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| Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force   |             |         |         |              |   |               |         |         |         | Date: February 2015 |                  |            |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|---------|---------------------|------------------|------------|
| Appropriation/Budget Activity<br>3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD) |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0604429F I Airborne Electronic Attack |               |         |         |         |                     |                  |            |
| COST (\$ in Millions)   | Prior Years | FY 2014 | FY 2015 | FY 2016 Base | FY 2016 OCO   | FY 2016 Total | FY 2017 | FY 2018 | FY 2019 | FY 2020             | Cost To Complete | Total Cost |
| Total Program Element   | -           | 4.422   | 30.687  | 8.358        | -   | 8.358         | 7.779   | 7.139   | 7.274   | 7.404               | Continuing       | Continuing |
| 655192: Network & Sys -of-Sys Dev   | -           | 4.422   | 30.687  | 8.358        | -   | 8.358         | 7.779   | 7.139   | 7.274   | 7.404               | Continuing       | Continuing |
| Quantity of RDT&E Articles  | -           | -       | -       | -            | -   | -             | -       | -       | -       | -                   |                  |            |

## **A. Mission Description and Budget Item Justification**

This project concentrates on the overall systems engineering, modeling and simulation, architecture and network requirements development, effectiveness assessment and requirements allocation to component systems of the Airborne Electronic Attack (AEA) System of Systems (SoS). It also includes establishment and use of virtual test capabilities for system of systems effectiveness testing/evaluation for AEA, studies and technology risk mitigation demonstrations for potential AEA SoS components and AEA SoS battle management, development planning, and the development and maintenance of the Air Force electronic warfare capability investment strategy. These efforts are crucial in the development of critical electronic attack capabilities in support of Air Force and joint operations to include Global Strike and Persistent Global Attack Concepts of Operations (CONOPS).

The joint AEA SoS includes the Navy EA-6B and EA-18G core components; the Air Force Miniature Air Launched Decoy (MALD) and its stand-in jammer variant, MALD-J; the EC-130H Compass Call Baseline 0 (formerly Block 35) configuration; Active Electronically Scanned Array (AESA) radar equipped aircraft; potentially an unmanned recoverable stand-in jamming platform; potentially a manned low/mid frequency, high power component capable of location and reactive jamming suppression of enemy integrated air defense system (IADS) radars outside the ranges of the associated Surface-to-Air Missiles (SAMs) and non-IADS targets. Recent events have led to an increased focus on developing advanced electronic attack capabilities for use in irregular warfare against non-IADS targets such as communication networks, remote controlled improvised explosive devices and man portable air defenses. In addition, there is an increased focus on examining non-traditional electronic attack alternatives to counter both IADS and non-IADS components such as communication networks, computers, command and control links, etc. in both major combat and irregular warfare scenarios.

This program is included in Budget Activity 5, System Development and Demonstration, because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production.

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| Appropriation/Budget Activity<br>3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)   |  | R-1 Program Element (Number/Name)<br>PE 0604429F I Airborne Electronic Attack |         |                     |             |               |             |               |
| B. Program Change Summary (\$ in Millions)  |  | FY 2014   | FY 2015 | FY 2016 Base        | FY 2016 OCO | FY 2016 Total |             |               |
| Previous President's Budget   |  | 4.575   | 30.687  | 8.413               | -           | 8.413         |             |               |
| Current President's Budget  |  | 4.422   | 30.687  | 8.358               | -           | 8.358         |             |               |
| Total Adjustments   |  | -0.153  | -       | -0.055              | -           | -0.055        |             |               |
| • Congressional General Reductions  |  | -   | -       |                     |             |               |             |               |
| • Congressional Directed Reductions   |  | -   | -       |                     |             |               |             |               |
| • Congressional Rescissions   |  | -   | -       |                     |             |               |             |               |
| • Congressional Adds  |  | -   | -       |                     |             |               |             |               |
| • Congressional Directed Transfers  |  | -   | -       |                     |             |               |             |               |
| • Reprogrammings  |  | -   | -       |                     |             |               |             |               |
| • SBIR/STTR Transfer  |  | -0.153  | -       |                     |             |               |             |               |
| • Other Adjustments   |  | -   | -       | -0.055              | -           | -0.055        |             |               |
| C. Accomplishments/Planned Programs (\$ in Millions)  |  |   |         | FY 2014             | FY 2015     | FY 2016 Base  | FY 2016 OCO | FY 2016 Total |
| Title: System Engineering Studies & Technology Transition (AEA SoS)   |  |   |         | 2.172               | 2.750       | 4.698         | -           | 4.698         |
| Description: Apply systems engineering rigor to manage Air Force Airborne Electronic Attack (AEA) System of Systems (SoS) program requirements, designs, and operational concepts. Assess operational effectiveness of multiple Electronic Warfare systems in both offensive and defensive roles.   |  |   |         |                     |             |               |             |               |
| FY 2014 Accomplishments:<br>Conducted cost and operational effectiveness assessments of contributions of emerging AEA components such as non-kinetic counter electronics capabilities to both IADS and non-IADS scenarios for major and irregular warfare, refined AF electronic support system mitigation alternatives, updated AF EW Roadmap as directed by HQ AF, updated AF EW Capabilitiy Investment Strategy with studies in support of AF Core Function Master Plans.                    |  |   |         |                     |             |               |             |               |
| FY 2015 Plans:<br>Conduct cost and operational effectiveness assessments of contributions of emerging AEA components such as non-kinetic counter electronics capabilities to both IADS and non-IADS scenarios for major and irregular warfare, define and recommend implementation strategies to mitigate AF electronic support system risks, update AF EW Roadmap as directed by HQ AF, update AF EW Capabilitiy Investment Strategy with studies in support of AF Core Function Master Plans. |  |   |         |                     |             |               |             |               |
| FY 2016 Base Plans:   |  |   |         |                     |             |               |             |               |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force   |  |   | Date: February 2015 |              |             |               |
| Appropriation/Budget Activity<br>3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)   |  | R-1 Program Element (Number/Name)<br>PE 0604429F I Airborne Electronic Attack |                     |              |             |               |
| C. Accomplishments/Planned Programs (\$ in Millions)  |  | FY 2014   | FY 2015             | FY 2016 Base | FY 2016 OCO | FY 2016 Total |
| Conduct cost and operational effectiveness assessments of contributions of emerging AEA components such as non-kinetic counter electronics capabilities to both IADS and non-IADS scenarios for major and irregular warfare, define and recommend implementation strategies to mitigate AF electronic support system risks, update AF EW Roadmap as directed by HQ AF, update AF EW Capabilitiy Investment Strategy with studies in support of AF Core Function Master Plans.<br><br>FY 2016 OCO Plans:<br>N/A  |  |   |                     |              |             |               |
| Title: Capability Planning (AEA SoS)<br><br>Description: Provide capability planning to the Air Force electronic warfare and Airborne Electronic Attack (AEA) System of Systems (SoS) portfolio and constructive modeling and simulation and analysis management.<br><br>FY 2014 Accomplishments:<br>Conducted AEA SoS simulations to assess effectiveness of newly emerging and/or proposed upgraded systems (MALD-J, 4th Gen fighter upgrades, advanced Electronic Support Measures risk mitigation approaches, non-kinetic counter electronics capabilities, etc.) operating together in stressing IADS and Irregular Warfare/non-IADS environments.<br><br>FY 2015 Plans:<br>Conduct various analysis of alternatives related to electronic attack as well as conduct additional AEA simulations in support of a non-kinetic counter electronics analysis of alternatives and contributions of AEA components to effectiveness and survivability of 4th Generation fighters operating in both stressing IADS and Irregular Warfare/non-IADS environments.<br><br>FY 2016 Base Plans:<br>Conduct various analysis of alternatives related to electronic attack as well as conduct additional AEA simulations in support of a non-kinetic counter electronics analysis of alternatives and contributions of AEA components to effectiveness and survivability of 4th Generation fighters operating in both stressing IADS and Irregular Warfare/non-IADS environments.<br><br>FY 2016 OCO Plans:<br>N/A |  | 2.250   | 27.937              | 3.660        | -           | 3.660         |
| Accomplishments/Planned Programs Subtotals  |  | 4.422   | 30.687              | 8.358        | -           | 8.358         |

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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2016 Air Force  |   | <b>Date:</b> February 2015 |
| <b>Appropriation/Budget Activity</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 5: System Development &amp; Demonstration (SDD)</i>   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604429F / <i>Airborne Electronic Attack</i> |                            |
| <b>D. Other Program Funding Summary (\$ in Millions)</b><br>N/A   |   |                            |
| <b>Remarks</b>  |   |                            |
| <b>E. Acquisition Strategy</b><br>"Network and System of Systems Development" uses existing Air Force Life Cycle Management Center, Air Force Research Lab, and other contracts and instruments to provide engineering, architecture development, and other support for the Airborne Electronic Attack (AEA) System of Systems. |   |                            |
| <b>F. Performance Metrics</b><br>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 2016 Air Force  |                        |                                |             |         |            |   |            |                 |            |   |            | Date: February 2015 |                  |            |                          |
|--|------------------------|--------------------------------|-------------|---------|------------|---|------------|-----------------|------------|---|------------|---------------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity<br>3600 / 5  |                        |                                |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604429F / Airborne Electronic Attack |            |                 |            | Project (Number/Name)<br>655192 / Network & Sys -of-Sys Dev |            |                     |                  |            |                          |
| <b>Product Development (\$ in Millions)</b>  |                        |                                |             | FY 2014 |            | FY 2015   |            | FY 2016<br>Base |            | FY 2016<br>OCO  |            | FY 2016<br>Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost            | Award Date | Cost  | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| AEA system of systems engineering  | C/CPFF                 | Various : Various,             | -           | 2.172   | Dec 2013   | 2.750   | Dec 2014   | 4.698           | Dec 2015   | -   |            | 4.698               | Continuing       | Continuing | -                        |
| AF EW Capability/ Development Planning   | MIPR                   | Various : Various,             | -           | 1.890   | Dec 2013   | 27.087  | Dec 2014   | 3.285           | Dec 2015   | -   |            | 3.285               | Continuing       | Continuing | -                        |
| <b>Subtotal</b>  |                        |                                | -           | 4.062   |            | 29.837  |            | 7.983           |            | -   |            | 7.983               | -                | -          | -                        |
| <b>Remarks</b><br>Includes system of systems engineering; architecture development; network requirements planning; requirements refinement and development; EW assessments, including Air Force Electronic Warfare Capability Investment Strategy (AFEWCIS) roadmap development, maintenance & assessments; technology risk mitigation, DoD scenario initiation & distribution; working group support; engineering and test planning; capability planning for AF EW portfolio; conduct of constructive/virtual modeling simulation and analysis. |                        |                                |             |         |            |   |            |                 |            |   |            |                     |                  |            |                          |
| <b>Support (\$ in Millions)</b>  |                        |                                |             | FY 2014 |            | FY 2015   |            | FY 2016<br>Base |            | FY 2016<br>OCO  |            | FY 2016<br>Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost            | Award Date | Cost  | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| <b>Subtotal</b>  |                        |                                | -           | -       |            | -   |            | -               |            | -   |            | -                   | -                | -          | -                        |
| <b>Test and Evaluation (\$ in Millions)</b>  |                        |                                |             | FY 2014 |            | FY 2015   |            | FY 2016<br>Base |            | FY 2016<br>OCO  |            | FY 2016<br>Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost            | Award Date | Cost  | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| <b>Subtotal</b>  |                        |                                | -           | -       |            | -   |            | -               |            | -   |            | -                   | -                | -          | -                        |
| <b>Management Services (\$ in Millions)</b>  |                        |                                |             | FY 2014 |            | FY 2015   |            | FY 2016<br>Base |            | FY 2016<br>OCO  |            | FY 2016<br>Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost  | Award Date | Cost            | Award Date | Cost  | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| Mission Support  | Various                | Various : Various,             | -           | 0.360   | Dec 2013   | 0.850   | Dec 2014   | 0.375           | Dec 2015   | -   |            | 0.375               | Continuing       | Continuing | -                        |
| <b>Subtotal</b>  |                        |                                | -           | 0.360   |            | 0.850   |            | 0.375           |            | -   |            | 0.375               | -                | -          | -                        |
| <b>Remarks</b><br>Element includes miscellaneous support to projects. Costs include travel and unique security expenses.   |                        |                                |             |         |            |   |            |                 |            |   |            |                     |                  |            |                          |

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|---|----------------|---------|--|---------|---|-----------------|--|----------------|--|---|---------------------|---------------|--------------------------------|--|
| Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Air Force |                |         |  |         |   |                 |  |                |  |   | Date: February 2015 |               |                                |  |
| Appropriation/Budget Activity<br>3600 / 5                   |                |         |  |         | R-1 Program Element (Number/Name)<br>PE 0604429F / Airborne Electronic Attack |                 |  |                |  | Project (Number/Name)<br>655192 / Network & Sys -of-Sys Dev |                     |               |                                |  |
|   | Prior<br>Years | FY 2014 |  | FY 2015 |   | FY 2016<br>Base |  | FY 2016<br>OCO |  | FY 2016<br>Total  | Cost To<br>Complete | Total<br>Cost | Target<br>Value of<br>Contract |  |
| Project Cost Totals   | -              | 4.422   |  | 30.687  |   | 8.358           |  | -              |  | 8.358   | -                   | -             | -                              |  |

Remarks

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|   |                            |
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| <b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2016 Air Force | <b>Date:</b> February 2015 |
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| <b>Appropriation/Budget Activity</b><br>3600 / 5 | <b>R-1 Program Element (Number/Name)</b><br>PE 0604429F / <i>Airborne Electronic Attack</i> | <b>Project (Number/Name)</b><br>655192 / <i>Network &amp; Sys -of-Sys Dev</i> |
|--|---|---|

|   | FY 2014 |   |   |   | FY 2015 |   |   |   | FY 2016 |   |   |   | FY 2017 |   |   |   | FY 2018 |   |   |   | FY 2019 |   |   |   | FY 2020 |   |   |   |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
|   | 1       | 2 | 3 | 4 | 1       | 2 | 3 | 4 | 1       | 2 | 3 | 4 | 1       | 2 | 3 | 4 | 1       | 2 | 3 | 4 | 1       | 2 | 3 | 4 | 1       | 2 | 3 | 4 |
| DoD Planning Scenarios Suppressor updates |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| Continuing to Support EW Assessments      |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| AEA SoS Suppressor Improvements           |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| AF EW Investment Strategy                 |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| AESA/RWR analysis/test                    |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| Non Kinetic Counter Electronics Analysis  |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |
| NKCE Technology Demonstration             |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |         |   |   |   |

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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2016 Air Force |   |   | <b>Date:</b> February 2015 |
| <b>Appropriation/Budget Activity</b><br>3600 / 5                   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604429F / <i>Airborne Electronic Attack</i> | <b>Project (Number/Name)</b><br>655192 / <i>Network &amp; Sys -of-Sys Dev</i> |                            |

Schedule Details

| Events                                    | Start   |      | End     |      |
|---|---------|------|---------|------|
|   | Quarter | Year | Quarter | Year |
| DoD Planning Scenarios Suppressor updates | 4       | 2014 | 4       | 2020 |
| Continuing to Support EW Assessments      | 4       | 2014 | 4       | 2020 |
| AEA SoS Suppressor Improvements           | 4       | 2014 | 4       | 2020 |
| AF EW Investment Strategy                 | 4       | 2014 | 4       | 2020 |
| AESA/RWR analysis/test                    | 1       | 2014 | 4       | 2015 |
| Non Kinetic Counter Electronics Analysis  | 1       | 2014 | 4       | 2016 |
| NKCE Technology Demonstration             | 3       | 2014 | 2       | 2015 |