Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy											Date: March 2024	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603860N *I JNT Precision Approach & Ldg Sys*							
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	1,428.894	15.022	22.590	4.047	-	4.047	13.430	42.078	44.242	49.445	Continuing	Continuing
2329: *JPALS*	1,428.894	15.022	22.590	4.047	-	4.047	13.430	42.078	44.242	49.445	Continuing	Continuing

A. Mission Description and Budget Item Justification

A. Mission Description and Budget Item Justification

The Joint Precision Approach and Landing System (JPALS) is the primary precision approach and landing system for CVN and LHA/D ships to support aircraft without AN/SPN-46 Automatic Carrier Landing Systems (ACLS) capability including F-35B, F-35C, MQ-25A and future platforms. JPALS ship systems are required to provide CVN and LHA/D ships a primary precision approach capability during night and instrument flight conditions, including coupled approach capability to a hover transition point for LHA/D ships, and coupled approach to the deck (auto-land) capability aboard CVN ships, and contested environments. JPALS also provides the over-the-air inertial alignment capability for CVN and LHA/D ships to support aircraft platforms without Link-4A capability, including F-35, MQ-25A and future platforms. JPALS efforts include addressing broadened CyberSecurity requirements to remain compliant with software CyberSecurity directives and Information Assurance mandates.
This budget also ensures required capability improvements to JPALS shipboard systems is accomplished, to ensure the successful integration of Landing Autonomous Navigation Technology for Enhanced Recovery to Navy Ships (LANTERNS). LANTERNS is a technological improvement being researched by Future Naval Capabilities/Advanced Technology Development (PE 0603673N) to ensure the continued development of enhanced, Precise Ship-Relative Navigation (PS-RN) for reliable autonomous ship recovery of Unmanned Aerial Systems (UAS) in all weather, high deck motion environments.

The FNC research is centered on aircraft systems.

The JPALS RDT&E supports integration of LANTERNS into the JPALS shipboard systems, delivering lethality through resilient launch and recovery operations in contested environments and during Distributed Maritime Operations.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in high fidelity and realistic operating environments.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy					Date: March 2024
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*			R-1 Program Element (Number/Name) PE 0603860N *I JNT Precision Approach & Ldg Sys*		
B. Program Change Summary ($ in Millions)	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**
Previous President's Budget	18.628	22.590	6.628	-	6.628
Current President's Budget	15.022	22.590	4.047	-	4.047
Total Adjustments	-3.606	0.000	-2.581	-	-2.581
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.000	0.000			
• SBIR/STTR Transfer	-0.606	0.000			
• Program Adjustments	0.000	0.000	-2.544	-	-2.544
• Rate/Misc Adjustments	0.000	0.000	-0.037	-	-0.037

Change Summary Explanation

Technical: N/A

Schedule: Due to deferment of M-Code development and procurement, risk reduction efforts and development and integration efforts have been extended. Additionally, Follow-on Operational Test and Evaluation (FOT&E) has been moved to align with current MQ-25 schedule.

Financial: Reduction in FY 2025 for proper phasing.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JNT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
2329: *JPALS*	1,428.894	15.022	22.590	4.047	-	4.047	13.430	42.078	44.242	49.445	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This budget reflects the Department of Defense certified Component Cost Position of the restructured Joint Precision Approach and Landing System (JPALS) program that funds the developmental, testing, and integration activities to implement and field JPALS ship systems that deliver the primary precision approach, landing, on-deck inertial alignment, surveillance, and auto-land capability for current and future low observable manned and unmanned platforms onboard all CVN and LHA/D ships. JPALS provides for development, integration, installation, and test of JPALS on CVN and LHA/D ships in accordance with the Joint Requirements Oversight Council (JROC) March 2016 approved JPALS Capability Development Document (CDD). JPALS Engineering Development Model (EDM) articles have been delivered to support JPALS EMD activities.

JPALS EDMs have been installed at shore based test facilities and (temporarily) on CVN and LHA/D ships to support F-35B/C developmental and operational testing and MQ-25A concept refinement, system requirements identification, allocation, surrogate risk reduction, and test. Two JPALS EDMs were procured in FY 2017 to support testing and F-35 shipboard operational deployments. JPALS will continue to invest in software development in direct support of precision approach and auto-land capabilities for the F-35B/C, MQ-25A, and future air platforms. JPALS effort includes addressing broadened CyberSecurity requirements to remain compliant with software CyberSecurity directives and Information Assurance mandates. Remaining costs are associated with the completion of the test and support to fielded EDM units and to develop, test, and transition JPALS to use GPS M-Code. Additionally, costs are to enhance Precision Ship-Relative Navigation (PS-RN) for Navy and Marine Corps unmanned, and potentially manned, platforms, enabling resilient Distributed Maritime Operations (DMO) via the Landing Autonomous Navigation Technology for Enhanced Recovery to Navy Ships (LANTERNS) Future Naval Capabilities (FNC) and other system improvements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: JPALS Ship Systems and Test	7.499	14.917	1.846	0.000	1.846
Articles:	-	-	-	-	-
Description: JPALS provides for development, integration, installation, and test of Sea-Based JPALS on CVN and LHA/D ships.					
FY 2024 Plans: Begin development of M-code capable GOTS receivers and continue development of JPALS-capable receiver interfaces and output requirements.					
FY 2025 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JNT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Continue development of M-code capable GOTS receivers and continue development of JPALS-capable receiver interfaces and output requirements. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $13.071M from FY 2024 to FY2025 is due to higher Navy priorities, delaying M-Code receiver efforts by one year.					
Title: Joint Strike Fighter (JSF) F-35B Marine Corp STOVL and F-35C Navy Carrier Variant Support ***Articles:*** ***Description:*** Provide technical development, shore based, and ship based support for F-35B and F-35C JPALS Integration and Developmental Test (DT) and Operational Test (OT) events. Provide JPALS system certification and documentation to certify shipboard all weather precision approach capability for F-35 operational test and deployments. ***FY 2024 Plans:*** Continue support of the JPALS UDB operations for F-35 aircraft. ***FY 2025 Base Plans:*** Continue support of the JPALS UDB operations for F-35 aircraft. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $.886M from FY 2024 to FY 2025 for proper phasing.	1.500 -	1.530 -	0.644 -	0.000 -	0.644 -
Title: MQ-25 Support ***Articles:*** ***Description:*** Provide technical support, lab support, requirements identification, allocation and test activities for MQ-25. Support MQ-25 concept refinement, requirements development, integration specifications, and risk reduction activities for JPALS integration. Support MQ-25 concept refinement and JPALS integration and developmental activities.	1.800 -	1.836 -	1.182 -	0.000 -	1.182 -

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JNT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
FY 2024 Plans: Continue preparation of JPALS system integration lab at Patuxent River for MQ-25 shore-based testing. ***FY 2025 Base Plans:*** Continue preparation of JPALS system integration lab at Patuxent River for MQ-25 shore-based testing. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $.654M from FY 2024 to FY 2025 for proper phasing.					
Title: Advanced Technology Integration	4.223	4.307	0.375	0.000	0.375
Articles:	-	-	-	-	-
Description: This project provides funding for integrating and transitioning new capabilities into the JPALS ship system requirements. ***FY 2024 Plans:*** Continue surrogate aircraft engineering and modification, CVN ship flight test planning and execution, and post test data analysis. The system will be shore-tested and baselined into the appropriate programs of record. ***FY 2025 Base Plans:*** Begin JPALS Part 1 ECP to execute a proof-of-concept to investigate and demonstrate integration utilizing the proposed Landing Autonomous Navigation Technology for Enhanced Recovery to Navy Ships (LANTERNS) radio to transport Joint Precision Approach and Landing System (JPALS) data to provide a precision approach capability. ***FY 2025 OCO Plans:*** N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $3.932M from FY 2024 to FY 2025 is due to the planned completion of the development efforts.					
Accomplishments/Planned Programs Subtotals	15.022	22.590	4.047	0.000	4.047

Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JNT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• OPN/2867: *JPALS*	8.186	3.343	7.287	-	7.287	5.540	4.216	6.894	11.879	Continuing	Continuing

Remarks

D. Acquisition Strategy

Technology Development phase was conducted jointly by NAVAIRSYSCOM (PMA-213), USAF Electronic Systems Command (Global Air) and multiple industry partners. This effort provided the concept of operations, performance specifications and technology readiness levels necessary to provide the foundation from which to launch the Increment 1 System Development and Demonstration (SDD) phase development. Joint Precision Approach and Landing System (JPALS) reached MS-B on 14 July 2008 and the SDD phase development contract was awarded on 17 July 2008. Tasking consisted of sea-based JPALS, related ship and airborne reference systems, end-to-end software algorithms, necessary ship installation hardware, test equipment, system simulation software, and other RDT&E deliverable products. The SDD contract was awarded after full and open competition. JPALS is being developed by the Navy with an open system architecture in order to facilitate the compatible integration of many different aircraft and avionics architectures. JPALS provides for development, integration, installation, and test of Sea-Based JPALS to meet Initial Operation Capability of CVN and LHA/D ships in accordance with the JPALS Capability Development Document (CDD). Additionally, this requirement provides critical enabling technology for Joint Strike Fighter (JSF) F-35B Marine Corps Short Take-Off and Vertical Landing (STOVL) and F-35C Navy Carrier Variant, ship-based MQ-25A, and future Navy and Marine Corps air platforms.

As a result of the DON Resource and Requirements Review Board approved PALC Roadmap, the JPALS production phase was deferred to include design improvements to provide manned and unmanned aircraft with autoland capabilities. The current Engineering and Manufacturing Development (EMD) contract was modified in FY14 to add detailed requirements and design trade studies to identify specific system design improvements. An extension for pre-Milestone B efforts was awarded in fourth quarter FY15.

A Development RFP Release Decision Point (DRRDP) Defense Acquisition Board (DAB) was completed and the RFP for JPALS EMD 16 was released on 24 November 2015. A Milestone B (MS B) DAB was completed 02 June 2016. The MS B Acquisition Decision Memorandum (ADM) was approved 27 June 2016, which granted entry into the EMD phase for the restructured JPALS program and officially completed all actions required to exit Nunn-McCurdy. JPALS now has an approved Acquisition Program Baseline (APB) and has been designated an Acquisition Category (ACAT) 1C program. Sole Source contract was awarded to Raytheon in fourth quarter FY 2016. Completed Milestone C in April 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JNT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAWCAD : Pax River, MD	85.018	0.000		0.000		0.000		-		0.000	0.000	85.018	-
Primary Hardware Development - EMD Phase I	C/CPIF	Raytheon : Fullerton, CA	410.181	0.000		0.000		0.000		-		0.000	0.000	410.181	410.181
Primary Hardware Development - New EMD Contract	C/CPIF	Raytheon : Fullerton, CA	265.207	0.000		0.000		0.000		-		0.000	0.000	265.207	268.895
JPALS Modifications for ARC-210	C/CPFF	RCI : Cedar Rapids, IA	8.603	0.000		0.000		0.000		-		0.000	0.758	9.361	10.119
Risk Reduction for Auto-land - FFRDC Support	FFRDC	JHU : Laurel, MD	0.493	0.000		0.000		0.000		-		0.000	0.000	0.493	-
Primary Hardware Development - M-Code	TBD	Various : Various	0.000	5.083	Nov 2022	13.333	Nov 2023	0.500	Nov 2024	-		0.500	0.000	18.916	-
Prior Year Prod Dev no longer funded in the FYDP	TBD	Various : Various	249.870	0.000		0.000		0.000		-		0.000	0.000	249.870	-
		Subtotal	1,019.372	5.083		13.333		0.500		-		0.500	0.758	1,039.046	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support - JPALS	WR	NAWCAD : Pax River, MD	224.185	3.948	Nov 2022	3.410	Nov 2023	1.722	Nov 2024	-		1.722	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NAWCAD : Pax River, MD	22.779	0.000		0.000		0.000		-		0.000	0.000	22.779	-
Systems Engineering Suppt - Advanced Technologies	TBD	Various : Various	1.000	3.951	Nov 2022	3.898	Nov 2023	0.375	Nov 2024	-		0.375	0.000	9.224	-
Prior Year Support Costs non longer funded in FYDP	Various	Various : Various	21.514	0.000		0.000		0.000		-		0.000	0.000	21.514	-
		Subtotal	269.478	7.899		7.308		2.097		-		2.097	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JNT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NAWCAD : Pax River, MD	76.770	0.000		0.000		0.000		-		0.000	0.000	76.770	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	COMOPTEVFOR : Norfolk, VA	6.703	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NAWCAD : Pax River, MD	9.349	1.413	Nov 2022	1.441	Nov 2023	1.201	Nov 2024	-		1.201	Continuing	Continuing	Continuing
		Subtotal	92.822	1.413		1.441		1.201		-		1.201	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCAD : Pax River, MD	31.455	0.617	Nov 2022	0.503	Nov 2023	0.244	Nov 2024	-		0.244	0.000	32.819	-
PM Support - MSS	C/CPFF	Amelex : Pax River, MD	10.753	0.000		0.000		0.000		-		0.000	0.000	10.753	-
PM Support - MSS	C/CPFF	Avian : Pax River, MD	1.592	0.000		0.000		0.000		-		0.000	0.000	1.592	-
PM Support - MSS	C/CPFF	SAIC : Pax River, MD	2.487	0.000		0.000		0.000		-		0.000	0.000	2.487	-
PM Support - MSS	C/CPFF	DDG : Pax River, MD	0.390	0.000		0.000		0.000	Feb 2025	-		0.000	0.000	0.390	-
Travel	WR	NAVAIR : Pax River, MD	0.545	0.010	Nov 2022	0.005	Nov 2023	0.005	Nov 2024	-		0.005	0.000	0.565	-
		Subtotal	47.222	0.627		0.508		0.249		-		0.249	0.000	48.606	N/A

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,428.894	15.022		22.590		4.047		-		4.047	Continuing	Continuing	N/A

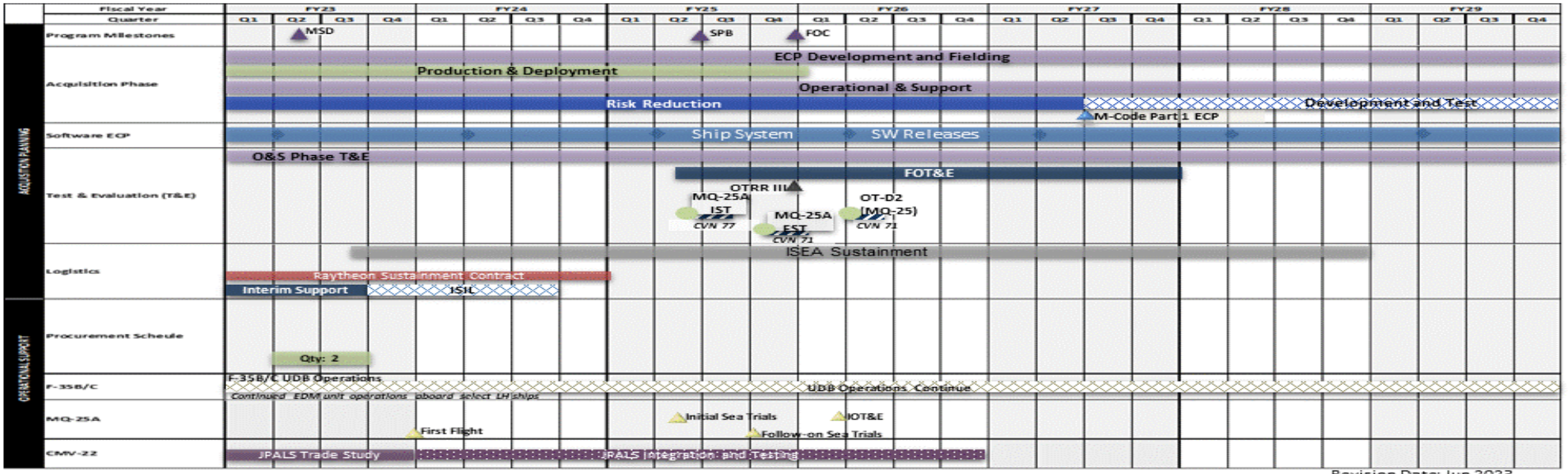
Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy			Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JNT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JNT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

JPALS Program Schedule



Revision Date: Jun 2023

Notes:
M-Code schedule based on notional planning package
SPB notional

Legend:
- Critical Path to JPALS IOC
- EDM Unit
- Production Unit
- System Build 4.x.y
- Lot Buys
- Unit Delivery
- Projected Test/Cert

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JNT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

Advanced Technology Integration

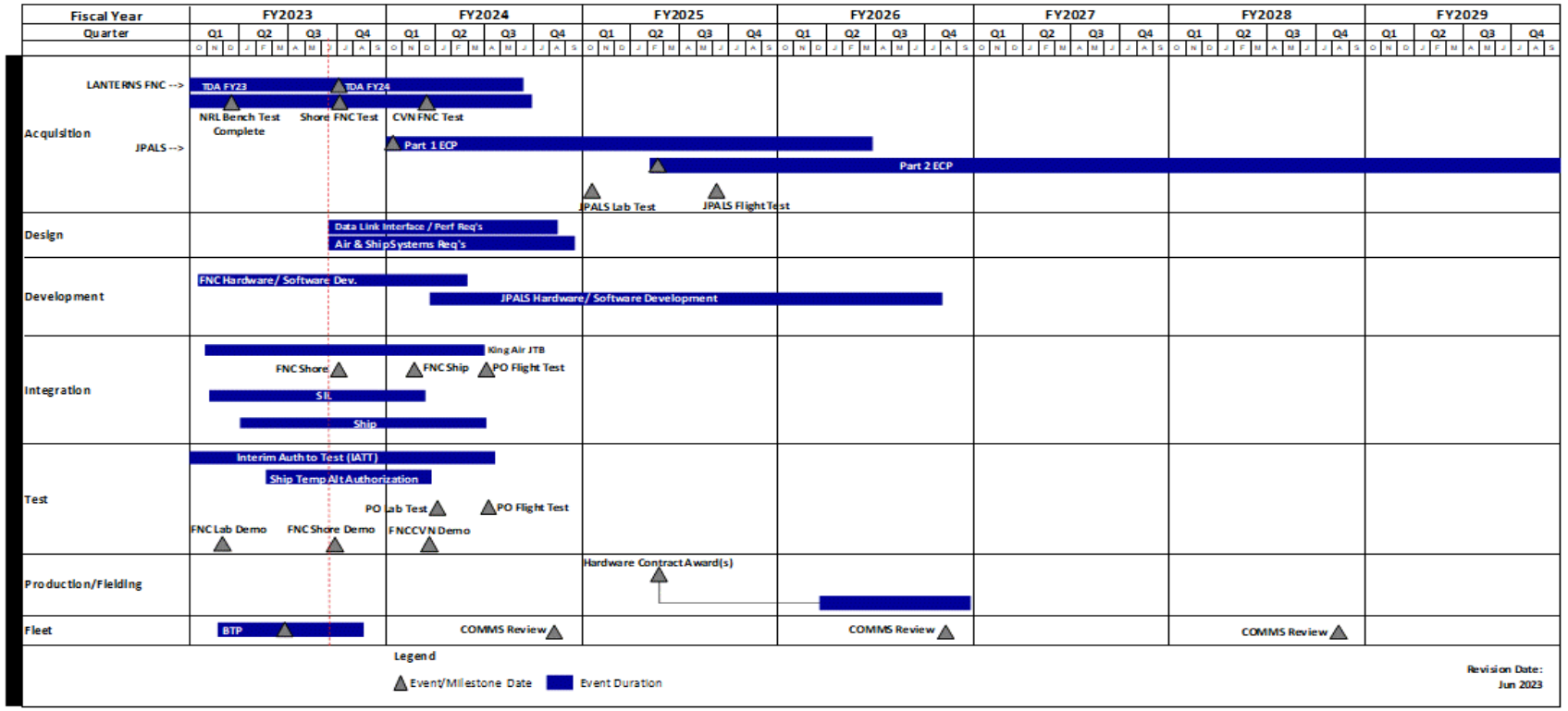


Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JNT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JPALS				
Acquisition Milestones: MSD	2	2023	2	2023
Acquisition Milestones: FOC	1	2026	1	2026
Test & Evaluation: JPALS Operational Test Readiness Review (OTRR) III	1	2026	1	2026
Test & Evaluation: JPALS Follow-on Operational Test and Evaluation	2	2025	4	2027
Advanced Technology Integration				
Acquisition Milestones: Demo	3	2024	3	2024
Systems Development: FNC Hardware/Software Development	1	2023	2	2024
Systems Development: JPALS Hardware/Software Development	1	2024	2	2026
Test & Evaluation: JPALS Lab Test	1	2025	1	2025
Test & Evaluation: JPALS Flight Test	3	2025	3	2025