

**UNCLASSIFIED**

PE NUMBER: 0302015F  
 PE TITLE: E-4B NATIONAL AIRBORNE OPERATIONS CENTER

<b>Exhibit R-2, RDT&amp;E Budget Item Justification</b>	DATE <b>May 2009</b>
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<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>
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Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	18.576	4.058	26.107	0.000	0.000	0.000	0.000	0.000	0.000	210.293
4777 E-4B Aircraft Modernization	18.576	4.058	17.259	0.000	0.000	0.000	0.000	0.000	0.000	210.293
5301 Next Generation NAOC	0.000	0.000	8.848	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**(U) A. Mission Description and Budget Item Justification**

E-4B NAOC fleet satisfies the military need for an airborne operations center with communications capabilities that permit military and civilian leadership to monitor and control military and civil national assets during all phases of nuclear and non-nuclear conflict or natural disaster. The E-4B NAOC fleet also satisfies the military requirement to provide a highly survivable alternate operations center to the National Military Command Center (NMCC). Developmental modifications include, but are not limited to, upgrades and enhancements to aircraft structures, propulsion system, fuel system, environmental control system, electrical generation and distribution systems, flight safety and navigation systems (with their associated communications equipment), and the related aircraft operations center facilities, equipment, and communications necessary for the E-4B fleet to execute its mission. Additionally, funds may be utilized to explore modifications, upgrades, and future systems required to meet mission requirements.

Developmental modifications and studies/projects currently underway or planned for accomplishment under this program include:

- The E-4B NAOC Aircraft Replacement Analysis of Alternatives (AoA) was completed in October 2008 with briefings to Air Force leadership beginning in January 2009. The purpose of the study was to analyze cost, effectiveness, risk, and affordability of various airframes mated with a mission package for replacement of the E-4B to support all NAOC missions in 2020 and beyond. The AoA was conducted by a government / contractor team of over 50 personnel from across the Department of Defense stakeholder community, with inputs from relevant US Government agencies. Aircraft availability analysis from the AoA was a key driver for retaining and modifying aircraft 74-0787.
- The Executive Support Study is a Department-wide effort to analyze the support provided to the Executive Office of the President. The study leverages efforts of the Presidential Airlift Recapitalization (PAR) AoA, ICD, and CDD as well as of the E-4B Aircraft Replacement AoA to ensure that all mission requirements will be met, with emphasis on identifying efficiencies from the recapitalization efforts. The study was completed in January 2009.
- Based on the recommendations of the E-4B NAOC Aircraft Replacement AoA, the Air Force is requesting RDT&E funds in FY10 to continue analysis for a replacement fleet. Funds will be utilized to develop a Technology Development Strategy, Test and Evaluation Strategy, Systems Engineering Plan, Lifecycle Management Plan, draft Capabilities Development Document, and other required documents leading up to a Milestone A decision in second fiscal quarter 2010.
- The STU III Replacement project replaces the current Secure Telephone Units III (STU III) on board the E-4B with a more reliable secure voice system. The National Security Agency (NSA) has set a decertification date for the STU IIIIR driving the need for a new secure voice system that is certified for aircraft use. This modification will integrate a secure voice system that is certified for aircraft use into the E-4B. The prototype kit and install is on contract through the Defense Red

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Switch Network (DRSN) program office, Ogden AFB, UT, and is scheduled for install June 2009.

- Electromagnetic Pulse (EMP) testing will be conducted in FY10 and FY11 to validate the E-4B fleet compliance with updated EMP protection Mil Standards. FY08 O&M funds were leveraged to update the EMP hardness and maintenance plan, update EMP training procedures, procure test articles, write test procedures, as well as conduct initial testing on one aircraft. FY10-11 RDT&E funds will be used to fully test each aircraft. The E-4B fleet will begin an annual EMP testing program with O&M funds once each aircraft has been tested.

- The Super High Frequency (SHF) Multiplexor (MUX) project integrates a new permanently installed MUX to replace the current temporary SHF MUX. The current SHF MUX is prone to intermittent disconnects and poor performance. A new device will allow the E-4B to better meet requirements of transmitting combined secure and non-secure digital data streams via satellite. This effort will integrate and test a new SHF MUX into the E-4B.

- The CNS/ATM modification upgrades the air traffic communications systems to improve Navigation and Instrument Approach capabilities. These ongoing modifications are required to comply with both U.S. and international air traffic management requirements and maintain world-wide (anytime-anywhere) availability. This modification will add Automatic Dependent Surveillance - Broadcast (ADS-B) surveillance capability, replace the current obsolete Flight Management Computers (FMCs), and upgrade or install required systems to meet domestic and foreign CNS/ATM requirements. This is expected to be an on-going program to meet evolving CNS/ATM requirements.

The E-4B program is categorized as a Budget Activity 7 - Operational System Development, because it develops modifications for a fielded system.

(U) **B. Program Change Summary (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Previous President's Budget	19.406	4.069	11.554
(U) Current PBR/President's Budget	18.576	4.058	26.107
(U) Total Adjustments	-0.830	-0.011	
(U) Congressional Program Reductions			
Congressional Rescissions		-0.011	
Congressional Increases			
Reprogrammings	-0.301		
SBIR/STTR Transfer	-0.529		

(U) **Significant Program Changes:**

All remaining C3 UHF Digitization FY08-09 RDT&E (\$2.8M in FY08 and \$3.9M in FY09) is expected to be removed upon Congressional approval of Reprogramming Action FY09-04 PA, Nuclear Surety. \$9M was added in FY10 for post-AoA analysis, and \$6M in FY10 was added for EMP testing.

## Exhibit R-2a, RDT&amp;E Project Justification

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BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT NUMBER AND TITLE		
<b>07 Operational System Development</b>		<b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>						<b>4777 E-4B Aircraft Modernization</b>		
Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
4777 E-4B Aircraft Modernization	18.576	4.058	17.259	0.000	0.000	0.000	0.000	0.000	0.000	210.293
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) **A. Mission Description and Budget Item Justification**

E-4B NAOC fleet satisfies the military need for an airborne operations center with communications capabilities that permit military and civilian leadership to monitor and control military and civil national assets during all phases of nuclear and non-nuclear conflict or natural disaster. The E-4B NAOC fleet also satisfies the military requirement to provide a highly survivable alternate operations center to the National Military Command Center (NMCC). Developmental modifications include, but are not limited to, upgrades and enhancements to aircraft structures, propulsion system, fuel system, environmental control system, electrical generation and distribution systems, flight safety and navigation systems (with their associated communications equipment), and the related aircraft operations center facilities, equipment, and communications necessary for the E-4B fleet to execute its mission. Additionally, funds may be utilized to explore modifications, upgrades, and future systems required to meet mission requirements.

Developmental modifications and studies/projects currently underway or planned for accomplishment under this program include:

- The E-4B NAOC Aircraft Replacement Analysis of Alternative (AoA) was completed in October 2008 with briefings to Air Force leadership beginning in January 2009. The purpose of the study was to analyze cost, effectiveness, risk, and affordability of various airframes mated with a mission package for replacement of the E-4B to support all NAOC missions in 2020 and beyond. The AoA was conducted by a government / contractor team of over 50 personnel from across the Department of Defense stakeholder community, with inputs from relevant US Government agencies. Aircraft availability analysis from the AoA was a key driver for retaining and modifying aircraft 74-0787.
- The Executive Support Study is a Department-wide effort to analyze the support provided to the Executive Office of the President. The study leverages efforts of the Presidential Airlift Recapitalization (PAR) AoA, ICD, and CDD as well as of the E-4B Aircraft Replacement AoA to ensure that all mission requirements will be met, with emphasis on identifying efficiencies from the recapitalization efforts. The study was completed January 2009.
- The STU III Replacement project replaces the current Secure Telephone Units III (STU III) on board the E-4B with a more reliable secure voice system. The National Security Agency (NSA) has set a decertification date for the STU IIIR driving the need for a new secure voice system that is certified for aircraft use. This modification will integrate a secure voice system that is certified for aircraft use into the E-4B. The prototype kit and install is on contract through the Defense Red Switch Network (DRSN) program office, Ogden AFB, UT, and is scheduled for install June 2009.
- Electromagnetic Pulse (EMP) testing will be conducted in FY10 and FY11 to validate the E-4B fleet compliance with updated EMP protection Mil Standards. FY08 O&M funds were leveraged to update EMP hardness and maintenance plan, update EMP training procedures, procure test articles, write test procedures, as well as initial testing on one aircraft. FY10-11 RDT&E funds will be used to fully test each aircraft. The E-4B fleet will begin an annual EMP testing program with O&M funds once each aircraft has been tested.

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BUDGET ACTIVITY <b>07 Operational System Development</b>	PE NUMBER AND TITLE <b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>	PROJECT NUMBER AND TITLE <b>4777 E-4B Aircraft Modernization</b>
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- The Super High Frequency (SHF) Multiplexor (MUX) project integrates a new permanently installed MUX to replace the current temporary SHF MUX. The current SHF MUX is prone to intermittent disconnects and poor performance. A new device will allow the E-4B to better meet requirements of transmitting combined secure and non-secure digital data streams via satellite. This effort will integrate and test a new SHF MUX into the E-4B.

- The CNS/ATM modification upgrades the air traffic communications systems to improve Navigation and Instrument Approach capabilities. These ongoing modifications are required to comply with both U.S. and international air traffic management requirements and maintain world-wide (anytime-anywhere) availability. This modification will add Automatic Dependent Surveillance - Broadcast (ADS-B) surveillance capability, replace the current obsolete Flight Management Computers (FMCs), and upgrade or install required systems to meet domestic and foreign CNS/ATM requirements. This is expected to be an on-going program to meet evolving CNS/ATM requirements.

The E-4B program is categorized as a Budget Activity 7 - Operational System Development, because it develops modifications for a fielded system.

(U) <b><u>B. Accomplishments/Planned Program (\$ in Millions)</u></b>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Executive Support Study	1.000		
(U) STU III - Prototype design, kit manufacturing, install, and test	14.459		
(U) SHF MUX - Prototype design, kit manufacturing, install, and test			1.054
(U) EMP Testing			6.000
(U) CNS/ATM I - Prototype design, kit manufacturing, install, and test			9.816
(U) Test plan development and test execution	0.097	0.108	0.089
(U) SPO support (A&AS) and travel	3.020	3.950	0.300
(U) Total Cost	18.576	4.058	17.259

\*\$2.8M of FY08 and \$3.9M of FY09 funds were reprogrammed out of the PE for higher priorities, but this is not reflected in the totals. For purposes of this exhibit, these funds are included in the SPO support and travel line.

(U) <b><u>C. Other Program Funding Summary (\$ in Millions)</u></b>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost to</u>	
	<u>Actual</u>	<u>Estimate</u>	<u>Complete</u>	<u>Total Cost</u>						
(U) Operations & Maintenance, AF, PE 0302015F, Used for EMP test preparation	0.600									0.600
(U) Aircraft Procurement AF, Budget Activity 5, Weapon System Code E00400, PE 0302015F; Mod 4393 STU III Replacement		11.396	6.200							17.596

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

(U) Aircraft Procurement AF, Budget Activity 5, Weapon System Code E00400, PE 0302015F; Mod 4389 C-3 UHF Digitization	2.223	2.354	4.577
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(U) **D. Acquisition Strategy**

Implementation of most modifications will be contracted under the sole source Product Support Integration (PSI) with Boeing - Wichita. However, the E-4B NAOC Aircraft Replacement AoA and the Executive Support Study is contracted through DISA to Booz Allen Hamilton, and STU III Replacement is contracted through the Defense Red Switch Network (DRSN) office at Hill AFB with Raytheon.

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**Exhibit R-3, RDT&E Project Cost Analysis**

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<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>					<b>PE NUMBER AND TITLE</b> <b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>					<b>PROJECT NUMBER AND TITLE</b> <b>4777 E-4B Aircraft Modernization</b>		
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<u>(U) Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior to FY 2008 Cost</u>	<u>FY 2008 Cost</u>	<u>FY 2008 Award Date</u>	<u>FY 2009 Cost</u>	<u>FY 2009 Award Date</u>	<u>FY 2010 Cost</u>	<u>FY 2010 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
(U) <u>Product Development</u> Executive Support Study	CPIF	Booz Allen Hamilton, McLean, VA	0.000	1.000	Mar-08					0.000	1.000	1.000
STU III replacement integration and testing	CPIF	Raytheon, St. Petersburg, FL	0.000	14.459	Jun-08					0.000	14.459	14.027
SHF MUX Upgrade Development and Integration	CPIF	Boeing, Wichita Development & Modification Center, Wichita, KS	0.000					1.054	Mar-10	0.000	1.054	1.304
CNS/ATM Development and Integration	CPIF	Boeing, Wichita Development & Modification Center, Wichita, KS	0.000					9.816	Jun-10	Continuing	TBD	TBD
EMP Testing	FFP	Naval Air Warfare Center, Patuxent River, MD						6.000	Feb-10	0.000	6.000	8.000
Subtotal Product Development			0.000	15.459		0.000		16.870		Continuing	TBD	TBD
Remarks:	Contracting Method and Type may be altered at time of contract.											
(U) <u>Test and Evaluation</u> Modification test plan development and test execution		Boeing, Wichita Development & Modification Center, Wichita, KS		0.097	Jun-08	0.108	Jun-09	0.089	Jun-10	Continuing	TBD	TBD
Subtotal Test and Evaluation			0.000	0.097		0.108		0.089		Continuing	TBD	TBD
Remarks:												
(U) <u>Management</u> E-4B Program Office contractor support	Small	Chickasaw		0.220	May-08	0.000		0.245		Continuing	TBD	TBD

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BUDGET ACTIVITY		PE NUMBER AND TITLE			PROJECT NUMBER AND TITLE				
<b>07 Operational System Development</b>		<b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>			<b>4777 E-4B Aircraft Modernization</b>				
	Business T&M	Nation Industries, Inc., Oklahoma City, OK							
E-4B Program Office Govt TDY/PMA			2.800	3.950	0.055	Continuing	TBD	TBD	
Subtotal Management			0.000	3.020	3.950	0.300	Continuing	TBD	TBD
Remarks:	\$2.8M of FY08 and \$3.9M of FY09 funds were reprogrammed out of the PE for higher priorities, but this is not reflected in the totals. For purposes of this exhibit, these funds are included in the E-4B Program Office Govt TDY/ PMA line.								
(U) Total Cost			0.000	18.576	4.058	17.259	Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile

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PROJECT NUMBER AND TITLE  
4777 E-4B Aircraft Modernization



# E-4B NAOC Modification Schedule

	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15
<b>Executive Support Study</b>	Exec Study							
<b>STU III Replacement</b>								
<b>SHF MUX Upgrade</b>								
<b>CNS/ATM</b>								
<b>EMP Testing</b>								

Time now

- Concept activities
- Design / development
- Integration / test
- Production / fielding
- Operations / sustainment
- Key events

**FY10 Staffer Brief**

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<b>Exhibit R-4a, RDT&amp;E Schedule Detail</b>	DATE <b>May 2009</b>
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	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) <b><u>Schedule Profile</u></b>			
(U) Executive Support Study	2-4Q	1-2Q	
(U) STU III Replacement	2-4Q		
(U) SHF Mux Upgrade			1-4Q
(U) CNS/ATM			1-4Q
(U) EMP Testing	4Q	1-4Q	3-4Q

**Exhibit R-2a, RDT&E Project Justification**

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BUDGET ACTIVITY <b>07 Operational System Development</b>					PE NUMBER AND TITLE <b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>			PROJECT NUMBER AND TITLE <b>5301 Next Generation NAOC</b>		
Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
5301 Next Generation NAOC	0.000	0.000	8.848	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

**(U) A. Mission Description and Budget Item Justification**

The E-4B NAOC fleet satisfies the military need for an airborne operations center with communications capabilities that permit military and civilian leadership to monitor and control military and civil national assets during all phases of nuclear and non-nuclear conflict or natural disaster. The E-4B NAOC fleet also satisfies the military requirement to provide a highly survivable alternate operations center to the National Military Command Center (NMCC). The Air Force does not expect E-4B NAOC requirements to substantively change during the next two decades. Additionally, lifecycle costs, particularly O&M, will increase substantially as the fleet ages and support for the Boeing 747-200 class diminishes. Thus, it is imperative to further analyze recapitalization of the E-4B NAOC fleet.

Based on the recommendations of the E-4B NAOC Aircraft Replacement AoA, the Air Force is requesting RDT&E funds in FY10 to continue analysis for a replacement fleet. Funds will be utilized to develop a Technology Development Strategy, Test and Evaluation Strategy, Systems Engineering Plan, Lifecycle Management Plan, draft Capabilities Development Document, and other required documents leading up to a Milestone A decision in 2011.

**(U) B. Accomplishments/Planned Program (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Technology Development Strategy, Test and Evaluation Strategy, Systems Engineering Plan, Lifecycle Management Plan, draft Capabilities Development Document, and other required documents leading up to a Milestone A decision in second fiscal quarter 2010			8.848
(U) Total Cost	0.000	0.000	8.848

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

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Complete</u>							
(U) Operations & Maintenance, Air Force, PE 0302015F	0.917								0.000	0.917

**(U) D. Acquisition Strategy**

Post-AoA activities are currently being funded through DISA to Booz Allen Hamilton from E-4B FY08 O&M funds (\$.917M FY08); however, ESC/XR will be the contracting authority for the \$8.8M FY10 RDT&E. A contracting strategy for this effort is being developed and will be further defined upon Air Force direction.

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**Exhibit R-3, RDT&E Project Cost Analysis**

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BUDGET ACTIVITY				PE NUMBER AND TITLE					PROJECT NUMBER AND TITLE			
<b>07 Operational System Development</b>				<b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>					<b>5301 Next Generation NAOC</b>			
(U) <u>Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior to FY 2008 Cost</u>	<u>FY 2008 Cost</u>	<u>FY 2008 Award Date</u>	<u>FY 2009 Cost</u>	<u>FY 2009 Award Date</u>	<u>FY 2010 Cost</u>	<u>FY 2010 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
(U) <u>Product Development</u>												
Subtotal Product Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) <u>Support</u>												
Project Management Support	FFP	Booz Allen Hamilton, McLean, VA						8.348	Feb-10		8.348	
Subtotal Support			0.000	0.000		0.000		8.348		0.000	8.348	0.000
Remarks:		Contracting Method and Type may be altered at time of contract										
(U) <u>Test &amp; Evaluation</u>												
Subtotal Test & Evaluation			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) <u>Management</u>												
Govt TDY								0.500			0.500	
Subtotal Management			0.000	0.000		0.000		0.500		0.000	0.500	0.000
Remarks:												
(U) Total Cost			0.000	0.000		0.000		8.848		0.000	8.848	0.000

Exhibit R-4, RDT&E Schedule Profile

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BUDGET ACTIVITY  
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PROJECT NUMBER AND TITLE  
5301 Next Generation NAOC

# E-4B NAOC Replacement Program

	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15
<b>E-4B Replacement Activities</b>	AoA							
	Exec Study							
		Material Solution Analysis						

■ Concept activities  
■ Production / fielding

■ Design / development  
■ Operations / sustainment

■ Integration / test  
 △◇ Key events

**PB10 R-Docs**

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<b>Exhibit R-4a, RDT&amp;E Schedule Detail</b>	DATE <b>May 2009</b>
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BUDGET ACTIVITY <b>07 Operational System Development</b>	PE NUMBER AND TITLE <b>0302015F E-4B NATIONAL AIRBORNE OPERATIONS CENTER</b>	PROJECT NUMBER AND TITLE <b>5301 Next Generation NAOC</b>
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(U) <u>Schedule Profile</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Material Solutions Analysis		1-4Q	1-4Q