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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Air Force **Date:** February 2015

| | |
|---|--|
| Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i> | R-1 Program Element (Number/Name) PE 0605213F / <i>F-22 Modernization Increment 3.2B</i> |
|---|--|

| 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 | 110.432 | 88.268 | 173.647 | 140.640 | - | 140.640 | 72.467 | 1.399 | 1.426 | 1.452 | 23.348 | 613.079 |
| 654785: <i>F-22 INCREMENT 3.2B</i> | 110.432 | 88.268 | 173.647 | 140.640 | - | 140.640 | 72.467 | 1.399 | 1.426 | 1.452 | 23.348 | 613.079 |
| Quantity of RDT&E Articles | 9 | - | - | - | - | - | - | - | - | - | - | - |

MDAP/MAIS Code: 474

Note

All Increment 3.2B efforts and associated funding prior to FY13 are included in the F-22A Squadrons budget documentation, PE 0207138F and other outside funding PEs. Prior year funding:

- PE 0207138F (FY04-FY12): \$422.4M
- PE 0207163F (FY10-FY13): \$39.8M
- PE 0207445F (FY07-FY10): \$39.6M
- PE 0200001F (FY07): \$32.9M

A. Mission Description and Budget Item Justification

Increment 3.2B will integrate the newest air-to-air intercept missiles (i.e., AIM-9X and AIM-120D), further improve the Electronic Protection (EP) capability over Increment 3.2A, and enhance the F-22's geolocation capability from the Increment 3.1 baseline with the addition of Geolocation 2. Increment 3.2B will include the Enhanced Stores Management System (ESMS), as well as Common Weapon Engagement Zone (Common WEZ), and an Intra-Flight Datalink (IFDL) improvement to increase IFDL bandwidth and enable cooperative functions required to realize Increment 3.2B capabilities.

Increment 3.2B will develop, certify and integrate a new platform operational flight program to ensure the system interoperability and performance of all increment-level developments.

The development program includes development, studies, and analysis to enhance the air vehicle and training system to improve/enhance F-22 weapons, communications, Electronic Warfare, and Intelligence Surveillance Reconnaissance (ISR) capabilities.

BA5 - This program is in Budget Activity 5, System Development and Demonstration (SDD) 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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| B. Program Change Summary (\$ in Millions) | FY 2014 | FY 2015 | FY 2016 Base | FY 2016 OCO | FY 2016 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 115.000 | 173.647 | 141.575 | - | 141.575 |
| Current President's Budget | 88.268 | 173.647 | 140.640 | - | 140.640 |
| Total Adjustments | -26.732 | - | -0.935 | - | -0.935 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | -23.000 | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | -3.732 | - | | | |
| • Other Adjustments | - | - | -0.935 | - | -0.935 |

Change Summary Explanation

FY14: \$26.732 reduction due to: \$23M for Congressional Rescission and \$3.732M due to SBIR

FY15: N/A

FY16: \$0.935M reduction due to inflation rate adjustments

| C. Accomplishments/Planned Programs (\$ in Millions) | FY 2014 | FY 2015 | FY 2016 |
|---|----------------|----------------|----------------|
| Title: F -22 Increment 3.2B | 75.028 | 109.097 | 79.640 |
| Description: The F-22 Increment 3.2B Modernization Program consists of the studies, analysis, demonstrations, and hardware/software development necessary to provide Increment 3.2B capabilities including Intra-Flight Data Link Improvements, Electronic Protection, AIM-9X and AIM-120D integration with Common Weapon Engagement Zone, Geolocate 2.0 and Stores Management System Common Split Bus. The Enhanced Stores Management System (ESMS) program is a hardware development program required to integrate any new weapons on the F-22 beyond Increment 3.1. Mission Support of the F-22 Program Office: travel, computer costs, and other miscellaneous contract support. | | | |
| FY 2014 Accomplishments: F-22 Increment 3.2B finalized system design and continued Development, Code, Integration and Flight Test. Provided Management and infrastructure activities in support of the F-22 Program Office. | | | |
| FY 2015 Plans: F-22 Increment 3.2B will continue work in the Development, Code, Integration, and Test Phase. In addition will provide management and infrastructure activities in support of the F-22 Program Office. | | | |
| FY 2016 Plans: | | | |

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| Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i> | | R-1 Program Element (Number/Name) PE 0605213F / <i>F-22 Modernization Increment 3.2B</i> | | |
| C. Accomplishments/Planned Programs (\$ in Millions) | | FY 2014 | FY 2015 | FY 2016 |
| F-22 Increment 3.2B will continue work in the Development, Code, Integration, and Test Phase in preparation for 3QFY16 Milestone C. In addition, will conduct management and infrastructure activities in support of the F-22 Program Office. | | | | |
| Title: Combined Test Force (CTF) | | 3.730 | 29.500 | 27.500 |
| Description: The F-22 Combined Test Force (CTF), located at Edwards Air Force Base, conducts testing to assess performance and military utility of Increment 3.2B. The CTF uses operationally relevant ground and flight test scenarios to identify Increment 3.2B performance deficiencies. This funds Inc 3.2B unique test costs. | | | | |
| FY 2014 Accomplishments: The CTF accomplished detailed test planning of Increment 3.2B and continued testing AIM-9X separations for a full AIM-9X integration in Increment 3.2B. CTF initiated Increment 3.2B Flight Test. | | | | |
| FY 2015 Plans: The CTF will continue detailed test planning and Increment 3.2B Flight Test execution. | | | | |
| FY 2016 Plans: The CTF will complete developmental flight test in preparation for Low Rate Initial Production (LRIP) decision (Milestone C). | | | | |
| Title: Lab Test & Operations | | 9.510 | 35.050 | 33.500 |
| Description: Increment 3.2B Lab Test & Operations will plan and conduct software build, integration & testing in the F-22 system integration at the laboratories: the Agile Integration Lab (AIL); the Raptor Integration Lab (RaIL); the Air Combat Simulation (ACS) Lab; the Vehicle Management System (VMS) Vehicle Integration Facility (VIF); and the Vehicle System Simulator (VSS). | | | | |
| FY 2014 Accomplishments: F-22 Increment 3.2B Lab Test & Operations planned and conducted software builds, integration & testing in the F-22 system integration at the laboratories: the Agile Integration Lab (AIL); the Raptor Integration Lab (RaIL); the Air Combat Simulation (ACS) Lab; the Vehicle Management System (VMS) Vehicle Integration Facility (VIF); and the Vehicle System Simulator (VSS). | | | | |
| FY 2015 Plans: Increment 3.2B Lab Test & Operations will continue to plan and conduct software builds, integration & testing on production representative hardware in the F-22 system integration laboratories: the Agile Integration Lab (AIL); the Raptor Integration Lab (RaIL); the Air Combat Simulation (ACS) Lab; the Vehicle Management System (VMS) Vehicle Integration Facility (VIF); and the Vehicle System Simulator (VSS). To enhance software maturation, the developmental software labs will deliver several planned software versions to support developmental flight test execution. | | | | |
| FY 2016 Plans: | | | | |

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|---|--|

| C. Accomplishments/Planned Programs (\$ in Millions) | FY 2014 | FY 2015 | FY 2016 |
|--|----------------|----------------|----------------|
| Increment 3.2B Lab Test & Operations will continue to plan and conduct software builds, integration & testing on production representative hardware in the F-22 system integration laboratories: the Agile Integration Lab (AIL); the Raptor Integration Lab (Rall); the Air Combat Simulation (ACS) Lab; the Vehicle Management System (VMS) Vehicle Integration Facility (VIF); and the Vehicle System Simulator (VSS). Increment 3.2B Lab Test & Operations will deliver the fully integrated Operational Flight Program (OFF) required to complete developmental flight test and resolve performance deficiencies in preparation for Air Force Operational Flight Test Evaluation. | | | |
| Accomplishments/Planned Programs Subtotals | 88.268 | 173.647 | 140.640 |

D. Other Program Funding Summary (\$ in Millions)

| Line Item | 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 |
|---|----------------|----------------|-------------------------|------------------------|--------------------------|----------------|----------------|----------------|----------------|-----------------------------|-------------------|
| • RDT&E: BA07: PE 0207138F: <i>F-22A Squadrons, RDT&E*</i> | 266.431 | 146.299 | 262.552 | - | 262.552 | 382.198 | 406.094 | 415.207 | 422.636 | Continuing | Continuing |
| • APAF: BA05: Line Item # F2232B: <i>Increment 3.2B**</i> | - | 28.500 | 69.325 | - | 69.325 | 79.091 | 144.831 | 13.187 | 20.529 | - | 355.463 |
| • APAF: BA05: Line Item # F02200: <i>F-22A***</i> | 358.268 | 301.426 | 129.251 | - | 129.251 | 285.014 | 218.692 | 222.923 | 275.407 | Continuing | Continuing |
| • APAF: BA056: 000999: <i>Initial Spares</i> | - | - | 2.934 | - | 2.934 | 4.470 | 7.782 | - | - | - | 15.186 |
| • RDT&E: BA07: PE 0207163F: <i>AIM-120D, AMRAAM T&E, RDT&E****</i> | 20.830 | 23.940 | 5.820 | - | 5.820 | - | - | - | - | - | 50.590 |

Remarks

NOTES:

*F-22A Squadrons, RDT&E/PE 0207138F includes F-22A Squadrons modernization and development. Both PEs 0207138F and 0605213F share lab and Combined OTF Test Force infrastructure support costs across the F-22 enterprise.

**Increment 3.2B, APAF/PE 0207138F, F2232B includes BP11 (Aircraft Modifications) for Increment 3.2B only.

***F-22A Squadrons, APAF/PE 0207138F, F02200 includes BPs 11 (Aircraft Modifications), 13 (Post-Production Support), 16 (Initial Spares), and 19 (Depot Activation) for F-22 Squadrons only.

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| Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i> | R-1 Program Element (Number/Name) PE 0605213F / <i>F-22 Modernization Increment 3.2B</i> |
|---|--|

D. Other Program Funding Summary (\$ in Millions)

| <u>Line Item</u> | <u>FY 2014</u> | <u>FY 2015</u> | <u>FY 2016</u> <u>Base</u> | <u>FY 2016</u> <u>OCO</u> | <u>FY 2016</u> <u>Total</u> | <u>FY 2017</u> | <u>FY 2018</u> | <u>FY 2019</u> | <u>FY 2020</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
|--|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| ****AIM-120D, AMRAAM RDT&E/PE 0207163F, funding provides for the AIM-120D development as a part of the F-22 Increment 3.2B effort. | | | | | | | | | | | |

E. Acquisition Strategy

The Raptor Enhancement Development & Integration (REDI) contract is an Indefinite Delivery/Indefinite Quantity Ordering contract that maximizes flexibility to start, stop, accelerate and decelerate projects as required. The REDI contract was established to be more responsive to evolving war fighter requirements. The REDI contract allows the issuance of orders for the highest priority war fighter capabilities in operationally meaningful capability increments, requirements analysis, contractor cost estimates and studies, development and demonstration of capability enhancements, and unanticipated future war fighter requirements. Each increment is broken into phases to initiate requirements analysis, the design phase and the development, integration and verification phase of a specific incremental development effort. The REDI II contract is a follow-on Indefinite Delivery/Indefinite Quantity contract to the initial REDI contract. REDI II provides maximum flexibility to manage various modernization projects. The REDI II contract allows for the issuance of orders for efforts associated with the planning, analysis, design, development, qualification, test and documentation of F-22 weapon system performance enhancements, life-cycle improvements, Operational Flight Program (OFP) upgrades, and associated efforts essential to accomplishing the F-22 mission.

F. 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 2016 Air Force **Date:** February 2015

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| Appropriation/Budget Activity 3600 / 5 | R-1 Program Element (Number/Name) PE 0605213F / F-22 Modernization Increment 3.2B | Project (Number/Name) 654785 / F-22 INCREMENT 3.2B |
|--|--|--|

| Product Development (\$ in Millions) | | | | FY 2014 | | FY 2015 | | FY 2016 Base | | FY 2016 OCO | | FY 2016 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------|---------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | | | |
| Increment 3.2B | Various | Lockheed Martin : Ft. Worth, TX | 107.877 | 75.028 | Nov 2013 | 109.097 | Nov 2014 | 79.640 | Nov 2015 | - | | 79.640 | 71.082 | 442.724 | 488.035 |
| Subtotal | | | 107.877 | 75.028 | | 109.097 | | 79.640 | | - | | 79.640 | 71.082 | 442.724 | 488.035 |

Remarks
Target Value of Contract includes only active REDI/REDI II delivery orders DO 0070, DO 0071, and DO 0004. Target Value of Contract and Total cost do not match due to prior year costs executed in F-22 Squadrons PE 0207138F and other outside funded PE's as documented in the R-2A.

| Support (\$ in Millions) | | | | FY 2014 | | FY 2015 | | FY 2016 Base | | FY 2016 OCO | | FY 2016 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---------------------------------|------------------------|--------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | | | |
| Subtotal | | | - | - | | - | | - | | - | | - | - | - | - |

| Test and Evaluation (\$ in Millions) | | | | FY 2014 | | FY 2015 | | FY 2016 Base | | FY 2016 OCO | | FY 2016 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------|----------------------------------|-------------|---------|------------|---------|------------|--------------|------------|-------------|------------|---------------|------------------|------------|--------------------------|
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | | | |
| Combined Test Force | Various | Various : Various, | 0.660 | 3.730 | Nov 2013 | 29.500 | Dec 2014 | 27.500 | Dec 2015 | - | | 27.500 | 21.100 | 82.490 | - |
| Laboratory Test Operations | SS/ Various | Lockheed Martin : Fort Worth, TX | 1.895 | 9.510 | Nov 2013 | 35.050 | Nov 2014 | 33.500 | Nov 2015 | - | | 33.500 | 7.910 | 87.865 | - |
| Subtotal | | | 2.555 | 13.240 | | 64.550 | | 61.000 | | - | | 61.000 | 29.010 | 170.355 | - |

Remarks
FY12 and prior year costs for Increment 3.2B are shown under PE 0207138F. FY13 and later are shown under PE 0605213F. The Combined Test Force and Laboratory Test & Operations costs appear to increase significantly starting in FY2013 due to the addition of Increment 3.2B test costs. The corresponding decrease in test costs are captured in PE 0207138F documentation.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Air Force **Date:** February 2015

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| Appropriation/Budget Activity 3600 / 5 | R-1 Program Element (Number/Name) PE 0605213F / <i>F-22 Modernization Increment 3.2B</i> | Project (Number/Name) 654785 / <i>F-22 INCREMENT 3.2B</i> |
|--|--|---|

| Management Services (\$ in Millions) | | | | FY 2014 | | FY 2015 | | FY 2016 Base | | FY 2016 OCO | | FY 2016 Total | Cost To Complete | Total Cost | Target Value of Contract |
|---|-----------------------------------|---|--------------------|----------------|-------------------|----------------|-------------------|---------------------|-------------------|--------------------|-------------------|----------------------|-------------------------|-------------------|---------------------------------|
| Cost Category Item | Contract Method & Type | Performing Activity & Location | Prior Years | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | Award Date | Cost | | | |
| Subtotal | | | - | - | | - | | - | | - | | - | - | - | - |
| Project Cost Totals | | | 110.432 | 88.268 | | 173.647 | | 140.640 | | - | | 140.640 | 100.092 | 613.079 | - |

Remarks

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| Exhibit R-4, RDT&E Schedule Profile: PB 2016 Air Force | | Date: February 2015 |
| Appropriation/Budget Activity 3600 / 5 | R-1 Program Element (Number/Name) PE 0605213F / F-22 Modernization Increment 3.2B | Project (Number/Name) 654785 / F-22 INCREMENT 3.2B |

| | 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 |
| Increment 3.2B HW Development/Risk Reduction/Lab Equipment** | ██████████ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Increment 3.2B Code, Integration, and Test | ██ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Increment 3.2B Critical Design Review (CDR) | | | | | | | | | ████ | | | | | | | | | | | | | | | | | | | |
| Increment 3.2B Milestone C | | | | | | | | | ████ | | | | | | | | | | | | | | | | | | | |
| Increment 3.2B Initial Operational Test & Evaluation (IOT&E) | | | | | | | | | | | | | ██████████ | | | | | | | | | | | | | | | |
| Increment 3.2B Fleet Release | | | | | | | | | | | | | | | | | ████ | | | | | | | | | | | |
| Increment 3.2B Retrofit | | | | | | | | | | | | | | | | | | | | | ██ | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2016 Air Force | | Date: February 2015 |
| Appropriation/Budget Activity 3600 / 5 | R-1 Program Element (Number/Name) PE 0605213F / <i>F-22 Modernization Increment 3.2B</i> | Project (Number/Name) 654785 / <i>F-22 INCREMENT 3.2B</i> |

Schedule Details

| Events | Start | | End | |
|--|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| Increment 3.2B HW Development/Risk Reduction/Lab Equipment** | 1 | 2014 | 2 | 2015 |
| Increment 3.2B Code, Integration, and Test | 1 | 2014 | 1 | 2018 |
| Increment 3.2B Critical Design Review (CDR) | 1 | 2016 | 1 | 2016 |
| Increment 3.2B Milestone C | 3 | 2016 | 3 | 2016 |
| Increment 3.2B Initial Operational Test & Evaluation (IOT&E) | 2 | 2017 | 4 | 2017 |
| Increment 3.2B Fleet Release | 2 | 2018 | 2 | 2018 |
| Increment 3.2B Retrofit | 2 | 2018 | 4 | 2020 |