Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
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 JT Precision Approach & Ldg Sys*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	901.794	41.644	81.466	104.144	-	104.144	104.954	102.569	50.679	38.974	Continuing	Continuing
2329: *JPALS*	901.794	41.644	81.466	104.144	-	104.144	104.954	102.569	50.679	38.974	Continuing	Continuing
Program MDAP/MAIS Code: 238												

Note

On 15 June 2014, USD(AT&L) signed the Nunn-McCurdy Acquisition Decision Memorandum (ADM) for the restructured Joint Precision Approach and Landing System (JPALS) Increment 1A program, which certified the program in lieu of termination. Accordingly, the JPALS Milestone B decision of June 2008 was rescinded. JPALS was directed to complete specific development phase tasks of the current program, with the addition of risk reduction efforts to prepare for manned and unmanned auto-land capability. The actual production phase of JPALS Increment 1A was deferred to align with future acquisition of the auto-land capability. The ADM directed the Navy to: continue Increment 1A development that will culminate with completion of developmental testing activities and a Letter of Observation from the Commander, Operational Test and Evaluation Force on the JPALS Increment 1A ship system, and provide a draft Increment 1A Technical Data Package; and continue auto-land trade studies and risk reduction efforts through 3QFY16. The ADM also directed the Navy to return to the Defense Acquisition Board (DAB) for Milestone B approval for the restructured JPALS program not later than 3QFY16.

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 LH ships to support aircraft without SPN-46 ACLS capability including F-35B, F-35C, UCLASS and future platforms. JPALS ship systems are required to provide CVN and LH ships a precision approach capability down to 200' ceiling and 1/2 nm visibility weather, a coupled approach capability to a 200' decision height and 1/2 nm for LH ships, and coupled approach to the deck (auto-land) capability aboard CVN ships. JPALS also provides the over-the-air inertial alignment capability for CVN and LH ships to support aircraft platforms without Link-4A capability, including F-35, UCLASS and future platforms.

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 environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy					Date: February 2016
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 JT Precision Approach & Ldg Sys*			
B. Program Change Summary ($ in Millions)	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Previous President's Budget	41.886	91.479	75.934	-	75.934
Current President's Budget	41.644	81.466	104.144	-	104.144
Total Adjustments	-0.242	-10.013	28.210	-	28.210
• Congressional General Reductions	-	-0.013			
• Congressional Directed Reductions	-	-10.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.242	0.000			
• Program Adjustments	0.000	0.000	34.661	-	34.661
• Rate/Misc Adjustments	0.000	0.000	-6.451	-	-6.451

Change Summary Explanation

Technical: Tasking added to the program to reflect additional development, testing, and integration activities to implement and field a JPALS ship system that includes UHF Data Broadcast (UDB), precision approach and auto-land capability for manned and unmanned platforms as directed by the Department of the Navy (DON) Resource and Requirements Review Board (R3B) and certified by the post Nunn-McCurdy USD(AT&L) ADM.

Schedule: Schedule revised to reflect additional development, testing, and integration activities to implement and field a JPALS ship system that includes UDB, precision approach and auto-land capability for manned and unmanned platforms as directed by the DON R3B and certified by the post Nunn-McCurdy USD(AT&L) ADM.

Financial: The Department added FY 17 funding to finance additional development, testing, and integration activities to implement and field a JPALS ship system that includes UDB, precision approach and auto-land capability for manned and unmanned platforms as directed by the DON R3B and certified by the post Nunn-McCurdy USD(AT&L) ADM.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
2329: *JPALS*	901.794	41.644	81.466	104.144	-	104.144	104.954	102.569	50.679	38.974	Continuing	Continuing
Quantity of RDT&E Articles	8	-	-	2	-	2	-	-	-	-		

A. Mission Description and Budget Item Justification

The increase from FY 16 to FY 17 reflects the additional funding added by the Department to finance additional development, testing, and integration activities to implement and field a JPALS ship system that includes UDB, precision approach, and auto-land capability for manned and unmanned platforms. The FY 17 funding request includes two additional Engineering Development Models to support F-35 JPALS early operational capability.

Joint Precision Approach and Landing System (JPALS) provides for development, integration, installation, and test of Sea-Based JPALS on CVN/LHA/LHD ships in accordance with the JPALS Capability Development Document. This requirement supports the JPALS Integration on CVN/LHA/LHD ships and establishes requirements for enabling critical technology for Joint Strike Fighter (JSF) F-35B Marine Corps Short Take-Off and Vertical Landing and F-35C Navy Carrier Variant, and Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS). Initial JPALS capability is baselined in F-35 Block 3F software.

JPALS Engineering Development Model (EDM) test articles have been delivered to support system development and demonstration, and JPALS ship systems will be installed on CVN/LHA/LHD ships in support of the F-35B/C and UCLASS shipboard testing.

JPALS will continue to invest in software development in direct support of precision approach and auto-land capabilities for the F-35B/C, UCLASS, and future air platforms.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: JPALS Ship Systems and Test	35.787	76.316	98.749	0.000	98.749
Articles:	-	-	2	-	2
Description: JPALS provides for development, integration, installation, and test of Sea-Based JPALS on CVN/ LHA/LHD ships.					
FY 2015 Accomplishments: Continue development of JPALS system and activities related to technical maturity and auto-land risk reduction. Continue updating of acquisition and technical documentation in preparation of 3rd quarter FY16 Milestone B. Awarded contract modification for pre-Milestone B efforts in 4th quarter. Continue Prototype Risk Reduction					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
testing. Perform System Requirements Review (SRR) in 3rd quarter and Systems Functional Review (SFR) in 4th quarter. ***FY 2016 Plans:*** Complete Integrated Logistics Assessment (ILA) in 1st quarter. Complete required update of acquisition and technical documentation to support Milestone B decision. Complete Preliminary Design Review (PDR) in 2nd quarter. Accomplish Milestone B and award new Engineering Manufacturing and Development contract in 3rd quarter. Continue Prototype Risk Reduction testing in preparation for JPALS Integrated Test (IT) in FY17. Continue auto-land risk reduction activities. ***FY 2017 Base Plans:*** Fund two additional Engineering Development Models (EDM) to support F-35 Early Operational Capability (EOC). Perform Initial Baseline Review (IBR) for the new JPALS Engineering Manufacturing and Demonstration (EMD) contract in the 1st quarter. Perform Critical Design Review (CDR) and install an EDM on a LHD in 2nd quarter. Install EDMs on CVNs for JPALS Integrated Test (IT) and for F-35 operational testing in 4th quarter. ***FY 2017 OCO Plans:*** N/A					
Title: Joint Strike Fighter (JSF) F-35B Marine Corp STOVL and F-35C Navy Carrier Variant Test Support ***Articles:*** ***Description:*** Provide support for F-35B Marine Corps Short Take-Off and Vertical Landing (STOVL) aircraft and F-35C Navy Carrier Variant Developmental Test (DT) and Operational Tests (OT). ***FY 2015 Accomplishments:*** Install Engineering Development Model (EDM) on a CVN in 2nd quarter in support of F-35C Navy Carrier Variant DT-2. Provide support for F-35B Marine Corps STOVL DT-3 on an LHA in 3rd quarter. ***FY 2016 Plans:*** Provide support for F35-B Marine Corps STOVL variant DT-3 on an LHA. Install EDM on a CVN in 4th quarter in support of F-35C Navy Carrier Variant DT-3. ***FY 2017 Base Plans:*** Support testing on CVN and LHA/D of F-35B Marine Corps STOVL variant and F-35C Navy Carrier variant. ***FY 2017 OCO Plans:***	4.157 -	3.750 -	3.973 -	0.000 -	3.973 -

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) Test Support	1.700	1.400	1.422	0.000	1.422
Articles:	-	-	-	-	-
Description: Provide Developmental Test (DT) and Operational Test (OT) support for UCLASS.					
FY 2015 Accomplishments: Provide test planning and other support as required for Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) Developmental Test (DT).					
FY 2016 Plans: Continue development of test documentation and planning in support of UCLASS DT.					
FY 2017 Base Plans: Continue development test support of UCLASS as required.					
FY 2017 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	41.644	81.466	104.144	0.000	104.144

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• OPN/2867: *JPALS*	0.000	0.000	0.000	-	0.000	0.000	58.202	68.534	69.905	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 consists 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 decided 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

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

Operation Capability of CVN/LHA/LHD 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 Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS), 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 4th quarter of FY15.

A Development RFP Release Decision Point (DRRDP) Defense Acquisition Board (DAB) was completed and the RFP was released on 24 November 2015.

E. Performance Metrics

Original Milestone B (June 2008) was rescinded by USD(ATL)-issued Acquisition Decision Memorandum, dtd 15 June 2014. New Milestone B is scheduled for 3rd quarter FY16.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT 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 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAWCAD : Pax River, MD	35.091	1.724	Dec 2014	12.650	Dec 2015	9.800	Nov 2016	-		9.800	Continuing	Continuing	Continuing
Primary Hardware Development - EMD Phase I	C/CPAF	Raytheon : Fullerton, CA	355.218	18.839	Jul 2015	19.020	Nov 2015	0.000		-		0.000	0.000	393.077	393.077
Primary Hardware Development - New EMD Contract	TBD	Raytheon : Fullerton, CA	0.000	0.000		8.365	Jun 2016	47.426	Nov 2016	-		47.426	166.040	221.831	221.831
Risk Reduction for Auto-land - ARC-210	C/CPFF	RCI : Cedar Rapids, IA	1.549	1.480	Dec 2014	1.700	Dec 2015	0.000		-		0.000	0.000	4.729	4.729
Risk Reduction for Auto-land - FFRDC Support	FFRDC	JHU : Laurel, MD	0.493	0.000		1.487	Oct 2015	1.502	Nov 2016	-		1.502	0.000	3.482	3.482
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	642.221	22.043		43.222		58.728		-		58.728	-	-	-

Remarks

The Primary Hardware Development contract with Raytheon is a combined CPAF and CPIF contract. Ship Integration funding in FY17 lower than FY16 due to fewer EDM installations/de-installations. Primary Hardware Development funding increases in FY17 due to contractor production of two Engineering Demonstration Models (EDMs) and commencing new EMD work post MS-B.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support	WR	NAWCAD : Pax River, MD	135.498	8.190	Dec 2014	20.167	Dec 2015	26.393	Nov 2016	-		26.393	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NAWCAD : Pax River, MD	21.563	1.229	Dec 2014	2.220	Dec 2015	2.250	Nov 2016	-		2.250	Continuing	Continuing	Continuing
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	178.575	9.419		22.387		28.643		-		28.643	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Ramp up of FY17 Systems Engineering to support Engineering Manufacturing and Development (EMD) Phase II initialization, Critical Design Review (CDR), production of two EDM Early Operational Concept (EOC) units to support F-35 operational testing.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Pax River, MD	48.016	6.234	Dec 2014	8.853	Dec 2015	9.899	Nov 2016	-		9.899	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	3.247	0.250	Dec 2014	0.650	Dec 2015	0.650	Nov 2016	-		0.650	Continuing	Continuing	Continuing
		Subtotal	51.263	6.484		9.503		10.549		-		10.549	-	-	-

Remarks

Increase of Developmental Test and Evaluation funding between FY16 and FY17 due to scheduled start of JPALS IT-B testing.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River, MD	15.938	0.978	Dec 2014	3.584	Dec 2015	3.600	Nov 2016	-		3.600	Continuing	Continuing	Continuing
PM Support-MSS	C/CPFF	Amelex : Pax River, MD	11.518	1.172	Dec 2014	1.200	Dec 2015	1.205	Nov 2016	-		1.205	0.000	15.095	15.095
PM Support-MSS	C/CPFF	Avian : Pax River, MD	1.140	0.452	Dec 2014	0.450	Dec 2015	0.453	Nov 2016	-		0.453	0.000	2.495	2.495
PM Support-MSS	C/CPFF	SAIC : Pax River, MD	1.027	1.026	Dec 2014	1.050	Dec 2015	0.898	Nov 2016	-		0.898	0.000	4.001	4.001
Travel	WR	NAVAIR : Pax River, MD	0.112	0.070	Dec 2014	0.070	Dec 2015	0.068	Nov 2016	-		0.068	Continuing	Continuing	Continuing
		Subtotal	29.735	3.698		6.354		6.224		-		6.224	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / *JT Precision Approach & Ldg Sys*	Project (Number/Name) 2329 / *JPALS*	

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	901.794	41.644		81.466		104.144		-		104.144	-	-	-

Remarks

The significant shifts in funding levels between FY15 and FY16 are due primarily to the program's use of FY14 appropriation for FY15 government labor.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

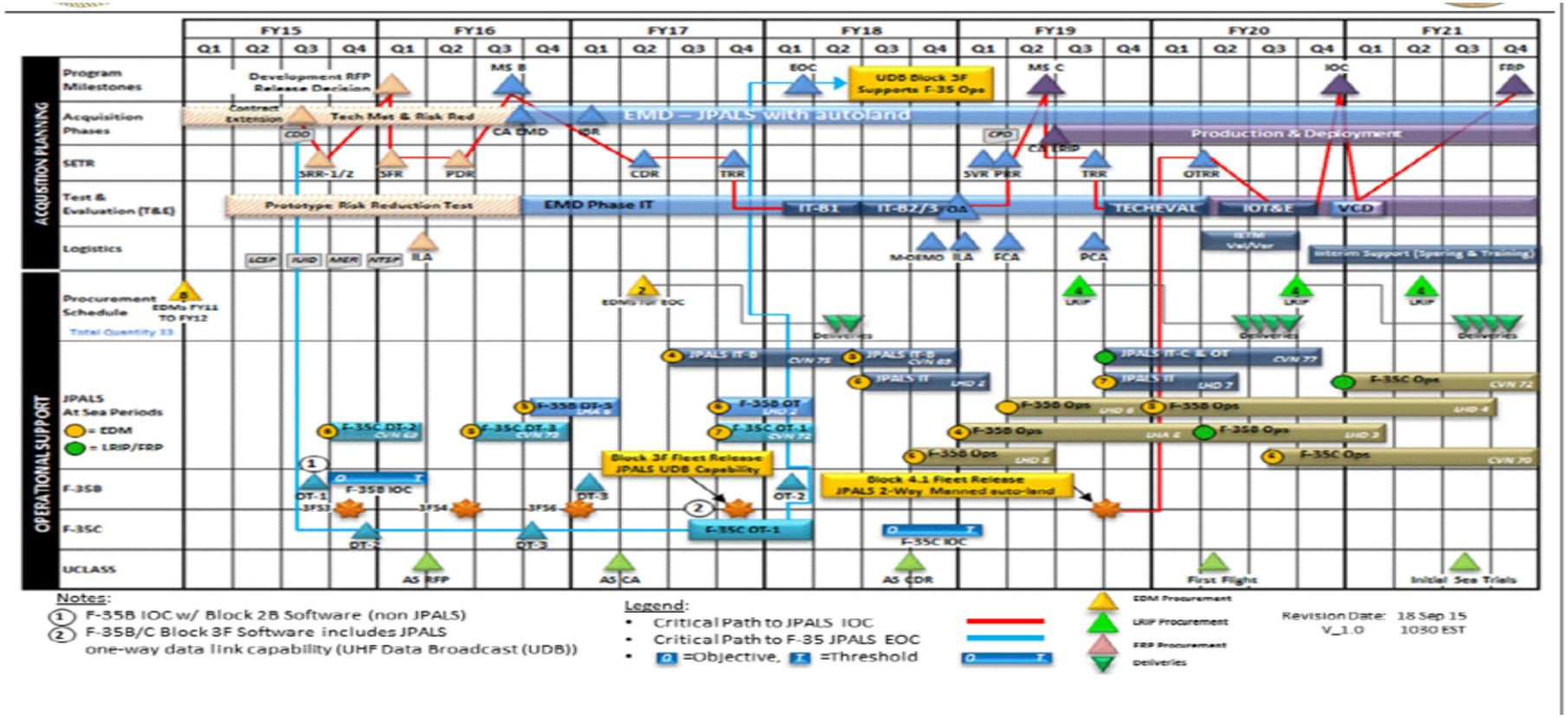

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603860N / *JT Precision Approach & Ldg Sys*	**Project (Number/Name)** 2329 / *JPALS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JPALS INC 1A				
Acquisition Milestones: MS B	3	2016	3	2016
Acquisition Milestones: Development RFP Release Decision Point (DRRDP)	1	2016	1	2016
Acquisition Milestones: MS C	3	2019	3	2019
Acquisition Milestones: Early Operating Concept (EOC)	1	2018	1	2018
Systems Development: Engineering and Manufacturing Development	1	2015	4	2021
Systems Development: Tech Maturity and Risk Reduction in support of Autoland	1	2015	1	2016
Systems Development: New Engineering & Manufacturing Development Implementation	3	2016	4	2021
Systems Development: Reviews: Critical Design Review (CDR)	2	2017	2	2017
Systems Development: Reviews: Preliminary Design Review (PDR)	2	2016	2	2016
Systems Development: Contract Awards: LRIP Contract Award	3	2019	3	2019
Systems Development: Contract Awards: EMD Extension adding pre- MS B efforts	4	2015	4	2015
Systems Development: Contract Awards: New EMD Contract Award	3	2016	3	2016
Test & Evaluation: Operational Test and Evaluation (IOT&E)	2	2020	4	2020
Test & Evaluation: JPALS Operational Test Readiness Review (OTRR)	2	2020	2	2020
Production Milestones: Production Readiness Review (PRR)	1	2019	1	2019
Deliveries: Inital LRIP Deliveries	2	2020	2	2020

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