Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy												DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*							
COST ($ in Millions)	**All Prior Years**	**FY 2012**	**FY 2013#**	**FY 2014 Base**	**FY 2014 OCO ##**	**FY 2014 Total**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	10.040	24.512	0.074	-	0.074	2.651	0.000	0.000	0.000	0.000	37.277
2777: *Highly Integrated Photonics (HIP)*	0.000	0.000	19.955	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.955
3331: *C-2 System Development*	0.000	10.040	4.557	0.074	-	0.074	2.651	0.000	0.000	0.000	0.000	17.322

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This program element supports the study, evaluation, optimization and enhancements of fielded aircraft systems not supported by a system specific RDTEN program element. The supported efforts will provide a basis to recommend options for improved efficiency, minimization of life cycle cost, and other affordable options. As naval aircraft systems age, and analysis of the programmatic and /or reliability enhancements options allows the Department of the Navy to more effectively understand and manage system lifecycle costs and implications in future airborne platforms.

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 a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	10.497	24.512	2.736	-	2.736
Current President's Budget	10.040	24.512	0.074	-	0.074
Total Adjustments	-0.457	0.000	-2.662	-	-2.662
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.076	0.000			
• SBIR/STTR Transfer	-0.381	0.000			
• Program Adjustments	0.000	0.000	-0.006	-	-0.006
• Rate/Misc Adjustments	0.000	0.000	-2.656	-	-2.656

Change Summary Explanation

Technical: Not applicable.

Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy	DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603251N: *(U)AIRCRAFT SYSTEMS*

Schedule: Schedule updated to reflect a change in the acquisition strategy. Schedule updated to reflect change in Validation, Verification and Kit Installation schedule due to reduction in funding allocation in FY14. Proj 2777 - funds were realigned from BSO14 to BSO19 in FY13. Schedule change for Developmental and Architectural Studies due to realignment.

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 2777: *Highly Integrated Photonics (HIP)*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
2777: *Highly Integrated Photonics (HIP)*	0.000	0.000	19.955	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.955
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

This program element supports the requirements study, technology maturation, system design and demonstration of a general-purpose, future-proof avionics network that replaces copper with glass. As both analog and digital onboard information transport and processing requirements continue to grow, life cycle costs associated with maintaining and upgrading current stove-piped networks aboard naval aircraft systems becomes unsustainable. The size, weight, power, high data rate and scalability advantages of a single-mode fiber optic network have significant total ownership cost savings implications that will allow the Department of the Navy to more affordably and effectively meet mission requirements well into the future. The activities funded will provide a networking baseline or standard that can be incorporated into airborne platforms that maximize networking system capability while minimizing associated life cycle costs. While the development under this program does specifically address airborne platforms where size and weight of the cable plant is particularly important, ultimately the network technology developed will have broad applicability to shipboard and submarine platform network requirements as well.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Title: Highly Integrated Photonics (HIP) Naval Networking	0.000	19.955	0.000
Articles:		0	
Description: The overarching objective of this activity is to develop and demonstrate a highly integrated Local Area Network (LAN) for airborne platforms incorporating an optical fiber network that uses wavelength division multiplexing (WDM) to address demanding military network re-configurability, scalability, and technology refresh challenges. The telecommunication network application of WDM technology is fully mature (TRL9) for commercial environments with little constraint on size, weight, and power (SWAP). The program will leverage and enhance the telecommunication standards for optical fiber networks while addressing the SWAP restrictions and severe environmental requirements of military airborne platforms. The functionality of the technology developed cannot be obtained through Commercial-Off-The-Shelf (COTS) components due to SWAP constraints and the military environment. Effort will involve understanding the properties of engineered optical fiber components and electronic semiconductors as they apply to highly integrated optical fiber networks. Ultimately these higher performance components and networks will address the needs for all classes of military platforms.			
FY 2013 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 2777: *Highly Integrated Photonics (HIP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Development and demonstration of highly integrated local area network for naval platforms.			
Accomplishments/Planned Programs Subtotals	0.000	19.955	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Highly Integrated Photonics Naval Networking strategy began as a joint effort with DARPA for development and demonstration of Analog and Digital Wavelength Division Multiplex Highly Integrated Photonics for aviation applications with the focus being a future technology refresh for the F-35 and, as an enterprise level technology, other applications. Funding extends the development and technology maturation to a technology/manufacturing readiness level compatible with transition to one, or more, Program(s) of Record.

E. Performance Metrics

Performance that adheres to the conventional Wavelength Division Multiplex optical network protocol standards, wavelengths and interface with Ethernet 10Gbit/s, MIL-STD-1553, and other protocols running concurrently on one or more single-mode fibers along with analog signals. Each critical component has a set of physical, environmental, and operational requirements driven by representative platform, systems, and operational metrics. Includes testing in a Systems/Software Integration Laboratory and in test aircraft.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 2777: *Highly Integrated Photonics (HIP)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental and Architectural Studies	C/FFP	APIC Corp:Culver, CA	0.000	0.000		0.500	Nov 2012	0.000		-		0.000	0.000	0.500	0.500
Primary Hardware Development	C/FFP	APIC Corp:Culver, CA	0.000	0.000		1.830	Nov 2012	0.000		-		0.000	0.000	1.830	1.830
Component Foundry & Fabrication	C/FFP	APIC Corp:Culver, CA	0.000	0.000		13.700	Jun 2013	0.000		-		0.000	0.000	13.700	13.700
Systems Engineering & Testing	C/FFP	APIC Corp:Culver, CA	0.000	0.000		2.670	Sep 2013	0.000		-		0.000	0.000	2.670	2.670
		Subtotal	0.000	0.000		18.700		0.000		0.000		0.000	0.000	18.700	18.700

Remarks

Changes due to BSO realignment from BSO14 to BSO19. Schedule change for Developmental and Architectural Studies due to realignment. Primary Hardware Development and Component Foundry & Fabrication fall under Design & Hardware Development on the R-4.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD:Pax River, MD	0.000	0.000		0.855	Oct 2012	0.000		-		0.000	0.000	0.855	
		Subtotal	0.000	0.000		0.855		0.000		0.000		0.000	0.000	0.855	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCAD:Pax River, MD	0.000	0.000		0.400	Oct 2012	0.000		-		0.000	0.000	0.400	
		Subtotal	0.000	0.000		0.400		0.000		0.000		0.000	0.000	0.400	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 2777: *Highly Integrated Photonics (HIP)*	

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		19.955		0.000		0.000		0.000	0.000	19.955	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 2777: *Highly Integrated Photonics (HIP)*

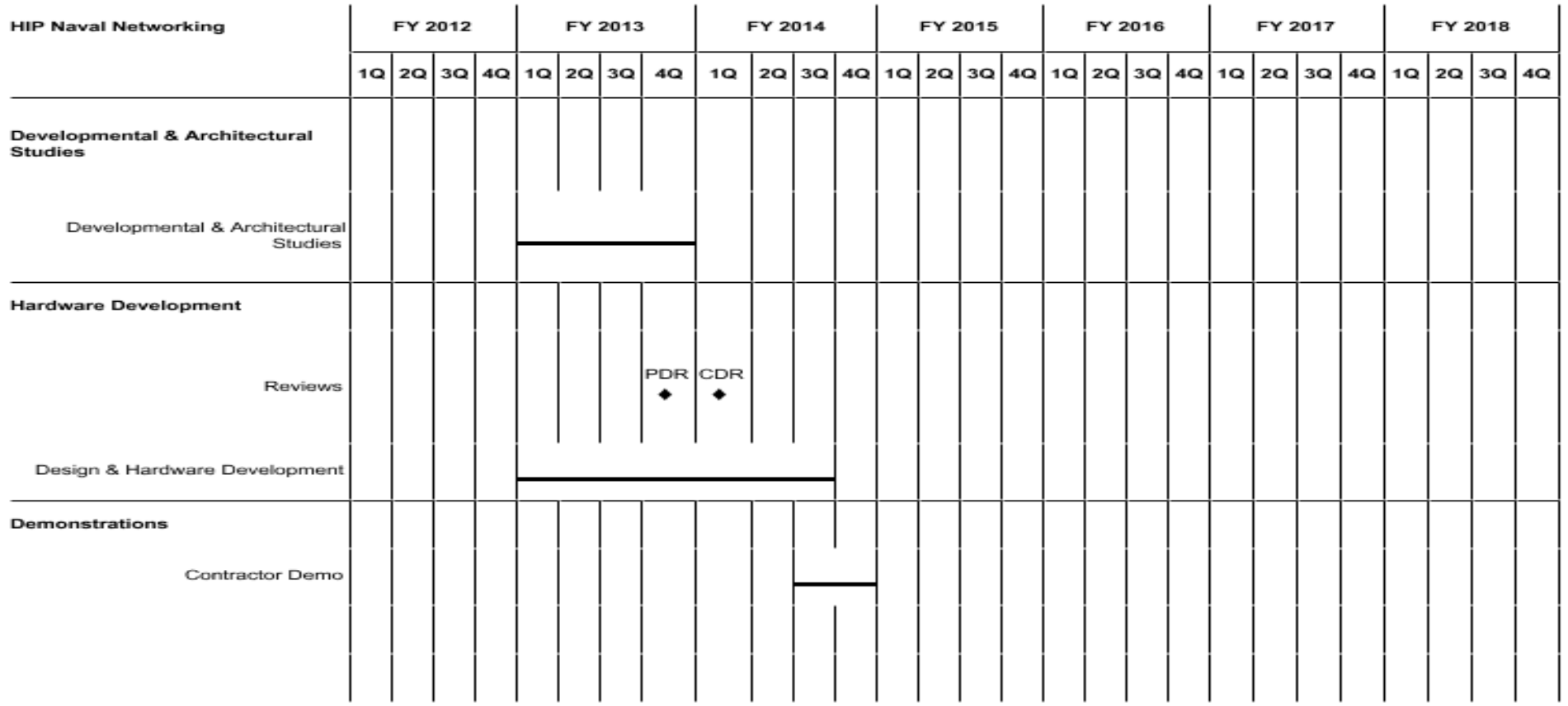

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603251N: *(U)AIRCRAFT SYSTEMS*	**PROJECT** 2777: *Highly Integrated Photonics (HIP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
HIP Naval Networking				
Developmental & Architectural Studies: Developmental & Architectural Studies:	1	2013	4	2013
Hardware Development: Reviews: Preliminary	4	2013	4	2013
Hardware Development: Reviews: Critical	1	2014	1	2014
Hardware Development: Design & Hardware Development:	1	2013	3	2014
Demonstrations: Contractor Demo:	3	2014	4	2014

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 3331: *C-2 System Development*	

COST ($ in Millions)	All Prior Years	FY 2012	FY 2013#	FY 2014 Base	FY 2014 OCO ##	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
3331: *C-2 System Development*	0.000	10.040	4.557	0.074	-	0.074	2.651	0.000	0.000	0.000	0.000	17.322
Quantity of RDT&E Articles	0	0	0	0		0	0	0	0	0		

FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

The C-2A Greyhound is a high wing monoplane, twin engine turbo-prop aircraft capable of operating from both a shore base and all operational United States Navy aircraft carrier classes. The mission of the C-2A is to provide rapid response Carrier Onboard Delivery of fleet essential supplies, repair parts, and personnel to sustain at sea operations of deployed battle groups. In addition, the C-2A provides airdrop delivery and mobilization support for special operations forces from land bases and carriers, Search and Rescue, and Humanitarian Relief.

This project will fund required development, analysis, and testing of a Critical Brake Upgrade to correct a deficiency related to the operational ground controllability of the C-2A.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2012	FY 2013	FY 2014
Title: Critical Brake Upgrade	10.040	4.557	0.074
Articles:	0	0	0
Description: Provides funding for development, design, integration and test of an anti-skid brake system for the C-2A aircraft. This will correct a deficiency related to the operational ground controllability of the C-2A.			
FY 2012 Accomplishments: Provides funding for development, design, integration and test of an anti-skid brake system for the C-2A aircraft.			
FY 2013 Plans: Funding is for on-going efforts to continue development, design, integration and test of anti-skid brake system for the C-2A aircraft.			
FY 2014 Plans: Funding is for on-going efforts to continue development, design, integration and test of anti-skid brake system for the C-2A aircraft.			
Accomplishments/Planned Programs Subtotals	10.040	4.557	0.074

Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 3331: *C-2 System Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
• APN/0556: *C-2A Series*	16.284	4.743	0.902		0.902	0.000	4.570	4.651	4.710	7.966	43.826

Remarks

D. Acquisition Strategy

The C-2 Operational Ground Controllability strategy will be exercised under an Engineering Change Proposal.

E. Performance Metrics

Validation is planned for first quarter FY15. Final Test Report is planned for fourth quarter FY15. Verification is planned for second quarter FY17.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy			DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 3331: *C-2 System Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	NGC:Bethpage, NY	0.000	6.639	Sep 2012	2.685	May 2013	0.000		-		0.000	0.539	9.863	9.863
		Subtotal	0.000	6.639		2.685		0.000		0.000		0.000	0.539	9.863	9.863

Remarks

Totals may not add due to rounding.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD:Pax River, MD	0.000	3.198	Feb 2012	0.515	Nov 2012	0.000		-		0.000	0.358	4.071	
Government Engineering Support	WR	North Island:North Island, CA	0.000	0.188	Feb 2012	0.545	Nov 2012	0.029	Nov 2013	-		0.029	0.259	1.021	
		Subtotal	0.000	3.386		1.060		0.029		0.000		0.029	0.617	5.092	

Remarks

Totals may not add due to rounding.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD:Pax River, MD	0.000	0.000		0.600	Nov 2012	0.040	Nov 2013	-		0.040	1.485	2.125	
Test Assets	WR	NAWCAD:Pax River, MD	0.000	0.000		0.200	Nov 2012	0.000		-		0.000	0.000	0.200	
		Subtotal	0.000	0.000		0.800		0.040		0.000		0.040	1.485	2.325	

Remarks

Totals may not add due to rounding.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 3331: *C-2 System Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	FY 2012 Cost	FY 2012 Award Date	FY 2013 Cost	FY 2013 Award Date	FY 2014 Base Cost	FY 2014 Base Award Date	FY 2014 OCO Cost	FY 2014 OCO Award Date	FY 2014 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various:Various	0.000	0.015	Jan 2012	0.012	Oct 2012	0.005	Oct 2013	-		0.005	0.010	0.042	
		Subtotal	0.000	0.015		0.012		0.005		0.000		0.005	0.010	0.042	

Remarks

Totals may not add due to rounding.

	All Prior Years	FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	10.040		4.557		0.074		0.000		0.074	2.651	17.322	

Remarks

Totals may not add due to rounding.

Exhibit R-4, RDT&E Schedule Profile: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 3331: *C-2 System Development*

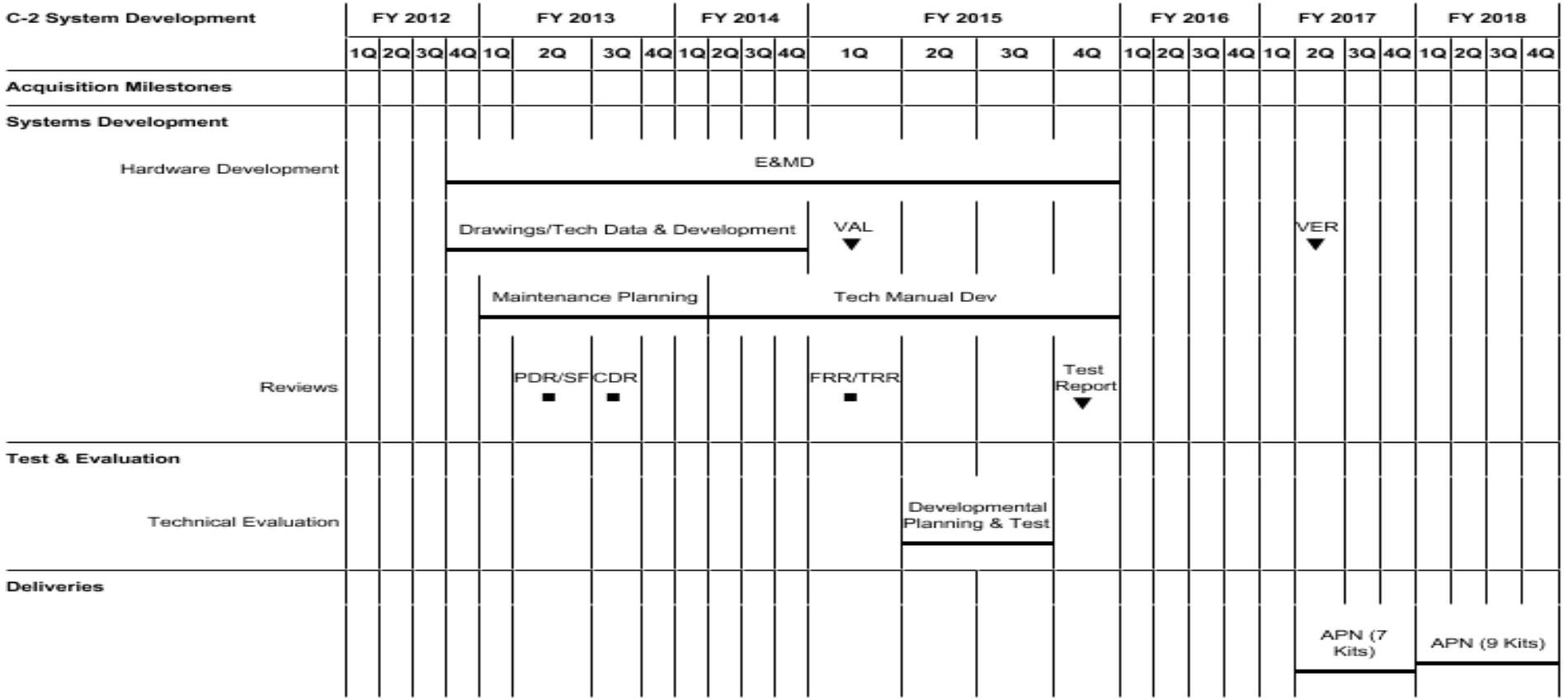

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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Navy		DATE: April 2013
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603251N: *(U)AIRCRAFT SYSTEMS*	PROJECT 3331: *C-2 System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C-2 System Development				
Systems Development: Hardware Development: Engineering & Manufacturing Development	4	2012	4	2015
Systems Development: Hardware Development: Validation	1	2015	1	2015
Systems Development: Hardware Development: Verification Install	2	2017	2	2017
Systems Development: Hardware Development: Drawings/Technical Data Development	4	2012	4	2014
Systems Development: Hardware Development: Maintenance Planning	1	2013	1	2014
Systems Development: Hardware Development: Technical Manual Development	2	2014	4	2015
Systems Development: Reviews: Preliminary Design Review/System Functional Review	2	2013	2	2013
Systems Development: Reviews: Critical Design Review	3	2013	3	2013
Systems Development: Reviews: Funtional Readiness Review/Test Readiness Review	1	2015	1	2015
Systems Development: Reviews: Test Report	4	2015	4	2015
Test & Evaluation: Technical Evaluation: Developmental Planning & Test	2	2015	3	2015
Deliveries: Production Deliveries - APN (7 Kits)	2	2017	4	2017
Deliveries: Production Deliveries FY16 - APN (9 Kits)	1	2018	4	2018