Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-292

Global Positioning System III (GPS III)

As of FY 2016 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President’s Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

Program Information

Program Name

Global Positioning System III (GPS III)

DoD Component

Air Force

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References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated January 31, 2011

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated January 31, 2011

Mission and Description

The Global Positioning System (GPS) is a satellite-based radio navigation system that provides worldwide military and civil users satellite signals they can process to determine accurate position, velocity, and time. On May 8, 2000, the USD (AT&L) approved entry into the initial modernization efforts for Navstar GPS. GPS III, an Acquisition Category 1D program, is the next generation Space Vehicle (SV) that will provide significant enhancements to complete the modernization of the constellation. GPS III complies with 10 United States Code (USC) § 2281, ensuring the continued sustainment and operation of GPS for military and civilian purposes, and 42 USC § 14712, continuing as an international standard available on a continuous worldwide basis free of direct user fees.

As captured in a November 6, 2006 Memorandum, the Joint Requirement Oversight Council validated and endorsed the GPS III CDD for vehicles 01-08, validating the requirements for the GPS III program. As a result, the GPS Directorate is on contract to deliver GPS III SV01 through SV08, as reflected in this SAR. Follow-on vehicles 09+ will be procured in a future increment(s) and are not reflected in this SAR.

The primary GPS III missions are positioning, navigation, and precise time transfer. GPS provides strategic and tactical support to the following DoD missions: Joint Operations by providing capabilities for Position Navigation and Timing (PNT); Command, Control, Communications, and Intelligence; Special Operations; Military Operations in Urban Terrain; Defense-Wide Mission Support; Air Mobility; and Space Launch Orbital Support.

For military users, the GPS III program provides Precise Positioning Service (PPS) to military operations and force enhancement. It also provides increased power to the earth coverage M-Code signals for anti-jam and implements anti-exploitation techniques in order to prevent unauthorized use of the GPS PPS signal. Additionally, the program will support, via a hosted payload, the United States Nuclear Detonation Detection System mission for worldwide monitoring and detection of nuclear events.

The GPS III program provides a Standard Positioning Service to a broad spectrum of civil users. It will also transmit a new civil signal (L1C), which is compatible with the European Galileo satellite navigation system signal, E1. L1C is also compatible with those signals planned for broadcast on Japan's Quasi-Zenith Satellite System, a system meant to augment GPS services. Once implemented, the common civil signal will be jointly broadcast by up to 60 satellites from both GPS and Galileo constellations, further increasing the accuracy and availability of civil PNT solutions.

Executive Summary

The Global Positioning System (GPS) III program has experienced significant delays and cost overruns, primarily due to technical issues with the Navigation Payload design. As reported in the previous SAR, these delays have caused a breach to the APB schedule, and led the program to conduct an Over Target Baseline (OTB) to implement a new, executable cost and schedule baseline. As of December 2014, the primary design issues on the Navigation Payload have been resolved through preliminary testing, although full qualification of the navigation payload hardware design will not be complete until May 2015. The Space Vehicle (SV)01 Navigation Panel has been delivered to the SV01 bus and SV01 has successfully completed initial system performance testing and is on track to complete space environmental Thermal Vacuum (TVAC) testing in 4th Quarter FY 2015. TVAC testing is the major remaining test that will retire system design risk. Production vehicles SV03-08 are on contract and are beginning to deliver long-lead parts to the production line. The OTB is taking advantage of a healthier-than-expected on-orbit GPS constellation to slow down production schedules and implement cost controls via a lower headcount profile.

As previously reported, the GPS III program office submitted a Program Deviation Report (PDR) declaring a schedule breach to the SV01, SV02 and SV08 Available for Launch (AFL) APB thresholds driven by delays to the Mission Data Unit (MDU) delivery. An APB update is planned after OTB and SCP activities have completed in 4th Quarter 2015.

The program office recognized a schedule breach in November 2013. Although schedule delays have resulted in RDT&E cost growth beyond our current budget, the program still remains under the APB cost threshold.

In December 2013, the GPS III program received permission from the Milestone Decision Authority (USD/AT&L) to exercise the current Cost Plust Incentive Fee/Award Fee (CPIF/AF) contract options for SV05-08. The option for SV05-06 was awarded in December 2013, and the SV07-08 option was awarded in March 2014.

Lockheed Martin Space Systems, the GPS III prime contractor, requested an OTB for SVs 01-08, due to an invalid contract baseline. The PEO concurred with this request in June 2014 and the OTB kicked off in July 2014. The OTB is expected to set a new program schedule for SVs 01-08 that will be focused on cost control and efficient SV production flow. The OTB activity is scheduled to complete in February 2015 and the first reports on the new baseline will be provided in March 2015. GPS III will be conducting an updated Single Best Estimate (SBE) and subsequent SCP as a result of the OTB. Once completed, the program will have significantly greater confidence in schedule and cost projections, which will be incorporated into an updated APB.

The MDU within the Navigation Payload remains the program's critical path and pacing item. Three significant issues caused MDU qualification and delivery delays: 1) Radio Frequency Isolation performance was not meeting performance requirement. To solve this issue, key circuit card assemblies within the MDU were respun to eliminate white wires. This solution has been demonstrated to be effective through functional testing at ambient, vacuum, and over temperature. 2) Cracked solder joints were discovered on the Voltage Controlled Crystal Oscillator, causing a concern for meeting mission life. The solder joint was redesigned to provide additional stress relief over temperature cycling. The redesigned solder joints have passed accelerated life testing and have been installed on the first flight MDU. 3) The MDU power converter shorted out during vacuum testing, caused by deformation of a hermetically sealed hybrid under vacuum conditions which caused a short inside the converter. A design correction was made to the converter to ensure sufficient spacing, and it was successfully tested in the MDU. All three of these MDU issues have corrective actions implemented, but will remain open until the MDU completes proto-qualification testing. MDU proto-qualification testing began on September 7, 2014 and will complete by May 2015. Additionally, MDU flight Software Item Qualification Test (SIQT) is expected to complete in July 2015.

While not on the critical path, the contractor also had to address a new issue found during qualification testing of the SV01 Enhanced Crosslink Transponder System (ECTS), which required a manufacturing redesign of the resonator rods. This issue affects the performance of Ultra High Frequency (UHF) crosslink of Nuclear Detonation Detection System (NDS) data. The ECTS is responsible for UHF crosslink of NDS data. The team is on-track to deliver redesigned ECTS boxes in January 2015, with a parallel re-qualification effort scheduled to complete by February 2015.

Despite these challenges, the overall program continues to make progress on the GPS III Non-Flight Satellite Testbed (GNST) and the SV01 and SV02 Development program.

The GNST, (SV0 Iron Bird), a fully functioning but less redundant pathfinder, is the first GPS III-vehicle through the assembly, integration and test flow, and a major risk-reduction activity for SV01. GNST was utilized to conduct bus and payload regression testing to verify test procedures. Solar Array Drive Assembly and NDS boom deployments were completed. The GNST is now in preparation to be put into the Passive Intermodulation chamber for Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) testing.

For SV01, development continues with over 98% of the SV01 bus delivered and integrated on the GPS III satellite. The remaining SV01 bus assemblies are on track for delivery and integration prior to SV-level core mate in 1st Quarter FY 2015. The transmitters have been installed onto the SV01 Navigation panel. In addition, the SV02 Bus, Network Communication, and Hosted Payload have been integrated and the satellite is in initial power turn-on testing at the GPS III Processing facility.

The software has demonstrated stability and maturity, but the verification scripts for the Navigation Payload have been significantly delayed. The software has been demonstrated through numerous assembly, panel, and system level tests, including in environmental conditions. Test equipment and personnel resource contention with the MDU have slipped the planned completion of MDU software qualification to July 2015.

Currently, the gap between SV01 Launch and OCX Block 1 availability is 1-2 years based on an SV01 launch of September 2016. The first nine months for SV01 will be used for an extended checkout period using the Launch and Checkout Capability of OCX Block 0. After that, the directorate is working parallel paths to be able to operate the SV after checkout is complete providing a contingency operation capability if needed.

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

Threshold Breaches

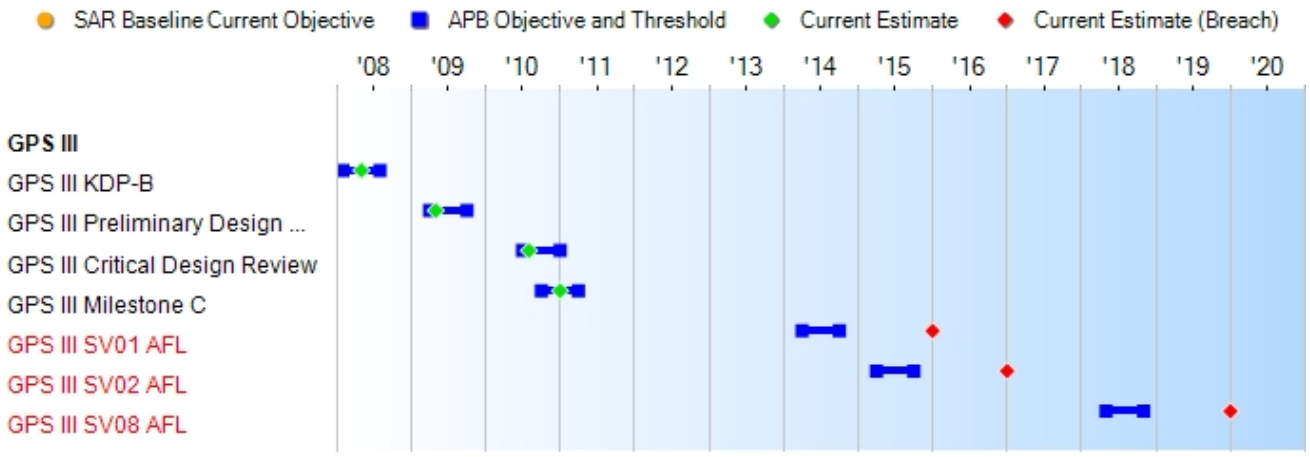
APB Breaches		
Schedule		☑
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

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

Explanation of Breach

The schedule breach was previously reported in the December 2013 SAR.

Schedule



Schedule Events				
Events	**SAR Baseline Production Estimate**	**Current APB Production Objective/Threshold**		**Current Estimate**
GPS III KDP-B	Feb 2008	Feb 2008	Aug 2008	May 2008
GPS III Preliminary Design Review	Apr 2009	Apr 2009	Oct 2009	May 2009
GPS III Critical Design Review	Jul 2010	Jul 2010	Jan 2011	Aug 2010
GPS III Milestone C	Oct 2010	Oct 2010	Apr 2011	Jan 2011
GPS III SV01 AFL	Apr 2014	Apr 2014	Oct 2014	**Jan 2016**[1]
GPS III SV02 AFL	Apr 2015	Apr 2015	Oct 2015	**Jan 2017**[1]
GPS III SV08 AFL	May 2018	May 2018	Nov 2018	**Jan 2020**[1] (Ch-1)

[1] *APB Breach*

Change Explanations

(Ch-1) The current estimate for GPS III SV08 AFL has changed from October 2019 to January 2020 to reflect the delivery plan for SV03-08 (one satellite delivered at six month intervals after the SV02 AFL).

Acronyms and Abbreviations

AFL - Available for Launch
GPS - Global Positioning System
KDP - Key Decision Point
SV - Space Vehicle

Performance

Performance Characteristics				
SAR Baseline Production Estimate	**Current APB Production Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Backward Compatibility				
All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers).	All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers).	All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers).	TBD	All modifications made to the existing GPS Space Segment and Control Segment shall allow continued operation of existing ICD-GPS-200 and 700, IS-GPS-705, and SS-GPS-001 compliant UE and continued operation of legacy receivers (to include Federal augmentation system receivers).
User Range Error (meters)				
.2	.2	1.1	TBD	1.0
Net-Ready				
The system must fully support execution of all joint operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations.	The system must fully support execution of all joint operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations.	The system must fully support execution of joint critical operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for transition to Net-Centric military operations.	TBD	The system must fully support execution of all joint operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations.
Satellite Availability				
0.984	0.984	0.984	TBD	0.984
Boosted Earth-Coverage M-Code Power (dBW)				
-148	-148	-153	TBD	-151.7
Minimum L1C Signal Power				
-157	-157	-157	TBD	-157
Position and Time Transfer Integrity (Probability of Misleading SIS Information)				
0.00000001	0.00000001	0.00001	TBD	0.00000001

Requirements Reference

Capability Development Document (CDD) for Increment A dated November 6, 2006

Change Explanations

None

Acronyms and Abbreviations

dBW - Decibel-watt
GPS - Global Positioning System
ICD - Interface Control Document
IS - Interface Specifications
M-Code - Military Code
SIS - Signal in Space
SS - System Specifications
UE - User Equipment

Track to Budget

General Notes

In December 2014, the Office of Management and Budget directed the DoD to establish a new space procurement appropriation as a five-year availability account. Beginning in FY 2016, Air Force major procurement funding formerly under appropriation 3020F (Missile Procurement, Air Force) BA 05 will now be under 3021F (Space Procurement, Air Force) BA 01. The FY 2016 PB justification books reflect the new 3021F appropriation, and the SARs for programs impacted by this new appropriation also reflect this change.

RDT&E

Appn		BA	PE		
Air Force	3600	07	0305265F		
	Project		**Name**		
	67A019		GPS IIIA	(Shared)	
Air Force	3600	04	0603421F		
	Project		**Name**		
	644993		GPS III Development		(Sunk)

Notes

The shared funding line includes funding for Space Vehicle (SV) 09+; beginning in FY 2008, however the SV09+ funds are not included in this SAR.

Procurement

Appn		BA	PE		
Air Force	3020	05	0305265F		
	Line Item		**Name**		
	GPSIII		GPS III Space Segment	(Shared)	(Sunk)
Air Force	3021	01	0305265F		
	Line Item		**Name**		
	GPSIII		GPS III Space Segment		

Notes

The shared funding line includes funding for SV09+ beginning in FY 2014 (long lead) which is not reported in this SAR.

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2010 $M			BY 2010 $M	TY $M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	2623.9	2623.9	2886.3	2885.6	2653.8	2653.8	2969.9
Procurement	1519.0	1519.0	1670.9	1576.5	1616.0	1616.0	1740.8
Flyaway	--	--	--	1276.0	--	--	1381.4
Recurring	--	--	--	1276.0	--	--	1381.4
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	300.5	--	--	359.4
Other Support	--	--	--	300.5	--	--	359.4
Initial Spares	--	--	--	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	4142.9	4142.9	N/A	4462.1	4269.8	4269.8	4710.7

Confidence Level

Confidence Level of cost estimate for current APB: 60%

The Milestone C Acquisition Program Baseline (APB) was established at the 60% confidence level. This estimate is built upon a product-oriented work breakdown structure, based on historical actual cost information to the maximum extent possible, and most importantly, based on conservative assumptions that are consistent with actual demonstrated contractor and government performance for a series of acquisition programs in which the Directorate has been successful.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	2	2	2
Procurement	6	6	6
Total	8	8	8

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	2528.2	207.0	119.4	28.5	17.7	27.2	14.8	27.1	2969.9
Procurement	1438.5	32.0	7.3	13.7	28.0	41.7	50.1	129.5	1740.8
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 2016 Total	3966.7	239.0	126.7	42.2	45.7	68.9	64.9	156.6	4710.7
PB 2015 Total	3986.9	181.8	43.0	38.3	28.8	21.5	23.2	181.0	4504.5
Delta	-20.2	57.2	83.7	3.9	16.9	47.4	41.7	-24.4	206.2

Quantity Summary										
FY 2016 President's Budget / December 2014 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	6	0	0	0	0	0	0	0	6
PB 2016 Total	2	6	0	0	0	0	0	0	0	8
PB 2015 Total	2	6	0	0	0	0	0	0	0	8
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding 3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	51.5
2003	--	--	--	--	--	--	39.7
2004	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	21.2
2006	--	--	--	--	--	--	51.4
2007	--	--	--	--	--	--	195.2
2008	--	--	--	--	--	--	189.6
2009	--	--	--	--	--	--	354.0
2010	--	--	--	--	--	--	386.2
2011	--	--	--	--	--	--	399.5
2012	--	--	--	--	--	--	409.8
2013	--	--	--	--	--	--	236.7
2014	--	--	--	--	--	--	193.4
2015	--	--	--	--	--	--	207.0
2016	--	--	--	--	--	--	119.4
2017	--	--	--	--	--	--	28.5
2018	--	--	--	--	--	--	17.7
2019	--	--	--	--	--	--	27.2
2020	--	--	--	--	--	--	14.8
2021	--	--	--	--	--	--	4.7
2022	--	--	--	--	--	--	4.8
2023	--	--	--	--	--	--	5.1
2024	--	--	--	--	--	--	5.4
2025	--	--	--	--	--	--	3.1
2026	--	--	--	--	--	--	2.0
2027	--	--	--	--	--	--	2.0
Subtotal	2	--	--	--	--	--	2969.9

Annual Funding 3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2002	--	--	--	--	--	--	60.1
2003	--	--	--	--	--	--	45.7
2004	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	23.2
2006	--	--	--	--	--	--	54.6
2007	--	--	--	--	--	--	202.0
2008	--	--	--	--	--	--	192.4
2009	--	--	--	--	--	--	354.5
2010	--	--	--	--	--	--	381.9
2011	--	--	--	--	--	--	387.7
2012	--	--	--	--	--	--	390.8
2013	--	--	--	--	--	--	221.9
2014	--	--	--	--	--	--	178.5
2015	--	--	--	--	--	--	188.7
2016	--	--	--	--	--	--	107.0
2017	--	--	--	--	--	--	25.1
2018	--	--	--	--	--	--	15.3
2019	--	--	--	--	--	--	23.0
2020	--	--	--	--	--	--	12.3
2021	--	--	--	--	--	--	3.8
2022	--	--	--	--	--	--	3.8
2023	--	--	--	--	--	--	4.0
2024	--	--	--	--	--	--	4.1
2025	--	--	--	--	--	--	2.3
2026	--	--	--	--	--	--	1.5
2027	--	--	--	--	--	--	1.4
Subtotal	2	--	--	--	--	--	2885.6

The RDT&E Air Force funding profile above represents funding for satellites 1 and 2 as displayed in the associated R-2A exhibit in the FY 2016 PB (R-1 Line #218).

Annual Funding 3020 | Procurement | Missile Procurement, Air Force							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2010	--	96.0	--	--	96.0	--	96.0
2011	--	--	--	--	--	--	--
2012	2	412.4	--	--	412.4	39.8	452.2
2013	2	459.2	--	--	459.2	33.1	492.3
2014	2	363.8	--	--	363.8	34.2	398.0
2015	--	--	--	--	--	32.0	32.0
Subtotal	6	1331.4	--	--	1331.4	139.1	1470.5

Annual Funding 3020 | Procurement | Missile Procurement, Air Force							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2010	--	94.0	--	--	94.0	--	94.0
2011	--	--	--	--	--	--	--
2012	2	389.1	--	--	389.1	37.5	426.6
2013	2	422.5	--	--	422.5	30.5	453.0
2014	2	329.4	--	--	329.4	31.0	360.4
2015	--	--	--	--	--	28.6	28.6
Subtotal	6	1235.0	--	--	1235.0	127.6	1362.6

The Missile Procurement Air Force (MPAF) funding profile above represents funding for Space Vehicles (SV) 03-08 as displayed in the associated P-5 exhibit in the FY 2016 PB. MPAF funds for SV09+ are excluded above, but are reflected in the assocated P-5 exhibit in the FY 2016 PB (P-1 Lines #17 and #18).

Cost Quantity Information 3020 | Procurement | Missile Procurement, Air Force		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2010 $M**
2010	--	--
2011	--	--
2012	2	417.0
2013	2	416.9
2014	2	416.9
2015	--	--
Subtotal	6	1250.8

Annual Funding 3021 | Procurement | Space Procurement, Air Force							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	1.7	--	--	1.7	5.6	7.3
2017	--	4.8	1.2	--	6.0	7.7	13.7
2018	--	6.2	3.7	--	9.9	18.1	28.0
2019	--	4.6	6.3	--	10.9	30.8	41.7
2020	--	1.5	7.8	--	9.3	40.8	50.1
2021	--	--	6.7	--	6.7	23.3	30.0
2022	--	--	4.1	--	4.1	24.4	28.5
2023	--	--	1.4	--	1.4	18.6	20.0
2024	--	--	--	--	--	6.0	6.0
2025	--	--	--	--	--	6.0	6.0
2026	--	--	--	--	--	6.0	6.0
2027	--	--	--	--	--	6.0	6.0
2028	--	--	--	--	--	6.0	6.0
2029	--	--	--	--	--	6.0	6.0
2030	--	--	--	--	--	6.0	6.0
2031	--	--	--	--	--	5.0	5.0
2032	--	--	--	--	--	3.0	3.0
2033	--	--	--	--	--	1.0	1.0
Subtotal	--	18.8	31.2	--	50.0	220.3	270.3

Annual Funding 3021 | Procurement | Space Procurement, Air Force							
Fiscal Year	Quantity	BY 2010 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	1.5	--	--	1.5	4.9	6.4
2017	--	4.1	1.0	--	5.1	6.7	11.8
2018	--	5.2	3.1	--	8.3	15.3	23.6
2019	--	3.8	5.2	--	9.0	25.5	34.5
2020	--	1.2	6.3	--	7.5	33.2	40.7
2021	--	--	5.3	--	5.3	18.6	23.9
2022	--	--	3.2	--	3.2	19.0	22.2
2023	--	--	1.1	--	1.1	14.2	15.3
2024	--	--	--	--	--	4.5	4.5
2025	--	--	--	--	--	4.4	4.4
2026	--	--	--	--	--	4.3	4.3
2027	--	--	--	--	--	4.2	4.2
2028	--	--	--	--	--	4.2	4.2
2029	--	--	--	--	--	4.1	4.1
2030	--	--	--	--	--	4.0	4.0
2031	--	--	--	--	--	3.3	3.3
2032	--	--	--	--	--	1.9	1.9
2033	--	--	--	--	--	0.6	0.6
Subtotal	--	15.8	25.2	--	41.0	172.9	213.9

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

None

Nuclear Costs

None

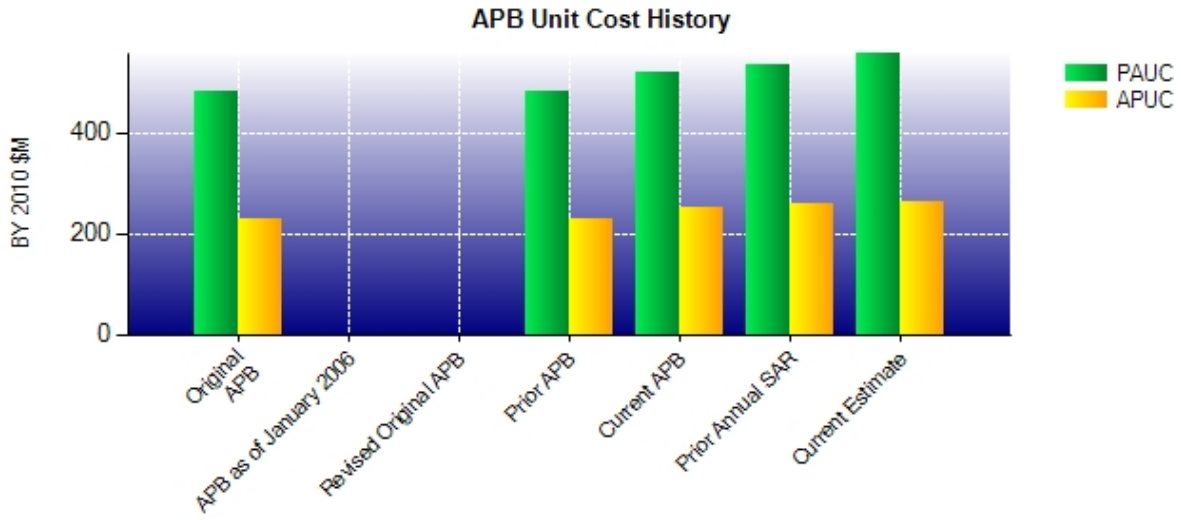
Unit Cost

Unit Cost Report

Item	BY 2010 $M Current UCR Baseline (Jan 2011 APB)	BY 2010 $M Current Estimate (Dec 2014 SAR)	% Change
Program Acquisition Unit Cost			
Cost	4142.9	4462.1	
Quantity	8	8	
Item	517.862	557.762	+7.70
Average Procurement Unit Cost			
Cost	1519.0	1576.5	
Quantity	6	6	
Unit Cost	253.167	262.750	+3.79

Item	BY 2010 $M Original UCR Baseline (May 2008 APB)	BY 2010 $M Current Estimate (Dec 2014 SAR)	% Change
Program Acquisition Unit Cost			
Cost	3840.8	4462.1	
Quantity	8	8	
Unit Cost	480.100	557.762	+16.18
Average Procurement Unit Cost			
Cost	1381.0	1576.5	
Quantity	6	6	
Unit Cost	230.167	262.750	+14.16

Unit Cost History



Item	Date	BY 2010 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	May 2008	480.100	230.167	500.288	248.383
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	May 2008	480.100	230.167	500.288	248.383
Current APB	Jan 2011	517.862	253.167	533.725	269.333
Prior Annual SAR	Dec 2013	533.750	257.950	563.062	286.083
Current Estimate	Dec 2014	557.762	262.750	588.838	290.133

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY $M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
500.288	-9.013	0.000	0.775	0.000	63.063	-9.513	-11.875	33.437	533.725

Current SAR Baseline to Current Estimate (TY $M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
533.725	5.112	0.000	0.000	0.000	4.575	0.000	45.426	55.113	588.838

Initial SAR Baseline to Current SAR Baseline (TY $M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
248.383	-6.450	0.000	1.033	0.000	54.933	-12.733	-15.833	20.950	269.333

Current SAR Baseline to Current Estimate (TY $M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
269.333	4.383	0.000	0.000	0.000	-44.150	0.000	60.567	20.800	290.133

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	Feb 2008	Feb 2008	May 2008
Milestone C	N/A	Sep 2009	Oct 2010	Jan 2011
IOC	N/A	N/A	N/A	N/A
Total Cost (TY $M)	N/A	4002.3	4269.8	4710.7
Total Quantity	N/A	8	8	8
PAUC	N/A	500.288	533.725	588.838

Cost Variance

Summary TY $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Production Estimate)	2653.8	1616.0	--	4269.8
Previous Changes				
Economic	+17.1	+33.2	--	+50.3
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+117.1	-260.8	--	-143.7
Other	--	--	--	--
Support	--	+328.1	--	+328.1
Subtotal	+134.2	+100.5	--	+234.7
Current Changes				
Economic	-2.5	-6.9	--	-9.4
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+184.4	-4.1	--	+180.3
Other	--	--	--	--
Support	--	+35.3	--	+35.3
Subtotal	+181.9	+24.3	--	+206.2
Adjustments	--	--	--	--
Total Changes	+316.1	+124.8	--	+440.9
CE - Cost Variance	2969.9	1740.8	--	4710.7
CE - Cost & Funding	2969.9	1740.8	--	4710.7

Summary BY 2010 $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Production Estimate)	2623.9	1519.0	--	4142.9
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+98.4	-236.0	--	-137.6
Other	--	--	--	--
Support	--	+264.7	--	+264.7
Subtotal	+98.4	+28.7	--	+127.1
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+163.3	-7.0	--	+156.3
Other	--	--	--	--
Support	--	+35.8	--	+35.8
Subtotal	+163.3	+28.8	--	+192.1
Adjustments	--	--	--	--
Total Changes	+261.7	+57.5	--	+319.2
CE - Cost Variance	2885.6	1576.5	--	4462.1
CE - Cost & Funding	2885.6	1576.5	--	4462.1

Previous Estimate: December 2013

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-2.5
Decrease due to transfer of funds to cover Small Business Innovation Research in FY 2014. (Estimating)	-4.6	-4.9
Increased cost for SV01 and SV02 development. (Estimating)	+147.1	+166.2
Increase for Contingency Operations. (Estimating)	+19.0	+21.2
Adjustment for current and prior escalation. (Estimating)	+1.8	+1.9
RDT&E Subtotal	+163.3	+181.9

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-6.9
Decrease due to transfer of Advance Procurement funds via Below Threshold Reprogramming to the Defense Meteorological Satellite Program. (Estimating)	-15.3	-16.2
Decrease due to reclassification of funds from flyaway to support. (Estimating)	-5.7	-6.4
Decrease in integration costs. (Estimating)	-15.7	-18.0
Increase in storage costs. (Estimating)	+26.6	+32.9
Support funds transferred from one procurement appropriation to another with the addition of appropriation 3021. The true net support total should be $35.1M which was an increase in direct support ($28.7) and reclassification of funds from flyway to support ($6.4M). (Subtotal)	-137.5	-185.2
Support funds transferred out of the 3020 procurement appropriation into the procurement appropriation 3021. (Support)	(-143.2)	(-191.6)
Increase due to reclassification of funds from flyway to support. (Support)	(+5.7)	(+6.4)
Adjustment for current and prior escalation. (Estimating)	+3.1	+3.6
Adjustment for current and prior escalation. (Support)	+0.4	+0.2
Support funds transferred into the 3021 procurement appropriation and out of the procurement appropriation 3020. (Support)	+172.9	+220.3
Procurement Subtotal	+28.8	+24.3

Contracts

Contract Identification

Appropriation: RDT&E
Contract Name: Global Positioning System (GPS) III (Development)
Contractor: Lockheed Martin Corporation
Contractor Location: Newtown, PA 18940
Contract Number: FA8807-08-C-0010
Contract Type: Cost Plus Incentive Fee (CPIF), Cost Plus Award Fee (CPAF)
Award Date: May 15, 2008
Definitization Date: May 15, 2008

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1249.1	N/A	2	1593.7	N/A	2	1847.6	1997.9

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional scope associated with the award of the GPS III Launch and Checkout Capability, associated information security upgrades, and additional costs as a result of immature technical requirements for parts and processes.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/26/2014)	-418.4	-38.6
Previous Cumulative Variances	-357.3	-37.6
Net Change	-61.1	-1.0

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to additional work by the Navigation Payload Element (NPE) Integrated Product Team (IPT), specifically the continued unplanned Mission Data Unit (MDU) and Transmitters rework. The bus IPT was also a significant driver due to unplanned effort in Transient Suppression Assembly (TSA) test and additional support needed for Solar Array Drive Assemblies Physical Configuration Audit. Test Information Sheets (TIS), Test Procedure (TP), test scripts, product development and risk reduction testing in Assembly, Integration and Test (AI&T) also contributed to the unfavorable cost variance.

The unfavorable net change in the schedule variance is due to Mission Data Unit (MDU) and transmitter issues in the Navigation Payload Element (NPE). Additional unfavorable schedule variance was caused by delayed launch processing in the Launch Operations Support IPT as the baseline plan supported the May 2014 launch date. The net unfavorable schedule variance masked favorable schedule recovery in the BUS area where several earth sensor assembly milestones were completed.

Contract Identification

Appropriation: Procurement
Contract Name: Global Positioning System (GPS) III (Production)
Contractor: Lockheed Martin Corporation
Contractor Location: Newtown, PA 18940
Contract Number: FA8807-08-C-0010/2
Contract Type: Cost Plus Incentive Fee (CPIF)
Award Date: May 15, 2008
Definitization Date: May 15, 2008

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
74.7	N/A	2	704.9	N/A	2	913.3	1030.9

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the addition of the SV05/06 and SV07/08 efforts.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/26/2014)	-74.9	-12.1
Previous Cumulative Variances	-20.6	-14.6
Net Change	-54.3	+2.5

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to the Navigation Payload Element (NPE) IPT's delay in material receipt, Assembly, Integration and Test (AI&T) IPT's material and hardware costs greater than the baseline plan, and the SV BUS Power Storage issue with the battery cell procurement at Eagle Pitcher. The net unfavorable variances masked positive schedule recovery in BUS from Electrical Power Subsystem (EPS) circuit board completion and favorable performance on hinges, structures and frangibolts.

The favorable net change in the schedule variance is due to the NPE IPT's Mission Data Unit (MDU) SMIL effort close out and SV03 Transmitter Circuit Card Assembly (CCA) and Rubidium Atomic Frequency Standards (RAFS) progress in addition to the early material receipt in NPE and COM IPT's.

Notes

The Estimated Price at Completion grew as a result of authorizing Space Vehicles 07/08.

Contract Identification

Appropriation: Procurement
Contract Name: GPS III Long Lead SV05-08
Contractor: Lockheed Martin Corporation
Contractor Location: Newtown, PA 18940
Contract Number: FA8807-13-C-0002
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: February 08, 2013
Definitization Date: February 08, 2013

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
119.5	142.4	4	119.5	142.4	4	119.6	119.7

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/26/2014)	+1.2	-4.3
Previous Cumulative Variances	+0.1	-3.1
Net Change	+1.1	-1.2

Cost and Schedule Variance Explanations

The favorable net change in the cost variance is due to the Exelis Navigation Payload Systems Engineering Integration and Test/Project Management (SEIT/PM) Support Equipment Area correcting Authority to Proceed (ATP) milestone payment plan billing and the recovery of material costs incurred in the bus Integrated Product Team.

The unfavorable net change in the schedule variance is due to Space Vehicle (SV)05 Rubidium Atomic Frequency Standard material and SV06 Triplexer, Diplexer and L3 Filter material being behind schedule.

Deliveries and Expenditures

Deliveries				
Delivered to Date	**Planned to Date**	**Actual to Date**	**Total Quantity**	**Percent Delivered**
Development	0	0	2	0.00%
Production	0	0	6	0.00%
Total Program Quantity Delivered	0	0	8	0.00%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	4710.7	Years Appropriated	14
Expended to Date	2999.7	Percent Years Appropriated	43.75%
Percent Expended	63.68%	Appropriated to Date	4205.7
Total Funding Years	32	Percent Appropriated	89.28%

The above data is current as of February 24, 2015.

The expenditures for GPS III grew slightly from the last approved SAR. This is because the SAR was erroneously reporting OCX expenditures. Before 2009, OCX and GPS III shared a PE (0603421F) and only a portion of those expenditures belong to GPS III.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:

Source of Estimate:

Quantity to Sustain:

Unit of Measure:

Service Life per Unit:

Fiscal Years in Service:

The GPS III program will provide O&S for on-orbit support through the Launch and On-Orbit Support (LOOS) contract. For Space Vehicle (SV)01 and SV02, this is funding using RDT&E (3600) dollars and for SV03-08, procurement funds (3020) will be used. These costs are captured in the cost and funding section of the SAR and will not appear here. The O&S responsibility for the control system will be accomplished through the GPS Logistics Directorate within the Next Generation Operational Control System (OCX).

Sustainment Strategy

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Antecedent Information

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Annual O&S Costs BY2010 $M		
Cost Element	**GPS III**	**No Antecedant (Antecedent)**
Unit-Level Manpower	--	--
Unit Operations	--	--
Maintenance	--	--
Sustaining Support	--	--
Continuing System Improvements	--	--
Indirect Support	--	--
Other	--	--
Total	--	--

Item	Total O&S Cost $M			
	GPS III			No Antecedant (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	N/A	N/A	N/A	N/A
Then Year	N/A	N/A	N/A	N/A

O&S Cost Variance

Category	BY 2010 $M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2013 SAR	0.0	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	0.0	
Current Estimate	0.0	

Disposal Estimate Details

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 2010 $M):