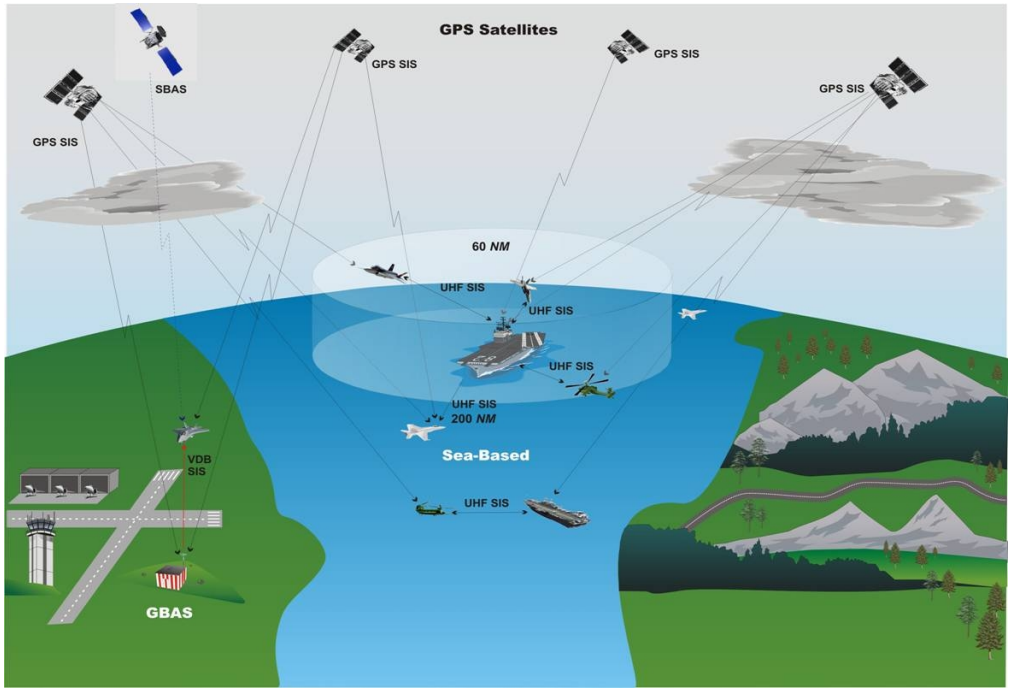
Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-238



Joint Precision Approach and Landing System Increment 1A (JPALS Inc 1A)

As of FY 2017 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

Joint Precision Approach and Landing System Increment 1A (JPALS Inc 1A)

DoD Component

Navy

Responsible Office

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References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 19, 2008

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 19, 2008

Mission and Description

Precision approach and landing is a critical enabler for joint, coalition, combined, and inter-agency aviation assets to complete approaches and landings in limited visibility conditions. Today, the DoD relies heavily on a more expeditionary and agile joint force, which in turn places increased emphasis on aviation assets for deployment, employment, sustainment, and redeployment. To be readily available to the Joint Force Commander (JFC), aviation assets need to be able to operate into and out of all civil and military air facilities (airfields, landing areas, and air capable ships at sea) across the range of military operations in a fully automatic landing (auto-land) mode. A key to joint operational success is the ability of aviation assets to land anywhere, at any time. However, a standard precision approach and landing system with auto-land capability does not exist for joint forces, nor is there a standard system to fully support unmanned aircraft Precision Approach and Landing Capability (PALC) requirements.

Joint Precision Approach and Landing System (JPALS), in conjunction with the F-35B/C program, will provide precision guidance in support of coupled flight to 200 feet height above touchdown for the F-35B to Amphibious Assault (LH) type ships and precision guidance in support of auto-land for the F-35C and RAQ-25 to Nuclear Aircraft Carriers (CVN). JPALS will also support the F-35B/C and RAQ-25 interim PALC.

When delivered, the JPALS program will secure the minimum acceptable capability to support the joint military requirement and safeguard the future PALC requirements of any JPALS-equipped aircraft (e.g., F-35B/C and RAQ-25) during operations at sea in virtually any weather condition within platform limitations. These enhancements will support the JFC's vital sea-based combat capabilities across a broad range of military operations in an uncertain future.

JPALS is a Global Positioning System-based precision approach and landing system that will function in more operational environments, and support all DoD sea-based applications. The National Defense Strategy of the United States of America calls for highly mobile forces that can rapidly respond to crises worldwide. Success in meeting this challenge requires the ability to land aviation assets virtually anywhere, at any time. JPALS will provide this capability by being rapidly deployable, survivable, and interoperable with U.S. allies. JPALS will support manned and unmanned aircraft and will be able to operate during restricted emission control conditions.

Executive Summary

As reported in the December 2014 SAR, on January 28, 2014, the JPALS Inc 1A PM submitted a Program Deviation Report on a likely critical Nunn-McCurdy cost breach. On March 19, 2014, the Secretary of the Navy notified Congress and the USD(AT&L) of the critical breach. Subsequently, USD(AT&L) initiated a Nunn-McCurdy review of the program, which resulted in certification of the restructured JPALS program on June 15, 2014. Accordingly, the July 2008 JPALS Milestone B decision was rescinded. The Navy was directed to continue auto-land trade studies and risk reduction efforts through third quarter FY 2016, develop a draft Technical Data Package (TDP) for the JPALS ship system (previously known as Increment 1A), complete Developmental Test (DT) with a Letter of Observation (LOO) from the Commander, Operational Test Force (COTF), and return to the Defense Acquisition Board (DAB) for Milestone B approval for the restructured JPALS program not later than third quarter FY 2016.

DT was completed and a LOO was signed by COTF on December 22, 2015; a draft TDP is scheduled for delivery in second quarter FY 2016. The auto-land trade studies were completed, with the results defining the path forward to meet the auto-land requirements for manned and unmanned air vehicles. All JPALS ship system requirements have been developed, and a successful Government led System Requirements Review 1 and 2 was completed in March 2015. A Systems Functional Review (SFR) was conducted in November 2015. Remaining risk reduction trade studies to further refine the system's technical design are on track to complete in time to support the JPALS Preliminary Design Review (PDR) scheduled for second quarter FY 2016.

In support of the Nunn-McCurdy ADM and in preparation for returning to the DAB for Milestone B approval, a contract extension was awarded July 2015 to the existing EMD contract to enable the program to continue with requirements derivation and system development through PDR. The program completed a successful Navy Gate 4 Review in June 2015, followed by an Overarching Integrated Product Team (OIPT) review with Deputy Assistant Secretary of Defense (Tactical Warfare Systems) in July 2015. The Navy Gate 5 Review with Assistant Secretary, Navy (Research Development & Acquisition) was conducted October 26, 2015, followed by the DAB Readiness Meeting (DRM) on October 29, 2015. USD (AT&L) conducted a JPALS Development Request for Proposal (RFP) Release Decision Point (DRRDP) DAB review on November 4, 2015, resulting in a signed ADM authorizing the release of the EMD RFP, which was released on November 23, 2015.

In anticipation of the post Milestone B contract for EMD, the program is on schedule for the planned Milestone B decision in third quarter FY 2016.

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	Critical
	APUC	Critical
Original UCR Baseline		
	PAUC	Critical
	APUC	Critical

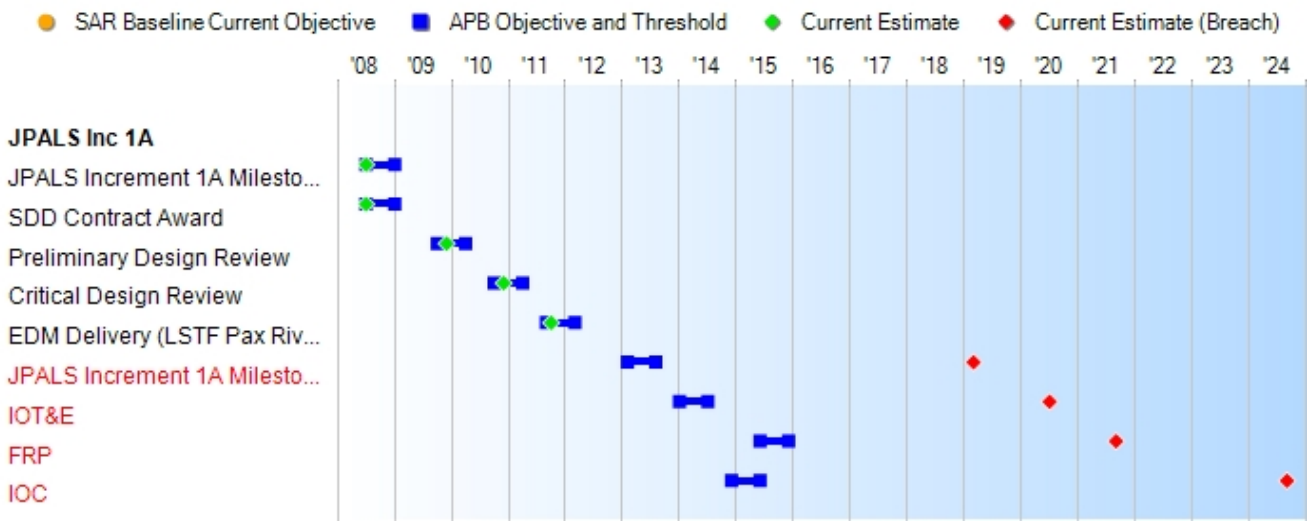
Explanation of Breach

The schedule breach, RDT&E and procurement cost breaches, and Nunn-McCurdy unit cost breaches were previously reported in the December 2013 SAR.

As previously reported in the December 2013 SAR, JPALS Inc 1A experienced critical Nunn-McCurdy breaches. The June 2014 Nunn-McCurdy ADM certified the restructured JPALS program in lieu of termination. A revised APB for the restructured JPALS program will be approved in conjunction with Milestone B approval by the third quarter of FY 2016.

As previously reported in the December 2014 SAR, the O&S cost breach occurred as a result of the updated O&S cost estimate.

Schedule



Schedule Events				
Events	**SAR Baseline Development Estimate**	**Current APB Development Objective/Threshold**		**Current Estimate**
JPALS Increment 1A Milestone B	Jul 2008	Jul 2008	Jan 2009	Jul 2008
SDD Contract Award	Jul 2008	Jul 2008	Jan 2009	Jul 2008
Preliminary Design Review	Oct 2009	Oct 2009	Apr 2010	Dec 2009
Critical Design Review	Oct 2010	Oct 2010	Apr 2011	Dec 2010
EDM Delivery (LSTF Pax River)	Sep 2011	Sep 2011	Mar 2012	Oct 2011
JPALS Increment 1A Milestone C	Feb 2013	Feb 2013	Aug 2013	**Mar 2019**[1]
IOT&E	Jan 2014	Jan 2014	Jul 2014	**Jul 2020**[1]
FRP	Jun 2015	Jun 2015	Dec 2015	**Sep 2021**[1]
IOC	Dec 2014	Dec 2014	Jun 2015	**Sep 2024**[1]

[1] *APB Breach*

Change Explanations

None

Acronyms and Abbreviations

EDM - Engineering Development Model
IOT&E - Initial Operational Test and Evaluation
JPALS - Joint Precision Approach and Landing System
LSTF - Landing Systems Test Facility
Pax - Patuxent
SDD - System Development and Demonstration

Performance

Performance Characteristics				
SAR Baseline Development Estimate	**Current APB Development Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Network Ready: The system must support Net-Centric military operations. The system must be able to enter and be managed in the network, and exchange data in a secure manner to enhance mission effectiveness. The system must continuously provide survivable, interoperable, secure, and operationally effective information exchanges to enable a Net-Centric military capability.				
The system must fully support execution of operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services, 4) IA requirements including availability, integrity, authenticat-ion, confidential-ity, and nonrepudiat-ion, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; mission critical performance and IA attributes; data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	The system must fully support execution of operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services, 4) IA requirements including availability, integrity, authenticat-ion, confidential-ity, and nonrepudiat-ion, and issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; mission critical performance and IA attributes; data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	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 to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services, 4) IA requirements including availability, integrity, authenticat-ion, confidential-ity, and nonrepudiat-ion, and issuance of an IATO by the (DAA), and 5) Operationally effective information exchanges; mission critical performance and IA attributes; data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated	TBD	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 to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1, 2) DISR mandated GIG KIPs identified in the KIP declaration table, 3) NCOW RM Enterprise Services, 4) IA requirements including availability, integrity, authentica-tion, confidential-ity, and nonrepudiati-on, and issuance of an IATO by the (DAA), and 5) Operationally effective information exchanges; mission critical performance and IA attributes; data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated

		architecture views.		architecture views.
Guidance Quality				
Certification for operations in 0 ft ceiling and 0 NM visibility conditions.	Certification for operations in 0 ft ceiling and 0 NM visibility conditions.	Sufficient quality to allow the Service to certify the sea-based system for use in 200 ft ceiling and ½ NM visibility weather conditions.	Coupled approaches to the deck were demonstrated at -sea with test aircraft under test conditions.	Meeting Threshold with margin. Sufficient quality to allow the Service to certify the sea-based system for use in 200 ft ceiling and ½ NM visibility weather conditions.
Manpower				
Should reduce current manning levels when currently fielded systems are phased out. Should require no dedicated personnel. Should be reduced to no more than one qualified air traffic controller.	Should reduce current manning levels when currently fielded systems are phased out. Should require no dedicated personnel. Should be reduced to no more than one qualified air traffic controller.	The total number of dedicated maintenance and/or logistics personnel needed to support Sea-Based JPALS per shift shall be no more than one person. The number of qualified final controller positions per shift on CVN/LH ship classes shall be no more than two air traffic controllers.	TBD	Current manning level
Operational Availability (Ao) in Clear Air				
JPALS Ao requirement in clear air for manned aircraft to 200 ft - ½ NM mins should be at least 99.7%.	JPALS Ao requirement in clear air for manned aircraft to 200 ft - ½ NM mins should be at least 99.7%.	JPALS Ao requirement in clear air for manned aircraft to 200 ft - ½ NM mins shall be at least 99.0%.	TBD	99.1%

Requirements Reference

Capability Development Document (CDD) dated March 16, 2007

Change Explanations

None

Acronyms and Abbreviations

Ao - Operational Availability
ATO - Approval to Operate
CVN - Nuclear Aircraft Carrier
DAA - Designated Approval Authority
DISR - DOD Information Technology Standards and Profile Registry
ft - feet
GIG - Global Information Grid
IA - Information Assurance
IATO - Interim Approval to Operate
IT - Information Technology
KIP - Key Interface Profile
LH - Amphibious Assault Ship
mins - minimums
NCOW RM - Net Centric Operations and Warfare Reference Model
NM - Nautical Mile
TV - Technical Standards View

Track to Budget

RDT&E

Appn	BA	PE
Navy 1319	04	0603860N

Project	Name
2329	JPALS

Procurement

Appn	BA	PE
Navy 1810	02	0305014N

Line Item	Name
2867	Joint Precision Approach and Landing System

Appn	BA	PE
Navy 1810	08	0305014N

Line Item	Name	
9020	Spares and Repair Parts	(Shared)

MILCON

Appn	BA	PE
Navy 1205	01	0805376N

Project	Name	
P977	Facilities Restoration and Modification - RDT&E	(Sunk)

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2008 $M			BY 2008 $M	TY $M		
	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Development Estimate	Current APB Development Objective	Current Estimate
RDT&E	753.7	753.7	829.1	**1299.4**[1]	781.4	781.4	1433.3
Procurement	202.9	202.9	223.0	**418.1**[1]	243.7	243.7	540.1
Flyaway	--	--	--	317.3	--	--	409.0
Recurring	--	--	--	317.3	--	--	409.0
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	100.8	--	--	131.1
Other Support	--	--	--	83.8	--	--	108.9
Initial Spares	--	--	--	17.0	--	--	22.2
MILCON	6.6	6.6	7.3	6.6	6.8	6.8	6.8
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	963.2	963.2	N/A	1724.1	1031.9	1031.9	1980.2

[1] ***APB Breach***

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	12	12	10
Procurement	25	25	17
Total	37	37	27

Quantity Notes

Unit of Measure: The physical architecture of Joint Precision Approach and Landing System (JPALS) consists of multiple equipment racks, processing equipment, sensors, radios, and antennas.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	849.9	81.5	104.1	105.0	102.6	50.7	39.0	100.5	1433.3
Procurement	0.0	0.0	0.0	0.0	58.7	69.1	70.4	341.9	540.1
MILCON	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2017 Total	856.7	81.5	104.1	105.0	161.3	119.8	109.4	442.4	1980.2
PB 2016 Total	854.1	91.5	76.4	28.7	60.5	70.5	91.4	325.1	1598.2
Delta	2.6	-10.0	27.7	76.3	100.8	49.3	18.0	117.3	382.0

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	10	0	0	0	0	0	0	0	0	10
Production	0	0	0	0	0	4	3	3	7	17
PB 2017 Total	10	0	0	0	0	4	3	3	7	27
PB 2016 Total	10	0	0	0	0	2	3	3	9	27
Delta	0	0	0	0	0	2	0	0	-2	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	--	--	--	7.4
2002	--	--	--	--	--	--	13.2
2003	--	--	--	--	--	--	15.3
2004	--	--	--	--	--	--	17.7
2005	--	--	--	--	--	--	25.9
2006	--	--	--	--	--	--	32.4
2007	--	--	--	--	--	--	36.0
2008	--	--	--	--	--	--	66.7
2009	--	--	--	--	--	--	74.1
2010	--	--	--	--	--	--	134.5
2011	--	--	--	--	--	--	118.8
2012	--	--	--	--	--	--	64.0
2013	--	--	--	--	--	--	75.5
2014	--	--	--	--	--	--	126.8
2015	--	--	--	--	--	--	41.6
2016	--	--	--	--	--	--	81.5
2017	--	--	--	--	--	--	104.1
2018	--	--	--	--	--	--	105.0
2019	--	--	--	--	--	--	102.6
2020	--	--	--	--	--	--	50.7
2021	--	--	--	--	--	--	39.0
2022	--	--	--	--	--	--	27.6
2023	--	--	--	--	--	--	19.8
2024	--	--	--	--	--	--	20.8
2025	--	--	--	--	--	--	15.4
2026	--	--	--	--	--	--	16.9
Subtotal	10	--	--	--	--	--	1433.3

Annual Funding 1319 | RDT&E | Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2008 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	--	--	--	8.5
2002	--	--	--	--	--	--	15.0
2003	--	--	--	--	--	--	17.2
2004	--	--	--	--	--	--	19.3
2005	--	--	--	--	--	--	27.6
2006	--	--	--	--	--	--	33.4
2007	--	--	--	--	--	--	36.3
2008	--	--	--	--	--	--	66.0
2009	--	--	--	--	--	--	72.4
2010	--	--	--	--	--	--	129.5
2011	--	--	--	--	--	--	111.7
2012	--	--	--	--	--	--	59.2
2013	--	--	--	--	--	--	69.1
2014	--	--	--	--	--	--	114.4
2015	--	--	--	--	--	--	37.1
2016	--	--	--	--	--	--	71.5
2017	--	--	--	--	--	--	89.6
2018	--	--	--	--	--	--	88.7
2019	--	--	--	--	--	--	85.0
2020	--	--	--	--	--	--	41.2
2021	--	--	--	--	--	--	31.0
2022	--	--	--	--	--	--	21.5
2023	--	--	--	--	--	--	15.1
2024	--	--	--	--	--	--	15.6
2025	--	--	--	--	--	--	11.3
2026	--	--	--	--	--	--	12.2
Subtotal	10	--	--	--	--	--	1299.4

Annual Funding 1810 | Procurement | Other Procurement, Navy							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2019	4	46.3	--	--	46.3	12.4	58.7
2020	3	55.7	--	--	55.7	13.4	69.1
2021	3	56.8	--	--	56.8	13.6	70.4
2022	4	91.9	--	--	91.9	30.4	122.3
2023	3	90.1	--	--	90.1	30.0	120.1
2024	--	51.6	--	--	51.6	14.2	65.8
2025	--	16.6	--	--	16.6	3.8	20.4
2026	--	--	--	--	--	13.3	13.3
Subtotal	17	409.0	--	--	409.0	131.1	540.1

Annual Funding 1810 | Procurement | Other Procurement, Navy							
Fiscal Year	Quantity	BY 2008 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2019	4	38.0	--	--	38.0	10.2	48.2
2020	3	44.8	--	--	44.8	10.8	55.6
2021	3	44.8	--	--	44.8	10.7	55.5
2022	4	71.0	--	--	71.0	23.5	94.5
2023	3	68.3	--	--	68.3	22.7	91.0
2024	--	38.3	--	--	38.3	10.6	48.9
2025	--	12.1	--	--	12.1	2.8	14.9
2026	--	--	--	--	--	9.5	9.5
Subtotal	17	317.3	--	--	317.3	100.8	418.1

Cost Quantity Information 1810 | Procurement | Other Procurement, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2008 $M**
2019	4	78.3
2020	3	44.8
2021	3	44.8
2022	4	81.1
2023	3	68.3
2024	--	--
2025	--	--
2026	--	--
Subtotal	17	317.3

Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**TY $M**
	Total Program
2008	6.8
Subtotal	6.8

Annual Funding 1205 | MILCON | Military Construction, Navy and Marine Corps	
Fiscal Year	**BY 2008 $M**
	Total Program
2008	6.6
Subtotal	6.6

Low Rate Initial Production

There is no LRIP for this program.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost $M	Description
United Kingdom	6/1/2012	1	3.9	This is a technical services case.

Notes

There is a technical services case with the United Kingdom (UK) which has been extended through the end of December 2016 to allow for the exchange of technical information and services for both the AN/SPN-41 instrument carrier landing system and the JPALS ship system. This technical service case also allows further discussions between the U.S. and UK in support of a JPALS procurement decision. There are no Technology Security/Foreign Disclosure issues related to the technical services case with the UK.

Nuclear Costs

None

Unit Cost

Unit Cost Report

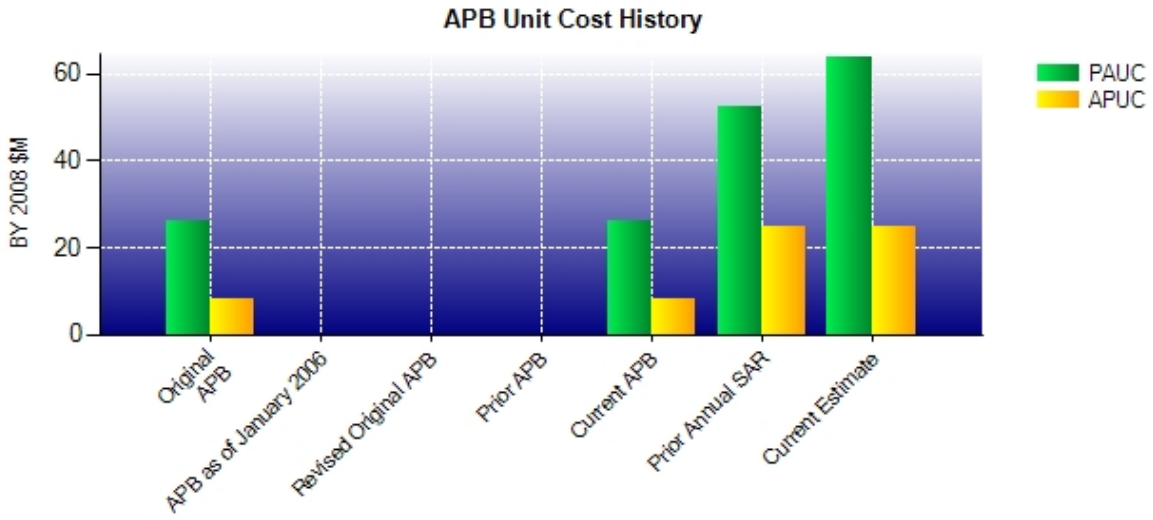
Item	BY 2008 $M Current UCR Baseline (Dec 2008 APB)	BY 2008 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	963.2	1724.1	
Quantity	37	27	
Unit Cost	26.032	63.856	+145.30[1]
Average Procurement Unit Cost			
Cost	202.9	418.1	
Quantity	25	17	
Unit Cost	8.116	24.594	+203.03[1]

Item	BY 2008 $M Original UCR Baseline (Dec 2008 APB)	BY 2008 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	963.2	1724.1	
Quantity	37	27	
Unit Cost	26.032	63.856	+145.30[1]
Average Procurement Unit Cost			
Cost	202.9	418.1	
Quantity	25	17	
Unit Cost	8.116	24.594	+203.03[1]

[1] *Nunn-McCurdy Breach*

JPALS Inc 1A previously reported critical Nunn-McCurdy breaches and provided detailed Unit Cost reporting in the December 2013 SAR. The Department certified a restructured program to Congress on June 15, 2014. This section will be updated when an APB is approved at Milestone B.

Unit Cost History



Item	Date	BY 2008 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Dec 2008	26.032	8.116	27.889	9.748
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	N/A	N/A	N/A	N/A	N/A
Current APB	Dec 2008	26.032	8.116	27.889	9.748
Prior Annual SAR	Dec 2014	52.237	24.865	59.193	32.324
Current Estimate	Dec 2015	63.856	24.594	73.341	31.771

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY $M)									
Initial PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
27.889	-0.659	7.878	9.881	8.148	17.441	0.000	2.763	45.452	73.341

Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
9.748	-0.871	1.018	1.412	0.000	16.076	0.000	4.388	22.023	31.771

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	Jul 2008	N/A	Jul 2008
Milestone C	N/A	Feb 2013	N/A	Mar 2019
IOC	N/A	Dec 2014	N/A	Sep 2024
Total Cost (TY $M)	N/A	1031.9	N/A	1980.2
Total Quantity	N/A	37	N/A	27
PAUC	N/A	27.889	N/A	73.341

Cost Variance

Summary TY $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	781.4	243.7	6.8	1031.9
Previous Changes				
Economic	-1.2	-10.3	--	-11.5
Quantity	-5.5	-60.7	--	-66.2
Schedule	+242.8	+28.6	--	+271.4
Engineering	+220.0	--	--	+220.0
Estimating	-195.6	+273.0	--	+77.4
Other	--	--	--	--
Support	--	+75.2	--	+75.2
Subtotal	+260.5	+305.8	--	+566.3
Current Changes				
Economic	-1.8	-4.5	--	-6.3
Quantity	--	--	--	--
Schedule	--	-4.6	--	-4.6
Engineering	--	--	--	--
Estimating	+393.2	+0.3	--	+393.5
Other	--	--	--	--
Support	--	-0.6	--	-0.6
Subtotal	+391.4	-9.4	--	+382.0
Total Changes	+651.9	+296.4	--	+948.3
CE - Cost Variance	1433.3	540.1	6.8	1980.2
CE - Cost & Funding	1433.3	540.1	6.8	1980.2

Summary BY 2008 $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Development Estimate)	753.7	202.9	6.6	963.2
Previous Changes				
Economic	--	--	--	--
Quantity	-5.1	-49.1	--	-54.2
Schedule	+214.5	+7.8	--	+222.3
Engineering	+191.6	--	--	+191.6
Estimating	-173.6	+208.6	--	+35.0
Other	--	--	--	--
Support	--	+52.5	--	+52.5
Subtotal	+227.4	+219.8	--	+447.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+318.3	-3.9	--	+314.4
Other	--	--	--	--
Support	--	-0.7	--	-0.7
Subtotal	+318.3	-4.6	--	+313.7
Total Changes	+545.7	+215.2	--	+760.9
CE - Cost Variance	1299.4	418.1	6.6	1724.1
CE - Cost & Funding	1299.4	418.1	6.6	1724.1

Previous Estimate: December 2014

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-1.8
Revised estimate to meet post Nunn-McCurdy certification. (Estimating)	+329.4	+406.3
Revised estimate to reflect prior year actuals. (Estimating)	+2.7	+2.9
Revised estimate due to Congressional budget adjustments. (Estimating)	-8.7	-10.0
Revised estimate due to Service level budget adjustments. (Estimating)	-6.1	-7.1
Adjustment for current and prior escalation. (Estimating)	+1.0	+1.1
RDT&E Subtotal	+318.3	+391.4

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-4.5
Acceleration of procurement buy-profile shifting two systems to FY 2019 from FY 2023 and FY 2024. (Schedule)	0.0	-4.6
Revised estimate based on government staffing plan updates. (Estimating)	-3.9	+0.3
Decrease in Other Support due to training estimate changes. (Support)	-0.6	-0.9
Increase in Initial Spares due to Service level budget adjustments. (Support)	-0.1	+0.3
Procurement Subtotal	-4.6	-9.4

Contracts

Contract Identification

Appropriation: RDT&E
Contract Name: JPALS Development Contract
Contractor: Raytheon Company
Contractor Location: 1801 Hughes Drive
Fullerton, CA 92833-2200
Contract Number: N00019-08-C-0034
Contract Type: Cost Plus Award Fee (CPAF), Cost Plus Incentive Fee (CPIF), Firm Fixed Price (FFP)
Award Date: September 15, 2008
Definitization Date: September 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
232.8	N/A	12	427.1	N/A	10	424.4	427.1

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to EMD contract completion and the Phase I 19-month and 11-month JPALS Inc 1A EMD contract extensions being awarded for risk reduction activities in support of manned and unmanned auto-land capability improvements. There was also a Technical Incentive Fee payout of $6.3M and a cost overrun of $1.3M.

Current Contract Price includes all CLINs. This includes FFP CLIN for proposal costs, award fee and schedule incentive payout out on separate CLINs, travel costs CLIN, and separate CLINs for the integration work and availability in Jamming.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2015)	-28.2	-0.8
Previous Cumulative Variances	-27.0	+0.2
Net Change	-1.2	-1.0

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to additional unplanned work developing the navigational sensor for the Global Positioning System/Intertial Navigation System and unplanned work upgrading from Windows 7 to Windows 10. Conversion from old Integrated Data Environment system to new system was complex with the inclusion of the subcontractor's system. Software efforts added to the cost variance with more rework than planned.

The unfavorable net change in the schedule variance is due to Systems Engineering requiring additional time to complete a planned trade study than originally estimated. Training was required for new resources for Technical Publications.

Notes

This contract is more than 90% complete; therefore, this is the final report for this contract.

Deliveries and Expenditures

Deliveries				
Delivered to Date	**Planned to Date**	**Actual to Date**	**Total Quantity**	**Percent Delivered**
Development	8	8	10	80.00%
Production	0	0	17	0.00%
Total Program Quantity Delivered	8	8	27	29.63%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	1980.2	Years Appropriated	16
Expended to Date	855.1	Percent Years Appropriated	61.54%
Percent Expended	43.18%	Appropriated to Date	938.2
Total Funding Years	26	Percent Appropriated	47.38%

The above data is current as of February 09, 2016.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	December 31, 2015
Source of Estimate:	POE
Quantity to Sustain:	25
Unit of Measure:	System
Service Life per Unit:	20.00 Years
Fiscal Years in Service:	FY 2020 - FY 2046

The December 2015 SAR estimate is for all JPALS ship systems and a single Naval Air Technical Training Center (NATTC) trainer from FY2020 - FY2046 with a system service life assumed to end in 2046. The service life is expected to be at least 20 years with no end of life defined at this time. The ramp up period is from FY2020-FY2026 with the last certification scheduled for FY2026.

The sustainment quantity of 25 systems is based on the 17 productions systems funded by Other Procurement, Navy (OPN); 2 of the development systems funded by Research, Development, Test, & Evaluation (RDT&E); and 6 systems being procured by the Naval Sea Systems command (NAVSEA) funded by Shipbuilding and Conversion, Navy (SCN). The JPALS Inc 1A program office is not responsible for the acquisition of the NAVSEA units and not included in the Deliveries and Expenditures section, but is responsible for the sustainment of these units. Eight of the developmental units are considered test assets and therefore not explicitly identified in the O&S estimate.

JPALS Systems: 24 Nuclear Aircraft Carriers (CVN)/Amphibious Assault (LH) Class Ships and 1 NATTC Trainer
Life Cycle Cost Estimate: 20 years after the last install/certification
Total Operating Years: 608 years
Annual Operation Tempo: 4,000 hours per ship and 3,500 hours for NATTC
No sundown period or disposal costs planned

Sustainment Strategy

The program is pre-Milestone B as a result of June 2014 Nunn-McCurdy decision. The program is scheduled for Milestone B in the third quarter of FY 2016.

The sustainment strategy is being analyzed. The current estimate assumes a 2-level Organizational - Depot (O-D) maintenace concept. The O-D maintenance concept will be evaluated during two planned Business Case Analysis addressing the Software Support Activity and Depot Source of Repair. Maintenance is based on a historical average of 4,000 annual operating hours for every ship beginning in the year of installation or certification and utilizes the predicted reliability and maintainabilty rates. Sustaining Engineering has been identified in the In-Service Engineering Activity support plan. The JPALS system is expected to be removed from a decommissioned ship and installed on a similar new type ship. The decommissioned schedule is based on a 50 year service life of the ship. Hardware and software improvements are based on comparable system historical percentages.

Antecedent Information

The antecedent system associated with this estimate is the AN/SPN-46(V)3. Legacy systems continue to experience service life adjustments and system modification that make Total O&S Costs compilation in a static service life (e.g., 25 years) to be not credible. In addition, the capture of O&S data in available reporting systems has changed significantly

over time. The Visibility and Management of Operating and Support Costs database, the Navy's official system for collecting and reporting O&S costs, provides costs from 1997-present. The cost data for platforms in existence prior to 1997 is either unavailable or incomplete. Sufficient historical data and resources do not exist to create comparable, credible Total O&S Costs.

The AN/SPN-46(V)3 is an analogous system to the JPALS system with the Precision Approach Landing Capability (PALC) Roadmap decision. The AN/SPN-46(V)3 will remain in service on the ships as the landing system for legacy aircraft.

Annual O&S Costs BY2008 $M		
Cost Element	**JPALS Inc 1A Average Annual Cost Per System**	**AN/SPN-46(V)3 (Antecedent) Average Annual Cost Per System**
Unit-Level Manpower	0.000	0.716
Unit Operations	0.000	0.000
Maintenance	0.524	0.051
Sustaining Support	0.203	0.027
Continuing System Improvements	0.131	0.408
Indirect Support	0.000	0.000
Other	0.000	0.000
Total	0.858	1.202

Item	Total O&S Cost $M			
	JPALS Inc 1A			AN/SPN-46(V)3 (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	338.6	372.5	**521.8**[1]	0.0
Then Year	520.6	N/A	867.8	N/A

[1] *APB O&S Cost Breach*

The O&S cost estimate has been updated to reflect quantity, schedule, and scope changes as a result of the Nunn-McCurdy process. The O&S estimate will be updated for Milestone B to reflect quantity, schedule, and scope changes to reflect the Technical and Programmatic Baseline following the JPALS Engineering Technical Assurance Board review in January 2016.

Equation to Translate Annual Cost to Total Cost

JPALS Average Annual Unit O&S Cost * 608 operating system years = Total JPALS O&S Cost

The unitized costs are based on the 608 operating years. This is the cumulative total of the systems operating through FY2046. $521.7 = $0.858 * 608 operating years. The small delta between this calculated value and the total O&S cost shown is due to rounding. The unitized costs include the NATTC unit, OPN ships, and SCN ships.

O&S Cost Variance

Category	BY 2008 $M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2014 SAR	512.0	
Programmatic/Planning Factors	-2.7	Ship schedule updates and 2016 Inflation Indices
Cost Estimating Methodology	0.0	
Cost Data Update	12.5	Updates to simulator annual cost and repair pricing changes
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	9.8	
Current Estimate	521.8	

The O&S Cost Variances are due to ship schedule updates, annual simulator costs, and repair pricing changes.

Disposal Estimate Details

Date of Estimate:

Source of Estimate:

Disposal/Demilitarization Total Cost (BY 2008 $M):

Disposal costs have not been identified at this time.