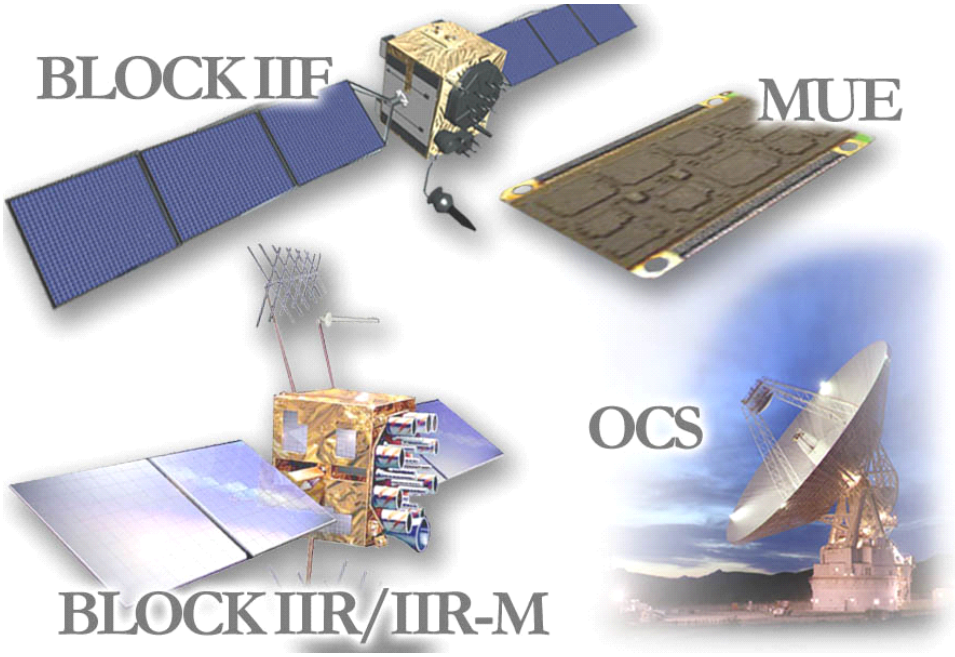
Selected Acquisition Report (SAR)

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



NAVSTAR GPS

As of December 31, 2010

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Program Information

Designation And Nomenclature (Popular Name)

Navstar Global Positioning System (GPS)

DoD Component

Air Force

Responsible Office

Responsible Office

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

USER EQUIPMENT

SAR Baseline (Production Estimate)

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

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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

Since the last SAR submission, the Global Positioning System (GPS) IIF program continues to maintain an outstanding focus on mission assurance, as proven by the successful launch and on-orbit checkout/test of GPS IIF Space Vehicle (SV)-1. SV-1 was shipped to Cape Canaveral Air Force Station (CCAFS) in February 2010 and achieved the Acquisition Program Baseline (APB) milestone of "1st IIF SV available for launch" in March 2010. SV-1 was launched on May 27, 2010, completed on-orbit test, and then transitioned the SV's navigation mission to operations on August 26, 2010. SV-1 is the first of 12 GPS IIF satellites that modernize the GPS constellation while bringing new capabilities to both military and civilian users. GPS IIF brings into service L5, a dedicated civilian safety-of-life signal, as well as improved accuracy, greater security and anti-jam capabilities, while maintaining baseline legacy GPS performance.

The GPS IIF production "pulse line" is fully implemented with rigorous mission assurance processes and currently has four SVs in various stages of assembly, integration and test. GPS IIF SV-2 is scheduled for shipment to CCAFS by March 2011, and is manifested for launch in June-July 2011 timeframe. During system level thermal vacuum (TVAC) testing, the Rubidium Frequency Standard (RBS), Cesium Frequency Standard (CFS), L3 signal, and Remote Multiplexer Unit 2 (RMU2) experienced anomalies. As a result, these anomalies and failures have necessitated investigation, removal and repair of the units and have adversely impacted production cost and schedule. The failures are mostly attributable to defects that occurred during manufacturing. An intense effort is underway to complete necessary manufacturing and performance analysis not previously accomplished in order to prevent future defects, improve perceptivity of unit ATP, and prevent defective units from being installed in the future. Production of the modified L2, L3 and L5 transmitters yielded 18 flight worthy units and removed the transmitters from the critical path. Transmitters for SV-2 to SV-6 have been built, tested, and installed.

Anomaly investigations during 2009 identified compatibility issues between the Navigation Data Unit (NDU) and U.S. NUDET (Nuclear Detonation) Detection System (USNDS) units. Redesign efforts began in February 2010. The Crosslink Transponder Data Unit (CTDU) interface was redesigned, with a successful critical design review held in December 2010. The first modified CTDUs to be available in June 2011. The NDU redesign effort identified the need to redesign the Department of Energy/National Nuclear Security Administration (DOE/NNSA) provided Global Burst Detector (GBD) units to resolve the NDU-GBD compatibility issue. The program office is assessing the need and feasibility of redesigns with USNDS community. A solution that resolves the issue but reduces USNDS redundancy was implemented on SV-2 and is also being evaluated as a fleet fix.

Recent improvements in characterizing the natural radiation in the GPS orbit environment led to concerns of premature degradation of the solar array wire harnesses. Solar array rework and verification was completed on SVs 1-3 to help mitigate impacts of the risk. Radiation and thermal testing was completed in May 2010 and showed minimal degradation; therefore, the risk of solar array failure due to radiation degradation was deemed low. In October 2010, the Program Executive Officer (PEO) provided direction to rework the rest of the fleet's solar arrays as performed on SVs 1-3. The rework consists of protecting positive-negative wire crossings and the yoke harness with Kapton tape as well as protecting nested wire regions with Kapton shielding. This protection, along with additional inspections and panel level testing, dramatically reduces the likelihood of the single point failure scenario. In addition, solar array wiring topology and lack of isolation diodes between solar arrays and batteries led to a single point failure concern. Even though failure is a remote likelihood, the Government and Boeing are conducting a special study to identify Electrical Power System re-design options to completely eliminate the single point failure concern for the remaining SVs. The special study is scheduled to conclude end of month January 2011 and will be summarized for the PEO in February 2011.

Cost and schedule indices continue to degrade as a result of optimistic scheduling, late hardware deliveries, test anomalies, and unit failures during system-level testing. The contractor reported an Estimate at Complete (EAC) increase, bringing the total cost for production of SV 1-3 to $654M. A re-evaluation of the Government's Independent Estimate at Complete (IEAC) resulted in an increase, raising the total from $655M to $702M. In order to develop

more accurate cost and schedule estimates in the future, the Government and the Contractor implemented comprehensive shoulder-to-shoulder quarterly EAC reviews.

Due to an increase in launch services, on-orbit support, and mission assurance activities the program office prepared an Above Threshold Reprogramming (ATR) of $90M. The ATR was approved by OSD on April 2010 and by Congress on June 2010. SMC/GP received $72M of a $90M ATR in July 2010, with the remaining $18M is expected to arrive in Fiscal Year (FY)11. In FY11, there is an Unfunded Requirement (UFR) of $54M for Launch and On-Orbit systems and a Top-Down has been submitted to SMC/PIF.

There are no significant software issues at this time.

GPS Control Segment

The final developmental version of software for the new Architectural Evolution Plan (AEP) satellite command and control (C2) system—AEP Version 5.5C—went operational at the GPS Master Control Station (MCS) on January 11, 2010. This new version provides the capability to fly GPS IIF Space Vehicles (SVs) and enable the new security architecture inherent in Selective Availability Anti-Spoofing Module (SAASM)-capable User Equipment. AEP V5.5C was followed by AEP V5.5D, which provided the last of the ground segment changes needed to fly the first GPS IIF satellite. AEP V5.5D installed at the MCS on March 5, 2010. AEP mission control teams (MCTs) also performed six AEP exercises to rehearse GPS IIF satellite operations prior to launch of GPS IIF-1 on May 27, 2010.

Upon successful completion of GPS IIF On-Orbit Testing (OOT) and turnover of GPS IIF SV-1 Spacecraft Control Authority (SCA) to 14th Air Force, the 17th Test Squadron (17TS) conducted the GPS Enterprise IIF Modernization Architectural Evolution Plan (AEP) Force Development Evaluation (FDE) from August 25 – September 27, 2010.

This FDE focused on the operational suitability of the AEP Version 5.5 satellite command and control system and the GPS IIF satellite to perform the precise position and timing mission. 17TS provided their AEP V5.5/GPS IIF Final Results Briefing on December 3, 2010. No Category 1 deficiency reports were found and the AEP V5.5/GPS IIF system was found to be “Mission Capable”. Headquarters Air Force Space Command (AFSPC) operationally accepted the AEP V5.5 system on January 27, 2011. Receipt of the FDE Final Results Briefing, combined with ops acceptance, allowed SMC/GP to satisfy the AEP V5.5 APB schedule milestone in January.

The AEP Positional Training Emulator (PTE), which supports the AEP C2 system, was upgraded with both AEP V5.5C and D. AFSPC/A3TT conducted their formal Simulator Certification (SIMCERT) evaluation of the upgraded crew trainer on September 13-14, 2010. Overall, the evaluators found the PTE trainer to be an accurate representation of the actual operational GPS system. The PTE was rated GREEN (e.g., effective simulation to achieve positive transfer of learning for > 95% of tasks observed). The PTE developers also completed a delta PTE Physical/Functional Configuration Audit (FCA/PCA) and provided PTE org-level maintenance training in September 2010 in preparation for turning over the PTE to routine ops/sustainment.

Likewise, the new GPS Launch/Early Orbit, Anomaly Resolution and Disposal Operations (LADO) satellite C2 system was upgraded with the last of the GPS IIF-1 launch-specific changes. LADO Release 2.8.3 went operational on February 11, 2010. The LADO MCTs completed LADO IIF Rehearsal 6 in December 2009, Rehearsal 7 in March 2010 and the actual mission dress rehearsal for GPS IIF-1 in April 2010. 17TS observed the LADO MCTs perform the GPS IIF-1 launch and early orbit mission as part of the GPS IIF Modernization FDE. The LADO portion of the FDE occurred on May 27 - June 25, 2010. Again, no Category 1 Deficiency Reports were found and the LADO IIF system was found to be “Mission-Capable”. 17TS provided their GPS LADO FDE Interim Results Briefing on October 14, 2010. Based on the results of the operational test, AFSPC/DA3 agreed to exit the LADO trial period on October 28, 2010, and operationally accept the system.

There are no outstanding software issues at this time.

GPS User Equipment

The Modernized User Equipment (MUE) effort was initiated in 2006 to demonstrate the "proof of existence" and mature the critical technologies necessary to realize modernized GPS capabilities. Prototype GPS receiver cards built under this activity are currently undergoing Government testing and will be evaluated by an independent technology readiness assessment team. The results from this Technology Readiness Assessment (TRA) will support Military GPS User Equipment (MGUE) Increment 1 MS-B. Under the MUE Completion effort, the GPS Directorate will continue to leverage the technology development contract to provide further risk reduction for MGUE Increment 1 by implementing several updates to Interface Control Documents (ICDs) and fixing several Functional Qualification Test (FQT) deficiencies. 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.

The GPS MUE contracts have continued to mature Military-Code (M-Code) capable GPS receiver technology and MUE developmental testing began in April 2010. The resulting security evaluation, receiver card characterization, integration into operational platforms, and Government testing will form the basis for the TRA for MGUE, the follow-on to the MUE receiver card and development effort.

The Rockwell Collins MUE team has experienced challenges developing the GB GRAM-M receiver card. In April 2008 a stop-work order was issued for the development of the GRAM S/M. Later in 2008 at the CDR, the Government identified numerous critical findings, primarily with regards to information assurance requirements, that severely impacted Rockwell Collins's ability to maintain cost and schedule baseline. Subsequently, they have experienced significant cost growth in their original EAC primarily due to software/hardware integration, an unexpected issue with the memory volatility, and low yield rates on their wafer boards from a sub-contractor. Delivery of the GB GRAM-M was accomplished in August 2010 with cost overrun exceeding $17M. Despite the challenges with maturing state-of-art GPS receiver technology, Rockwell Collins has made significant accomplishments to include completing Formal Qualification Testing (FQT), acquiring and tracking live pseudo M-Code (in addition to legacy signals) with their Application Specific Integrated Circuit (ASIC) and, overall, maturing the critical technology elements (CTEs) that are key for future production contracts. Rockwell Collins continues to work with their primary subcontractor, IBM, to resolve ASIC yield issues, but the root cause has not yet been identified.

The L-3 MUE team has also experienced challenges. Late in 2008, L-3 reported to the Government that significant cost growth would be realized in order to meet contractual requirements. Following a thorough program review in January 2009, Government direction was given to descope the GRAM S/M effort. CDR was held in July 2008, but due to numerous critical findings and insufficient time allocated to close them, review closure wasn't approved until July 2009. This resulted in additional unplanned work, increasing both cost and schedule. Additional sources of cost growth and schedule delays can be attributed to software and hardware integration activities and underestimating anti-spoofing software development time. The total cost overrun exceeds $33.8M, a combination of $11.3M negative Cost Variance (CV) and $22.5M Over-Target Baseline (OTB). Despite the challenges in developing M-Code GPS receiver technology, L-3 has significantly contributed to maturing the CTEs and delivered their GB GRAM-M in November 2010. Formal Qualification Review (FQR) is scheduled for January 2011.

The Raytheon MUE team has made great progress in developing and delivering both the GB GRAM-M and GRAM S/M cards, but they have also experienced similar cost overrun and schedule delays. The GB GRAM-M card was delivered in October 2010. The GRAM S/M delivery has slipped to May 2011, and cost overrun exceeds $15M. The primary sources of cost growth and schedule slip were due to severely underestimating the complexity of the anti-spoofing software development and software/hardware integration on the receiver cards. Despite these challenges, Raytheon has experienced many successes over the past two years including successful completion of CDR, developing an ASIC that acquires/tracks pseudo M-Code (and legacy codes), successful integration of the ASIC onto two different receiver cards (Ground Based and SAASM M-Code) and delivery of hardware samples (ASICs) to the Government.

L-3/Interstate Electronics Company (IEC), Rockwell Collins, and Raytheon have each concluded Special Studies on Interface Control Document (ICD) Impact Analysis and X53/X67 requirements analysis. In addition, interim reports have been received and are in Government review on: ASIC yield improvement analysis, Power Mode Study, Global Navigation Satellite System (GNSS) Signal Incorporation, SAASM extended functions, Government Furnished

Equipment/ Government Furnished Information (GFE/GFI) (i.e., Test Vectors, Regression Test Tools, and Test Equipment), and MUE Lessons Learned that we expect to decrease risk on the execution of the MGUE program.

Shortly after the GPS Master Control Station was upgraded with AEP V5.5C, the 50th Space Wing GPS Operations Center (GPSOC) and the US Coast Guard Navigation Center started receiving problem reports from a small number of military users who reported their SAASM-capable receivers were intermittently losing lock of the GPS signal. Subsequent investigation uncovered the problem was limited to eight different receiver models which were manufactured by Trimble Military and Advanced Systems (TMAS) that were not compliant with IS-GPS-200. Working with the National Security Agency (NSA), the GPS Directorate (SMC/GP) determined that these receivers could be given a special key (i-key) to turn off their message authentication functions, allowing them to operate normally. A GPS User Equipment Crisis Action Team was stood up to expedite distribution of these special keys to all mission-critical users and to any other users who requested it. Working with TMAS, SMC/GP was able to further isolate the problem and develop a permanent fix in the form of a software patch. SMC/GP is in the process of fielding this permanent fix. The UE vendor is also working the 746th Test Squadron at Holloman Air Force Base (AFB), NM, and SPAWAR in San Diego, CA, to improve 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.

There are no significant software issues 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

A more stringent interpretation of the Architectural 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. This breach was previously reported in the December 2009 SAR.

USER EQUIPMENT

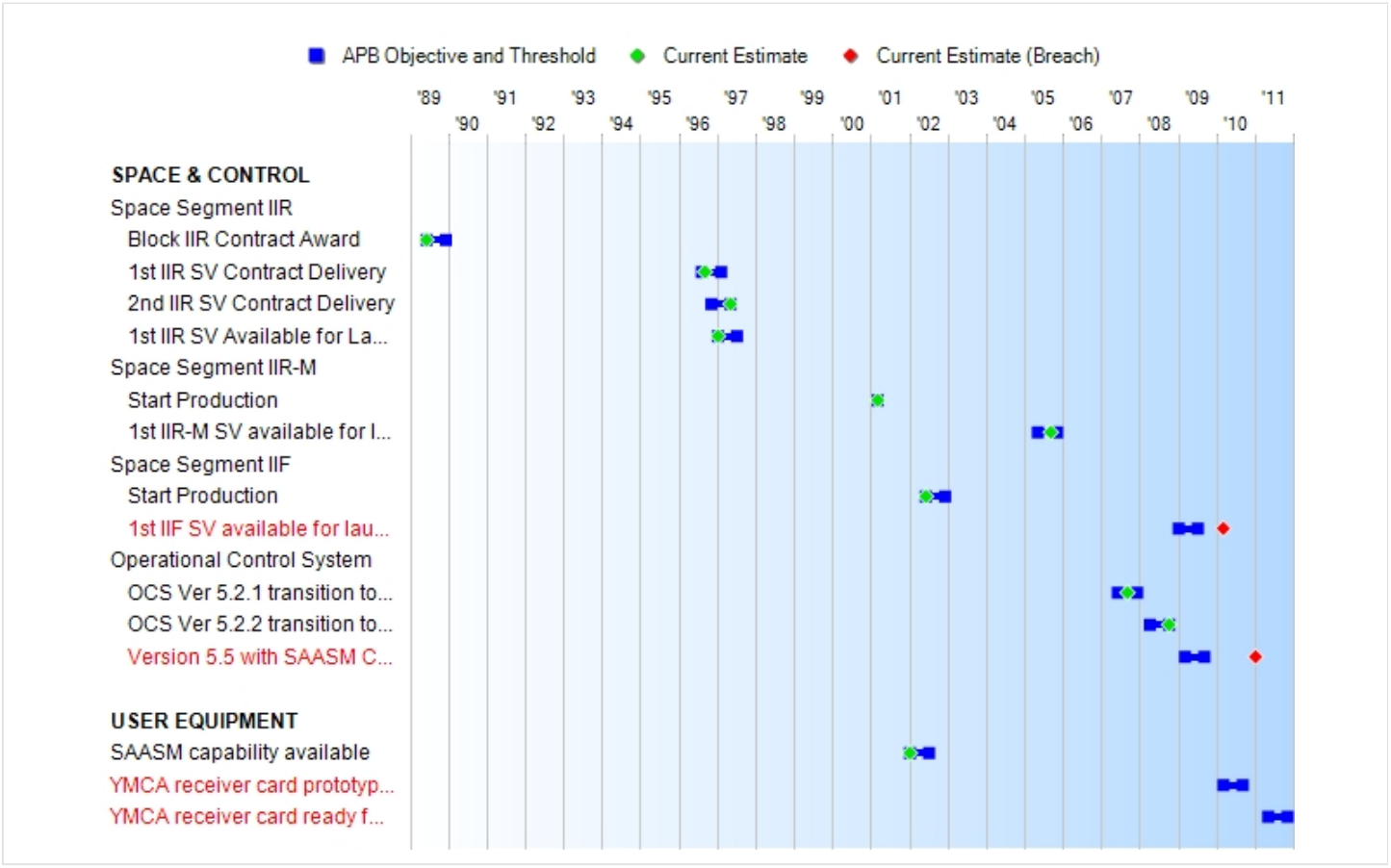
APB Breaches		
Schedule		☑
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
Unit Cost	PAUC	☐
	APUC	☐

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

Explanation of Breach

Based on the recommendation of the Office of the Under Secretary of Defense for Acquisitions, Technology, and Logitics (OSD (AT&L)) at the January 29, 2010 Annual Global Positioning System (GPS) Enterprise Review (AGER) and recorded in a May 24, 2010 Acquisition Decision Memoradum (ADM), the Modernized User Equipment (MUE) milestones in the Navstar Acquisition Program Baseline (APB) are no longer applicable. A new APB is not required since the updated programmatic requirements will be caputred in the Milestone-B Military GPS User Equipment (MGUE) APB.

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]	(Ch-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

(Ch-1) The current estimate changed from February 2010 to January 2011 because a more stringent interpretation of the Architectural 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]	(Ch-1)
YMCA receiver card ready for delivery to platform	N/A	MAY 2011	NOV 2011	**N/A** [1]	(Ch-1)

[1] *APB Breach*

Acronyms And Abbreviations

SAASM - Selective Availability/Anti-Spoofing Module
YMCA - Y-Code/M-Code coarse-acquisition

Change Explanations

(Ch-1) 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) AFSPC/ACC 003-92-I/II/III Global Positioning System (GPS) 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 - 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: 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 - 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)	(Shared)

Shared funding line supports both Modernized User Equipment (MUE) and Military GPS UE (MGUE).

Procurement

Because this SAR reports only on the Modernized User Equipment (MUE) program, we have deleted appropriations 3010 and 3080 which were erroneously reported in the past.

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	--	3361.6	2430.2	3984.8	3630.2
Procurement	3493.7	4025.8	--	3988.5	3565.1	4259.0	4239.7
Flyaway	3205.8	--	--	3594.0	3259.8	--	3781.8
Recurring	2996.5	--	--	3412.5	3043.2	--	3595.1
Non Recurring	209.3	--	--	181.5	216.6	--	186.7
Support	287.9	--	--	394.5	305.3	--	457.9
Other Support	254.3	--	--	389.2	273.5	--	451.8
Initial Spares	33.6	--	--	5.3	31.8	--	6.1
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	7350.1	5995.3	8243.8	7869.9

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	2145.0	1829.3	2330.2	2243.3
Procurement	3239.4	3768.6	4145.5	3988.5	3291.6	3977.8	4239.7
Flyaway	3205.8	--	--	3594.0	3259.8	--	3781.8
Recurring	2996.5	--	--	3412.5	3043.2	--	3595.1
Non Recurring	209.3	--	--	181.5	216.6	--	186.7
Support	33.6	--	--	394.5	31.8	--	457.9
Other Support	0.0	--	--	389.2	0.0	--	451.8
Initial Spares	33.6	--	--	5.3	31.8	--	6.1
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	6133.5	5120.9	6308.0	6483.0

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	1216.6	600.9	1654.6	1386.9
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	1216.6	874.4	1935.8	1386.9

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
FY2012 President's Budget / December 2010 SAR (TY$ M)

Appropriation	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
RDT&E	3292.9	200.4	121.9	15.0	0.0	0.0	0.0	0.0	3630.2
Procurement	3930.0	72.3	75.3	69.3	81.4	11.0	0.4	0.0	4239.7
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 2012 Total	7222.9	272.7	197.2	84.3	81.4	11.0	0.4	0.0	7869.9
PB 2011 Total	7331.0	274.6	235.0	208.7	214.7	144.1	2.4	0.0	8410.5
Delta	-108.1	-1.9	-37.8	-124.4	-133.3	-133.1	-2.0	0.0	-540.6

Cost and Funding

Funding Summary - SPACE & CONTROL

Appropriation and Quantity Summary - SPACE & CONTROL
FY2012 President's Budget / December 2010 SAR (TY$ M)

Appropriation	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
RDT&E	2175.9	34.5	17.9	15.0	0.0	0.0	0.0	0.0	2243.3
Procurement	3930.0	72.3	75.3	69.3	81.4	11.0	0.4	0.0	4239.7
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 2012 Total	6105.9	106.8	93.2	84.3	81.4	11.0	0.4	0.0	6483.0
PB 2011 Total	5975.5	106.8	95.0	86.6	83.8	11.3	2.4	0.0	6361.4
Delta	130.4	0.0	-1.8	-2.3	-2.4	-0.3	-2.0	0.0	121.6

Quantity	Undistributed	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	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 2012 Total	0	33	0	0	0	0	0	0	0	33
PB 2011 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
FY2012 President's Budget / December 2010 SAR (TY$ M)

Appropriation	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
RDT&E	1117.0	165.9	104.0	0.0	0.0	0.0	0.0	0.0	1386.9
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 2012 Total	1117.0	165.9	104.0	0.0	0.0	0.0	0.0	0.0	1386.9
PB 2011 Total	1355.5	167.8	140.0	122.1	130.9	132.8	0.0	0.0	2049.1
Delta	-238.5	-1.9	-36.0	-122.1	-130.9	-132.8	0.0	0.0	-662.2

Quantity	Undistributed	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	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 2012 Total	0	0	0	0	0	0	0	0	0	0
PB 2011 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	--	--	--	--	--	--	34.5
2012	--	--	--	--	--	--	17.9
2013	--	--	--	--	--	--	15.0
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**2243.3**

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	--	--	--	--	--	--	92.8
2009	--	--	--	--	--	--	72.0
2010	--	--	--	--	--	--	41.6
2011	--	--	--	--	--	--	28.0
2012	--	--	--	--	--	--	14.3
2013	--	--	--	--	--	--	11.8
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**2145.0**

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	352.0	--	13.8	365.8	--	365.8
2006	3	357.6	--	14.3	371.9	--	371.9
2007	--	91.1	--	14.4	105.5	--	105.5
2008	--	126.8	68.7	--	195.5	32.0	227.5
2009	--	62.7	21.1	--	83.8	41.0	124.8
2010	--	47.3	49.5	--	96.8	27.3	124.1
2011	--	--	26.4	--	26.4	38.2	64.6
2012	--	--	29.3	--	29.3	38.4	67.7
2013	--	--	25.5	--	25.5	36.0	61.5
2014	--	--	44.6	--	44.6	36.4	81.0
2015	--	--	2.1	--	2.1	8.5	10.6
Subtotal	**33**	**3327.9**	**267.2**	**186.7**	**3781.8**	**257.8**	**4039.6**

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	316.0	--	12.4	328.4	--	328.4
2006	3	312.1	--	12.5	324.6	--	324.6
2007	--	77.6	--	12.2	89.8	--	89.8
2008	--	106.1	57.5	--	163.6	26.8	190.4
2009	--	51.8	17.4	--	69.2	33.9	103.1
2010	--	38.5	40.4	--	78.9	22.2	101.1
2011	--	--	21.2	--	21.2	30.7	51.9
2012	--	--	23.2	--	23.2	30.3	53.5
2013	--	--	19.8	--	19.8	28.0	47.8
2014	--	--	34.1	--	34.1	27.8	61.9
2015	--	--	1.6	--	1.6	6.4	8.0
Subtotal	**33**	**3197.3**	**215.2**	**181.5**	**3594.0**	**206.1**	**3800.1**

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	564.8
1998	3	564.9
1999	--	--
2000	--	--
2001	--	--
2002	--	--
2003	--	--
2004	--	--
2005	3	564.9
2006	3	564.9
2007	--	--
2008	--	--
2009	--	--
2010	--	--
2011	--	--
2012	--	--
2013	--	--
2014	--	--
2015	--	--
Subtotal	**33**	**3197.3**

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	--	--	--	--	--	0.4	0.4
2015	--	--	--	--	--	0.4	0.4
2016	--	--	--	--	--	0.4	0.4
Subtotal	**--**	**--**	**--**	**--**	**--**	**200.1**	**200.1**

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	--	--	--	--	--	6.3	6.3
2012	--	--	--	--	--	6.1	6.1
2013	--	--	--	--	--	6.1	6.1
2014	--	--	--	--	--	0.3	0.3
2015	--	--	--	--	--	0.3	0.3
2016	--	--	--	--	--	0.3	0.3
Subtotal	**--**	**--**	**--**	**--**	**--**	**188.4**	**188.4**

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	--	--	--	--	--	--	165.9
2012	--	--	--	--	--	--	104.0
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**1386.9**

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	--	--	--	--	--	--	130.2
2009	--	--	--	--	--	--	101.3
2010	--	--	--	--	--	--	108.3
2011	--	--	--	--	--	--	134.7
2012	--	--	--	--	--	--	83.2
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**1216.6**

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

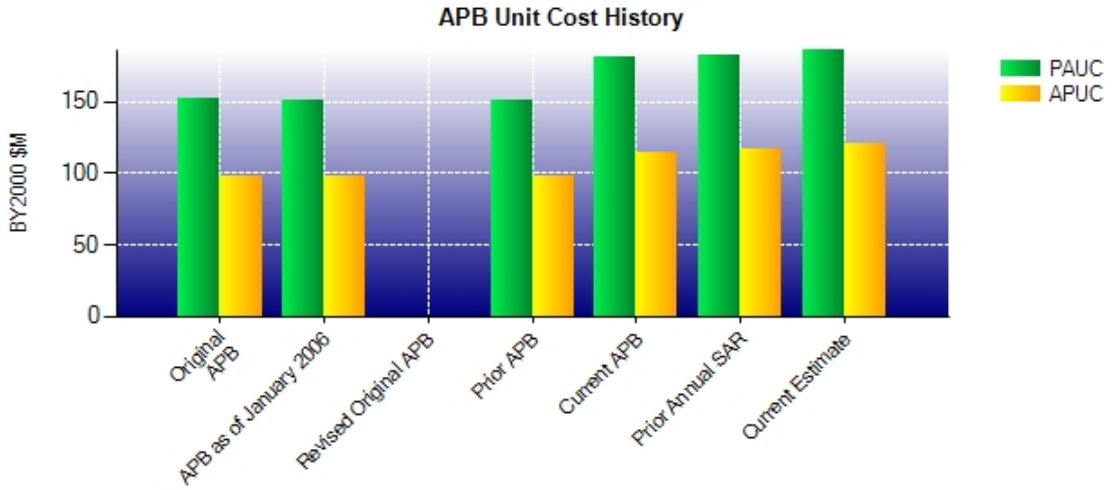
Unit Cost Report

Unit Cost	BY2000 $M Current UCR Baseline (FEB 2007 APB)	BY2000 $M Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	5987.7	6133.5	
Quantity	33	33	
Unit Cost	181.445	185.864	+2.44
Average Procurement Unit Cost (APUC)			
Cost	3768.6	3988.5	
Quantity	33	33	
Unit Cost	114.200	120.864	+5.84

Unit Cost	BY2000 $M Original UCR Baseline (FEB 2002 APB)	BY2000 $M Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	5015.6	6133.5	
Quantity	33	33	
Unit Cost	151.988	185.864	+22.29
Average Procurement Unit Cost (APUC)			
Cost	3239.4	3988.5	
Quantity	33	33	
Unit Cost	98.164	120.864	+23.12

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 2009	182.670	117.424	192.770	124.497
Current Estimate	DEC 2010	185.864	120.864	196.455	128.476

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	0.779	-0.071	0.252	13.194	14.555	0.000	12.567	41.276	196.455

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	0.518	-0.069	0.252	2.800	12.342	0.000	12.888	28.731	128.476

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	6483.0
Total Quantity	N/A	N/A	33	33
Prog. Acq. Unit Cost (PAUC)	N/A	N/A	155.179	196.455

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 in 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

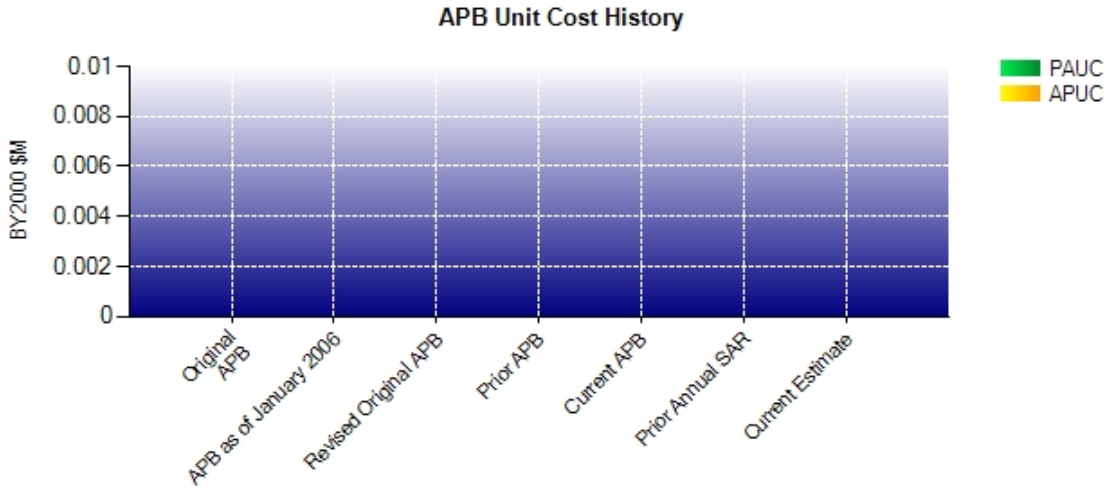
Unit Cost Report

Unit Cost	BY2000 $M Current UCR Baseline (FEB 2007 APB)	BY2000 $M Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	1688.5	1216.6	
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 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	797.8	1216.6	
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 2009	N/A	N/A	N/A	N/A
Current Estimate	DEC 2010	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	1386.9
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	+16.7	--	+25.3
Quantity	--	-2.3	--	-2.3
Schedule	--	+8.3	--	+8.3
Engineering	+343.0	+92.4	--	+435.4
Estimating	+82.7	+232.9	--	+315.6
Other	--	--	--	--
Support	-10.6	+468.8	--	+458.2
Subtotal	+423.7	+816.8	--	+1240.5
Current Changes				
Economic	--	+0.4	--	+0.4
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-9.7	+174.4	--	+164.7
Other	--	--	--	--
Support	--	-43.5	--	-43.5
Subtotal	-9.7	+131.3	--	+121.6
Total Changes	+414.0	+948.1	--	+1362.1
CE - Cost Variance	2243.3	4239.7	--	6483.0
CE - Cost & Funding	2243.3	4239.7	--	6483.0

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	+66.6	+149.5	--	+216.1
Other	--	--	--	--
Support	-10.4	+394.9	--	+384.5
Subtotal	+376.9	+635.6	--	+1012.5
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-8.1	+147.5	--	+139.4
Other	--	--	--	--
Support	--	-34.0	--	-34.0
Subtotal	-8.1	+113.5	--	+105.4
Total Changes	+368.8	+749.1	--	+1117.9
CE - Cost Variance	2145.0	3988.5	--	6133.5
CE - Cost & Funding	2145.0	3988.5	--	6133.5

Previous Estimate: December 2009

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Reductions taken for Small Business Innovation Research, Small Business Technology Transfer, and Economic Assumption (Estimating)	-8.0	-9.6
Taken for non-pay non-fuel reduction (Estimating)	-0.1	-0.1
RDT&E Subtotal	-8.1	-9.7

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+0.4
Adjustment for current and prior escalation. (Estimating)	-0.1	0.0
Additional funds received for IIF Navigation Data Unit (NDU) and Crosslink Transponder Data Unit (CTDU) fixes (Estimating)	+56.1	+62.5
Above Threshold Reprogramming (ATR) funds for IIF SV 1-3 production, launch and on-orbit support cost growths, mission assurance, and other support activities (Estimating)	+58.8	+71.9
Realignment in classification of 3020 funds from Support to Flyaway (Estimating)	+28.8	+37.4
Decrease due to the reclassification of funds from Support to Flyaway. (Support)	-29.2	-37.4
Realignment in classification of 3080 funds from Support to Flyaway (Estimating)	+4.8	+5.9
Decrease due to the reclassification of funds from Support to Flyaway (Support)	-4.7	-5.9
Decrease due to acquisition program management administration efficiencies, program management administration (PMA) reduction, and non-pay non-fuel reduction (Estimating)	-6.0	-7.7
Adjustment to reflect correct Budget Authority (BA) (Estimating)	+10.2	+10.8
End of year (EOY) withdrawal of funds (Estimating)	-0.6	-0.8
Reduction in Operational Control Segment (OCS) Architectural Evolution Plan (AEP) tail requirement (Estimating)	-1.5	-2.0
Reimbursement of Judgment Funds in settlement of Motorola Claim (Estimating)	-0.5	-0.6
Decrease due to excess funds being identified and withdrawn (Estimating)	-2.5	-3.0
Adjustment for current and prior escalation. (Support)	-0.1	-0.2
Procurement Subtotal	+113.5	+131.3

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	-4.7	+0.2	--	-4.5
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	+277.8	--	--	+277.8
Estimating	+947.2	+0.4	--	+947.6
Other	--	--	--	--
Support	--	-46.2	--	-46.2
Subtotal	+1220.3	-45.6	--	+1174.7
Current Changes				
Economic	-1.0	--	--	-1.0
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-433.3	--	--	-433.3
Other	--	--	--	--
Support	--	-227.9	--	-227.9
Subtotal	-434.3	-227.9	--	-662.2
Total Changes	+786.0	-273.5	--	+512.5
CE - Cost Variance	1386.9	--	--	1386.9
CE - Cost & Funding	1386.9	--	--	1386.9

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	+761.4	--	--	+761.4
Other	--	--	--	--
Support	--	-38.1	--	-38.1
Subtotal	+1013.0	-38.1	--	+974.9
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-339.9	--	--	-339.9
Other	--	--	--	--
Support	--	-216.2	--	-216.2
Subtotal	-339.9	-216.2	--	-556.1
Total Changes	+673.1	-254.3	--	+418.8
CE - Cost Variance	1216.6	--	--	1216.6
CE - Cost & Funding	1216.6	--	--	1216.6

Previous Estimate: December 2009

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	-1.0
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
Decrease due to overestimated costs of direct mission support efforts. Current figure is updated to reflect actuals. (Estimating)	-4.5	-5.6
Decrease in funds due to the removal of all current User Equipment (CUE) funding. This SAR reports only Modernized UE (MUE) funds and this correction removes all non-MUE funds (Estimating)	-15.5	-15.1
Decrease in funds due the removal of MIlitary GPS User Equipment (MGUE) funding from FY 2012- 2015. This SAR should only reflect MUE funding and this correction removes all non-MUE funds. (Estimating)	-320.0	-412.7
RDT&E Subtotal	-339.9	-434.3

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Decrease in funds due to the removal of all current User Equipment (CUE) funding. This SAR reports only Modernized UE (MUE) funds and this correction removes all non-MUE funds (Support)	-173.2	-178.6
Decrease in funds due to the removal of all current User Equipment (CUE) funding. This SAR reports only Modernized UE (MUE) funds and this correction removes all non-MUE funds (Support)	-43.0	-49.3
Procurement Subtotal	-216.2	-227.9

Contracts

Appropriation: RDT&E

Contract Name	**GPS IIF OCS DEV**
Contractor	The Boeing Company
Contractor Location	Seal Beach, CA 90740
Contract Number, Type	F04701-96-C-0025/1, 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
13.9	N/A	1	779.3	N/A	1	909.4	909.4

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-13.7	0.0
Previous Cumulative Variances	-14.6	-0.2
Net Change	+0.9	+0.2

Cost And Schedule Variance Explanations

The net favorable cost variance (CV) of $0.9 million was due to lower than expected Control Segment program management, system engineering and business management costs.

The net favorable schedule variance (SV) of $0.2 million was due to the successful completion of the final delta Combined System Test (CST) with GPS IIF-1. The program is now >99% complete and only completion of an L-Band test set accounts for the remaining schedule variance.

Contract Comments

The contract information above pertains to the Operational Control Segment (OCS) Research, Development, Test, and Evaluation (RDT&E) Cost Plus Award Fee (CPAF) development efforts.

This will be the last time we report the OCS contract in the SAR. The contract is 99% complete.

There have been no changes in the contract target price since the last SAR.

The current contract target price is $779.3 million, compared to the initial contract target price of $13.9 million. At the time the GPS Block IIF contract was signed (April 1996), the Government only envisioned needing to add the GPS Block IIF functionality to a completed distributed OCS architecture. However, completion of the distributed (Architecture Evolution Plan) AEP under the GPS OCS Support Contract (GOSC) became significantly more difficult than originally expected. In 1999, the government decided to alleviate Government Furnished Equipment (GFE) concerns and provide for a more efficient acquisition of AEP by transferring the responsibilities from GOSC to the Single Prime Initiative (SPI). Because of funding limitations, completion of the original GPS IIF functionality was stretched out into three different operational versions. Cumulatively, these actions raised the contract target price from $13.9 million to $416 million.

In August 2000, Congress authorized the modernization of the entire GPS system - adding two new civil signals (L2C and L5) and a new military signal (M-Code). In order to ensure the Control Segment could command and control the new signals, several subsequent modifications were added to provide the capability to build uploads for all the new signals and to modernize the monitor stations at the various remote sites. In April 2003, during the Control Segment Integrated Baseline Review, the government found there was additional work that needed to be placed on contract for AEP and LADO. Cumulatively, these actions raised the contract target price from $416 million to $835 million. Several additional minor contract changes then raised the total contract target price to $839.4 million.

Development of AEP Version 6 and 7 were impacted by a 2003 funding cut (e.g., PBD 703). The GPS Wing worked with the contractor to replan the effort. Revised schedules showed that the AEP V6 would be delivered almost at the same time as Block I of the next-generation GPS Operational Control Segment (OCX) and AEP V7 would be delivered in the Block II timeframe. In order to avoid any duplication of effort, the GPS Wing recommended descoping these requirements from the GPS IIF contract. OSD concurred. The V6/V7 descope decreased the contract target price to $760.5 million and originally recognized $22M in cost. This was subsequently adjusted to $19.6M during definitization Recognition of the need for a new AEP crew trainer (e.g., the Positional Training Emulator) increased the target contract price by $14.9 million and settlement of the AEP V5.5 Request for Equitable Adjustment (REA) increase cost by $25.8M and increased fee by $3.4M. Several minor contract actions then raised the contract target price to $779.3 million.

Program Manager's (PM's) Estimated Cost: GPS OCS/MOSC DEV

The most likely EAC is now $822.5 million, with an Estimated Price at Completion of $909.4 million(86.9M difference in EAC and Estimated Price at Completion istarget profit/fee). These numbers are $2.9 million less than in the last SAR and are due to the successful settlement of an outstanding request for equitable adjustment by one of the major subs.

Appropriation: Procurement

Contract Name	**GPS IIF Sat Production**
Contractor	The Boeing Company
Contractor Location	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	659.3	702.0

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-211.5	-9.1
Previous Cumulative Variances	-146.7	-20.6
Net Change	-64.8	+11.5

Cost And Schedule Variance Explanations

The net unfavorable change in cost variance (CV) of $64.8M since the 2009 SAR was primarily due to multiple technical issues to include solar arrays wiring harnesses, Crosslink Transponder Data Unit (CTDU), atomic clocks, L5, L2 circulator, Radio Frequency (RF) cabled, and Reaction Wheel Assemblies (RWAs). Additional CV contributors were extended assembly, integration and test of Space Vehicle (SV)-2 and SV-3, SV-2 support for improved STE performance, costs to Eagle Pitcher for delayed activation of the batteries in the spacecraft sub-systems, customized mandatory 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 net favorable change in schedule variance (SV) of $11.5M since the 2009 SAR is due primarily to credit being taken for previously scheduled tasks for delivery, integration, launch, and orbital check-out and acceptance of GPS IIF SV-1. Schedule variance always approaches zero as a program closes out.

Contract Comments

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

The initial contract price increased from $157.6M to $194.7M because the contract was rebaselined to shift to modernized IIF satellites as a result of the direction given by the Acquisition Decision Memorandum (ADM) dated May 2000. The current contract price is comprised of the baseline settlement funding adjustments for the actual work performed under the original baseline plus the final negotiated price for 3 modernized GPS IIF satellites (SV1-3).

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 2010, the contractor is reporting an EAC of $659M against a negotiated cost of $172.3M. The Government updated its current Program Manager (PM) EAC from $655 to $702M.

The award date of this contract had been improperly stated as October 24, 2002 in the past SARs. We have changed it to the correct date of April 22, 1996.

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	145.8	169.1	3	145.8	145.8

Cost And Schedule Variance Explanations

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

Contract Comments

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 Beaach, 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	174.3	192.2	3	174.3	174.3

Cost And Schedule Variance Explanations

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

Contract Comments

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	166.8	183.8	3	166.8	166.8

Cost And Schedule Variance Explanations

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

Contract Comments

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	**Rockwell Collins, Inc**
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	97.6	N/A	N/A	97.6	101.8

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-17.1	0.0
Previous Cumulative Variances	-9.4	-0.9
Net Change	-7.7	+0.9

Cost And Schedule Variance Explanations

The net unfavorable change on cost variance of $-7.7M was due to software rework effort to address open Change Requests (CRs) and additional integration efforts to resolve power monitoring and control, temperature performance and timing issues with the hardware. The final integration testing effort also contributed to the unfavorable change. The activity to execute integration and dry run testing slip from January 2010 to April 2010 due to delays in hardware and software builds.

The net favorable change in schedule variance was due to the contractor delivering the Ground-Based GPS Receiver Application Module Modernized (GB GRAM-M) cards to Government in August 2010.

Contract Comments

The Contractor's Estimated Price at Completion increased due to the schedule was extended additional four months due to 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 increased to incorporated additional risk associated with the potential schedule delay and software growth.

The contract price changed from $82.3M to $97.6M. Rockwell Collins 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	**L-3 Communications Corporation**
Contractor	L-3 Interstate Electronics Corporation
Contractor Location	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	111.7	N/A	N/A	111.7	111.7

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-11.3	-0.1
Previous Cumulative Variances	-3.1	-1.1
Net Change	-8.2	+1.0

Cost And Schedule Variance Explanations

The net unfavorable change in cost variance of-$8.2M is driven by lab support and program management, scenario generation, script checkout process, and Anti-Tamper verification tasks requiring more efforts than planned. Also, the Hardware and Software integration was more difficult and the complexity of the test equipment was greater than expected.

The net favorable change in schedule variance was due to the contractor delivering the Ground-Based GPS Receiver Application Module (GB GRAM) cards to the Government in November 2010.

Contract Comments

The Contractor's Estimated Price at Completion increased due to issues and delays associated with software FQT (Final Qualification Test) and system level integration, along with AT (Anti-Tamper) V&V (Verification and Validation) 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 increased because it incorporated the latest contractor’s factored risks and additional software growth.

The contract price has changed from $77.4M to $111.7M. Their cost overrun is primarily 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 had planned for. Also, their digital ASIC required significant rework, causing unplanned labor and subcontractor cost.

Appropriation: RDT&E

Contract Name	**Raytheon Company**
Contractor	Raytheon Space and Airborne Systems
Contractor Location	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	120.3	N/A	N/A	120.3	120.7

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date	-15.6	-1.1
Previous Cumulative Variances	-8.4	-2.7
Net Change	-7.2	+1.6

Cost And Schedule Variance Explanations

The net unfavorable change in cost variance of -$7.2M is due to Ground-Based GPS Receiver Application Module Modernized (GB GRAM-M) and Digital (Application Specific Integrated Circuit) ASIC design complexities, GRAM-Standard Electronics Module Type E (GRAM-SM) production module design growth, software integration, and information assurance verification requirements issues which required more resources than planned.

The net favorable change in schedule variance was due to the contractor delivering the GB-GRAM cards to Government in September 2010.

Contract Comments

The Contractor's Estimated Price at Completion increased due to additional support and complexities in verification testing and support, Ground Based GPS Receiver Application Module (GB GRAM)-M and Digital Application Specific Integrated Circuit (ASIC) design complexities, GRAM-SM production module design growth, software integration and verification testing.

The Government's Estimated Price at Completion increased to capture additional support and complexities in verification testing and support, GB GRAM-M and Digital ASIC design complexities, GRAM-S/M production module design growth, software integration, and verification testing. This also incorporates the latest contractor-factored risks and potential for additional software growth.

The contract price changed from $105.7M to $120.3M because 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	22	33	66.67%
Total Program Quantities Delivered	33	22	33	66.67%

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	6483.0	Years Appropriated	26
Expenditures To Date	4971.2	Percent Years Appropriated	83.87%
Percent Expended	76.68%	Appropriated to Date	6212.7
Total Funding Years	31	Percent Appropriated	95.83%

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	1386.9	Years Appropriated	18
Expenditures To Date	858.9	Percent Years Appropriated	94.74%
Percent Expended	61.93%	Appropriated to Date	1282.9
Total Funding Years	19	Percent Appropriated	92.50%

The Modernized User Equipment (MUE) expenditures to date have decreased due to the fact that in the previous SAR, the MUE program was reporting expenditures for the entire UE program. Because the MUE program does not include legacy UE items, the current expenditures no longer include legacy expenditures and only include those from the MUE program.

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 and the Consolidated Space Operations Center program elements. The Sustaining support cost includes the Material Support Division (MSD) direct costs. Costs reflect updates as of January 19, 2011.

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, 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 FY08-FY16.

An accurate cost for the Legacy portion is not available. For this, we will put N/A in lieu of a number.

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	20.8	19.2
Unit Operations	--	--
Maintenance	20.8	16.8
Sustaining Support	5.2	2.4
Continuing System Improvements	--	--
Indirect Support	5.2	2.4
Other	--	--
Total Unitized Cost (Base Year 2000 $)	52.0	40.8

Total O&S Costs $M	SPACE & CONTROL	Block I/II Legacy
Base Year	468.7	--
Then Year	589.4	--

Funding went down from last SAR due to an overall decrease in funding

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	--	--