Selected Acquisition Report (SAR)

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

Global Positioning System III (GPS III)

As of FY 2020 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Sensitivity Originator

No originator info Available at this time.

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)
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

Program Information

Program Name
Global Positioning System III (GPS III)

DoD Component
Air Force

Responsible Office

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References

SAR Baseline (Production Estimate)

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

Approved APB

Air Force Acquisition Executive (AFAE) Approved Acquisition Program Baseline (APB) dated December 12, 2017

Mission and Description

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 IC program, is the next generation space vehicle (SV) that will provide significant enhancements to complete the modernization of the constellation. GPS III complies with section 2281 of title 10, United States Code, ensuring the continued sustainment and operation of GPS for military and civilian purposes, and section 50112 of title 51, USC, 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 JROC validated and endorsed the GPS III CDD for the first increment, validating the requirements for the GPS III program and authorized the Air Force to deliver SV01-SV08. In his February 27, 2015 ADM, the USD(AT&L) directed the procurement of SV09/10 as technical equivalents for SV01-08. Follow -on vehicles SV11+ will be procured in a separate ACAT IB program called GPS III Follow-On (GPS IIIF).

The primary GPS III missions are worldwide 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 anti-jam power to the earth coverage Military code signals and anti-exploitation techniques in order to prevent unauthorized use of the GPS PPS signal. In addition, the program will support the U.S. Nuclear Detonation Detection System mission for worldwide monitoring and detection of nuclear events via a hosted payload.

The GPS III program provides a Standard Positioning Service to a broad spectrum of civil users which will include the three civil signals (L1 C/A, L2C, and L5) flown on previous satellites. It will also transmit a new fourth 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 Quazi-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 user PNT solutions.

Executive Summary

Program Highlights Since Last Report

On August 10, 2018, the Air Force declared Space Vehicle (SV)02 Available for Launch (AFL), and is currently in process of preparing for a Summer 2019 launch. On August 21, 2018, the first Global Positioning System (GPS) III SV shipped from the Lockheed Martin facility in Littleton, CO to Astrotech in Titusville, FL. On December 23, 2018, SV01 was successfully launched aboard a Space Exploration Technologies Falcon 9 rocket.

The Mission Readiness Campaign (MRC) team completed Rehearsals 2 through 4 in 2018 and the Mission Dress Rehearsal which vigorously prepared the Launch and Checkout Capability for Launch and Early Orbit operations. In addition to the rehearsals, the MRC ran Mini-Events 9-10 and GPS III Cape Mission Readiness Test, passing 97/98 objectives. The team received Authority to Operate on October 2, 2018, established the GPS III Launch Freeze Charter for SV01-SV10, and championed the Space Segment Operational Configuration Control Board, which paved the way for of our first successful launch on December 23, 2018.

The Assembly, Integration & Test team completed major milestones. SV02 completed Passive Intermodulation / Electromagnetic Interference/Electromagnetic Compatibility in June 2018 and was declared AFL in August 2018; SV03 completed Thermal Vacuum (TVAC) testing in June 2018; SV04 completed TVAC in November 2018; SV05 was core mated in September 2018; SV06 Mission Data Unit was delivered and installed in September 2018. All subsequent production SVs are proceeding nominally.

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

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
November 2000	Global Positioning System (GPS) III-specific concepts were pursued through two 1-year GPS III System Architecture and Requirements Definition (SARD) contracts awarded to Boeing and Lockheed Martin on November 9, 2000.
January 2004	Following the SARD efforts, two competitive GPS III Phase A contracts were authorized. These contracts continued to mature the GPS III joint space and control segment concept.
January 2005	The Under Secretary of the Air Force, (SAF/US) directed that the GPS III control and space segments be contracted for separately to the "best of breed" industry partners for each segment, concurrently designating the program office as the integrator of the two segments.
February 2005	Pursuant to SAF/US direction, the program office released a Request for Information to assess the technical, programmatic, and contractual alternatives available for the control and space segment acquisitions. The program office determined that Boeing and Lockheed Martin were the only two viable space segment prime contractors and extended the Phase A contracts with Boeing and Lockheed Martin to conduct Payload Risk Reduction and System Definition, a Delta-System Requirements Review that concluded in November 2006, a System Design Review that concluded in April 2007, and Space Vehicle (SV) Risk Reduction and Systems Definition.
May 2008	The USD(AT&L) signed the GPS III APB and ADM, designating GPS III as an ACAT ID MDAP with approval to proceed into Phase B, preliminary design, and the authority to procure development SVs 01 -02. On May 15, 2008, the GPS III contract was awarded to Lockheed Martin, giving them authority to proceed.
October 2008	GPS III successfully completed its Integrated Baseline Review (IBR). The program implemented a comprehensive IBR process that validated the content, integrity and executability of the GPS III baseline, and ensured a low risk and high confidence execution.
May 2009	GPS III successfully completed its SV Preliminary Design Review (PDR). This significant milestone demonstrated that the technical baseline had been established, requirements were stable and allocated to the appropriate level, the requirements were under configuration control, and the preliminary design met all KPPs.
August 2010	As a result of the successful PDR completion, GPS III proceeded into its Critical Design Review (CDR) process which concluded with a successful SV CDR. This significant milestone demonstrated that the detailed design met all KPP requirements and was producible.
December 2010	In preparation for the Annual GPS Enterprise Review, GPS III successfully completed an Independent Program Assessment review, an Air Force Review Board, and an Overarching Integrated Product Team review.
January 2011	GPS III secured Milestone C approval and was authorized to begin long lead procurement. An ADM, an updated Acquisition Strategy Document and an updated APB were signed by the MDA authorizing the program to begin long lead procurement of production SV03-SV08.
January 2011	Initial indications of technical problems with the Navigation Payload led to the formation of the Mission Data Unit (MDU) Tiger Team.
February 2013	The SV01 BUS achieved Initial Power Turn-On and the team successfully completed a third simulation of GPS III Launch and Checkout System readiness exercise between GPS III and GPS Next Generation Operational Control System in August 2013.
December 2013	The GPS III program received permission from the MDA to exercise the current Cost Plus Incentive Fee/Award Fee contract options for SV05-08. The option for SV05-SV06 was awarded in December 2013, and the SV07-SV08 option was awarded in March 2014.

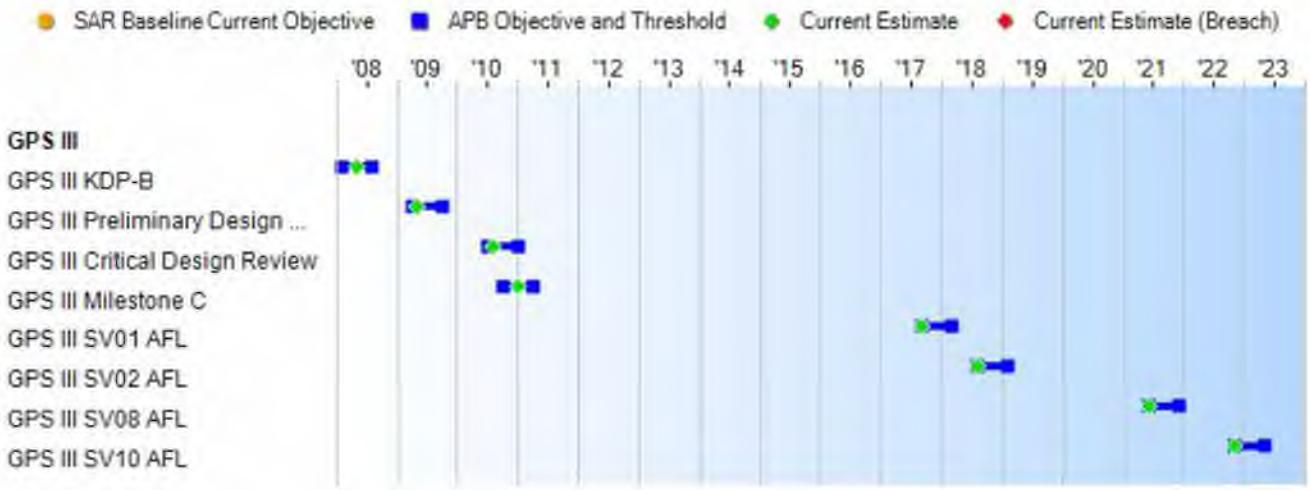
March 2014	The program addressed Navigation Payload MDU technical challenges associated with SV01, which impacted the GPS III contract cost and schedule baseline.
June 2014	The program approved Lockheed Martin to conduct an Over Target Baseline (OTB) for SVs 01-08. The OTB concluded in May 2015.
February 2015	USD(AT&L) signed an ADM approving the purchase of SV09-10 as technical equivalents to SV01-08.
March 2015	The GPS III prime contractor requested an OTB due to an invalid contract baseline. The Government completed OTB activities and the MDA approved a new contract baseline.
December 2015	SV01 successfully completed baseline Thermal Vacuum (TVAC) testing on December 23, 2015. This is a major system-level event. Significant confidence was gained in contractor design and workmanship based on TVAC testing, demonstrating the satellite can perform successfully in a space environment.
January 2016	USD(AT&L) signed the updated APB. This update to the original APB was due to both cost and schedule breaches. In addition, the revised APB added SV09-10 to the MDAP program of record.
November 2017	USD(AT&L) delegated the MDA for the program to the Secretary of the Air Force as an ACAT IC.
December 2017	The MDA signed the updated APB Change 2, approving new Available for Launch (AFL) dates for SVs 01, 02 and 08 due to a schedule breach and projected schedule deviations.
August 2018	SV02 declared AFL on August 10, 2018 with Initial Launch Capability projected for June 2019.
November 2018	SV01 declared Consent to Fuel on November 9, 2018 with scheduled launch date set for December 2018.
December 2018	SV01 successfully launched on the Space Exploration Technologies Falcon 9 from Cape Canaveral on December 23, 2018.

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

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	Sep 2017	Mar 2018	Sep 2017
GPS III SV02 AFL	Apr 2015	Aug 2018	Feb 2019	Aug 2018
GPS III SV08 AFL	May 2018	Jun 2021	Dec 2021	Jun 2021
GPS III SV10 AFL	N/A	Nov 2022	May 2023	Nov 2022

Change Explanations

None

Acronyms and Abbreviations

AFL - Available for Launch
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).	(T=O) 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	(T=O) 0.984	TBD	0.984
Boosted Earth-Coverage M-Code Power (dBW)				
-148	-148	-153	TBD	-151.7
Minimum L1C Signal Power				
-157	-157	(T=O) -157	TBD	-157
Position and Time Transfer Integrity (Probability of Misleading SIS Information)				
0.0000001	0.0000001	0.0001	TBD	0.00000001

Requirements Reference

CDD for Increment A dated November 6, 2006

Change Explanations

None

Notes

Demonstrated Performance for the Net Ready KPPs is TBD until it is verified with the completion of integrated system test 3-1 which verifies that OCX Block 1 can command and control legacy GPS II and new GPS III SVs. Estimated completion dates for the capabilities are as follows:

- Backward Compatibility and Satellite availability: Completed Second Quarter FY 2019
- Position Time Transfer and User Range Error: Second Quarter FY 2020
- Boosted Earth Coverage M-Code Power (dBW): Fourth Quarter FY 2020
- Minimum L1C Signal Power: Third Quarter FY 2022

Acronyms and Abbreviations

dBW - Decibel-watt
GPS - Global Positioning System
ICD - Interface Control Document
IS - Interface Specifications
M-Code - Military Code
O - Objective
OCX - Next Generation Operational Control System
SIS - Signal in Space
SS - System Specifications
SV - Space Vehicle
T - Threshold
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. Beginning in FY 2016, Air Force major procurement funding formerly under 3020F (Missile Procurement, Air Force) BA 05 will now be under 3021F (Space Procurement, Air Force) BA 01, a three-year procurement account.

RDT&E

Appn		BA	PE		
Air Force	3600	07	0305265F		
	Project		**Name**		
	67A019		GPS IIIA	(Shared)	(Sunk)
Air Force	3600	04	0603421F		
	Project		**Name**		
	644993		GPS III Development		(Sunk)
Air Force	3600	07	1203265F		
	Project		**Name**		
	67A019		GPS III	(Shared)	

Notes

The shared funding lines include funding for SV11+ however these 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	(Shared)	(Sunk)
Air Force	3021	01	1203265F		
	Line Item		**Name**		
	GPSIII		GPS III Space Segment	(Shared)	

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	2985.1	3283.6	2979.2	2653.8	3080.1	3076.5
Procurement	1519.0	2311.3	2542.4	1940.3	1616.0	2570.0	2138.0
Flyaway	--	--	--	1702.2	--	--	1860.6
Recurring	--	--	--	1701.6	--	--	1859.9
Non Recurring	--	--	--	0.6	--	--	0.7
Support	--	--	--	238.1	--	--	277.4
Other Support	--	--	--	238.1	--	--	277.4
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	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
Total	4142.9	5296.4	N/A	4919.5	4269.8	5650.1	5214.5

Current APB Cost Estimate Reference

SCP dated July 02, 2015

Cost Notes

If an Independent Cost Estimate, Component Cost Estimate, or Program Office Estimate has been completed for the program in the previous year, list any program risks identified in the estimates, the potential impacts of the risks on program cost, and approaches to mitigate the risks.

The January 9, 2019 PEO approved GPS III SV 01-10 Single Best Estimate (SBE) for the GPS program shows production at $2,278.5M. The uncertainty captured in the 2018 GPS III SV 01-10 SBE is based on schedule risk on Space Vehicles (SVs) 04-10 across Assembly Integration and Test, Thermal Vacuum, and Passive Inter Modulation testing balanced against lessons learned on SVs 01-03.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	2	2	2
Procurement	6	8	8
Total	8	10	10

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2020 President's Budget / December 2018 SAR (TY$ M)									
Appropriation	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
RDT&E	2985.7	33.4	24.0	7.1	7.3	7.5	7.6	3.9	3076.5
Procurement	1949.4	66.0	31.5	20.1	21.3	19.4	19.7	10.6	2138.0
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 2020 Total	4935.1	99.4	55.5	27.2	28.6	26.9	27.3	14.5	5214.5
PB 2019 Total	4937.5	102.4	96.0	64.6	67.2	84.5	21.0	37.6	5410.8
Delta	-2.4	-3.0	-40.5	-37.4	-38.6	-57.6	6.3	-23.1	-196.3

Quantity Summary										
FY 2020 President's Budget / December 2018 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Development	2	0	0	0	0	0	0	0	0	2
Production	0	8	0	0	0	0	0	0	0	8
PB 2020 Total	2	8	0	0	0	0	0	0	0	10
PB 2019 Total	2	8	0	0	0	0	0	0	0	10
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	--	--	--	--	--	--	189.8
2009	--	--	--	--	--	--	356.7
2010	--	--	--	--	--	--	390.6
2011	--	--	--	--	--	--	405.3
2012	--	--	--	--	--	--	399.6
2013	--	--	--	--	--	--	237.1
2014	--	--	--	--	--	--	193.3
2015	--	--	--	--	--	--	172.6
2016	--	--	--	--	--	--	101.3
2017	--	--	--	--	--	--	73.1
2018	--	--	--	--	--	--	107.3
2019	--	--	--	--	--	--	33.4
2020	--	--	--	--	--	--	24.0
2021	--	--	--	--	--	--	7.1
2022	--	--	--	--	--	--	7.3
2023	--	--	--	--	--	--	7.5
2024	--	--	--	--	--	--	7.6
2025	--	--	--	--	--	--	3.9
Subtotal	2	--	--	--	--	--	3076.5

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	--	--	--	--	--	--	192.6
2009	--	--	--	--	--	--	357.2
2010	--	--	--	--	--	--	386.3
2011	--	--	--	--	--	--	393.4
2012	--	--	--	--	--	--	381.2
2013	--	--	--	--	--	--	222.4
2014	--	--	--	--	--	--	178.8
2015	--	--	--	--	--	--	158.1
2016	--	--	--	--	--	--	91.4
2017	--	--	--	--	--	--	64.7
2018	--	--	--	--	--	--	92.9
2019	--	--	--	--	--	--	28.4
2020	--	--	--	--	--	--	20.0
2021	--	--	--	--	--	--	5.8
2022	--	--	--	--	--	--	5.8
2023	--	--	--	--	--	--	5.9
2024	--	--	--	--	--	--	5.8
2025	--	--	--	--	--	--	2.9
Subtotal	2	--	--	--	--	--	2979.2

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	413.1	--	--	413.1	39.0	452.1
2013	2	458.3	--	--	458.3	33.0	491.3
2014	2	417.5	--	--	417.5	31.8	449.3
2015	1	196.0	--	0.7	196.7	19.5	216.2
Subtotal	7	1580.9	--	0.7	1581.6	123.3	1704.9

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	390.0	--	--	390.0	36.8	426.8
2013	2	422.9	--	--	422.9	30.4	453.3
2014	2	379.6	--	--	379.6	29.0	408.6
2015	1	176.2	--	0.6	176.8	17.5	194.3
Subtotal	7	1462.7	--	0.6	1463.3	113.7	1577.0

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	417.9
2013	2	417.9
2014	2	417.8
2015	1	209.1
Subtotal	7	1462.7

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	161.9	--	--	161.9	10.9	172.8
2017	--	15.3	--	--	15.3	9.6	24.9
2018	--	23.6	--	--	23.6	23.2	46.8
2019	--	19.1	8.9	--	28.0	38.0	66.0
2020	--	6.2	8.8	--	15.0	16.5	31.5
2021	--	7.3	8.9	--	16.2	3.9	20.1
2022	--	4.5	4.5	--	9.0	12.3	21.3
2023	--	4.4	--	--	4.4	15.0	19.4
2024	--	5.6	--	--	5.6	14.1	19.7
2025	--	--	--	--	--	1.5	1.5
2026	--	--	--	--	--	1.3	1.3
2027	--	--	--	--	--	1.3	1.3
2028	--	--	--	--	--	1.3	1.3
2029	--	--	--	--	--	1.3	1.3
2030	--	--	--	--	--	1.3	1.3
2031	--	--	--	--	--	1.1	1.1
2032	--	--	--	--	--	0.8	0.8
2033	--	--	--	--	--	0.5	0.5
2034	--	--	--	--	--	0.2	0.2
Subtotal	1	247.9	31.1	--	279.0	154.1	433.1

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	143.0	--	--	143.0	9.6	152.6
2017	--	13.2	--	--	13.2	8.3	21.5
2018	--	19.9	--	--	19.9	19.6	39.5
2019	--	15.8	7.4	--	23.2	31.5	54.7
2020	--	5.0	7.1	--	12.1	13.5	25.6
2021	--	5.8	7.1	--	12.9	3.1	16.0
2022	--	3.5	3.5	--	7.0	9.6	16.6
2023	--	3.4	--	--	3.4	11.4	14.8
2024	--	4.2	--	--	4.2	10.6	14.8
2025	--	--	--	--	--	1.1	1.1
2026	--	--	--	--	--	0.9	0.9
2027	--	--	--	--	--	0.9	0.9
2028	--	--	--	--	--	0.9	0.9
2029	--	--	--	--	--	0.9	0.9
2030	--	--	--	--	--	0.9	0.9
2031	--	--	--	--	--	0.7	0.7
2032	--	--	--	--	--	0.5	0.5
2033	--	--	--	--	--	0.3	0.3
2034	--	--	--	--	--	0.1	0.1
Subtotal	1	213.8	25.1	--	238.9	124.4	363.3

Cost Quantity Information 3021 | Procurement | Space Procurement, Air Force		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2010 $M**
2016	1	213.8
2017	--	--
2018	--	--
2019	--	--
2020	--	--
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--
2028	--	--
2029	--	--
2030	--	--
2031	--	--
2032	--	--
2033	--	--
2034	--	--
Subtotal	1	213.8

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

None

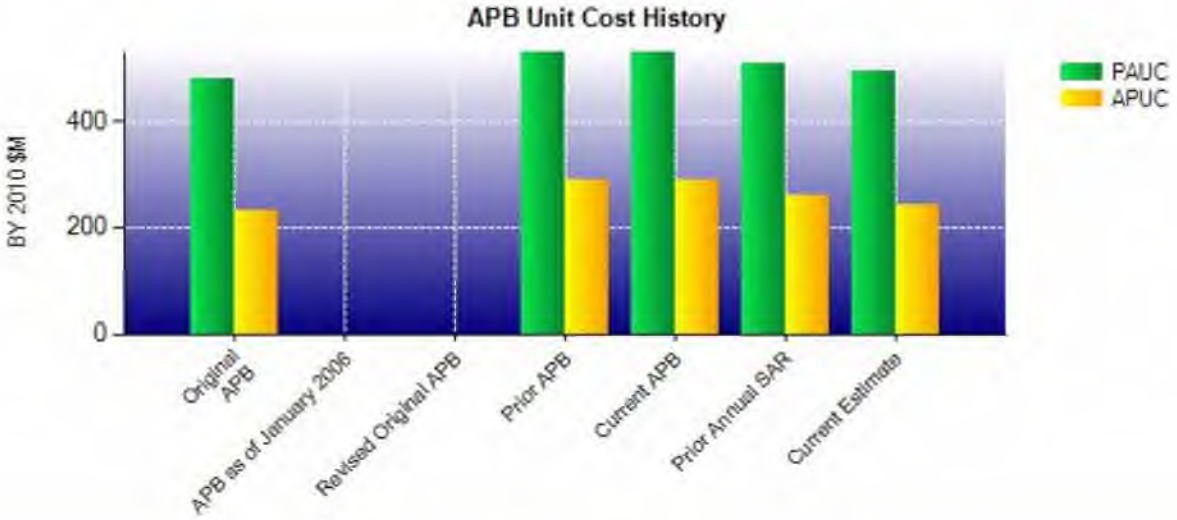
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 $M Current UCR Baseline (Dec 2017 APB)	BY 2010 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	5296.4	4919.5	
Quantity	10	10	
Unit Cost	529.640	491.950	-7.12
Average Procurement Unit Cost			
Cost	2311.3	1940.3	
Quantity	8	8	
Unit Cost	288.912	242.538	-16.05

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2010 $M Original UCR Baseline (May 2008 APB)	BY 2010 $M Current Estimate (Dec 2018 SAR)	% Change
Program Acquisition Unit Cost			
Cost	3840.8	4919.5	
Quantity	8	10	
Unit Cost	480.100	491.950	+2.47
Average Procurement Unit Cost			
Cost	1381.0	1940.3	
Quantity	6	8	
Unit Cost	230.167	242.538	+5.37



APB 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	Jan 2016	528.520	287.912	565.010	321.250
Current APB	Dec 2017	529.640	288.912	565.010	321.250
Prior Annual SAR	Dec 2017	507.950	261.900	541.080	291.212
Current Estimate	Dec 2018	491.950	242.538	521.450	267.250

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	3.560	-31.275	0.000	0.000	-12.680	0.000	28.120	-12.275	521.450

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	3.012	27.005	0.000	0.000	-67.250	0.000	35.150	-2.083	267.250

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	5214.5
Total Quantity	N/A	8	8	10
PAUC	N/A	500.288	533.725	521.450

Cost Variance

Summary TY $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	2653.8	1616.0	--	4269.8
Previous Changes				
Economic	+9.5	+18.1	--	+27.6
Quantity	--	+754.7	--	+754.7
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+417.8	-531.2	--	-113.4
Other	--	--	--	--
Support	--	+472.1	--	+472.1
Subtotal	+427.3	+713.7	--	+1141.0
Current Changes				
Economic	+2.0	+6.0	--	+8.0
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-6.6	-6.8	--	-13.4
Other	--	--	--	--
Support	--	-190.9	--	-190.9
Subtotal	-4.6	-191.7	--	-196.3
Total Changes	+422.7	+522.0	--	+944.7
CE - Cost Variance	3076.5	2138.0	--	5214.5
CE - Cost & Funding	3076.5	2138.0	--	5214.5

Summary BY 2010 $M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	2623.9	1519.0	--	4142.9
Previous Changes				
Economic	--	--	--	--
Quantity	--	+661.1	--	+661.1
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+360.4	-474.9	--	-114.5
Other	--	--	--	--
Support	--	+390.0	--	+390.0
Subtotal	+360.4	+576.2	--	+936.6
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-5.1	-3.0	--	-8.1
Other	--	--	--	--
Support	--	-151.9	--	-151.9
Subtotal	-5.1	-154.9	--	-160.0
Total Changes	+355.3	+421.3	--	+776.6
CE - Cost Variance	2979.2	1940.3	--	4919.5
CE - Cost & Funding	2979.2	1940.3	--	4919.5

Previous Estimate: December 2017

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+2.0
Revised estimate to reflect actuals. (Estimating)	-1.3	-1.5
Revised estimate due to higher AF priorities. (Estimating)	+1.7	+2.0
Revised estimate to match current Single Best Estimate dated January 9, 2019 for FY 2025 - FY 2029. (Estimating)	-5.4	-7.5
Revised estimate to align with FY 2020 PB. (Estimating)	+1.8	+2.4
Adjustment for current and prior escalation. (Estimating)	-1.3	-1.4
Revised estimate to reflect application of new outyear inflation. (Estimating)	-0.6	-0.6
RDT&E Subtotal	-5.1	-4.6

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+6.0
Correction of administrative error in FY 2017 SAR of misallocation of funds as Nonrecurring Flyaway funds. (Estimating)	-7.3	-8.7
Revised estimate due to increased funding for system integration. (Estimating)	+7.9	+9.1
Revised estimate due to reallocation of SV03 Storage shifting from FY 2018 to FY 2019 (Estimating)	-0.1	0.0
Reallocation from support to flyaway in FY 2016. (Estimating)	+15.8	+17.9
Reallocation of funds from GPS III to GPS IIIF in FY 2021 - FY 2024. (Estimating)	-16.3	-21.0
Reallocation due to higher Air Force priorities. (Estimating)	-13.7	-16.7
Revised estimate to reflect actuals. (Estimating)	+13.1	+15.5
Adjustment for current and prior escalation. (Estimating)	-1.9	-2.0
Revised estimate to reflect application of new outyear inflation (Missile Procurement, Air Force). (Estimating)	0.0	-0.3
Revised estimate to reflect application of new outyear inflation (Space Procurement, Air Force). (Estimating)	-0.5	-0.6
Adjustment for current and prior escalation. (Support)	-1.0	-1.2
Revised estimate due to a realignment of funding between GPS III and GPS IIIF (-106.3M), reduction due to higher Air Force priorities (-22.6M), Reallocation of funding from support to flyaway (-17.9M), and a reduction in GPS support costs (-2.8M). (Support)	-150.9	-190.0
Increase in Other Support to reflect application of new outyear inflation (Missile Procurement, Air Force). (Support)	0.0	+0.3
Procurement Subtotal	-154.9	-191.7

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: Global Positioning System (GPS) III (Production)
Contractor: Lockheed Martin Space Systems Denver
Contractor Location: Littleton, CO 80125
Contract Number: FA8807-08-C-0010/2
Contract Type: Cost Plus Incentive Fee (CPIF), Cost Plus Award Fee (CPAF)
Award Date: December 23, 2010
Definitization Date: December 23, 2010

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	1164.7	N/A	8	1678.8	1706.1

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 Space Vehicles (SV) 05-06, 07-08 and 09-10; Launch Schedule Extension (LSE); and Lithium Ion (Li-Ion) battery technology conversion for SV07 and installation for SV09-10.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/27/2019)	+18.2	-72.8
Previous Cumulative Variances	+35.0	-83.7
Net Change	-16.8	+10.9

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Scalable Power Regulation Unit overruns, procurement of additional materials (SV09-10), LSE, and inefficiencies in manufacturing.

The favorable net change in the schedule variance is due to completion of SV03 and SV04 Thermal Vacuum Testing (TVAC), completion of SV03 Post Environment System Performance Test, core mate of SV05, and completion of Subcontractor's milestones.

Notes

The Contractor's Estimated Price at Completion increased due to award of the Li-Ion battery technology into SV07, SV09 and SV10, the Contractor's Forward Pricing Rate impacts, SV05 TVAC growth, and Earth Deck Antenna Assembly risk realization.

The Program Manager's Estimated Price at Completion decreased due to a favorable Schedule Risk Assessment.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	1	1	2	50.00%
Production	0	0	8	0.00%
Total Program Quantity Delivered	1	1	10	10.00%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	5214.5	Years Appropriated	18
Expended to Date	4295.5	Percent Years Appropriated	54.55%
Percent Expended	82.38%	Appropriated to Date	5034.5
Total Funding Years	33	Percent Appropriated	96.55%

The above data is current as of March 11, 2019.

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 contract. For Space Vehicle (SV)01 and SV02, this is funded with RDT&E, Air Force (AF) and for SV03-10, it is funded with Space Procurement, AF. 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.

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	0.0	0.0	N/A	N/A
Then Year	0.0	N/A	N/A	0.0

O&S Cost Variance

Category	BY 2010 $M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2017 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):