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EXHIBIT R-2, RDT&E Budget Item Justification				DATE: MAY 2009
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7				0604402N, UNMANNED COMBAT AIR VEHICLE (UCAV) ADV CP/PROTO DEV
COST (\$ in Millions)	FY 2008	FY 2009	FY 2010	
Total PE Cost	153.920	274.714	311.204	
3178 UNMANNED COMBAT AIR SYSTEM CV-DEMO	153.920	267.483	311.204	
3191 UCAS TECHNOLOGY MATURATION		7.231		

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Navy Unmanned Combat Air Vehicle (UCAS) designed for autonomous launch and recovery as well as operations in the Carrier Control Area (CCA), is comprised of a LO planform 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 (PRI-FLY) displays, Landing Safety Officer (LSO) displays, and Carrier Air Traffic Control Center (CATCC) stations. The Navy UCAS program will be structured to match program resources to United States Navy (USN) objectives/constraints with the goals of identifying and maturing critical technologies and reducing the risk of carrier integration of a UCAS.

In previous budget requests, separate Project Units were identified for the Navy UCAS CV-Demo (PU 3178) and Technology Maturation (PU 3191) efforts. Candidate Technology Maturation efforts include transformation: communications, advanced integrated propulsion, CV suitable materials, LO sensors and apertures, sense and avoid functionality (all operating in a LO environment), autonomous operations (software algorithms and interfaces), and computer resource data storage and access systems. The demonstration and the technology maturation efforts will develop data to support a follow-on acquisition milestone decision. The Navy has consolidated Project 3191 into Project 3178 beginning in FY10. Engineering and Manufacturing Development (EMD) funding is not covered, nor described in this exhibit.

Funding:	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
Previous President's Budget:	158.212	275.823	315.805
Current President's Budget:	153.920	274.714	311.204
Total Adjustments	-4.292	-1.109	-4.601

Summary of Adjustments

Congressional Rescissions			
Congressional Adjustments	-3.000	-0.362	
SBIR/STTR/FTT Assessments	-1.292		
Program Adjustments			-4.597
Rate/Misc Adjustments		-0.747	-0.004
Subtotal	-4.292	-1.109	-4.601

Schedule: The schedule has been updated from PB09 to present greater clarity into scheduled efforts and events

Technical: Not Applicable.

EXHIBIT R-2a, RDT&E Project Justification				DATE: May 2009															
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME			PROJECT NUMBER AND NAME															
RDT&E,N / BA-7	0604402N, UNMANNED COMBAT AIR VEHICLE (UCAV) ADV CP/PROTO DEV			3178, UNMANNED COMBAT AIR SYSTEM CV-DEMO (UCAS-D)															
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RDT&E Articles Qty																			
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<p>B. ACCOMPLISHMENTS / PLANNED PROGRAM:</p> <table border="1"> <thead> <tr> <th>Product Development</th> <th>FY 2008</th> <th>FY 2009</th> <th>FY 2010</th> </tr> </thead> <tbody> <tr> <td>Accomplishments / Effort / Sub-total Cost</td> <td>144.995</td> <td>252.735</td> <td>291.629</td> </tr> <tr> <td>RDT&E Articles Qty</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>								Product Development	FY 2008	FY 2009	FY 2010	Accomplishments / Effort / Sub-total Cost	144.995	252.735	291.629	RDT&E Articles Qty			
Product Development	FY 2008	FY 2009	FY 2010																
Accomplishments / Effort / Sub-total Cost	144.995	252.735	291.629																
RDT&E Articles Qty																			
<p>The primary effort in the Navy UCAS program is design, development, integration and validation of Air Vehicle Segment, Mission Control Segment 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 Automated Air Refueling (AAR) will be conducted. Shipboard evaluation of the Navy UCAS includes integration of the Navy UCAS with shipboard systems such as PRI-FLY displays, LSO displays and CATCC stations. Technology maturation aligns with the Navy UCAS demonstration to evolve this capability to achieve the requirements outlined in the Joint Strike Enabler for Unmanned Systems Initial Capabilities Document. Modeling, simulation, analysis, industrialcapability assessments, system/component development, and analysis of architectures and concept designs support the evaluation of alternatives needed to support a future milestone decision and subsequent entry into Engineering, Manufacturing and Development (EMD).</p>																			
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Management	FY 2008	FY 2009	FY 2010																
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RDT&E Articles Qty																			
<p>Government management, engineering and contract support.</p>																			

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EXHIBIT R-2a, RDT&E Project Justification			DATE:	May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME		
RDT&E,N / BA-7	0604402N, UNMANNED COMBAT AIR VEHICLE (UCAV) ADV CP/PROTO DEV	3178, UNMANNED COMBAT AIR SYSTEM CV-DEMO (UCAS-D)		
Test and Evaluation Support	FY 2008	FY 2009	FY 2010	
Accomplishments / Effort / Sub-total Cost	2.174	4.047	9.049	
RDT&E Articles Qty				
<p>Perform test and evaluation of Navy UCAS. Efforts include detailed test and evaluation plan development, test site facility preparation, system integration, ground and flight test execution and reporting, and carrier at sea test planning.</p> <p>C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable</p> <p>D. ACQUISITION STRATEGY: In the 2005 QDR, the Navy was directed to restructure the J-UCAS program and develop an unmanned, longer-range carrier-based aircraft capable of being air-refueled to provide greater (CV) standoff capability, to expand payload and launch options, and to increase naval reach and persistence. The primary goal is risk reduction for carrier integration and maturation of critical technologies, 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 FAR-based, cost plus incentive fee-type contract competitively awarded to a single contractor. Future technology development efforts will be conducted in accordance with DoDI 5000.02.</p>				

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Exhibit R-3 Cost Analysis							DATE: May 2009					
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT			PROJECT NUMBER AND NAME							
RDT&E,N / BA-7		0604402N, UNMANNED COMBAT AIR VEHICLE (UCAV) ADV CP/PROTO DEV			3178, UNMANNED COMBAT AIR SYSTEM CV-DEMO (UCAS-D)							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYS Cost	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date					
PRODUCT DEVELOPMENT												
Air Ship Integration	C/CPFF	ROCKWELL/AFRL, ROME, NY	4.185	2.200	Dec 2008	1.200	Dec 2009					
Air Ship Integration	C/FFP	L-3 COMMUNICATIONS TITAN CORP, ANNAPOLIS JUNCTION, MD	3.408	2.936	Dec 2008	1.538	Dec 2009					
Air Ship Integration	WX	NAWCAD, PATUXENT RIVER, MD	8.225	4.873	Nov 2008	10.917	Nov 2009					
Air Ship Integration	TBD	TBD				2.142	Feb 2010					
Primary Hdw Development	C/CPIF	NORTHROP GRUMMAN CORP, SAN DIEGO, CA	149.189	230.697	Nov 2008	214.298	Nov 2009					
Advanced Dev Eng	TBD	Other				29.700	Dec 2009					
Systems Eng	WX	NAWCAD, PATUXENT RIVER, MD	5.428	6.005	Nov 2008	9.437	Nov 2009					
Product Development	Various	Various	63.520	5.487		2.540						
SUBTOTAL PRODUCT DEVELOPMENT			233.955	252.198		271.772						
SUPPORT												
Studies and Analysis	TBD	TBD				1.338	Feb 2010					
Concept Development	WX	NAWCAD, PATUXENT RIVER, MD				7.400	Nov 2009					
Concept Development	TBD	TBD				11.000	Mar 2010					
Support	Various	Various	.467	.537		.119						
SUBTOTAL SUPPORT			.467	.537		19.857						
TEST & EVALUATION												
Dev Test & Eval	MIPR	AFFTC, EDWARDS AFB, CA	.700	2.228	Jan 2009	3.214	Nov 2009					
Test & Eval	Various	Various	.128	.155		.352						
Dev Test & Eval	WX	NAWCAD, PATUXENT RIVER, MD	1.594	1.664	Nov 2008	5.483	Nov 2009					
SUBTOTAL TEST & EVALUATION			2.422	4.047		9.049						
MANAGEMENT												
Government Eng Sup	WX	NAWCAD, PATUXENT RIVER MD	4.464	3.041	Nov 2008	3.533	Nov 2009					
Program Mgmt Support	WX	NAWCAD, PATUXENT RIVER MD	3.282	1.833	Nov 2008	2.750	Nov 2009					
Program Mgmt Sup - Contract	C-CPIF	VARIOUS	5.287	5.458	Dec 2008	3.800	Dec 2009					
Management	Various	Various	.656	.369		.443						
SUBTOTAL MANAGEMENT			13.689	10.701		10.526						
Total Cost			250.533	267.483		311.204						

EXHIBIT R4, Schedule Profile													DATE: May 2009				
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7					PROGRAM ELEMENT NUMBER AND NAME 0604402N, UNMANNED COMBAT AIR VEHICLE (UCAV) ADV CP/PROTO DEV					PROJECT NUMBER AND NAME 3178, UNMANNED COMBAT AIR SYSTEM CV-DEMO (UCAS-D)							
Fiscal Year	FY 2008				FY 2009				FY 2010								
	1	2	3	4	1	2	3	4	1	2	3	4					
Development																	
AV-1 Devel & Integr													[Bar: FY08 Q1-Q4, FY09 Q1-Q2]				
AV-2 Devel & Integr													[Bar: FY09 Q1-Q4, FY10 Q1-Q2]				
MCS Shelter Devel													[Bar: FY08 Q1-Q3]				
MCS S/W Devel, Int, & Supt													[Bar: FY08 Q2-Q4]				
Test and Evaluation																	
Surrogate Testing													[Bar: FY09 Q2-Q3], [Bar: FY10 Q1-Q2], [Bar: FY10 Q3-Q4]				
Airworthiness Testing													[Bar: FY09 Q3-Q4], [Bar: FY10 Q1-Q2]				
Land Based Catapult & Arresting Gear Testing													[Bar: FY10 Q4]				
First Flight 													[Point: FY09 Q3]				
Ship Integration																	
Precision GPS													[Bar: FY08 Q2-Q4] Coding, [Bar: FY09 Q1-Q2] Test, [Bar: FY10 Q1-Q2] Update				
Air Traffic Control Console													[Bar: FY08 Q2-Q4] Coding, [Bar: FY09 Q1-Q2] Test, [Bar: FY10 Q1-Q2] Update				
Shipboard Display Development & Integration													[Bar: FY08 Q2-Q4] Coding, [Bar: FY09 Q1-Q2] Test, [Bar: FY10 Q1-Q2] Update				
Aviation Data Management and Control System (ADMACS) Block II													[Bar: FY08 Q2-Q4] Coding, [Bar: FY09 Q1-Q2] Test, [Bar: FY10 Q1-Q2] Update				
Ship Modifications													[Bar: FY09 Q1-Q4] SCD Phase II Dev (TEMPALT)				
Autonomous Air-to-Air (AAR) Refueling																	
Preliminary Design													[Bar: FY09 Q3-Q4], [Bar: FY10 Q1-Q2]				
Detail Design													[Bar: FY10 Q1-Q2], [Bar: FY10 Q3-Q4]				
Technology Maturation													[Bar: FY10 Q1-Q2]				

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Exhibit R-4a, Schedule Detail				DATE: May 2009			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT			PROJECT NUMBER AND NAME			
RDT&E,N / BA-7	0604402N, UNMANNED COMBAT AIR VEHICLE (UCAV) ADV CP/PROTO DEV			3178, UNMANNED COMBAT AIR SYSTEM CV-DEMO (UCAS-D)			
Schedule Profile	FY 2008	FY 2009	FY 2010				
Development							
AV-1 Devel & Integr	1Q - 4Q	1Q - 4Q					
AV-2 Devel & Integr		2Q - 4Q	1Q - 4Q				
MCS Shelter Devel	1Q - 4Q	1Q					
MCS S/W Devel, Int, & Supt	2Q - 4Q	1Q - 4Q	1Q - 4Q				
Test and Evaluation							
Surrogate Testing		1Q - 4Q	1Q, 3Q - 4Q				
Airworthiness Testing			1Q - 4Q				
Land Based Catapult & Arresting Gear Testing			4Q				
Ship Integration							
Precision GPS	1Q - 4Q	1Q - 4Q	1Q - 4Q				
Air Traffic Control Console	1Q - 4Q	1Q - 4Q	1Q - 4Q				
Integration	1Q - 4Q	1Q - 4Q	1Q - 4Q				
Aviation Data Management and Control System (ADMACS) Block II	1Q - 4Q	1Q - 4Q	1Q - 4Q				
Ship Modifications	1Q - 4Q	1Q - 4Q	1Q - 4Q				
Autonomous Air-to-Air Refueling							
Preliminary Design		3Q - 4Q	1Q - 3Q				
Detail Design			2Q - 4Q				
Technology Maturation							
			1Q - 4Q				

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RDT&E,N / BA-7		0604402N, UNMANNED COMBAT AIR VEHICLE (UCAV) ADV CP/PROTO DEV			3191, UCAS TECHNOLOGY MATURATION															
COST (\$ in Millions)		FY 2008	FY 2009																	
3191 UCAS TECHNOLOGY MATURATION			7.231																	
RDT&E Articles Qty																				
<p>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy Unmanned Combat Air System (UCAS) Advanced Development effort.</p> <p>Navy UCAS technology maturation efforts are contained within Project 3178 beginning in FY10.</p> <p>B. ACCOMPLISHMENTS / PLANNED PROGRAM:</p> <table border="1" style="width:100%; border-collapse: collapse; margin-left: 20px;"> <thead> <tr> <th style="text-align: left;">Product Development</th> <th style="text-align: center;">FY 2008</th> <th style="text-align: center;">FY 2009</th> <th style="text-align: center;">FY 2010</th> </tr> </thead> <tbody> <tr> <td>Accomplishments / Effort / Sub-total Cost</td> <td></td> <td style="text-align: center;">7.231</td> <td></td> </tr> <tr> <td>RDT&E Articles Qty</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>A primary effort in the Navy UCAS program is the identification and maturation of technologies required to support the demonstration of an unmanned, LO platform Navy UCAS on an aircraft carrier. Technology maturation aligns with the Navy UCAS demonstration to evolve this capability to achieve the requirements outlined in the Joint Strike Enabler for Unmanned Systems Initial Capabilities Document. Modeling, simulation, analysis, industrial capability assessments, system/component development, and analysis of architectures and concept designs support the evaluation of alternatives needed to support a future milestone decision and subsequent entry into Engineering, Manufacturing and Development (EMD). No FY10 activities will be conducted under Project 3191.</p> <p>C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable</p> <p>D. ACQUISITION STRATEGY: Navy UCAS technology maturation efforts are contained within Project 3178 in FY10.</p>									Product Development	FY 2008	FY 2009	FY 2010	Accomplishments / Effort / Sub-total Cost		7.231		RDT&E Articles Qty			
Product Development	FY 2008	FY 2009	FY 2010																	
Accomplishments / Effort / Sub-total Cost		7.231																		
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