF |
| Award Date | April 22, 1996 |
| Definitization Date | June 22, 2003 |

| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
|---|---|---|---|---|---|---|---|
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 166.8 | 183.8 | 3 | 174.9 | 193.6 | 3 | 174.9 | 193.6 |

**Cost And Schedule Variance Explanations**

Cost and Schedule variance reporting is not required on this FPIF contract.

**Contract Comments**

The difference between the initial contract price target and the current contract price target is due to changes in spacecraft configuration and design. Technical anomalies found during unit and system level testing drove upgrades in unit hardware to preserve mission assurance.

The Government is responsible for 70% of any costs over the Target cost (and the contractor pays 30%) up to the ceiling price.

**Appropriation: RDT&E**

| | |
|---|---|
| Contract Name | **MUE: Rockwell Collins** |
| Contractor | Rockwell-Collins |
| Contractor Location | Cedar Rapids, IA 52498-0001 |
| Contract Number, Type | FA8807-06-C-0001, CPAF |
| Award Date | May 26, 2006 |
| Definitization Date | May 26, 2006 |

| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
|---|---|---|---|---|---|---|---|
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 82.3 | N/A | N/A | 121.5 | N/A | N/A | 130.5 | 135.0 |

| Variance | Cost Variance | Schedule Variance |
|---|---|---|
| Cumulative Variances To Date | -17.5 | -0.6 |
| Previous Cumulative Variances | -17.1 | 0.0 |
| Net Change | -0.4 | -0.6 |

**Cost And Schedule Variance Explanations**

The unfavorable net change in the cost variance is due to the execution of MUE completion contract which exceeds the baseline end date. Cumulative technical challenges from integration and maintaining customer relations also contributed to cost growth; including additional oversight in the Technical Director, Technical Project Manager and EPS support.

The unfavorable net change in the schedule variance is due to the MUE contract modification. In addition, design activities (Redesign CCA and Test fixture box) contributed to the variance. Both of these tasks were planned to start in June 2011, but the engineers assigned to complete the tasks completed very little effort in June & July because they were often diverted to higher priority tasks for MUE completion (debug and repair of customer cards, debug and repair of internal SW/Systems test assets).

**Contract Comments**

The difference between the initial contract price target and the current contract price target is due to Rockwell Collins employing a model-based software engineering tool, which was unfamiliar to their staff. This caused them to underestimate the software engineering level of effort in their proposal and created the need for more engineers than planned to be applied to the task. Also, extremely poor digital Application Specific Integrated Circuits (ASICs) fabrication yields caused insufficient available hardware to employ in system integration, which led to delays and additional unplanned cost. In addition, the MUE Completion Effort has been included in the contract price.

The increased variances reported in the Contractor Comments section of this report are mainly attributable to an in-scope contract modification referred to as the MUE completion effort. This in-scope effort is to address deficiencies identified during contractor functional qualification tests and to address updates to the system specification. These variances will remain until a scheduled Over Target Baseline and Integrated Baseline Review in third quarter FY 2012.

The Contractor’s Estimated Price at Completion increased from $97.6M at the end of December 2010 to $130.5M at the end of December 2011 due to the MUE Completion Effort being included in the EAC. The increase is also due to the complexity of hardware/ software integration, low yields on Application Specific Integrated Circuits (ASICs) and required root cause investigation/analysis effort that was not previously forecasted.

The Government’s Estimated Price at Completion (GEAC) increased from $101.8M at the end of December 2010 to $135.0M at the end of December 2011. The GEAC increased to incorporate the MUE Completion Effort as well as additional risk associated with potential schedule delay and software growth. .

The contract price changed from $97.6M at the end of December 2010 to $122.2M at the end of December 2011. This price change is primarily due to the inclusion of the MUE Completion Effort. Rockwell Collins also employed a model-based software engineering tool, which was unfamiliar to their staff. This caused them to underestimate the software engineering level of effort in their proposal and created the need for more engineers than planned to be applied to the task. Also, extremely poor digital ASIC fabrication yields caused insufficient available hardware to employ in system integration, which led to delays and additional unplanned cost.

**Appropriation: RDT&E**

| | |
|---|---|
| Contract Name | **MUE: L-3** |
| Contractor | L-3 Communications Corporation |
| Contractor Location | 2 Federal Street<br>Camden, NJ 08102-1004 |
| Contract Number, Type | FA8807-06-C-0003, CPAF |
| Award Date | May 26, 2006 |
| Definitization Date | May 26, 2006 |

| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
|---|---|---|---|---|---|---|---|
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 77.4 | N/A | N/A | 123.6 | N/A | N/A | 120.3 | 124.5 |

| Variance | Cost Variance | Schedule Variance |
|---|---|---|
| Cumulative Variances To Date | -18.2 | 0.0 |
| Previous Cumulative Variances | -11.3 | -0.1 |
| Net Change | -6.9 | +0.1 |

**Cost And Schedule Variance Explanations**

The unfavorable net change in the cost variance is due to the execution of MUE completion contract which exceeds the baseline end date. Additionally, the unplanned extension of the CAM/IPT role (w/p 121310.LX) in support of production activities related to preparation of receivers for FQT and delivery to the GPSD, the completion of the ARTS verification test & report, including the GB V3 receiver temperature testing has taking longer than planned. Finally, it has taken more time than expected to achieve temperature stabilization for each test repair and re-calibration effort, and prior growth in other work packages.

The favorable net change in the schedule variance is due to L-3 being able to complete tasks that were baselined to finish in prior months.

**Contract Comments**

The difference between the initial contract price target and the current contract price target is due to software engineering, wherein L-3 planned for much greater reuse of legacy code than they were able to use. In addition, their Radio Frequency (RF) Application Specific Integrated Circuit (ASIC) required two fabrication cycles rather than the single effort they planned for. Also, their digital ASIC required significant rework, causing unplanned labor and subcontractor cost. The Functional Qualification Testing fix portion of the MUE completion effort is now included as well.

The increased variances reported in the Contractor Comments section of this report are mainly attributable to an in-scope contract modification referred to as the MUE completion effort. This in-scope effort is to address deficiencies identified during contractor functional qualification tests and to address updates to the system specification. These variances will remain until a scheduled OTB/IBR in 3QFY12.

The Contractor’s Estimated Price at Completion increased from $111.7M at the end of December 2010 to $120.3M at the end of December 2011. The increase is due to the FQT portion of the MUE Completion Effort being included in the EAC. In addition, delays associated with software Functional Qualification Test (FQT) and system level integration; along with Anti Tamper (AT) Verification and Validation (V&V) plan refinement tasks which were more complex than originally planned. Also, the Defense Contract Management Agency (DCMA) EV surveillance support, IT support, and Lab/Security efforts were greater than planned.

The Government’s Estimated Price at Completion (GEAC) increased from $111.7M at the end of December 2010 to $125.5M at the end of December 2011. The GEAC increased to incorporate the MUE Completion Effort as well as capture the latest contractor’s factored risks and additional software growth.

The contract price changed from $111.7M at the end of December 2010 to $129.0M at the end of December 2011 as a result of the MUE Completion contract modification. L-3’s cost overrun is also due to software engineering, wherein L-3 planned for much greater reuse of legacy code than they were able to use. In addition, their Radio Frequency (RF) Application Specific Integrated Circuit (ASIC) required two fabrication cycles rather than the single effort they planned for. Also, their digital ASIC required significant rework, causing unplanned labor and subcontractor cost.

**Appropriation: RDT&E**

| | |
|---|---|
| Contract Name | **MUE: Raytheon** |
| Contractor | Raytheon Company |
| Contractor Location | 2000 East El Segundo Blvd<br>El Segundo, CA 90245-3507 |
| Contract Number, Type | FA8807-06-C-0004, CPAF |
| Award Date | May 26, 2006 |
| Definitization Date | May 26, 2006 |

| Initial Contract Price ($M) | | | Current Contract Price ($M) | | | Estimated Price At Completion ($M) | |
|---|---|---|---|---|---|---|---|
| Target | Ceiling | Qty | Target | Ceiling | Qty | Contractor | Program Manager |
| 105.7 | N/A | N/A | 132.1 | N/A | N/A | 114.3 | 117.7 |

| Variance | Cost Variance | Schedule Variance |
|---|---|---|
| Cumulative Variances To Date | -17.9 | -0.2 |
| Previous Cumulative Variances | -15.6 | -1.1 |
| Net Change | -2.3 | +0.9 |

**Cost And Schedule Variance Explanations**

The unfavorable net change in the cost variance is due to GRAM S/M Test bed activities greater than planned due to complexities to integrate the RF and Digital designs on the Test Receiver, ASIC integration on the ATB and production module layout. These issues required more resources than planned compared to the baseline.

The favorable net change in the schedule variance is due to completing tasks planned in prior months.

**Contract Comments**

The difference between the initial contract price target and the current contract price target is due to unexpected problems with their cryptography design in preparation for their GB-GRAM-S/M Test Readiness Review (TRR) causing delay and additional subcontractor costs. Earlier, Raytheon experienced difficulty with their digital ASIC requiring rework. Also, delays in their GRAM-S/M delivery are being experienced due to system integration issues.

The increased variances reported in the Contractor Comments section of this report are mainly attributable to an in-scope contract modification referred to as the MUE completion effort. This in-scope effort is to address deficiencies identified during contractor functional qualification tests and to address updates to the system specification. These variances will remain until a scheduled Over Target Baseline/Integrated Baseline Review (OTB/IBR) in 3QFY12.

The Contractor’s Estimated Price at Completion of $120.3M at the end of December 2010 remained the same at the end December 2011.

The Government’s Estimated Price at Completion (GEAC) of $120.7M at the end of December 2010 remained the same at the end of December 2011.

The contract price changed from $120.3M at the end of December 2010 to $123.8M at the end of December 2011. Raytheon ran into unexpected problems with their cryptography design in preparation for their GB-GRAM-M Test Readiness Review (TRR) causing delay and additional subcontractor costs. Earlier, Raytheon experienced difficulty with their digital ASIC requiring rework. Also, delays in their GRAM-SM delivery are being experienced due to system integration issues.

## Deliveries and Expenditures

## SPACE & CONTROL

| Deliveries To Date | Plan To Date | Actual To Date | Total Quantity | Percent Delivered |
|---|---|---|---|---|
| Development | 0 | 0 | 0 | -- |
| Production | 33 | 24 | 33 | 72.73% |
| Total Program Quantities Delivered | 33 | 24 | 33 | 72.73% |

| Expenditures and Appropriations (TY $M) | | | |
|---|---|---|---|
| Total Acquisition Cost | 6581.4 | Years Appropriated | 27 |
| Expenditures To Date | 5163.3 | Percent Years Appropriated | 84.38% |
| Percent Expended | 78.45% | Appropriated to Date | 6397.0 |
| Total Funding Years | 32 | Percent Appropriated | 97.20% |

Expenditures To Date info provided as of January 12, 2012

## USER EQUIPMENT

| Deliveries To Date | Plan To Date | Actual To Date | Total Quantity | Percent Delivered |
|---|---|---|---|---|
| Development | 0 | 0 | 0 | -- |
| Production | 0 | 0 | 0 | -- |
| Total Program Quantities Delivered | 0 | 0 | 0 | -- |

| Expenditures and Appropriations (TY $M) | | | |
|---|---|---|---|
| Total Acquisition Cost | 1406.4 | Years Appropriated | 19 |
| Expenditures To Date | 993.9 | Percent Years Appropriated | 95.00% |
| Percent Expended | 70.67% | Appropriated to Date | 1376.8 |
| Total Funding Years | 20 | Percent Appropriated | 97.90% |

Total Expenditures To Date are as of January 12, 2012

## Operating and Support Cost

## SPACE & CONTROL

| Assumptions And Ground Rules |
|---|

Operating and Support (O&S) costs include all costs of operating, maintaining, and supporting the Navstar Global Positioning System (GPS) spacecraft from the dedicated Master Control Station (MCS) located at Schriever Air Force Base (AFB), CO and the Alternate MCS (AMCS) located at Vandenberg AFB, CA. Also included are the costs of operating, maintaining, and supporting four dedicated GPS Ground Antennas (GAs) (located at Cape Canaveral Air Force Station (AFS), FL, Kwajalein Atoll, the Ascension Islands, and Diego Garcia); and five monitor stations (located at Schriever AFB, Maui, HI, Kwajalein Atoll, the Ascension Islands, and Diego Garcia). Satellite operations at the MCS include mission planning, mission payload operations, and monitoring of satellite state of health. GAs transmit navigation data uploads and commands to the GPS spacecraft, and receive telemetry data from the spacecraft. Monitor stations receive mission payload data and transfer this data to the MCS to ensure spacecraft are operating as desired. These costs do not include the unallocated costs associated with the shared use of remote tracking stations, which are programmed and funded by the Air Force Satellite Control Network program elements. Costs reflect updates as of January 4, 2012.

The total O&S costs for the Space and Control system are not calculable in a manner that is relevant for comparison to other space systems, as each element within the system has a different life cycle and associated upgrade, repair, and/or replacement sustainment cycle.

The O&S budget is derived by collecting the USAF Force and Financial plan dollars in 3400 and 3080 from Peterson Air Force Base. These dollars, combined with the 3400 Depot Purchased Equipment Maintenance and Logistics Commodities, also collected from Peterson, make up our total O&S costs. Because no life cycle cost estimate has ever been done, the O&S costs are calculated taking a combination of actuals to date and programmatic funding/budget amounts from fiscal years 2009-2017.

An accurate cost for the Block I/II Legacy portion is not available.

| Costs BY2000 $M | | |
|---|---|---|
| Cost Element | SPACE & CONTROL Avg Annual Cost for 24-Sat Constellation | Block I/II Legacy Avg Annual Cost for 24-Sat Constellation |
| Unit-Level Manpower | 20.4 | 19.2 |
| Unit Operations | -- | -- |
| Maintenance | 20.4 | 16.8 |
| Sustaining Support | 5.1 | 2.4 |
| Continuing System Improvements | -- | -- |
| Indirect Support | 5.1 | 2.4 |
| Other | -- | -- |
| Total Unitized Cost (Base Year 2000 $) | 51.0 | 40.8 |

| Total O&S Costs $M | SPACE & CONTROL | Block I/II Legacy |
|---|---|---|
| Base Year | 459.0 | -- |
| Then Year | 585.0 | -- |

## USER EQUIPMENT

| Assumptions And Ground Rules |
|---|
| The Modernized User Equipment (UE) program will not procure user equipment, but will instead develop UE enabling technologies, demonstrate solutions, deliver prototypes, and assist platform managers. |

| Costs BY2000 $M | | |
|---|---|---|
| **Cost Element** | **USER EQUIPMENT** | **Antecedent System** |
| Unit-Level Manpower | -- | -- |
| Unit Operations | -- | -- |
| Maintenance | -- | -- |
| Sustaining Support | -- | -- |
| Continuing System Improvements | -- | -- |
| Indirect Support | -- | -- |
| Other | -- | -- |
| Total Unitized Cost (Base Year 2000 $) | -- | -- |

| Total O&S Costs $M | USER EQUIPMENT | Antecedent System |
|---|---|---|
| Base Year | -- | -- |
| Then Year | -- | -- |