

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force** **DATE:** February 2010

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| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> |
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| COST (\$ in Millions)                      | FY 2009 Actual | FY 2010 Estimate | FY 2011 Base Estimate | FY 2011 OCO Estimate | FY 2011 Total Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost To Complete | Total Cost |
|--|----------------|------------------|-----------------------|----------------------|------------------------|------------------|------------------|------------------|------------------|------------------|------------|
| Total Program Element                      | 0.158          | 26.107           | 12.532                | 0.000                | 12.532                 | 5.762            | 1.719            | 9.234            | 5.978            | Continuing       | Continuing |
| 674777: <i>E-4B Aircraft Modernization</i> | 0.158          | 17.259           | 12.532                | 0.000                | 12.532                 | 5.762            | 1.719            | 9.234            | 5.978            | 0.000            | 210.293    |
| 675301: <i>Next Generation NAOC</i>        | 0.000          | 8.848            | 0.000                 | 0.000                | 0.000                  | 0.000            | 0.000            | 0.000            | 0.000            | 0.000            | 0.000      |

**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 node of the National Military Command System (NMCS). 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 Air Force requested RDT&E funds in FY10 to continue analysis for a replacement fleet based on the recommendations of the E-4B NAOC Aircraft Replacement AoA. Funds will be utilized to develop a Technology Development Strategy, Test and Evaluation Strategy, Systems Engineering Plan, Lifecycle Management Plan, Initial Capabilities Document, and other required documents leading up to a Milestone A decision. A number of risk reduction studies, such as a sustainability study and antenna/communications technology study, will also be accomplished.

- Electromagnetic Pulse (EMP) testing will be conducted in FY10 and FY11 to validate the E-4B fleet compliance with updated EMP protection Mil Standards. 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 a baseline has been established for each aircraft.

- The Secure Data Crypto modification replaces various E-4B cryptographic systems currently scheduled to be decertified by the National Security Agency (NSA). This modification ensures the continued transmission and receipt of critical strategic force orders. Funds for this modification will be used to design an engineering

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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2011 Air Force  |  | <b>DATE:</b> February 2010 |
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| <p>solution, develop compatible software, procure new secure data devices, and integrate NSA approved and Internet Protocol Version 6 (IPv6) compliant secure data cryptographic devices and associated peripherals on the aircraft.</p> <ul style="list-style-type: none"><li>- The Super High Frequency (SHF) Multiplexor (MUX) project integrates a more capable and logistically supportable MUX to replace the obsolete and temporary solution used today. 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 install and test a new SHF MUX into the E-4B.</li><li>- 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) Out capability, replace the obsolete Flight Management Computer (FMC), 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.</li><li>- Secure, Survivable Communication modifications will upgrade and replace existing systems required to meet existing National Security Presidential Directive (NSPD)-28 and NSPD-51/Homeland Security Presidential Directive (HSPD)-20 requirements and to ensure continued connectivity and interoperability as satellite and communications infrastructure evolves. Expected modifications requiring RDT&amp;E include, but are not limited to, installation of Family of Beyond-Line-of-Site Terminals (FAB-T), Presidential National Voice Conferencing (PNVC), modification of the current Super High Frequency (SHF) system to meet immediate needs, and eventual replacement of the SHF System. FAB-T Command Post Terminals will replace the MILSTAR Terminal and provide access to protected wideband Advanced Extremely High Frequency (AEHF) satellite networks. PNVC replaces Survivable Emergency Conferencing Network (SECN), which will not be supported once the AEHF satellite network is in place. Modification of the current SHF system is required in the near-term to replace the most critically obsolete components to ensure that the system remains operable and logistically supportable until a replacement system is fielded. A replacement to the SHF system is required as secure, survivable communications capability transitions from the Defense Satellite Communications System (DSCS).</li></ul> <p>The E-4B program is categorized as a Budget Activity 7 - Operational System Development, because it develops modifications for a fielded system.</p> |  |                            |

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

|                                     | <u>FY 2009</u> | <u>FY 2010</u> | <u>FY 2011 Base</u> | <u>FY 2011 OCO</u> | <u>FY 2011 Total</u> |
|-------------------------------------|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget         | 4.058          | 26.107         | 0.000               | 0.000              | 0.000                |
| Current President's Budget          | 0.158          | 26.107         | 12.532              | 0.000              | 12.532               |
| Total Adjustments                   | -3.900         | 0.000          | 12.532              | 0.000              | 12.532               |
| • Congressional General Reductions  |                | 0.000          |                     |                    |                      |
| • Congressional Directed Reductions |                | 0.000          |                     |                    |                      |
| • Congressional Rescissions         | 0.000          | 0.000          |                     |                    |                      |
| • Congressional Adds                |                | 0.000          |                     |                    |                      |
| • Congressional Directed Transfers  |                | 0.000          |                     |                    |                      |
| • Reprogrammings                    | 0.000          | 0.000          |                     |                    |                      |
| • SBIR/STTR Transfer                | 0.000          | 0.000          |                     |                    |                      |
| • Other Adjustments                 | -3.900         | 0.000          | 12.532              | 0.000              | 12.532               |

**Change Summary Explanation**

FY09 RDT&E (\$3.9M) was removed upon Congressional approval of Reprogramming Action FY09-04 PA, Nuclear Surety. \$26M in FY10 for EMP Test execution, SHF MUX Upgrade development, CNS/ATM development, and for Next Generation NAOC analysis. \$7M added to FY11 for Secure, Survivable Communications development since last year's budget submission. Reduced level of effort for EMP Test execution, SHF MUX Upgrade development, and CNS/ATM development in FY11 compared to FY10, and no funds requested for Next Gen funding in FY11.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2011 Air Force **DATE:** February 2010

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| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>674777: <i>E-4B Aircraft Modernization</i> |
|--|--|--|

| COST (\$ in Millions)                      | FY 2009 Actual | FY 2010 Estimate | FY 2011 Base Estimate | FY 2011 OCO Estimate | FY 2011 Total Estimate | FY 2012 Estimate | FY 2013 Estimate | FY 2014 Estimate | FY 2015 Estimate | Cost To Complete | Total Cost |
|--|----------------|------------------|-----------------------|----------------------|------------------------|------------------|------------------|------------------|------------------|------------------|------------|
| 674777: <i>E-4B Aircraft Modernization</i> | 0.158          | 17.259           | 12.532                | 0.000                | 12.532                 | 5.762            | 1.719            | 9.234            | 5.978            | 0.000            | 210.293    |
| Quantity of RDT&E Articles                 | 0              | 0                | 0                     | 0                    | 0                      | 0                | 0                | 0                | 0                |                  |            |

**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 node of the National Military Command System (NMCS). 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:

- Electromagnetic Pulse (EMP) testing will be conducted in FY10 and FY11 to validate the E-4B fleet compliance with updated EMP protection Mil Standards. 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 a baseline has been established for each aircraft.
- The Secure Data Crypto modification replaces various E-4B cryptographic systems currently scheduled to be decertified by the National Security Agency (NSA). This modification ensures the continued transmission and receipt of critical strategic force orders. Funds for this modification will be used to design an engineering solution, develop compatible software, procure new secure data devices, and integrate NSA approved and Internet Protocol Version 6 (IPv6) compliant secure data cryptographic devices and associated peripherals on the aircraft.
- The Super High Frequency (SHF) Multiplexor (MUX) project integrates a more capable and logistically supportable MUX to replace the obsolete and temporary solution used today. 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 install and test a new SHF MUX into the E-4B.

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| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>674777: <i>E-4B Aircraft Modernization</i> |
|--|--|--|

- 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) Out capability, replace the obsolete Flight Management Computer (FMC), 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.

- Secure, Survivable Communication modifications will upgrade and replace existing systems required to meet existing National Security Presidential Directive (NSPD)-28 and NSPD-51/Homeland Security Presidential Directive (HSPD)-20 requirements and to ensure continued connectivity and interoperability as satellite and communications infrastructure evolves. Expected modifications requiring RDT&E include, but are not limited to, installation of Family of Beyond-Line-of-Site Terminals (FAB-T), Presidential National Voice Conferencing (PNVC), modification of the current Super High Frequency (SHF) system to meet immediate needs, and eventual replacement of the SHF System. FAB-T Command Post Terminals will replace the MILSTAR Terminal and provide access to protected wideband Advanced Extremely High Frequency (AEHF) satellite networks. PNVC replaces Survivable Emergency Conferencing Network (SECN), which will not be supported once the AEHF satellite network is in place. Modification of the current SHF system is required in the near-term to replace the most critically obsolete components to ensure that the system remains operable and logistically supportable until a replacement system is fielded. A replacement to the SHF system is required as secure, survivable communications capability transitions from the Defense Satellite Communications System (DSCS).

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

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

|  | FY 2009 | FY 2010 | FY 2011<br>Base | FY 2011<br>OCO | FY 2011<br>Total |
|--|---------|---------|-----------------|----------------|------------------|
| MAJOR THRUST: Complete EMP Testing to validate compliance with applicable EMP hardness Mil Standards<br><br><i>FY 2009 Accomplishments:</i><br>In FY 2009: N/A<br><br><i>FY 2010 Plans:</i><br>In FY 2010: Complete initial EMP Test at Patuxent River Naval Air Station | 0.000   | 6.000   | 2.000           | 0.000          | 2.000            |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Air Force  |  |  |  | <b>DATE:</b> February 2010                                   |                |                         |                        |                          |
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| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>   |  |  |  |  |                |                         |                        |                          |
|  |  |  |  | <b>FY 2009</b>   | <b>FY 2010</b> | <b>FY 2011<br/>Base</b> | <b>FY 2011<br/>OCO</b> | <b>FY 2011<br/>Total</b> |
| <p><i>FY 2011 Base Plans:</i><br/>In FY 2011: Complete EMP Testing on two E-4Bs at Patuxent River Naval Air Station</p> <p><i>FY 2011 OCO Plans:</i><br/>In FY 2011 OCO: Not Applicable.</p>   |  |  |  |  |                |                         |                        |                          |
| <p>MAJOR THRUST: Develop, install, and test a more capable and logistically supportable Super High Frequency (SHF) Multiplexor (MUX).</p> <p><i>FY 2009 Accomplishments:</i><br/>In FY 2009: N/A</p> <p><i>FY 2010 Plans:</i><br/>In FY 2010: Develop prototype SHF MUX replacement</p> <p><i>FY 2011 Base Plans:</i><br/>In FY 2011: Install and test prototype SHF MUX replacement</p> <p><i>FY 2011 OCO Plans:</i><br/>In FY 2011 OCO: Not Applicable.</p>  |  |  |  | 0.000  | 0.954          | 0.285                   | 0.000                  | 0.285                    |
| <p>MAJOR THRUST: Develop, install, and test a prototype installation kit to modernize applicable CNS/ATM systems in accordance with domestic and foreign air traffic management requirements</p> <p><i>FY 2009 Accomplishments:</i><br/>In FY 2009: N/A</p> <p><i>FY 2010 Plans:</i><br/>In FY 2010: Develop a CNS/ATM roadmap to determine applicable air traffic management requirements and technical development of prototype CNS/ATM installation kit</p> |  |  |  | 0.000  | 9.505          | 2.747                   | 0.000                  | 2.747                    |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Air Force  |  |  | <b>DATE:</b> February 2010 |                     |                    |                      |
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| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>   |  |  |                            |                     |                    |                      |
|  |  | <b>FY 2009</b>   | <b>FY 2010</b>             | <b>FY 2011 Base</b> | <b>FY 2011 OCO</b> | <b>FY 2011 Total</b> |
| <i>FY 2011 Base Plans:</i><br>In FY 2011: Prototype CNS/ATM installation kit delivery<br><br><i>FY 2011 OCO Plans:</i><br>In FY 2011 OCO: Not Applicable.  |  |  |                            |                     |                    |                      |
| MAJOR THRUST: Develop, install, and test a prototype installation kit to replace the most critically obsolete components of the current SHF System<br><br><i>FY 2009 Accomplishments:</i><br>In FY 2009: N/A<br><br><i>FY 2010 Plans:</i><br>In FY 2010: N/A<br><br><i>FY 2011 Base Plans:</i><br>In FY 2011: Develop, install, and test a prototype installation kit to replace the most critically obsolete components of the current SHF System<br><br><i>FY 2011 OCO Plans:</i><br>In FY 2011 OCO: Not Applicable. |  | 0.000  | 0.000                      | 7.000               | 0.000              | 7.000                |
| MAJOR THRUST: SPO support (A&AS) and travel<br><br><i>FY 2009 Accomplishments:</i><br>In FY 2009: SPO support (A&AS) and travel<br><br><i>FY 2010 Plans:</i><br>In FY 2010: SPO support (A&AS) and travel  |  | 0.158  | 0.800                      | 0.500               | 0.000              | 0.500                |

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**Exhibit R-2A, RDT&E Project Justification:** PB 2011 Air Force **DATE:** February 2010

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| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>674777: <i>E-4B Aircraft Modernization</i> |
|--|--|--|

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

|   | FY 2009 | FY 2010 | FY 2011 Base | FY 2011 OCO | FY 2011 Total |
|---|---------|---------|--------------|-------------|---------------|
| <i>FY 2011 Base Plans:</i><br>In FY 2011: SPO support (A&AS) and travel |         |         |              |             |               |
| <i>FY 2011 OCO Plans:</i><br>In FY 2011 OCO: Not Applicable.            |         |         |              |             |               |
| <b>Accomplishments/Planned Programs Subtotals</b>                       | 0.158   | 17.259  | 12.532       | 0.000       | 12.532        |

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

| <u>Line Item</u>                        | <u>FY 2009</u> | <u>FY 2010</u> | <u>FY 2011 Base</u> | <u>FY 2011 OCO</u> | <u>FY 2011 Total</u> | <u>FY 2012</u> | <u>FY 2013</u> | <u>FY 2014</u> | <u>FY 2015</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
|---|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| • PE 0302015F: <i>E-4B NAOC, (APAF)</i> | 0.000          | 0.000          | 8.867               | 0.000              | 8.867                | 11.478         | 15.712         | 3.137          | 3.220          | 0.000                   | 0.000             |

**D. Acquisition Strategy**

Implementation of modifications will be contracted under the sole source Product Support Integration (PSI) with Boeing - Wichita. Patuxent River NAS will be providing EMP test support and execution.

**E. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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| <b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2011 Air Force</b>   |  |  |  |  |  |  |  |  |  | <b>DATE:</b> February 2010 |  |  |  |
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**Product Development (\$ in Millions)**

| Cost Category Item                          | Contract Method & Type | Performing Activity & Location                                | Total Prior Years Cost | FY 2010 |            | FY 2011 Base |            | FY 2011 OCO |            | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------|---|------------------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
|   |                        |   |                        | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| SHF MUX Upgrade Development and Integration | SS/CPIF                | Boeing, Wichita Development & Modification Center Wichita, KS | 0.000                  | 0.954   | Mar 2010   | 0.285        |            | 0.000       |            | 0.285         | 0.000            | 1.239      | Continuing               |
| CNS/ATM Development and Integration         | SS/CPIF                | Boeing, Wichita Development & Modification Center Wichita, KS | 0.000                  | 9.505   | Mar 2010   | 2.747        |            | 0.000       |            | 2.747         | Continuing       | Continuing | Continuing               |
| Secure Survivable Communication             | SS/CPIF                | Boeing, Wichita Development & Modification Center Wichita, KS | 0.000                  | 0.000   |            | 7.000        | Mar 2011   | 0.000       |            | 7.000         | 0.000            | 7.000      | Continuing               |
| <b>Subtotal</b>                             |                        |   | 0.000                  | 10.459  |            | 10.032       |            | 0.000       |            | 10.032        |                  |            |                          |

**Remarks**

Contracting Method and Type may be altered at time of contract.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force** **DATE:** February 2010

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**Test and Evaluation (\$ in Millions)**

| Cost Category Item        | Contract Method & Type | Performing Activity & Location                                | Total Prior Years Cost | FY 2010 |            | FY 2011 Base |            | FY 2011 OCO |            | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---------------------------|------------------------|---|------------------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
|                           |                        |   |                        | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| EMP Test Support - Boeing | SS/CPIF                | Boeing, Wichita Development & Modification Center Wichita, KS | 0.000                  | 4.000   | Jun 2010   | 1.333        | Mar 2011   | 0.000       |            | 1.333         | 0.000            | 5.333      | Continuing               |
| EMP Test Support - NAVAIR | MIPR                   | Naval Air Warfare Center Patuxent River NAS, MD               | 0.000                  | 2.000   | Jun 2010   | 0.667        | Mar 2011   | 0.000       |            | 0.667         | 0.000            | 2.667      | Continuing               |
| <b>Subtotal</b>           |                        |   | 0.000                  | 6.000   |            | 2.000        |            | 0.000       |            | 2.000         | 0.000            | 8.000      |                          |

**Remarks**

**Management Services (\$ in Millions)**

| Cost Category Item                     | Contract Method & Type | Performing Activity & Location                      | Total Prior Years Cost | FY 2010 |            | FY 2011 Base |            | FY 2011 OCO |            | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|--|------------------------|---|------------------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
|  |                        |   |                        | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| E-4B Program Office contractor support | TM                     | Chickasaw Nation Industries, Inc. Oklahoma City, OK | 0.000                  | 0.250   | Mar 2010   | 0.250        | Mar 2011   | 0.000       |            | 0.250         | Continuing       | Continuing | Continuing               |
| E-4B Program Office Govt TDY/PMA       | TBD/TBD                | TBD TBD   | 0.158                  | 0.550   |            | 0.250        |            | 0.000       |            | 0.250         | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>                        |                        |   | 0.158                  | 0.800   |            | 0.500        |            | 0.000       |            | 0.500         |                  |            |                          |

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force** **DATE:** February 2010

|  |  |  |
|--|--|--|
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>674777: <i>E-4B Aircraft Modernization</i> |
|--|--|--|

**Management Services (\$ in Millions)**

| Cost Category Item | Contract Method & Type | Performing Activity & Location | Total Prior Years Cost | FY 2010 |            | FY 2011 Base |            | FY 2011 OCO |            | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|--------------------|------------------------|--------------------------------|------------------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
|                    |                        |                                |                        | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |

**Remarks**

|                            | Total Prior Years Cost | FY 2010 | FY 2011 Base | FY 2011 OCO | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|----------------------------|------------------------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|
| <b>Project Cost Totals</b> | 0.158                  | 17.259  | 12.532       | 0.000       | 12.532        |                  |            |                          |

**Remarks**  
Total Prior Years Cost may include only FY 2009 data.

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force

DATE: February 2010

**APPROPRIATION/BUDGET ACTIVITY**

3600: Research, Development, Test & Evaluation, Air Force  
BA 7: Operational Systems Development

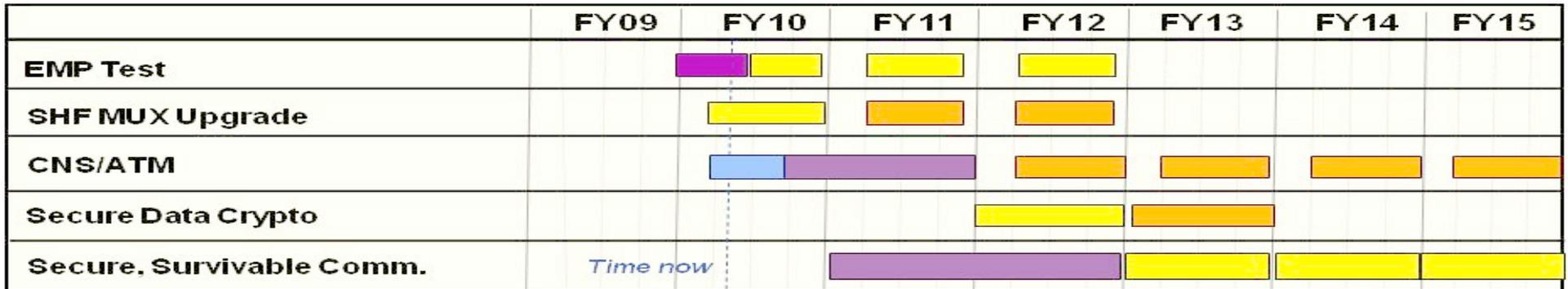
**R-1 ITEM NOMENCLATURE**

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

**PROJECT**

674777: E-4B Aircraft Modernization

## E-4B NAOC Modification Schedule



■ Concept activities  
■ Production / fielding

■ Design / development  
■ Operations / sustainment

■ Integration / test  
 △◇ Key events

**PB10 R-Docs**

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R-1 Line Item #174

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2011 Air Force   |  | <b>DATE:</b> February 2010                                   |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>674777: <i>E-4B Aircraft Modernization</i> |

Schedule Details

| Event                             | Start   |      | End     |      |
|-----------------------------------|---------|------|---------|------|
|                                   | Quarter | Year | Quarter | Year |
| EMP Testing                       | 1       | 2010 | 4       | 2010 |
| EMP Testing (1)                   | 2       | 2011 | 4       | 2011 |
| SHF MUX Upgrade                   | 1       | 2010 | 4       | 2010 |
| SHF MUX Upgrade (2)               | 2       | 2011 | 4       | 2011 |
| CNS/ATM                           | 1       | 2010 | 4       | 2011 |
| Secure Data Crypto                | 1       | 2010 | 4       | 2011 |
| Secure, Survivable Communications | 1       | 2011 | 4       | 2011 |

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|   |                       |                         |                              |  |                               |                         |                         |   |                            |                         |                   |  |
|---|-----------------------|-------------------------|------------------------------|--|-------------------------------|-------------------------|-------------------------|---|----------------------------|-------------------------|-------------------|--|
| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2011 Air Force   |                       |                         |                              |  |                               |                         |                         |   | <b>DATE:</b> February 2010 |                         |                   |  |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i>  |                       |                         |                              | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> |                               |                         |                         | <b>PROJECT</b><br>675301: <i>Next Generation NAOC</i> |                            |                         |                   |  |
| <b>COST (\$ in Millions)</b>  | <b>FY 2009 Actual</b> | <b>FY 2010 Estimate</b> | <b>FY 2011 Base Estimate</b> | <b>FY 2011 OCO Estimate</b>  | <b>FY 2011 Total Estimate</b> | <b>FY 2012 Estimate</b> | <b>FY 2013 Estimate</b> | <b>FY 2014 Estimate</b>                               | <b>FY 2015 Estimate</b>    | <b>Cost To Complete</b> | <b>Total Cost</b> |  |
| 675301: <i>Next Generation NAOC</i>   | 0.000                 | 8.848                   | 0.000                        | 0.000  | 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   | 0                          |                         |                   |  |
| <b>A. Mission Description and Budget Item Justification</b>   |                       |                         |                              |  |                               |                         |                         |   |                            |                         |                   |  |
| <p>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 node of the National Military Command System (NMCS). E-4B NAOC lifecycle costs, particularly O&amp;M costs, will increase substantially as the fleet ages and the Air Force assumes more sustainment support costs as the world-wide number of Boeing 747-200 class aircraft continues to diminish.</p> <p>Based on the recommendations of the E-4B NAOC Aircraft Replacement Analysis of Alternatives (AoA) and the Executive Support study, both completed in late 2009, the Air Force requested RDT&amp;E funds in FY10 to continue analysis of supportability and affordability of sustaining the current E-4B fleet as well as to explore options for a replacement fleet. Funds will be utilized to develop a Technology Development Strategy, Test and Evaluation Strategy, Systems Engineering Plan, Lifecycle Management Plan, Initial Capabilities Document, and other required documents leading up to a Milestone A decision. A number of risk reduction studies, such as a sustainability study and antenna/communications technology study, will also be accomplished.</p> |                       |                         |                              |  |                               |                         |                         |   |                            |                         |                   |  |
| <b>B. Accomplishments/Planned Program (\$ in Millions)</b>  |                       |                         |                              |  |                               |                         |                         |   |                            |                         |                   |  |
|   |                       |                         |                              |  |                               | <b>FY 2009</b>          | <b>FY 2010</b>          | <b>FY 2011 Base</b>                                   | <b>FY 2011 OCO</b>         | <b>FY 2011 Total</b>    |                   |  |
| MAJOR THRUST: Develop documentation leading to a Milestone A decision as well as execute a number of risk reduction studies, such as a sustainability study and antenna/communications technology study.<br><br><i>FY 2009 Accomplishments:</i><br>In FY 2009: N/A  |                       |                         |                              |  |                               | 0.000                   | 8.848                   | 0.000   | 0.000                      | 0.000                   |                   |  |

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**Exhibit R-2A, RDT&E Project Justification:** PB 2011 Air Force **DATE:** February 2010

|  |  |   |
|--|--|---|
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>675301: <i>Next Generation NAOC</i> |
|--|--|---|

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

|   | FY 2009 | FY 2010 | FY 2011 Base | FY 2011 OCO | FY 2011 Total |
|---|---------|---------|--------------|-------------|---------------|
| <p><i>FY 2010 Plans:</i><br/>In FY 2010: Develop documentation leading to a Milestone A decision as well as execute a number of risk reduction studies, such as a sustainability study and antenna/communications technology study.</p> <p><i>FY 2011 Base Plans:</i><br/>In FY 2011: Finalization of Milestone A documents and completion of risk reduction studies</p> <p><i>FY 2011 OCO Plans:</i><br/>In FY 2011 OCO: Not Applicable.</p> |         |         |              |             |               |
| <b>Accomplishments/Planned Programs Subtotals</b>   | 0.000   | 8.848   | 0.000        | 0.000       | 0.000         |

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

| <u>Line Item</u>                                       | <u>FY 2009</u> | <u>FY 2010</u> | <u>FY 2011 Base</u> | <u>FY 2011 OCO</u> | <u>FY 2011 Total</u> | <u>FY 2012</u> | <u>FY 2013</u> | <u>FY 2014</u> | <u>FY 2015</u> | <u>Cost To Complete</u> | <u>Total Cost</u> |
|--|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| • PE Not Provided (7915): <i>Activity Not Provided</i> | 0.000          | 0.000          | 0.000               | 0.000              | 0.000                | 0.000          | 0.000          | 0.000          | 0.000          | 0.000                   | 0.000             |

**D. Acquisition Strategy**

Air Force Electronic Systems Center (ESC) will be the NAOC Replacement contracting authority for the \$8.8M FY10 RDT&E, AF. ESC will lead risk reduction and technology exploration studies leading up to a Material Development Decision and Milestone A Decision. Each study will be supported by contract support with required expertise and may request data and other support from E-4B Product Support Integrator, Boeing Wichita Development & Modification Center.

**E. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force** **DATE:** February 2010

|  |  |   |
|--|--|---|
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>675301: <i>Next Generation NAOC</i> |
|--|--|---|

**Support (\$ in Millions)**

| Cost Category Item          | Contract Method & Type | Performing Activity & Location                                | Total Prior Years Cost | FY 2010 |            | FY 2011 Base |            | FY 2011 OCO |            | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|-----------------------------|------------------------|---|------------------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
|                             |                        |   |                        | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| Data and Analytical Support | SS/FFP                 | Boeing, Wichita Development & Modification Center Wichita, KS | 0.000                  | 1.000   | Jan 2010   | 0.000        |            | 0.000       |            | 0.000         | 0.000            | 1.000      | 0.000                    |
| Project Management Support  | SS/FFP                 | Booz Allen Hamilton McLean, VA                                | 0.000                  | 2.000   | Jan 2010   | 0.000        |            | 0.000       |            | 0.000         | Continuing       | Continuing | Continuing               |
| <b>Subtotal</b>             |                        |   | 0.000                  | 3.000   |            | 0.000        |            | 0.000       |            | 0.000         |                  |            |                          |

**Remarks**  
Contracting Method and Type may be altered at time of contract

**Management Services (\$ in Millions)**

| Cost Category Item        | Contract Method & Type | Performing Activity & Location | Total Prior Years Cost | FY 2010 |            | FY 2011 Base |            | FY 2011 OCO |            | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---------------------------|------------------------|--------------------------------|------------------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
|                           |                        |                                |                        | Cost    | Award Date | Cost         | Award Date | Cost        | Award Date | Cost          |                  |            |                          |
| A&AS Support and Govt TDY | TBD/TBD                | TBD TBD                        | 0.000                  | 5.848   |            | 0.000        |            | 0.000       |            | 0.000         | 0.000            | 5.848      | Continuing               |
| <b>Subtotal</b>           |                        |                                | 0.000                  | 5.848   |            | 0.000        |            | 0.000       |            | 0.000         | 0.000            | 5.848      |                          |

**Remarks**

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force** **DATE:** February 2010

|  |  |   |
|--|--|---|
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>675301: <i>Next Generation NAOC</i> |
|--|--|---|

|                            | Total Prior Years Cost | FY 2010 | FY 2011 Base | FY 2011 OCO | FY 2011 Total | Cost To Complete | Total Cost | Target Value of Contract |
|----------------------------|------------------------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|
| <b>Project Cost Totals</b> | 0.000                  | 8.848   | 0.000        | 0.000       | 0.000         |                  |            |                          |

**Remarks**  
Total Prior Years Cost may include only FY 2009 data.

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**Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force**

**DATE:** February 2010

**APPROPRIATION/BUDGET ACTIVITY**

3600: *Research, Development, Test & Evaluation, Air Force*  
 BA 7: *Operational Systems Development*

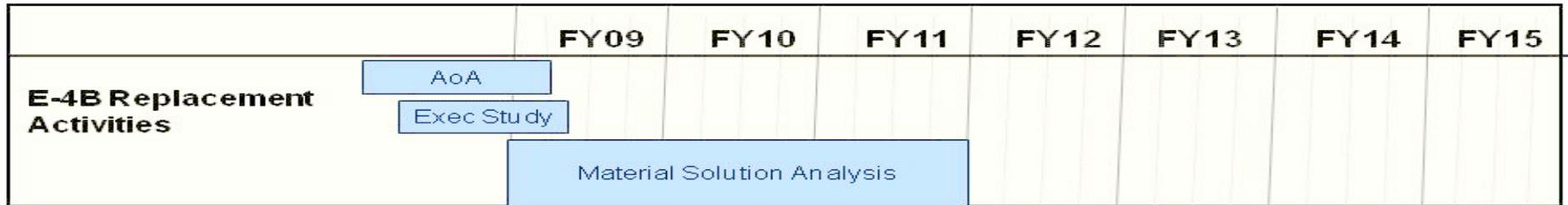
**R-1 ITEM NOMENCLATURE**

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

**PROJECT**

675301: *Next Generation NAOC*

## E-4B NAOC Replacement Program



Concept activities  
 Production / fielding

Design / development  
 Operations / sustainment

Integration / test  
 Key events

**PB10 R-Docs**

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R-1 Line Item #174

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|  |  |   |
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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2011 Air Force   |  | <b>DATE:</b> February 2010                            |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 7: <i>Operational Systems Development</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0302015F: <i>E-4B NATIONAL AIRBORNE OPERATIONS CENTER</i> | <b>PROJECT</b><br>675301: <i>Next Generation NAOC</i> |

Schedule Details

| Event                       | Start   |      | End     |      |
|-----------------------------|---------|------|---------|------|
|                             | Quarter | Year | Quarter | Year |
| AoA and Executive Study     | 1       | 2009 | 2       | 2009 |
| Material Solutions Analysis | 1       | 2009 | 4       | 2011 |

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