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EXHIBIT R-2, RDT&E Budget Item Justification	DATE: May 2009
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APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7	R-1 ITEM NOMENCLATURE 0204152N, E-2 SQUADRONS
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COST (\$ in Millions)	FY 2008	FY 2009	FY 2010				
Total PE Cost	18.969	53.834	63.058				
0463 E-2C IMPROVEMENTS	18.969	53.834	63.058				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

E-2 Improvements (0463) provides for incorporation of technologies for the evolution of E-2 Battle Management and Command and Control (BMC2) capabilities in support of naval warfare command and control requirements. It has previously funded developments for the modification or replacement of selected Weapon Replaceable Assemblies (WRAs) of currently installed subsystems, as well as provided for experimentation with narrowband and wideband internet protocol (IP) concepts, to include technologies such as High Frequency (HF) Secure IP Router Network (HF SIPRNET), VRC-99 digital IP radio as a surrogate to the Joint Tactical Radio System, machine-to-machine digital data communications, Advanced Digital Networking System (ADNS), Tactical Information Services (TIS), cooperative and non-cooperative identification, and open architecture hardware and software computing environments. These efforts have laid the foundation for growth to provide additional functional capabilities satisfying evolving operational requirements, e.g., Airborne Networking, Joint Sensor Netting, Tactical Decision Aids, Advanced communications, and permits the evolutionary growth of a Combat Identification (CID) and Theater Air and Missile Defense (TAMD) Capability.

A Core Open Architecture capability will modernize existing Mission Computer (MC) and Operational Flight Program (OFP) architecture, preserve interfaces to future E-2 weapon systems modification, simplify maintenance and upgrades, memory and operating systems (hardware/software independence), add an improved networking backbone to quickly field future interoperable warfighting applications and utilize open and commercially adopted standards and protocols to the maximum extent possible.

An In Flight Refueling (IFR) capability will allow the E-2 to receive fuel from various organic and strategic tanker aircraft. It provides Expanded Battle Space Surveillance and Targeting through significantly enhanced persistence and increased flexibility (range & endurance). IFR will better enable the E-2 to fully support current Carrier Strike Group (CSG)/Joint 24/7 Theater Operations by providing more versatile stationing and/or forward basing options. Previous domestic E-2 concept demonstration effort successfully established the feasibility of tanking behind the F/A-18E/F and KC-130 aircraft.

The Automatic Identification System (AIS) is a broadcast transponder system operating in the VHF maritime band that provides data exchange from Ship to Ship, Ship to Shore and Shore to Ship. Broadcast parameters include Registry Number, Port of Origin, Latitude, Longitude, Course, Speed and other vessel characteristics. The current prototype E-2C AIS installation is integrated into the E-2C weapon system without a means to transfer information off board to other platforms/systems.

FY2010 starts the Radar Improvement Program. This provides funding to develop, and field improvements to APS-145 WRAs to keep them viable until aircraft retirement.

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	0204152N, E-2 SQUADRONS	

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	22.483	54.096	54.712
Current President's Budget:	18.969	53.834	63.058
Total Adjustments	-3.514	-0.262	8.346

Summary of Adjustments

Congressional Rescissions			
Congressional Adjustments	-3.100	-0.115	
SBIR/STTR/FTT Assessments	-0.414		
Program Adjustments			8.380
Rate/Misc Adjustments		-0.147	-0.034
Subtotal	-3.514	-0.262	8.346

Schedule:

Schedule:

Project Unit 0463 - Changes to ABC2 are due to cessation of Trident Warrior exercises after FY09 and date change of FY09 exercise; and new Empire Challenge (EC) exercises. FY08 JEFX exercise is changed to an EC exercise. Also, increasing frequency of Limited Objective Experiments to annual events. MSI Phase 2 HE2K Development and Deployment cancelled. Schedule changes to Core OA are due to contract administration delays. HF IP requirements definition and analysis and design and code are moved up one quarter due to availability of hardware. Added schedule for Radar Improvement Program.

Technical:

Project Unit 0463 - Not Applicable.

EXHIBIT R-2a, RDT&E Project Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0204152N, E-2 SQUADRONS			PROJECT NUMBER AND NAME 0463, E-2C IMPROVEMENTS				
COST (\$ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	18.969	53.834	63.058					
RDT&E Articles Qty	*10							

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FY2010 starts the Radar Improvement Program. This provides funding to develop, and field improvements to APS-145 WRAs to keep them viable until aircraft retirement.

* Quantity reflects number of Core Open Architecture (5) and High Frequency Internet Protocol (5) test article sets procured. For each, 3 sets used for laboratory development efforts at both the Contractor and Government sites, 1 set installed in the test aircraft, and 1 set is a spare for both laboratory and aircraft use.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0204152N, E-2 SQUADRONS	PROJECT NUMBER AND NAME 0463, E-2C IMPROVEMENTS
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B. Accomplishments/Planned Program

Airborne Battlefield Command and Control (ABC 2)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	5.023	6.879	5.205	
RDT&E Articles Quantity				

Funds development and demonstration of E-2 airborne Joint Sensor Netting (including Network Centric Collaborative Targeting (NCCT)), IP networking concepts (including Advanced Digital Networking Systems, Tactical Information Services, and IP enabled communications systems), machine-to-machine interface, open architected computing environment, network applications, tactical decision aids, combat identification technologies, on and off-board data fusion capabilities, and advanced mission computer and communications technologies airborne demonstrations.

In Flight Refueling (IFR)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		8.734	15.451	
RDT&E Articles Quantity				

Funds the system development and testing to support the incorporation of In Flight Refueling (IFR) technology into the E-2 aircraft. Emphasis during system development is on design drawing updates, fuel system design, human systems integration and design, including interior/lighting modifications and seat replacement. Flight testing is required to evaluate field of view, aerodynamic performance, loads, and handling qualities.

Universal Automatic Identification System (UAIS)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		4.210	4.095	
RDT&E Articles Quantity				

Funding integrates Universal Automatic Identification System (UAIS) into the E-2 mission computer and provides for a means to transfer Automatic Identification System (AIS) data from the aircraft inflight to the warships. The integration includes non-recurring engineering, logistics and test and evaluation to integrate UAIS control features and output into the E-2 weapons system and to standardize and document the UAIS hardware already installed on E-2 aircraft. It integrates other enhancing identification technologies complimentary to UAIS into the E-2.

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0204152N, E-2 SQUADRONS	PROJECT NUMBER AND NAME 0463, E-2C IMPROVEMENTS

B. Accomplishments/Planned Program (Cont.)

E-2 Core Open Architecture (OA)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	10.165	26.274	24.415	
RDT&E Articles Quantity	*5			

Funding supports the development, integration and test of an open architected distributed computing environment and Internet Protocol networking infrastructure.

* Quantity reflects number of Core OA test article sets procured. 3 sets for laboratory development efforts at both the Contractor and Government sites. 1 set installed in the test aircraft, and 1 set is a spare for both laboratory and aircraft use.

E-2 High Frequency (HF) Internet Protocol (IP)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.781	7.737	4.724	
RDT&E Articles Quantity	*5			

Funds the development, integration and test of High Frequency (HF) radio and Mission Computer hardware and software modifications and additions to provide an E-2 HF digital data communications path, allowing for E-2 connectivity with other HF Internet Protocol (IP) users.

* Quantity reflects number of HF IP test article sets procured. 3 sets for laboratory development efforts at both the Contractor and Government sites. 1 set installed in the test aircraft, and 1 set is a spare for both laboratory and aircraft use.

Radar Improvements Program	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost			9.168	
RDT&E Articles Quantity				

New start program in FY10 to develop, integrate, test, and field new components within the E-2C radar that are of high failure rate and expected to be unsupported in the near term. Such improvements will keep the APS-145 radar viable until 2021, the projected E-2C retirement date. This funding also supports necessary modifications within the APS-145 Radar Test Bench System (RTBS).

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009																
APPROPRIATION/BUDGET ACTIVITY RDT&E,N / BA-7	PROGRAM ELEMENT NUMBER AND NAME 0204152N, E-2 SQUADRONS	PROJECT NUMBER AND NAME 0463, E-2C IMPROVEMENTS																
<p>C. OTHER PROGRAM FUNDING SUMMARY:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Line Item No. & Name</th> <th style="text-align: right; border-bottom: 1px solid black;"><u>FY 2008</u></th> <th style="text-align: right; border-bottom: 1px solid black;"><u>FY 2009</u></th> <th style="text-align: right; border-bottom: 1px solid black;"><u>FY 2010</u></th> </tr> </thead> <tbody> <tr> <td>APN-1/E-2C/D (LI# 18 & 19)</td> <td style="text-align: right;">52.22</td> <td style="text-align: right;">384.559</td> <td style="text-align: right;">606.169</td> </tr> <tr> <td>APN-5/E-2 (LI# 39)</td> <td style="text-align: right;">10.244</td> <td style="text-align: right;">27.408</td> <td style="text-align: right;">40.053</td> </tr> <tr> <td>APN-6/E-2C/D (LI# 57)</td> <td style="text-align: right;">0.970</td> <td style="text-align: right;">34.735</td> <td style="text-align: right;">53.047</td> </tr> </tbody> </table> <p>D. ACQUISITION STRATEGY:</p> <p>Not Applicable.</p>			Line Item No. & Name	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	APN-1/E-2C/D (LI# 18 & 19)	52.22	384.559	606.169	APN-5/E-2 (LI# 39)	10.244	27.408	40.053	APN-6/E-2C/D (LI# 57)	0.970	34.735	53.047
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APN-6/E-2C/D (LI# 57)	0.970	34.735	53.047															

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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			0204152N, E-2 SQUADRONS			0463, E-2C IMPROVEMENTS					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date				
Dev T&E ETS	VARIOUS	VARIOUS	0.556	0.268	12/08	0.199	12/09				
Dev Test & Eval - MSI	VARIOUS	VARIOUS	0.730								
Dev Test & Eval - ABC2	VARIOUS	VARIOUS	7.610	2.185	11/08	0.781	11/09				
Dev Test & Eval	WX	NAWCAD, PAX RIVER MD		2.379	11/08	1.439	11/09				
Test Assets	VARIOUS	VARIOUS				0.621	VARIOUS				
Subtotal T&E			8.896	4.832		3.040					
Remarks: Totals may not add due to rounding.											
Government Eng Sup	VARIOUS	VARIOUS	.042								
Government Eng Sup	WX	NAWCAD, PAX RIVER MD	1.319	2.425	11/08	1.783	11/09				
Program Management Support ABC2	VARIOUS	VARIOUS	4.584	.294	11/08	.296	11/09				
Program Mgmt Spt CSS	C-CPFF	Wyle Labs, Huntsville, AL	1.654	.158	12/08	.182	12/09				
Program Mgmt Spt ETS	VARIOUS	VARIOUS	.939	1.182	12/08	1.379	12/09				
Travel	VARIOUS	VARIOUS	.388	.150	10/08	.165	10/09				
Subtotal Management			8.926	4.209		3.805					
Remarks: Totals may not add due to rounding.											
Total Cost			44.428	53.834		63.058					
Remarks: Totals may not add due to rounding.											

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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	0204152N, E-2 SQUADRONS			0463, E-2C IMPROVEMENTS				
Schedule Profile	FY 2008	FY 2009	FY 2010					
Airborne Battlefield C2 - Development	1Q - 4Q	1Q - 4Q	1Q - 4Q					
Airborne Battlefield C2 - Empire Challenge (EC)	4Q							
Airborne Battlefield C2 - Trident Warrior (TW)		3Q						
Airborne Battlefield C2 - Joint Expeditionary Force Exercise (JEFX)			3Q					
Airborne Battlefield C2 - Limited Objective Experiment (LOE)	4Q	4Q	4Q					
Core Open Arch - Requirements Definition & Analysis	2Q-4Q	1Q						
Core Open Arch - Design & Code		2Q-4Q	1Q-4Q					
Core Open Arch - Test Asset Delivery (Est.)			2Q					
High Frequency Internet Proto - Requirements Definition & Analysis	1Q-3Q							
High Frequency Internet Proto - Design & Code	3Q-4Q	1Q-2Q						
High Frequency Internet Proto - Test Asset Delivery (Est.)		1Q						
High Frequency Internet Proto - System Integration & Test		3Q-4Q	1Q-2Q					
High Frequency Internet Proto - Deploy			3Q					
In Flight Refueling - Preliminary Design Review (PDR)		4Q						
In Flight Refueling - Developmental Test (DT)/Integrated Operational Test & Evaluation (IOT&E)		4Q	1Q-4Q					
In Flight Refueling - Critical Design Review (CDR)			2Q					
In Flight Refueling - Prototype System Installation			4Q					
Universal Automatic Info System - System Development		1Q-4Q						
Universal Automatic Info System - Test Readiness Review			1Q					
Universal Automatic Info System - Developmental Testing			1Q-4Q					
Radar Improvement Program - Development			1Q-4Q					
Radar Improvement Design Review (Est.)			4Q					