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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

| Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i> | | | | | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | | | | | | | |
|---|--------------------|----------------|----------------|---------------------|---|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| COST (\$ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
| Total Program Element | - | 33.666 | 59.693 | 57.725 | 0.000 | 57.725 | 44.777 | 36.511 | 31.655 | 32.237 | Continuing | Continuing |
| 662907: <i>Electronic Combat Intel Support</i> | - | 2.556 | 2.603 | 2.643 | 0.000 | 2.643 | 2.700 | 2.748 | 2.796 | 2.848 | Continuing | Continuing |
| 663321: <i>Electronic Warfare Ground Test Resources</i> | - | 23.869 | 49.714 | 47.593 | 0.000 | 47.593 | 34.429 | 25.980 | 20.937 | 21.321 | Continuing | Continuing |
| 667500: <i>Foreign Materiel Acquisition/Analysis</i> | - | 7.241 | 7.376 | 7.489 | 0.000 | 7.489 | 7.648 | 7.783 | 7.922 | 8.068 | Continuing | Continuing |

A. Mission Description and Budget Item Justification

The AF requires a comprehensive set of indoor and outdoor test facilities to implement the Air Force Electronic Warfare (EW) Test Process in order to test EW systems, including Directed Energy (DE). To manage program risk effectively throughout the EW weapons system acquisition process, and to conduct T&E effectively and efficiently, a broad multi-spectrum integrated set of T&E capabilities, ranging from Modeling and Simulation (M&S), to full-scale chamber testing, to flight testing on open-air ranges (OAR), is required. The EW Test Process Support task provides investment management and coordinated technical oversight of EW T&E facilities, including studies, analyses, and related documentation. Additionally, successful EW capabilities in battle are predicated upon a thorough understanding of the threat. To meet that requirement, this PE also includes funding to acquire foreign materiel, and to thoroughly test and evaluate that foreign materiel to understand how those threat systems affect and are affected by our EW systems.

This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.

| <u>B. Program Change Summary (\$ in Millions)</u> | <u>FY 2019</u> | <u>FY 2020</u> | <u>FY 2021 Base</u> | <u>FY 2021 OCO</u> | <u>FY 2021 Total</u> |
|--|-----------------------|-----------------------|----------------------------|---------------------------|-----------------------------|
| Previous President's Budget | 34.206 | 59.693 | 63.925 | 0.000 | 63.925 |
| Current President's Budget | 33.666 | 59.693 | 57.725 | 0.000 | 57.725 |
| Total Adjustments | -0.540 | 0.000 | -6.200 | 0.000 | -6.200 |
| • Congressional General Reductions | 0.000 | 0.000 | | | |
| • Congressional Directed Reductions | 0.000 | 0.000 | | | |
| • Congressional Rescissions | 0.000 | 0.000 | | | |
| • Congressional Adds | 0.000 | 0.000 | | | |
| • Congressional Directed Transfers | 0.000 | 0.000 | | | |
| • Reprogrammings | 0.000 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.540 | 0.000 | | | |
| • Other Adjustments | 0.000 | 0.000 | -6.200 | 0.000 | -6.200 |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force | | Date: February 2020 |
| Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i> | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | |

Change Summary Explanation

FY21: The FY 2021 funding request was reduced by \$6.1 million to account for the availability of prior year execution balances.

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| Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force | | | | | | | | | | Date: February 2020 | | |
| Appropriation/Budget Activity 3600 / 6 | | | | | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | | | | Project (Number/Name) 662907 / <i>Electronic Combat Intel Support</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
| 662907: <i>Electronic Combat Intel Support</i> | - | 2.556 | 2.603 | 2.643 | 0.000 | 2.643 | 2.700 | 2.748 | 2.796 | 2.848 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

This project provides funding to support Foreign Materiel Operational Test and Evaluation (FMOT&E), which ensures the ability of operational commands to test and develop effective Electronic Attack/Electronic Protection (EA/EP) techniques and tactics. Funds are required for: deployment of systems to test facilities; travel of personnel to the test sites to evaluate and validate test results; range and laboratory costs; test consumables; costs for instrumentation of systems; and contracted engineering support for the conduct of tests and subsequent reporting. Funding for this program is required to prevent future aircraft losses due to improper and inaccurate aircrew tactics (e.g., lack of evasive action or proper tactics training to avoid missile attack).

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2019 | FY 2020 | FY 2021 |
|--|----------------|----------------|----------------|
| Title: FMOT&E | 2.556 | 2.603 | 2.643 |
| Description: Supports Foreign Materiel Operational Test and Evaluation (FMOT&E) | | | |
| FY 2020 Plans: Continue operations of electronic combat intelligence support for fighter and bomber testing, mobility special operations transport and helicopter testing, classified operational assessments and extensive evaluations and reporting of system effectiveness. | | | |
| FY 2021 Plans: Continue operations of electronic combat intelligence support for fighter and bomber testing, mobility special operations transport and helicopter testing, classified operational assessments and extensive evaluations and reporting of system effectiveness. | | | |
| FY 2020 to FY 2021 Increase/Decrease Statement: Not applicable. | | | |
| Accomplishments/Planned Programs Subtotals | 2.556 | 2.603 | 2.643 |

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

| Line Item | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
|---|----------------|----------------|---------------------|--------------------|----------------------|----------------|----------------|----------------|----------------|-------------------------|-------------------|
| • RDTE 06 PE 0604759F: <i>Major T&E Investment</i> | 213.273 | 106.663 | 208.680 | - | 208.680 | 207.845 | 152.044 | 159.017 | 155.705 | Continuing | Continuing |

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| Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force | | | | | | | | | Date: February 2020 | | |
| Appropriation/Budget Activity 3600 / 6 | | | | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | | | | Project (Number/Name) 662907 / <i>Electronic Combat Intel Support</i> | | | |

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

| <u>Line Item</u> | <u>FY 2019</u> | <u>FY 2020</u> | <u>FY 2021</u> | <u>FY 2021</u> | <u>FY 2021</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>Cost To</u> | |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-------------------|
| | | | <u>Base</u> | <u>OCO</u> | <u>Total</u> | | | | | <u>Complete</u> | <u>Total Cost</u> |
| • RDTE 06 PE 0605807F: <i>Test and Evaluation Support</i> | 692.784 | 717.895 | 764.606 | - | 764.606 | 767.210 | 766.092 | 780.181 | 789.744 | Continuing | Continuing |
| • RDTE 06 PE 0605976F: <i>Facility Restoration and Modernization - T&E</i> | 187.216 | 88.445 | 70.985 | - | 70.985 | 70.622 | 71.888 | 73.173 | 74.520 | Continuing | Continuing |
| • RDTE 06 PE 0605978F: <i>Facility Sustainment - T&E Support</i> | 28.888 | 29.424 | 29.880 | - | 29.880 | 30.509 | 31.056 | 31.612 | 32.193 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

Not applicable.

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| Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force | | | | | | | | | | Date: February 2020 | | |
| Appropriation/Budget Activity 3600 / 6 | | | | | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | | | | Project (Number/Name) 663321 / <i>Electronic Warfare Ground Test Resources</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
| 663321: <i>Electronic Warfare Ground Test Resources</i> | - | 23.869 | 49.714 | 47.593 | 0.000 | 47.593 | 34.429 | 25.980 | 20.937 | 21.321 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

The AF requires a comprehensive set of test facility modernizations to improve Electronic Warfare (EW) which includes Directed Energy (DE) weapons Test and Evaluation (T&E) capabilities. This funding is used to improve and modernize threat system simulators, stimulators, emitters and supporting infrastructure to sufficiently and cost effectively test and evaluate current and future weapon systems' ability to perform in realistic EW threat representative environments. The National Radar Cross Section (RCS) Test Facility (NRTF) at Holloman AFB, NM, provides timely, accurate, and secure RCS and antenna measurements for tri-service and joint program offices, DoD laboratories, Defense Advanced Research Projects Agency (DARPA) and industry. The NRTF tests fielded and developmental systems and technologies to meet Low Observable (LO) and EW customer requirements. The Guided Weapons Evaluation Facility (GWEF) at Eglin AFB, FL, and the Digital Integrated Air Defense System (DIADS) at Edwards AFB, CA, provide the ability to realistically evaluate hardware and software components of US weapon systems against manned hardware threat representations throughout the acquisition process. The GWEF provides simulations of advanced Infrared (IR) Surface-to-Air Missiles (SAMs) and Air-to-Air Missiles (AAMs), IR and Laser countermeasure functions, and the integration of actual threat hardware and ground clutter into advanced threat IR missile simulations. DIADS provides mission level simulations of both algorithm-based and man-in-the-loop-based enemy command and control (C2) capabilities that integrate early warning radar detection, SAM engagement capabilities, and limited ground-controlled fighter intercepts. The Benefield Anechoic Facility (BAF) at Edwards AFB, CA, and the Joint Preflight Integration of Munitions and Electronic Systems (J-PRIMES) facility at Eglin AFB, FL, both provide threat-representative EW emitters and stimulators to replicate a variety of land, sea and airborne threats in a controlled RF environment to evaluate full-scale weapon systems. The BAF additionally provides an ability to perform Electromagnetic Interference/Compatibility (EMI/EMC) testing to ensure radars, jammers, radios, and other flight-critical electronic systems will not interfere with each other during a mission. The Central Inertial and GPS Test Facility (CIGTF) at the 704th Test Group at Holloman AFB, NM provides threat-representative GPS jammers and laydowns in both lab and open-air environments to test avionics systems' performance when under various GPS-denial conditions. Provides EW test process support, conducting requirements analyses and other studies in support of AF T&E investments in test infrastructure and capabilities.

In previous R-2 Exhibits, EW T&E modernization efforts within this PE's BPAC were identified via two mission area categories: Improvement and Modernization (I&M) and EC Test Process Support. To more accurately align this R-2 Exhibit with the funding/execution baseline for this BPAC, the two aforementioned mission area categories have been combined into a single mission area titled, "Electronic Warfare Ground Test Resources".

B. Accomplishments/Planned Programs (\$ in Millions)

| | | | |
|---|----------------|----------------|----------------|
| | FY 2019 | FY 2020 | FY 2021 |
| Title: Electronic Warfare Ground Test Resources | 23.869 | 49.714 | 47.593 |
| Description: Provides for planning, monitoring, improvement and modernization of test capabilities to conduct and support the AF EW test process. Provides for EW test process support. Conducts requirements analyses and other studies in support of Air Force T&E investments in test infrastructure and capabilities. Plans for FY2020 and FY2021 include, but are not limited to, | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force | | Date: February 2020 |
| Appropriation/Budget Activity 3600 / 6 | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | Project (Number/Name) 663321 / <i>Electronic Warfare Ground Test Resources</i> |

| B. Accomplishments/Planned Programs (\$ in Millions) | FY 2019 | FY 2020 | FY 2021 |
|--|----------------|----------------|----------------|
| the following EW efforts which may be accelerated or delayed due to variations in customer requirements and overall project execution. | | | |
| <i>FY 2020 Plans:</i> Continue executing development, procurement and integration of EW programs such as Red Integrated Air Defense System (Red-IADS), Electronics Warfare Test Capability Improvement Program (EWTCIP), Jammer Electronic Counter Measures (JECM) Enhancement and Integration, National RCS Test Facility (NRTF) Modernization and Measurement, Infra-Red Countermeasure-Capability Modernization (IRCM-CM), NEWEG for J-PRIMES (NEWEG-J Phase I) and CIGTF GPS NAVWAR Upgrade (CGNU). Continues 5GATE technology implementation projects. Also included is continued funding of SETA support necessary to implement planned Air Force test processes and infrastructure for EW capabilities, support tri-service monitoring and analysis teams established to identify emerging joint investment needs and requirements development, and assist in the management and monitoring of EW program elements and activities. | | | |
| <i>FY 2021 Plans:</i> Continue executing development, procurement and integration of EW programs such as Red Integrated Air Defense System (Red-IADS), Electronics Warfare Test Capability Improvement Program (EWTCIP), Jammer Electronic Counter Measures (JECM) Enhancement and Integration, National RCS Test Facility (NRTF) Modernization and Measurement, and Infra-Red Countermeasure-Capability Modernization (IRCM-CM). NEWEG for J-PRIMES (NEWEG-J Phase I), CIGTF GPS NAVWAR Upgrade (CGNU), and NRTF-Capability Modernization (CM) Programs are nearing the end of their development. This is also the final year for implementing 5GATE technologies. Also included is continued funding of SETA support necessary to implement planned Air Force test processes and infrastructure for I&M capabilities, support tri-service monitoring and analysis teams established to identify emerging joint investment needs and requirements development, and assist in the management and monitoring of I&M program elements and activities | | | |
| <i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Overall decrease due to a reduction in FY21 funding to account for the availability of prior year execution balances. | | | |
| Accomplishments/Planned Programs Subtotals | 23.869 | 49.714 | 47.593 |

| C. Other Program Funding Summary (\$ in Millions) | | | | | | | | | | | |
|--|----------------|----------------|-------------------------|------------------------|--------------------------|----------------|----------------|----------------|----------------|-----------------------------|-------------------|
| Line Item | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
| • RDTE 06 PE 0604759F: <i>Major T&E Investment</i> | 213.273 | 106.663 | 208.680 | - | 208.680 | 207.845 | 152.044 | 159.017 | 155.705 | Continuing | Continuing |
| • RDTE 06 PE 0605807F: <i>Test and Evaluation Support</i> | 692.784 | 717.895 | 764.606 | - | 764.606 | 767.210 | 766.092 | 780.181 | 789.744 | Continuing | Continuing |

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force **Date:** February 2020

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|--|---|--|
| Appropriation/Budget Activity 3600 / 6 | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | Project (Number/Name) 663321 / <i>Electronic Warfare Ground Test Resources</i> |
|--|---|--|

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

| <u>Line Item</u> | <u>FY 2019</u> | <u>FY 2020</u> | <u>FY 2021</u> <u>Base</u> | <u>FY 2021</u> <u>OCO</u> | <u>FY 2021</u> <u>Total</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
|---|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| • RDTE 06 PE 0605976: <i>Facility Restoration & Modernization - T&E</i> | 187.216 | 88.445 | 70.985 | - | 70.985 | 70.622 | 71.888 | 73.173 | 74.520 | Continuing | Continuing |
| • RDTE 06 PE 0605978F: <i>Facilities Sustainment - T&E Support</i> | 28.888 | 29.424 | 29.880 | - | 29.880 | 30.509 | 31.056 | 31.612 | 32.193 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

NA

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| | | | | | | | | | | | | |
|---|--------------------|----------------|----------------|---------------------|---|----------------------|----------------|----------------|--|----------------------------|-------------------------|-------------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force | | | | | | | | | | Date: February 2020 | | |
| Appropriation/Budget Activity 3600 / 6 | | | | | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | | | | Project (Number/Name) 667500 / <i>Foreign Materiel Acquisition/ Analysis</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2019 | FY 2020 | FY 2021 Base | FY 2021 OCO | FY 2021 Total | FY 2022 | FY 2023 | FY 2024 | FY 2025 | Cost To Complete | Total Cost |
| 667500: <i>Foreign Materiel Acquisition/Analysis</i> | - | 7.241 | 7.376 | 7.489 | 0.000 | 7.489 | 7.648 | 7.783 | 7.922 | 8.068 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

This project's specific purpose is to support USAF Foreign Materiel Program requirements through the acquisition and analysis of foreign materiel. Items considered for these Foreign Materiel Acquisition (FMA) funds are included in the prioritized Air Force FMA Top 20 list established each year. Each Major Command (MAJCOM) prepares and approves a Foreign Materiel - Mission Requirements Statement for each requirement. Annually, the MAJCOM commanders establish a list of their top 20 requirements. The MAJCOMs' requirements lists are integrated and prioritized into a classified Air Force requirement list. Each MAJCOM then approves the FMA Top 20 List and final validation comes from the Air Force Vice Chief of Staff. System analyses are based on and driven by acquisitions. The USAF provides assessments and data for threat systems to all DoD components.

B. Accomplishments/Planned Programs (\$ in Millions)

| | FY 2019 | FY 2020 | FY 2021 |
|---|----------------|----------------|----------------|
| Title: FMP | 7.241 | 7.376 | 7.489 |
| Description: Supports USAF Foreign Materiel Program (FMP) Requirements through the acquisition and analysis of foreign materiel. | | | |
| FY 2020 Plans: Continue to fund acquisition of available Foreign Materiel in accordance with the prioritized Air Force Foreign Materiel List; analysis of acquired Foreign Materiel; and operations and maintenance of the specialized Foreign Materiel assets. | | | |
| FY 2021 Plans: Continue to fund acquisition of available Foreign Materiel in accordance with the prioritized Air Force Foreign Materiel List; analysis of acquired Foreign Materiel; and operations and maintenance of the specialized Foreign Materiel assets. | | | |
| FY 2020 to FY 2021 Increase/Decrease Statement: Not applicable. | | | |
| Accomplishments/Planned Programs Subtotals | 7.241 | 7.376 | 7.489 |

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|--|---|--|
| Appropriation/Budget Activity 3600 / 6 | R-1 Program Element (Number/Name) PE 0604256F / <i>Threat Simulator Development</i> | Project (Number/Name) 667500 / <i>Foreign Materiel Acquisition/ Analysis</i> |
|--|---|--|

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

| <u>Line Item</u> | <u>FY 2019</u> | <u>FY 2020</u> | <u>FY 2021</u> <u>Base</u> | <u>FY 2021</u> <u>OCO</u> | <u>FY 2021</u> <u>Total</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> | <u>FY 2025</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
|--|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| • RDTE 06 PE 0604759F: <i>Major T&E Investment</i> | 213.273 | 106.663 | 208.680 | - | 208.680 | 207.845 | 152.044 | 159.017 | 155.705 | Continuing | Continuing |
| • RDTE 06 PE 0605807F: <i>Test and Evaluation Support</i> | 692.784 | 717.895 | 764.606 | - | 764.606 | 767.210 | 766.092 | 780.181 | 789.744 | Continuing | Continuing |
| • RDTE 06 PE 0605976F: <i>Facility Restoration & Modernization - T&E</i> | 187.216 | 88.445 | 70.985 | - | 70.985 | 70.622 | 71.888 | 73.173 | 74.520 | Continuing | Continuing |
| • RDTE 06 PE 0605978F: <i>Facilities Sustainment -T&E Support</i> | 28.888 | 29.424 | 29.880 | - | 29.880 | 30.509 | 31.056 | 31.612 | 32.193 | Continuing | Continuing |

Remarks

D. Acquisition Strategy

Not applicable.