Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Navy

DATE: February 2012

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

1319: Research, Development, Test & Evaluation, Navy

PE 0603251N: Aircraft Systems

BA 4: Advanced Component Development & Prototypes (ACD&P)

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COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
Total Program Element	-	10.497	24.512	-	24.512	2.736	-	-	-	0.000	37.745
2777: Highly Integrated Photonics (HIP)	-	-	19.955	-	19.955	-	-	-	-	0.000	19.955
3331: C-2 System Development	-	10.497	4.557	-	4.557	2.736	-	-	-	0.000	17.790

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.

B. Program Change Summary (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget	-	10.497	4.648	-	4.648
Current President's Budget	-	10.497	24.512	-	24.512
Total Adjustments	-	-	19.864	-	19.864
 Congressional General Reductions 	-	-			
 Congressional Directed Reductions 	-	-			
 Congressional Rescissions 	-	-			
 Congressional Adds 	-	-			
 Congressional Directed Transfers 	-	-			
 Reprogrammings 	-	-			
 SBIR/STTR Transfer 	-	-			
 Program Adjustments 	-	-	19.921	-	19.921
Rate/Misc Adjustments	-	-	-0.057	-	-0.057

Change Summary Explanation

Technical: Not applicable.

Schedule: Revised Integrated Master Schedule (IMS) to reflect more realistic program milestones and testing.

Exhibit R-2A, RD1&E Project Just	tification: P	B 2013 Navy	•					DATE: February 2012				
APPROPRIATION/BUDGET ACTIVITY					IOMENCLA			PROJECT				
1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)				PE 060325	1N: Aircraft	Systems		2777: Highly Integrated Photonics (HIP)				
COST (\$ in Millions)	EV 2011	EV 2012	FY 2013	FY 2013	FY 2013	EV 2014	EV 2015	EV 2016	EV 2017	Cost To	Total Cost	

COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
2777: Highly Integrated Photonics (HIP)	-	-	19.955	-	19.955	-	-	-	-	0.000	19.955
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

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 2011	FY 2012	FY 2013
Title: Highly Integrated Photonics (HIP) Naval Networking	-	-	19.955
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:			
Development and demonstration of highly integrated local area network for naval platforms.			
Accomplishments/Planned Programs Subtotals	-	-	19.955

Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy	DATE: February 2012		
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT	
1319: Research, Development, Test & Evaluation, Navy	PE 0603251N: Aircraft Systems	2777: Highl	y Integrated Photonics (HIP)
BA 4: Advanced Component Development & Prototypes (ACD&P)			
C Other Breazem Funding Summer (f in Millians)			

C. Other Program Funding Summary (\$ in Millions)

N/A

D. Acquisition Strategy

Highly Integrated Photonics (HIP) Naval Networking strategy begins with development and acceptance of a Memorandum of Transition with F-35 PEO in support of the Core Avionics Master Plan sponsored by PMA209, Air combat Electronics Program Manager of Naval Aviation.

E. Performance Metrics

Performance that adheres to the conventional Wavelength	Division Multiplex optical network protocol	standards, wavelengths and interface w	ith Ethernet 10Gbit/s
physical layer standard.			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy

BA 4: Advanced Component Development & Prototypes (ACD&P)

R-1 ITEM NOMENCLATURE

PE 0603251N: Aircraft Systems

DATE: February 2012

PROJECT

2777: Highly Integrated Photonics (HIP)

Product Development	(\$ in Millio	ns)		FY 2	FY 2012		2013 se	FY 2013 OCO		FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental and Architectural Studies	TBD	TBD:Not Specified	-	-		1.000	Oct 2012	-		1.000	0.000	1.000	
Primary Hardware Development	TBD	TBD:Not Specified	-	-		9.975	Apr 2013	-		9.975	0.000	9.975	
Component Foundry & Fabrication	TBD	TBD:Not Specified	-	-		4.500	Jun 2013	-		4.500	0.000	4.500	
Systems Engineering & Testing	TBD	TBD:Not Specified	-	-		2.400	Sep 2013	-		2.400	0.000	2.400	
		Subtotal	-	-		17.875		-		17.875	0.000	17.875	

Support (\$ in Millions)				FY:	2012		2013 ise		2013 CO	FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD:Pax River, MD	-	-		0.900	Oct 2012	-		0.900	0.000	0.900	
Government Engineering Support	WR	SPAWAR:San Diego, CA	-	-		0.200	Oct 2012	-		0.200	0.000	0.200	
Government Engineering Support	WR	NRL:Washington, DC	-	-		0.180	Oct 2012	-		0.180	0.000	0.180	
		Subtotal	-	-		1.280		-		1.280	0.000	1.280	

Management Services (\$ in Millions)			FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	SPAWAR:San Diego, CA	-	-		0.800	Oct 2012	-		0.800	0.000	0.800	
		Subtotal	-	-		0.800		-		0.800	0.000	0.800	

Navy

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R-1 Line #31

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy	DATE: February 2012					
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCI	_ATURE	PROJECT			
1319: Research, Development, Test & Evaluation, Navy	PE 0603251N: Aircra	ft Systems	2777: Highl	y Integrated I	Photonics (HI	P)
BA 4: Advanced Component Development & Prototypes (ACD&P)						
Total Prior						Target

	Total Prior Years Cost	FY:	2012	FY 2013 Base		2013 CO	FY 2013 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		19.955	-		19.955	0.000	19.955	

Remarks

PE 0603251N: Aircraft Systems Navy

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R-1 Line #31

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Navy	DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT
1319: Research, Development, Test & Evaluation, Navy	PE 0603251N: Aircraft Systems	2777: Highly Integrated Photonics (HIP)
BA 4: Advanced Component Development & Prototypes (ACD&P)		

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Navy

DATE: February 2012

APPROPRIATION/BUDGET ACTIVITY R-1 ITEM NOMENCLATURE PROJECT

1319: Research, Development, Test & Evaluation, Navy PE 0603251N: Aircraft Systems 2777: Highly Integrated Photonics (HIP)

BA 4: Advanced Component Development & Prototypes (ACD&P)

Schedule Details

	Sta	art	End		
Events by Sub Project	Quarter	Year	Quarter	Year	
HIP Naval Networking					
Developmental & Architectural Studies: Developmental & Architectural Studies:	1	2013	2	2013	
Hardware Development: Reviews: Preliminary	4	2013	4	2013	
Hardware Development: Reviews: Critical	1	2014	1	2014	
Hardware Development: Design & Hardware Development:	3	2013	3	2014	
Demonstrations: Contractor Demo:	3	2014	4	2014	

EXHIBIT IN-ZA, INDIAL Project Just	ilication. Fi	2013 Navy						DATE: 1 ebidary 2012				
APPROPRIATION/BUDGET ACTIV	ITY			R-1 ITEM N	IOMENCLA [*]	TURE		PROJECT				
1319: Research, Development, Test	PE 060325	1N: <i>Aircraft</i> 3	Systems		3331: C-2 S	3331: C-2 System Development						
BA 4: Advanced Component Develo												
COST (\$ in Millions)	FY 2013	FY 2013	FY 2013					Cost To				
COST (\$ III WIIIIOTIS)	Base	oco	Total	FY 2014	FY 2015	FY 2016	FY 2017	Complete	Total Cost			

COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
3331: C-2 System Development	-	10.497	4.557	-	4.557	2.736	-	-	-	0.000	17.790
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Exhibit R-2A RDT&F Project Justification: PR 2013 Navy

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 2011	FY 2012	FY 2013
Title: Critical Brake Upgrade	-	10.497	4.557
Articles:		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 Plans: 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.			
Accomplishments/Planned Programs Subtotals	-	10.497	4.557

C. Other Program Funding Summary (\$ in Millions)

			FY 2013	FY 2013	<u>FY 2013</u>					Cost To	
<u>Line Item</u>	FY 2011	FY 2012	Base	OCO	<u>Total</u>	FY 2014	FY 2015	FY 2016	FY 2017	Complete	Total Cost
• APN/0556: <i>C-2A(R) Series</i>	0.000	0.000	0.000	0.000	0.000	3.949	4.774	4.571	4.677	2.475	20.446
Modification (Includes OSIP											

007-14 Critical Brake Upgrade)

PE 0603251N: Aircraft Systems

DATE: February 2012

Exhibit R-2A, RDT&E Project Justification: PB 2013 Navy	DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603251N: Aircraft Systems	PROJECT 3331: C-2 System Development
D. Acquisition Strategy		
The C-2 Operational Ground Controllability strategy will be exercised	d under an Engineering Change Proposal.	
E. Performance Metrics		
Validation is planned for second quarter FY13. Verification is planned	ed for first quarter FY15. Final TD is planned	for first quarter FY15.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy

BA 4: Advanced Component Development & Prototypes (ACD&P)

R-1 ITEM NOMENCLATURE

PE 0603251N: Aircraft Systems

PROJECT

3331: C-2 System Development

DATE: February 2012

Product Development (\$ in Millions)				FY 2	2012	FY 2 Ba	2013 se		2013 CO	FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	TBD	TBD:TBD	-	3.816	May 2012	2.009	May 2013	-		2.009	0.643	6.468	6.468
Systems Engineering	Various	Various:Various	-	0.375	May 2012	-		-		-	0.000	0.375	
		Subtotal	-	4.191		2.009		-		2.009	0.643	6.843	

Remarks

Totals may not add due to rounding.

Support (\$ in Millions)				FY 2	2012	FY 2 Ba	2013 se		2013 CO	FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	TBD	TBD:TBD	-	2.232	May 2012	0.558	May 2013	-		0.558	0.000	2.790	2.790
Integrated Logisitics Support	WR	North Island:North Island, CA	-	0.247	Feb 2012	0.252	Nov 2012	-		0.252	0.256	0.755	
Configuration Management	WR	North Island:North Island, CA	-	0.025	Feb 2012	0.025	Nov 2012	-		0.025	0.026	0.076	
Technical Data	WR	North Island:North Island, CA	-	0.484	Feb 2012	0.375	Nov 2012	-		0.375	0.114	0.973	
Maintenance Planning	WR	North Island:North Island, CA	-	0.280	Feb 2012	0.280	Nov 2012	-		0.280	0.000	0.560	
Government Engineering Support	WR	NAWCAD:Pax River, MD	-	1.258	Feb 2012	0.177	Nov 2012	-		0.177	0.049	1.484	
Government Engineering Support	WR	North Island:North Island, CA	-	0.950	Feb 2012	0.275	Nov 2012	-		0.275	0.053	1.278	
ETS - Contractor Engineering Support	C/CPFF	Various:Various	-	0.450	Feb 2012	0.111	Dec 2012	-		0.111	0.000	0.561	0.561
		Subtotal	-	5.926		2.053		-		2.053	0.498	8.477	

Remarks

Navy

Totals may not add due to rounding.

PE 0603251N: Aircraft Systems

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R-1 Line #31

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy

APPROPRIATION/BUDGET ACTIVITY

1319: Research, Development, Test & Evaluation, Navy

BA 4: Advanced Component Development & Prototypes (ACD&P)

R-1 ITEM NOMENCLATURE

PE 0603251N: Aircraft Systems

PROJECT

3331: C-2 System Development

DATE: February 2012

Test and Evaluation (\$ i	n Millions	s)		FY 2	2012		2013 se	FY 2	2013 CO	FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD:Pax River, MD	-	-		-		-		-	0.472	0.472	
Operational Test & Evaluation	WR	NAWCAD:Pax River, MD	-	-		-		-		-	0.726	0.726	
Test Assets	WR	NAWCAD:Pax River, MD	-	-		0.200	Nov 2012	-		0.200	0.200	0.400	
		Subtotal	-	-		0.200		-		0.200	1.398	1.598	

Remarks

Totals may not add due to rounding.

Management Services	(\$ in Millio	ons)		FY 2	2012		2013 ise		2013 CO	FY 2013 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To	Total Cost	Target Value of Contract
Contractor Support - MSS	C/CPFF	Various:Various	-	0.125	Feb 2012	0.101	Dec 2012	-		0.101	0.045	0.271	0.271
Government Engineering Support	WR	NAWCAD:Pax River, MD	-	0.061	Feb 2012	0.063	Nov 2012	-		0.063	0.048	0.172	
Government Engineering Support	WR	North Island:North Island, CA	-	0.019	Feb 2012	0.012	Nov 2012	-		0.012	0.009	0.040	
Program Management Support	WR	NAWCAD:Pax River, MD	-	0.097	Feb 2012	0.074	Nov 2012	-		0.074	0.060	0.231	
Program Management Support	WR	North Island:North Island, CA	-	0.028	Feb 2012	0.020	Nov 2012	-		0.020	0.010	0.058	
Travel	Various	Various:Various	-	0.050	Jan 2012	0.025	Oct 2012	-		0.025	0.025	0.100	
		Subtotal	-	0.380		0.295		-		0.295	0.197	0.872	

Remarks

Totals may not add due to rounding.

PE 0603251N: Aircraft Systems

Navy Page 11 of 14

DATE: February 2012 Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Navy

APPROPRIATION/BUDGET ACTIVITY R-1 ITEM NOMENCLATURE PROJECT

1319: Research, Development, Test & Evaluation, Navy PE 0603251N: Aircraft Systems

3331: C-2 System Development BA 4: Advanced Component Development & Prototypes (ACD&P)

	Total Prior Years Cost	FY 2012	FY 2 Ba			Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.497	4.557	-	4.557	2.736	17.790	

Remarks

Totals may not add due to rounding.

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Navy		DATE: February 2012		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0603251N: Aircraft Systems	PROJECT 3331: C-2 System Development		

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Navy

APPROPRIATION/BUDGET ACTIVITY R-1 ITEM NOMENCLATURE

1319: Research, Development, Test & Evaluation, Navy PE 0603251N: Aircraft Systems

BA 4: Advanced Component Development & Prototypes (ACD&P)

DATE: February 2012

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	2	2012	2	2014	
Systems Development: Hardware Development: Validation	2	2013	2	2013	
Systems Development: Hardware Development: Verification Install		2015	1	2015	
Systems Development: Hardware Development: Drawings/Technical Data Development		2012	4	2014	
Systems Development: Hardware Development: Maintenance Planning	4	2013	4	2014	
Systems Development: Hardware Development: Technical Manual Development	2	2014	4	2015	
Systems Development: Reviews: Preliminary Design Review/System Functional Review		2012	4	2012	
Systems Development: Reviews: Critical Design Review	2	2013	2	2013	
Systems Development: Reviews: Funtional Readiness Review/Test Readiness Review		2014	1	2014	
Systems Development: Reviews: Technical Directive		2015	1	2015	
Test & Evaluation: Technical Evaluation: Developmental Planning & Test		2014	2	2014	
Deliveries: Production Deliveries - APN (6 Kits)	2	2014	2	2014	
Deliveries: Production Deliveries FY15 - APN (8 Kits)		2015	2	2015	
Deliveries: Production Deliveries FY16 - APN (8 Kits)		2016	2	2016	