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By kempr on Apr 24, 2023

Department of Defense  
OFFICE OF PREPUBLICATION AND SECURITY REVIEW

## Selected Acquisition Report (SAR)



## Paladin Integrated Management (PIM)

FY 2024 President's Budget

Defense Acquisition Visibility Environment  
(DAVE)

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## Common Acronyms and Abbreviations

\$B - Billions of Dollars  
\$K - Thousands of Dollars  
\$M - Millions of Dollars  
ACAT - Acquisition Category  
Acq O&M - Acquisition-Related Operations and Maintenance  
ADM - Acquisition Decision Memorandum  
APB - Acquisition Program Baseline  
APPN - Appropriation  
APUC - Average Procurement Unit Cost  
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  
FMS - Foreign Military Sales  
FOC - Full Operational Capability  
FRP - Full Rate Production  
FY - Fiscal Year  
FYDP - Future Years Defense Program  
ICE - Independent Cost Estimate  
Inc - Increment  
IOC - Initial Operational Capability  
JROC - Joint Requirements Oversight Council  
KPP - Key Performance Parameter  
LRIP - Low Rate Initial Production  
MDA - Milestone Decision Authority  
MDAP - Major Defense Acquisition Program  
MILCON - Military Construction  
N/A - Not Applicable  
O&M - Operations and Maintenance  
O&S - Operating and Support  
ORD - Operational Requirements Document  
OSD - Office of the Secretary of Defense  
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  
U.S. - United States  
UCR - Unit Cost Reporting  
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)  
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

## Program Information

### Program Name

Paladin Integrated Management

### DoD Component

Army

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## Responsible Office

## Program Manager

**Name:** COL Bonnette, Freeman T.

**Phone:** (586) 282-5630

**Email:** -freeman.t.bonnette.mil@army.mil

## **Mission and Description**

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## Executive Summary

### PIM

#### Program Highlights Since Last Report

FY 2024 President's Budget (PB) funding is adequate to meet cost, schedule and performance objectives. Full Rate Production was approved February 5, 2020. As of December 31, 2022, 8 units and 1 Army Pre-positioned Stock (APS) set have been fielded. Program total RDTE and Procurement quantities delivered are 225 of 691 weapon systems; making the program 32.6% delivered. Program expenditures to date are \$3,966M of \$11,167M; making the program 35.5% expended. 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
Feb - 2020	Army Acquisition Executive signed Acquisition Decision Memorandum (ADM) approving Full Rate Production (FRP) and procurement to the Army Acquisition Objective (AAO).
Dec - 2019	Army Acquisition Executive (AAE) signed ADM extending Low Rate Initial Production (LRIP); contract option exercised for 48 additional weapon systems.
Oct - 2018	Achieved Initial Operational Capability.
Sep - 2018	AAE signed ADM extending LRIP to procure up to 60 additional weapon systems.
Mar - 2018	Completed Initial Operational Testing.
Apr - 2017	Army Acquisition Executive signed ADM extending LRIP; authorizing 48 additional weapon systems.
Sep - 2015	Program delegated from OSD to Secretary of Army and designated ACAT IC.
Oct - 2013	Achieved Milestone C, LRIP contract awarded.
Oct - 2012	Completed Limited User Testing.
Jun - 2011	PIM designated ACAT ID.
Jun - 2007	Start of the M109A7 Family of Vehicles (PIM) acquisition program.

## Schedule

### PIM

Events	Milestone Baseline Objective	Current Baseline Objective/Threshold		Current Estimate/Actual	Deviation
Developmental Test Start Complete	May 2011	May 2011	May 2011	May 2011	
Milestone C Complete	Oct 2013	Oct 2013	Oct 2013	Oct 2013	
First Production Delivery Complete	Jun 2015	Mar 2015	Mar 2015	Mar 2015	
Operational Test Start Complete	Jun 2016	Oct 2016	Oct 2016	Oct 2016	
IOC Complete	Apr 2017	Oct 2018	Oct 2018	Oct 2018	

First Unit Equipped Complete	Jan 2017	Oct 2018	Oct 2018	Oct 2018	
Full Rate Production Complete	Jan 2017	Feb 2020	Feb 2020	Jan 2020	
FOC Complete	Mar 2020	Sep 2033	Mar 2034	Mar 2034	

**Notes****Deviation Explanation**



## Performance

### PIM

Performance Characteristics					
Milestone Baseline	Current Baseline Objective/Threshold	Demonstrated Performance	Current Estimate/Actual	Deviation	
<b>(KPP) - KPP 1: Net-Ready: The capability, system and/or service must support Net-Centric military operations by providing sufficient SWaP capacity to integrate information and communication systems to ensure C2 and SA. The capability, system and/or service must b</b>					
	This data has been marked as FOUO and has been removed	This data has been marked as FOUO and has been removed	Threshold achieved.	The program estimates that it will continue to achieve the Threshold requirement.	
<b>(KPP) - KPP 4: Digital Fire Control System (DFCS)</b>					
	This data has been marked as FOUO and has been removed	This data has been marked as FOUO and has been removed	Threshold achieved.	The program estimates that it will continue to achieve theThreshold requirement.	
<b>(KPP) - KPP 5: Range</b>					
	This data has been marked as FOUO and has been removed	This data has been marked as FOUO and has been removed	Threshold achieved.	The program estimates that it will continue to achieve theThreshold requirement.	
<b>(KPP) - KPP 6: Howitzer Reliability</b>					

	<p>This data has been marked as FOUO and has been removed</p>	<p>This data has been marked as FOUO and has been removed</p>	<p>Threshold not achieved at IOT.</p>	<p>Based on the last completed test (IOT), the threshold was not achieved, with a DOT&amp;E score of 65% per the DOT&amp;E Initial Operational Test and Evaluation 2 Report, July 16, 2018. The M109A7 fell short of its reliability requirements due to M109A6 legacy components that were not part of the current increment of the M109A7 FOV acquisition strategy. The program continues to improve reliability with the implementation of the breech reliability phase 2 upgraded components.</p>	
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**(KPP) - KPP 7: Howitzer Availability (Materiel Availability / Operational Availability)**

	<p>This data has been marked as FOUO and has been removed</p>	<p>This data has been marked as FOUO and has been removed</p>	<p>Based on the last completed test (IOT), the threshold was achieved for Ao, with a DOT&amp;E score of Ao 92.6% per the DOT&amp;E Initial Operational Test and Evaluation 2 Report, July 16, 2018. DOT&amp;E did not report an Am score as 3 years of fielding data is preferred to provide an accurate Am score.</p>	<p>The program estimates that availability will improve through implementation of breech reliability phase 2 upgraded components.</p>	
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**(KPP) - KPP 8: Carrier Ammunition Tracked Reliability**

	This data has been marked as FOUO and has been removed	This data has been marked as FOUO and has been removed	Threshold achieved at IOT with a DOT&E score of 97% per the DOT&E Initial Operational Test and Evaluation 2 Report, July 16, 2018.	The program estimates that it will continue to achieve theThreshold requirement.	
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**(KPP) - KPP 9: Carrier Ammunition Tracked Availability (Materiel Availability / Operational Availability)**

	This data has been marked as FOUO and has been removed	This data has been marked as FOUO and has been removed	Threshold achieved at IOT with a DOT&E score of Ao 95.6% per the DOT&E Initial Operational Test and Evaluation 2 Report, July 16, 2018. DOT&E did not report an Am score as 3years of fielding data is preferred to provide an accurate Am score.	The program estimates that it will continue to achieve theThreshold requirement.	
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**Requirement Reference**

Validated:

CPD v5.1 approved November 30, 2016.

**Deviation Explanation**

No deviations for this program/subprogram

**Notes**

All 29 Technical Performance Measures have been met with KPP6 and KPP7 being closed in accordance with ATEC Memo "Closure of Reliability Condition for the M109A7 Self-Propelled Howitzer" dated 13 April 2020.

## Acquisition Budget Estimate

PIM

### Total Acquisition Cost

		Milestone APB	Current Baseline		Budget Estimate PB 2024		
Category	Base Year	Objective (BY\$M)	Objective (BY\$M)	Threshold (BY\$M)	BY\$M	TY\$M	Deviation
RDT&E	2013	1,084.3	1,075.1	1,182.6	1,075.4	1,085.6	
Procurement	2013	5,759.3	7,500.6	8,250.7	7,950.7	10,074.3	
MILCON	2013	0	0	0			
Acq. O&M	2013	0	30.9	34.0	5.8	6.7	
<b>Total</b>		<b>6,843.6</b>	<b>8,606.6</b>		<b>9,031.9</b>	<b>11,166.6</b>	
PAUC	2013	12.265	12.455	13.701	13.071	16.160	
APUC	2013	10.358	10.886	11.975	11.539	14.622	

### Appropriation Category Deviation Explanations

### PAUC Deviation Explanation

### APUC Deviation Explanation

### Budget Notes

APUC and PAUC increased ~2% since the 2021 SAR due primarily to the procurement buy profile stretching out to align with the FY 2024 PB.

### *Total End Item Quantity*

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	2	2
Procurement	689	689
O&M-Acquired		

### Quantity Notes

**Unit Cost****PIM**

<b>Current UCR Baseline and Current Estimate (Base-Year Dollars)</b>			
<b>Category (\$M) Base Year:2013</b>	<b>Current UCR Baseline</b>	<b>Current Estimate</b>	<b>% Change</b>
<b>Program Acquisition Unit Cost</b>			
Cost	8,606.6	9,031.9	
Quantity	691	691	
Unit Cost	12.455	13.071	4.94%
<b>Average Procurement Unit Cost</b>			
Cost	7,500.6	7,950.7	
Quantity	689	689	
Unit Cost	10.886	11.539	6.00%
<b>Original UCR Baseline and Current Estimate (Base-Year Dollars)</b>			
<b>Category (\$M) Base Year:2011</b>	<b>Original UCR Baseline</b>	<b>Current Estimate</b>	<b>% Change</b>
<b>Program Acquisition Unit Cost</b>			
Cost	6,641.0	8,658.2	
Quantity	582	691	
Unit Cost	11.411	12.530	9.81%
<b>Average Procurement Unit Cost</b>			
Cost	5,640.1	7,611.5	
Quantity	580	689	
Unit Cost	9.724	11.047	13.61%
<b>Cost Growth Details</b>			
<b>Current Baseline PAUC Breach Explanation</b>			
<b>Current Baseline APUC Breach Explanation</b>			
<b>Original Baseline PAUC Breach Explanation</b>			
<b>Original Baseline APUC Breach Explanation</b>			
<b>Impacts of Schedule Changes on Unit Cost</b>			
<b>Impacts of Performance Changes on Unit Cost</b>			
<b>Actions Taken or Proposed to Control Future Cost Growth</b>			

*Risk and Sensitivity Analysis*

**PIM**

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<b>Risk and Sensitivity Analysis</b>
<b>Current Procurement Cost(December 2022)</b>
The M109A7 FoV current estimate, based on 689 weapon systems, reflects various time-phasing and budget adjustments; PAUC and APUC remain within 5% and 6%, respectively, of the Current UCR Baseline.
<b>Original Baseline Estimate (March - 2012)</b>
Original Baseline APUC based on quantity of 580 PIM weapon systems. Varying quantity will likely cause fluctuations in APUC.
<b>Current Baseline Estimate (March - 2020)</b>

Schedule Risk		
Current	2022-12-31	Electronic components continue to be the production pacing item due to supply challenges.
FRP	2020-02-05	Demonstration of production rate capability, while maintaining quality, to support fielding schedule.
FRP	2020-02-05	If production inefficiencies are not addressed, then future production costs may be higher.
MS C	2013-10-21	Industrial base risk of meeting Engine Minimum Sustainment Rate.
Technical Risks		

## Low Rate Initial Production

### PIM

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	10/21/2013	12/12/2019
Approved Quantity	67	223
Reference	Milestone C ADM	Extended LRIP ADM
Start Year	2014	2014
End Year	2017	2020

#### Rationale if quantity exceeds 10% of the total number of articles to be procured:

The Current Total LRIP Quantity is more than 10% of the total production quantity as authorized in the Milestone C ADM to provide adequate test assets to complete all required tests and to provide a gradual ramp-up to FRP.

#### Notes

The Current Total LRIP Approved Quantity buy of 175 PIM systems includes two RDT&E-funded LRIP systems procured in FY 2014 for Full Up System Live Fire Testing and 173 Procurement-funded PIM systems.



**Contracts & Efforts**

Contract Data	
Contract Number	W56HZV-17-C-0001
Effort Number	
Modification Number	
Award Date	
Definitization Date	12/21/2017
Order Number	
CAGE Code/CAGE Legal Name	/
Contract Title	FY17-FY20 M109A7 M992A3 Production
Contract Address	York, PA
Contracting Office	
Supported Phase	Production
Contract Strategy	
Contract Type	Fixed-Price Incentive (Firm Target)
Modification Date	
Work Start Date	
Technical Data Rights	
Work Completed	65.13%

**Contracts/Effort Price, Quantity, and Performance (TY\$M)**

Initial Target Price	Current Target Price	
\$557.3	\$1,928.1	
Initial Ceiling Price	Current Ceiling Price	
\$585.4	\$1,795.4	
Contractor EAC	PM EAC	
\$1,754.2	\$1,753	
Initial Quantity	Current Quantity	Delivered Quantity
96	488	325
BAC	BCWP	ACWP
\$1,666	\$1,085.1	\$1,141.8

BCWS	Cost Variance	Schedule Variance
\$1,099.5	-\$56.6	-\$14.4

**Contract Notes:****Factors Contributing to Cost Variance and Projected Effects on Program Costs**

Cost and Schedule Variance reporting is not required on this (FPIF) contract. The difference between the Initial Contract Price Target and the Current Contract Price Target is due to Award of FY 2019 Production December 2019 (planned 48 weapon systems) and FY 2020 Production March 2020 (planned 48 weapon systems). The Target Price includes data for all exercised FPIF and Cost Plus Fixed Fee Contract Line Items (CLIN), however, the contract Ceiling Price represents only FPIF CLINs. Contract quantities are tracked by vehicle rather than weapon systems.

**Factors Contributing to Schedule Variance and Projected Effects on Program Schedule**

**External Government Activities**

Activity Title		Government Entity		Supported Phase
PIM FRP				Production
CAGE		Work Start Date	42828	
City	York	State/Province:	PA	
Notes				

## Deliveries and Expenditures

### PIM

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	2	100.00%
Production	225	223	223	100.00%
<b>Total Program Quantity Delivered</b>	<b>227</b>	<b>225</b>	<b>225</b>	<b>100.00%</b>

### Expended and Appropriated (TY \$M)

Years Appropriated to date: 16

Total Years Appropriated Funding (Current Baseline): 27

Percent Years Appropriated: 59.26%

Then-Year Funding Appropriated as Percentage of Total Acquisition Estimate: 48.48%

Then-Year Funding Expended as Percentage of Total Acquisition Estimate: 35.58%

Total Acquisition Cost: 11,166.6

Deliveries & Expenditures Notes:

## Operating and Support Costs

### PIM

#### *O&S Cost Breakdown:*

Category (BY\$ Million)	PIM
Unit-Level Manpower	8,889.6
Unit Operations	1,472.9
Maintenance	2,435.3
Sustaining Support	2,157.9
Continued System Improvements	1,052.9
Other	
<b>Total</b>	<b>16,008.6</b>

#### Cost Estimate Source:

#### O&S Cost Notes:

Operating and Support Cost Estimate source: Program Office Estimate dated February 13, 2023.

Total Program O&S Cost Compared with Baseline					
	Current Baseline				
	Objective (BY\$M)	Threshold (BY\$M)	Current Estimate (BY\$M)	Current Estimate (TY\$M)	Deviation
<b>Total O&amp;S</b>	19,006	20,906.6	16,008.6		

Note:

O&S Current Then Year Cost Estimate is \$28,678.2M (could not save update in DAVE).

#### O&S Cost Deviation Explanation

***Operating and Support Costs - Disposal and Unitized Costs*****PIM****Annual Unitized O&S Cost Definition and Calculation Relative to Total O&S Cost:**

PIM Total O&S Cost = Average Annual O&S Cost Per System x Number of Systems x EUL = \$0.893635M x 689systems x 26 years = \$16,008.6M (BY 2013 \$M)

Sustainment Factors	System Name: PIM	Antecedent System Name: M109A6 Paladin / M992A2 FAASV
Quantity to Sustain	689	556
Unit of Measure	PIM weapon system or vehicle set (1 M109A7 Self-Propelled Howitzer + 1 M992A3 Carrier, Ammunition Tracked)	Weapon system or vehicle set (1 M992A6 Paladin + 1 M992A2 Field Artillery Ammunition Support Vehicle)
Unit Expected Service Life	26	26

**Base Year:**

Annual Unitized O&S Cost by Category Base Year \$ Unit:(\$M)	System Name: PIM	Antecedent System Name: M109A6 Paladin / M992A2 FAASV
Unit-Level Manpower	0.5	0.6
Unit Operations	0.1	0.1
Maintenance	0.1	0.1
Sustaining Support	0.1	0.1
Continued System Improvements	0.1	0.1
Other		
Total O&S	0.9	1.0

**Disposal/Demilitarization Cost Estimate**

(Base Year \$Millions)	System Name: PIM	Antecedent System Name: M109A6 Paladin / M992A2 FAASV
Total Disposal	50.9	

Cost Estimate Source - Disposal	
Type:	Program Office Estimate
Approval Authority and Date:	
Note:	
Program Office Estimate dated February 10, 2023.	
Disposal Cost Notes:	

**Additional O&S Estimate Assumptions:****Sustainment Strategy:**

The PIM product support concept will consist of Operational/Field and Sustainment support. Operational/Field support will be through the use of Brigade Support Battalions (BSB) which use the Fires Forward Support Company and the Supply Support Activity. Maintainers from BSB will requisition spares using the Army Supply System. Outside the Continental U.S. support includes Army Pre-positioned Stock (APS), which are primarily static sets, in various locations in conjunction with Combat Support Agencies.

**Antecedent Estimate Assumptions:**

The Antecedent System is the M109A6 Paladin / M992A2 Field Artillery Ammunition Support Vehicle (FAASV). O&S costs for the M109A6 Paladin / M992A2 FAASV are based on various sources including the O&S Management Information System, the Army Manpower Allocation Requirements Criteria Database and historical actuals from the program office. Operational Tempos are based on the Army's Forces Command model. The antecedent system estimate assumes 556 systems and Economic Useful Life (EUL) of 26 years.