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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

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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 0305205F / <i>Endurance Unmanned Aerial Vehicles</i> |
|---|---|

| COST (\$ in Millions) | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total | FY 2025 | FY 2026 | FY 2027 | FY 2028 | Cost To Complete | Total Cost |
|-------------------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | - | 0.000 | 0.000 | 30.000 | 0.000 | 30.000 | 30.002 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| 654236: <i>Engineering Analysis</i> | - | 0.000 | 0.000 | 30.000 | 0.000 | 30.000 | 30.002 | 0.000 | 0.000 | 0.000 | Continuing | Continuing |
| Quantity of RDT&E Articles | - | - | - | - | - | - | 2 | - | - | - | | |

A. Mission Description and Budget Item Justification

The Ultra Long-endurance Unmanned Reconnaissance Aircraft (ULTRA) is an Air Force-led technology and concept development effort to demonstrate, transition, and field an Unmanned Aerial System (UAS) that is capable of multiple-day duration flights while still being extremely affordable. ULTRA is a shift in UAS design paradigm by significantly leveraging commercial-off-the-shelf technologies to minimize expensive custom/proprietary items while at the same time simplifying maintenance and manpower costs. The payload integration for ULTRA maintains a modular and flexible architecture to allow for rapid integration of customer-driven payload options.

ULTRA was initiated by the Air Force Research Lab in 2018 in response to demand signals for long-endurance ISR that maintains an affordable edge. ULTRA leverages and builds off the successes and lessons learned of several AFRL, DoD, and other partner-funded development efforts from 2015-2021, including the Long Endurance Aerial Platform UAS which transitioned in 2019 and a number of unique payload developments and integrations. These prior developments guided and informed the initial development and demonstration of ULTRA. The initial ULTRA UAS was developed in 2018 and flight-tested in 2019. In 2020 ULTRA performed limited operational test and evaluation over a six-month period, the results of which informed payload and system requirements to meet current and future needs. Future operational test and evaluation in relevant operational environments is a critical next step in developing ULTRA as an affordable ultra-long endurance ISR platform that is responsive to current and future needs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F.

This effort is not a new start. It is a flight demonstration of the ULTRA program, which was previously executed in FY23 and prior years under Program 0604555D8Z Operational Energy Prototyping, and under Section 219 authorities.

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 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Current President's Budget | 0.000 | 0.000 | 30.000 | 0.000 | 30.000 |
| Total Adjustments | 0.000 | 0.000 | 30.000 | 0.000 | 30.000 |
| • 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 | 0.000 | 0.000 | | | |
| • Other Adjustments | 0.000 | 0.000 | 30.000 | 0.000 | 30.000 |

Change Summary Explanation

FY 2024 increased by \$30.000 million from previous President's Budget submission to establish an urgent demonstration capability in response to operational demand signals. Increase supports integration and preparation activities required to perform a flight demonstration in an operationally relevant environment.

| C. Accomplishments/Planned Programs (\$ in Millions) | FY 2022 | FY 2023 | FY 2024 |
|---|----------------|----------------|----------------|
| Title: Ultra Long-endurance Unmanned Reconnaissance Aircraft (ULTRA) Flight Demonstration | 0.000 | 0.000 | 30.000 |
| Description: This effort is not a new start. It is a flight demonstration of the ULTRA program, which was previously executed in FY23 and prior years under Program 0604555D8Z Operational Energy Prototyping, and under Section 219 authorities. This effort conducts integration and preparation work required to prepare the ULTRA platform for flight demonstration in operationally relevant environments in response to an urgent operational need. It leverages technologies and expertise from across all of the Air Force Research Laboratories, integrating and testing a variety of technologies. | | | |
| FY 2023 Plans: Development in this area was accomplished under PE 060455D8Z Operational Energy Prototyping and under Section 219 authorities. | | | |
| FY 2024 Plans: - Initiate and complete integration and test of commercial-off-the-shelf (COTS) turbo-charged engine to enable ULTRA altitude and airspeed for relevant geographically-constrained mission areas of interest - Initiate integration and testing of COTS engine control unit - Continue integration of ULTRA into the control system for common control of multiple unmanned aerial systems - Continue to conduct aircrew training to support extended operational testing and evaluation of ULTRA | | | |

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| C. Accomplishments/Planned Programs (\$ in Millions) | FY 2022 | FY 2023 | FY 2024 |
|---|----------------|----------------|----------------|
| <ul style="list-style-type: none"> - Continue development and refinement of training curriculum and documentation based on results from operational test and evaluation - Initiate early sustainment analyses to include long lead item evaluation of hardware and spares - Continue operational test and evaluation of ULTRA in operationally relevant environments <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY 2024 increased compared to FY 2023 by 30.000 million. This increase represents an urgent operational requirement to demonstrate the technology in an operationally relevant environment, and enables the integration and preparation activities required for such a demonstration.</p> | | | |
| Accomplishments/Planned Programs Subtotals | 0.000 | 0.000 | 30.000 |

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

N/A

Remarks

E. Acquisition Strategy

This effort will be awarded as a contract modification to an existing Phase III Small Business Innovation Research (SBIR) contract. This contract was awarded sole-source as required by SBIR policy. This approach was approved through AFRL/PZ.

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| Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force | | Date: March 2023 |
| Appropriation/Budget Activity 3600 / 5 | R-1 Program Element (Number/Name) PE 0305205F / <i>Endurance Unmanned Aerial Vehicles</i> | Project (Number/Name) 654236 / <i>Engineering Analysis</i> |

Schedule Details

| Events by Sub Project | Start | | End | |
|--|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>ULTRA Flight Test</i> | | | | |
| Commercial-off-the-shelf (COTS) Engine Integration | 2 | 2024 | 3 | 2024 |
| COTS Engine Electronic Control Unit Integration | 3 | 2024 | 2 | 2025 |
| Control System Integration | 1 | 2024 | 2 | 2025 |
| Aircrew Training Development | 1 | 2024 | 4 | 2024 |
| Training curriculum and transition documentation | 1 | 2024 | 4 | 2025 |
| Operational Test and Evaluation prep activities | 1 | 2024 | 2 | 2025 |
| Operational Assessment | 3 | 2025 | 4 | 2025 |