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Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Navy	DATE: April 2013
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APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE							
1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 7: <i>Operational Systems Development</i>					PE 0604402N: <i>Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev</i>							
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	1,036.285	202.188	142.282	20.961	-	20.961	0.000	0.000	0.000	0.000	0.000	1,401.716
3178: <i>Unmanned Combat Air System CV-Demo (UCAS-D)</i>	1,036.285	202.188	142.282	20.961	-	20.961	0.000	0.000	0.000	0.000	0.000	1,401.716

MDAP/MAIS Code(s): P388

[#] 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 2005 Quadrennial Defense Review published February 2006 and OSD Advanced Technology & Logistics Executive Committee Memorandum of February 2006 supported direction to restructure the Joint Unmanned Combat Air System (UCAS) program into a new Navy UCAS program. The Navy UCAS program will develop an unmanned, longer-range, carrier-based aircraft capable of being air-refueled to provide greater standoff capability, to expand payload and launch options, and to increase naval reach and persistence. The Navy was directed to demonstrate carrier operations, including Autonomous Aerial Refueling, of a Low Observable (LO) planform UCAS and to mature required technologies to a Technology Readiness Level-6; which, is required for a potential follow on acquisition program.

The Navy UCAS designed for autonomous launch and recovery as well as operations in the Carrier Control Area, is comprised of an Air Vehicle Segment, a Mission Control Segment (MCS) and a government led Aircraft Carrier Integration Segment. The scope of the Navy UCAS effort includes design, development, integration, and validation of an unmanned, LO planform Air Vehicle Segment and MCS in the land-based and shipboard environments. Evaluations will be conducted to investigate MCS interfaces with shipboard systems such as Primary Flight Control displays, Landing Safety Officer displays, and Carrier Air Traffic Control Center stations.

The Navy UCAS program will be structured to match program resources to United States Navy objectives and constraints with the goals of identifying and maturing critical technologies and reducing the risk of carrier integration of a UCAS. Candidate Technology Maturation efforts include transformational communications, advanced integrated propulsion, aircraft carrier suitable materials, LO sensors and apertures, sense and avoid functionality (in an LO environment), autonomous operations (software algorithms and interfaces), and computer resource data storage and access systems. Modeling, simulation, analysis, industrial capability assessments, system/component development, and analysis of architectures and concept designs are being developed as a result of the demonstration. Maturation of candidate technologies support the evaluation of alternatives needed for a future milestone decision.

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BA 7: Operational Systems Development					
B. Program Change Summary (\$ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	198.251	142.282	41.158	-	41.158
Current President's Budget	202.188	142.282	20.961	-	20.961
Total Adjustments	3.937	0.000	-20.197	-	-20.197
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	8.184	0.000			
• SBIR/STTR Transfer	-4.247	0.000			
• Program Adjustments	0.000	0.000	-20.153	-	-20.153
• Rate/Misc Adjustments	0.000	0.000	-0.044	-	-0.044
Change Summary Explanation					
Technical: N/A					
Schedule:					
System Development: Ship Integration Build 2					
From 2nd QTR 2013 to 4th QTR 2013 due to carrier schedule change.					

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Exhibit R-2A, RDT&E Project Justification: PB 2014 Navy									DATE: April 2013								
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 7: Operational Systems Development					R-1 ITEM NOMENCLATURE PE 0604402N: Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev				PROJECT 3178: Unmanned Combat Air System CV-Demo (UCAS-D)								
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					
3178: Unmanned Combat Air System CV-Demo (UCAS-D)	1,036.285	202.188	142.282	20.961	-	20.961	0.000	0.000	0.000	0.000	0.000	1,401.716					
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 Navy Unmanned Combat Air System (UCAS), designed for autonomous launch and recovery as well as operations in the Carrier Control Area, is comprised of an Air Vehicle Segment, a Mission Control Segment (MCS) and a government led Aircraft Carrier Integration Segment. The scope of the Navy UCAS effort includes design, development, integration, and validation of an unmanned, Low Observable (LO) planform Air Vehicle Segment and MCS in the land-based and shipboard environments. Evaluations will be conducted to investigate MCS interfaces with shipboard systems such as Primary Flight Control displays, Landing Safety Officer (LSO) displays, and Carrier Air Traffic Control Center (CATCC) stations.																	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2012	FY 2013	FY 2014						
Title: Product Development									177.816	122.571	13.923						
									Articles: 0	0	0						
Description: The primary effort in the Navy UCAS program is design, development, integration and validation of Air Vehicle Segment, MCS and government led Aircraft Carrier Segment leading to a Carrier demonstration of an unmanned, LO planform UCAS system, and development of internal/external interface documents. In addition, design and development of hardware/software to support Autonomous Aerial Refueling (AAR) will be conducted. Shipboard evaluation of the Navy UCAS includes integration of the Navy UCAS with shipboard systems such as Primary Flight Control displays, LSO displays and CATCC stations.																	
									FY 2012 Accomplishments:								
									Continue efforts in the Navy UCAS program designing, developing, integrating and validating the Navy UCAS Air Vehicle Segment, MCS and government led Aircraft Carrier Integration Segment. Installation of UCAS-D shipboard components on Nimitz class aircraft carrier. Continue AAR integration efforts. Continue Highly Integrated Photonics analysis and technical discussions for integration and installation on T-REX and ROADHAWK platforms. Continue process to transfer component fabrication processes from research facilities to a foundry environment. Continue to refine and prioritize system demonstration objectives and identify a demonstration platform.								
FY 2013 Plans:																	

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2012	FY 2013	FY 2014
Continue efforts in the Navy UCAS program designing, developing, integrating and validating the Navy UCAS Air Vehicle Segment, Mission Control Segment and government led Aircraft Carrier Integration Segment. Finalize temporary installations of UCAS-D shipboard components on Nimitz class aircraft carrier. Continue AAR integration efforts. FY 2014 Plans: Continue AAR integration efforts. Complete Navy UCAS demonstration objectives and contract closeout.				
Title: Test and Evaluation Support FY 2012 Accomplishments: After airworthiness and envelope expansion test completion, Air Vehicles 1 and 2 will transfer to NAWCAD Patuxent River, MD for shore-based carrier suitability testing. Conduct shore-based carrier suitability testing with Air Vehicles 1 and 2. Conduct the final verification testing of the CVN segment. FY 2013 Plans: Continue shore-based carrier suitability testing with Air Vehicles 1 and 2 at NAWCAD Patuxent River, MD. Conduct Sea Trial testing, including ship landings, for Air Vehicles 1 and 2 aboard a Nimitz class aircraft carrier. FY 2014 Plans: Complete UCAS Demonstration objectives and contract closeout.		Articles: 10.061 0	8.800 0	3.053 0
Title: Management FY 2012 Accomplishments: Government management, engineering, and contract support. FY 2013 Plans: Government management, engineering, and contract support. FY 2014 Plans: Government management, engineering, and contract support. The Carrier Demonstration will be complete and management support is required for program closeout.		Articles: 14.311 0	10.911 0	3.985 0
Accomplishments/Planned Programs Subtotals		202.188	142.282	20.961
C. Other Program Funding Summary (\$ in Millions) N/A				

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APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 7: <i>Operational Systems Development</i>	R-1 ITEM NOMENCLATURE PE 0604402N: <i>Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev</i>	PROJECT 3178: <i>Unmanned Combat Air System CV-Demo (UCAS-D)</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy In the 2005 Quadrennial Defense Review, the Navy was directed to restructure the Joint Unmanned Combat Air System (UCAS) program and develop an unmanned, longer-range carrier-based aircraft capable of being air-refueled to provide greater aircraft carrier standoff capability, to expand payload and launch options, and to increase naval reach and persistence. The primary goal is risk reduction for carrier integration while developing the critical data necessary to support a potential follow on acquisition milestone decision. The Navy UCAS effort will focus on designing, developing, and evaluating the core capabilities which safely demonstrate carrier interoperability. Currently, primary hardware development for the Navy UCAS effort is being performed under a Federal Acquisition Regulation based, cost plus incentive fee-type contract competitively awarded to a single contractor.		
E. Performance Metrics Complete airworthiness and envelope expansion testing. Conduct shore-based carrier suitability testing. Conduct F/A-18D surrogate aircraft testing with Nimitz class aircraft carrier. Conduct final sea trials of X-47B air vehicles. Demonstrate Autonomous Aerial Refueling.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Navy												DATE: April 2013			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 7: Operational Systems Development						R-1 ITEM NOMENCLATURE PE 0604402N: Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev				PROJECT 3178: Unmanned Combat Air System CV-Demo (UCAS-D)					
Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Aviation/ Ship Integration	C/CPFF	Rockwell/ AFRL:Rome, NY	8.535	1.766	Nov 2011	1.638	Nov 2012	0.500	Nov 2013	-		0.500	0.000	12.439	12.439
Aviation/ Ship Integration	C/CPFF	L-3 Com Titan:MD	10.278	1.857	Dec 2011	1.250	Dec 2012	1.030	Dec 2013	-		1.030	0.000	14.415	14.415
Aviation/Ship Integration	WR	NAWCAD:MD	39.626	18.664	Nov 2011	14.443	Nov 2012	4.279	Nov 2013	-		4.279	0.000	77.012	
Aviation/Ship Integration	C/CPIF	Various:Various	4.242	0.900	Jan 2012	0.843	Jan 2013	0.500	Jan 2014	-		0.500	0.000	6.485	6.485
Primary Hardware Development	C/CPIF	Northrop Grumman Corporation:CA	749.303	126.713	Dec 2011	87.187	Dec 2012	4.795	Dec 2013	-		4.795	0.000	967.998	967.998
Systems Engineering	WR	NAWCAD:MD	29.786	14.798	Nov 2011	12.857	Nov 2012	2.295	Nov 2013	-		2.295	0.000	59.736	
Product Development	Various	Various:Various	97.551	4.934	Dec 2011	4.353	Dec 2012	0.524	Dec 2013	-		0.524	0.000	107.362	
New Highly Integrated Photonics	Various	Various:Various	2.000	8.184	Mar 2012	0.000		0.000		-		0.000	0.000	10.184	10.184
Subtotal			941.321	177.816		122.571		13.923		0.000		13.923	0.000	1,255.631	
Support (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Support cost no longer funded in the FYDP	Various	Various:Various	20.861	0.000		0.000		0.000		-		0.000	0.000	20.861	
Subtotal			20.861	0.000		0.000		0.000		0.000		0.000	0.000	20.861	
Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MIPR	Edwards AFB:CA	9.475	0.722	Nov 2011	0.150	Nov 2012	0.000		-		0.000	0.000	10.347	
Developmental Test & Evaluation	WR	NAWCAD:MD	16.374	8.971	Nov 2011	8.345	Nov 2012	2.953	Nov 2013	-		2.953	0.000	36.643	
Test & Evaluation	Various	Various:Various	1.006	0.368	Nov 2011	0.305	Nov 2012	0.100	Nov 2013	-		0.100	0.000	1.779	

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APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 7: Operational Systems Development							R-1 ITEM NOMENCLATURE PE 0604402N: Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev				PROJECT 3178: Unmanned Combat Air System CV-Demo (UCAS-D)				
Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			26.855	10.061		8.800		3.053		0.000		3.053	0.000	48.769	
Management Services (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor SEPM Support	C/CPIF	Various:Various	18.745	3.487	Dec 2011	2.805	Dec 2012	1.713	Dec 2013	-		1.713	0.000	26.750	26.750
Government Engineering Support	WR	NAWCAD:MD	14.642	5.676	Nov 2011	4.846	Nov 2012	1.320	Nov 2013	-		1.320	0.000	26.484	
Program Management Support	WR	NAWCAD:MD	11.115	5.148	Nov 2011	3.260	Nov 2012	0.952	Nov 2013	-		0.952	0.000	20.475	
Prior year Mgmt cost no longer funded in the FYDP	Various	Various:Various	2.746	0.000		0.000		0.000		-		0.000	0.000	2.746	
Subtotal			47.248	14.311		10.911		3.985		0.000		3.985	0.000	76.455	
			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			1,036.285	202.188		142.282		20.961		0.000		20.961	0.000	1,401.716	
Remarks															

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PE 0604402N: *Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev*
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R-1 ITEM NOMENCLATURE

PE 0604402N: *Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev*

3178: *Unmanned Combat Air System CV-Demo (UCAS-D)*

Unmanned Combat Air Vehicle (UCAV) ADV CP/PROTO DEV	FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017				FY 2018			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Systems Development																												
	Mission Control Segment Software Devel, Int, & Supt																											
Ship Integration	Ship Integration and Installations (Build 2)																											
Autonomous Aerial Refueling (AAR)	System Integration																											
	Surrogate/Air Vehicle Flight Test																											
Test & Evaluation																												
Surrogate Testing	Surrogate Testing																											
Airworthiness Testing	Airworthiness Testing																											
Land Based Carrier Control Area, Catapult Launch & Arrestment Testing	Land Based Carrier Control Area, Catapult Launch & Arrestment Testing																											
Sea Trials					Sea Trials																							
							First Ship Landing ▼																					

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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 7: Operational Systems Development	R-1 ITEM NOMENCLATURE PE 0604402N: Unmanned Combat Air Veh(UCAV) Adv Cp/Proto Dev	PROJECT 3178: Unmanned Combat Air System CV- Demo (UCAS-D)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Unmanned Combat Air Vehicle (UCAV) ADV CP/PROTO DEV				
Systems Development: Software Devel, Int, & Supt	1	2012	4	2012
Systems Development: Ship Integration: Build 2	1	2012	4	2013
Systems Development: Autonomous Aerial Refueling (AAR): System Integration - AAR	1	2012	2	2014
Systems Development: Autonomous Aerial Refueling (AAR): Surrogate/Air Vehicle Flight Test - AAR	1	2012	3	2013
Test & Evaluation: Surrogate Testing: Surrogate Testing	1	2012	4	2013
Test & Evaluation: Airworthiness Testing: Airworthiness Testing	1	2012	2	2012
Test & Evaluation: Land Based Carrier Control Area, Catapult Launch & Arrestment Testing: Land Based Carrier Control Area, Catapult Launch & Arrestment Testing	1	2012	4	2013
Test & Evaluation: Sea Trials: Sea Trials	1	2013	1	2014
Test & Evaluation: Sea Trials: First Ship Landing	3	2013	3	2013