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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 7: Operational Systems Development</i> | R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</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 | - | 87.925 | 50.000 | 66.932 | 0.000 | 66.932 | 82.229 | 131.884 | 120.806 | 125.177 | 0.000 | 664.953 |
| 674804: <i>Compass Call</i> | - | 87.925 | 50.000 | 66.932 | 0.000 | 66.932 | 82.229 | 131.884 | 120.806 | 125.177 | 0.000 | 664.953 |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | - | - |

A. Mission Description and Budget Item Justification

Compass Call is the Air Force's wide-area, standoff, Airborne Electromagnetic Attack (AEA) Command and Control Warfare/Information Operations (C2W/IO) weapon system. The employment of this weapon system interrupts the adversary's use of the electromagnetic battlespace and is a key active component in the information battlespace and prosecution of current ground and airborne threats. Compass Call's sophisticated electromagnetic attack system is capable of surgical denial and/or disruption of adversary Radio Frequency (RF) communications, radar, and sensor systems. Development funds are required to perform trade studies, accomplish system upgrades and associated test activities, and develop/test Quick Reaction Capabilities (QRCs).

Due to rapid advances in Electromagnetic Attack (EA) techniques and technology, Compass Call is designed to be adaptable, making it well-suited for a continuous modernization strategy. Such a strategy ensures Compass Call techniques evolve at a pace capable of addressing adversary tactics and emerging technologies. The Compass Call weapon system is continuously improved using a rapid development and acquisition process supporting a Baseline upgrade strategy. User needs and technology insertion opportunities are continuously reviewed. As a result of technology refresh initiatives, including incorporation of open architectures, "plug and play" systems, software defined radios, and modular software development, Compass Call is implementing agile processes to support weapon system development activities.

In FY2017, the Compass Call re-host program was initiated prompting transition of mission capabilities from the legacy EC-130H airframe to an EC-37B airframe. The re-hosted Compass Call platform is based on a commercially-available modified G550 aircraft that already holds Federal Aviation Administration (FAA) Supplemental Type Certificates (STCs) for airworthiness. The platform will undergo modifications to host Compass Call's Prime Mission Equipment (PME) and antenna arrays and receive additional STCs and Military Type Certificates (MTCs). The EC-37B aircraft utilize PME harvested from the EC-130H aircraft and upgraded to the latest Baseline. Due to the age of the EC-130H fleet (average is 49 years), re-hosting of the PME is crucial to ensuring the longevity of this critical capability. In an effort to put capability into the warfighter's hands as soon as possible, the EC-37B program pursues concurrent developmental and production activities.

EC-37B Baseline 3 (BL3) updates fielded Mid-Baseline 2 (MBL2) capabilities, while significantly increasing operating altitude and standoff distances through re-host onto the EC-37B airframe. Incremental low band capability has been added to BL3 through the extension of an existing frequency band. Baseline 4 (BL4) transitions the software baseline to an agile software framework and implements System-Wide Open Reconfigurable Dynamic Architecture (SWORD-A) to enable rapid integration of new capabilities offering increased target capacity. Baseline 5 (BL5) requirements are currently being developed and formalized.

As a result of the FY23 Appropriations Act, the Compass Call program received 0.946M for training and simulation activities. This funding will support studies and analysis of future training and simulation upgrades, as well as future simulation capabilities for testing PME effectiveness against adversary threats.

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FY24 RDT&E efforts concentrate on BL4 development activities, maturation of AEA technologies, and trade studies for future Baseline efforts. Activities encompassed within the BL3 and BL4 PME upgrade may include, but are not limited to, aircraft system integration; assembly, test and checkout; mission system upgrades; obsolescence resolution; software development; systems engineering; test and evaluation; flight test; training systems; training events; support equipment; and Program Support Costs (PSC).

Specific mission system developmental activities may include, but are not limited to, studies and analyses for future capabilities and baselines; preparation of white papers and technical reports; maturation of Technology Readiness Level (TRL) capabilities for future insertion; development of QRC applications for integration into Compass Call Software Defined Radios (SDRs); technology roadmap development; power expansion; transmit and receive development; size, weight, power and cooling (SWAP-C) reductions; hardware obsolescence and DMS/vanishing vendor items (VVI); transition of Compass Call PME to open architecture compliant standards; and continued migration of the Compass Call Operating System (CCOS) to an agile software construct.

Compass Call funding also supports innovation activities to include studies, analyses, requirements definition, and QRC prototypes/demonstrations to accelerate planning for technology transition, technology insertion, and future acquisition programs.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver Compass Call for emergent or unanticipated 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 program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

| B. Program Change Summary (\$ in Millions) | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 91.266 | 49.054 | 87.991 | 0.000 | 87.991 |
| Current President's Budget | 87.925 | 50.000 | 66.932 | 0.000 | 66.932 |
| Total Adjustments | -3.341 | 0.946 | -21.059 | 0.000 | -21.059 |
| • Congressional General Reductions | 0.000 | 0.000 | | | |
| • Congressional Directed Reductions | 0.000 | 0.000 | | | |
| • Congressional Rescissions | 0.000 | 0.000 | | | |
| • Congressional Adds | 0.000 | 0.946 | | | |
| • Congressional Directed Transfers | 0.000 | 0.000 | | | |
| • Reprogrammings | 0.000 | 0.000 | | | |
| • SBIR/STTR Transfer | -3.341 | 0.000 | | | |
| • Other Adjustments | 0.000 | 0.000 | -21.059 | 0.000 | -21.059 |

Change Summary Explanation

FY22: Decrease due to SBIR Transfer

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FY23: As a result of the FY23 Appropriations Act, the Compass Call program received 0.964M for training and simulation activities
 FY24: Funding request was reduced by 21.059M to account for the availability of prior year execution balances

| | | | |
|---|----------------|----------------|----------------|
| C. Accomplishments/Planned Programs (\$ in Millions) | FY 2022 | FY 2023 | FY 2024 |
|---|----------------|----------------|----------------|

| | | | |
|--|--------|--------|--------|
| Title: Baseline Upgrade Development | 87.925 | 50.000 | 66.932 |
|--|--------|--------|--------|

Description: Development of upgraded PME baseline (BL), other subsystem, and platform upgrades in order to ensure Compass Call capabilities remain ahead of emerging adversary tactics and technologies.

FY 2023 Plans:

Continue PME development, integration, and test on an upgraded platform and associated simulators, address PME anomalies as required, and begin future baseline development activities.

Specific efforts may include, but are not limited to, the following:

- Expanding frequency coverage
- Advanced military & commercial communications offensive capabilities
- Emerging and modern targets
- Platform integration for future capabilities
- Updates to PME infrastructure
- Platform upgrades and associated non-recurring engineering
- Studies and analysis for current/future baseline development planning
- System Wide Open Reconfigurable Dynamic-Architecture (SWORD-A)
- Training system/simulator upgrades
- Software defined radios
- Containerized agile software development/implementation
- Software applications and QRCs
- PME integration and testing
- Hardware prototyping and integration analysis
- Testing activities
- External communications upgrades
- Studies and analysis
- Investigating opportunities for technology insertion/TRL maturation
- Hardware obsolescence and DMS/Vanishing Vendor Items (VVIs)
- White papers and technical reports
- Technology roadmap development

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| C. Accomplishments/Planned Programs (\$ in Millions) | | FY 2022 | FY 2023 | FY 2024 |
| <ul style="list-style-type: none"> • Program Support Costs (PSC), advisory & assistance service, and systems engineering support <p>FY 2024 Plans: Will continue PME development, integration, and test on an upgraded platform and associated simulators, address PME anomalies as required, and future baseline development activities.</p> <p>Specific efforts may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Expanding frequency coverage • Advanced military & commercial communications offensive capabilities • Emerging and modern targets • Platform integration for future capabilities • Updates to PME infrastructure • Platform upgrades and associated non-recurring engineering • Studies and analysis for current/future baseline development planning • System Wide Open Reconfigurable Dynamic-Architecture (SWORD-A) • Training system/simulator upgrades • Software defined radios • Containerized agile software development/implementation • Software applications and QRCs • PME integration and testing • Hardware prototyping and integration analysis • Testing activities • External communications upgrades • Studies and analysis • Investigating opportunities for technology insertion/TRL maturation • Hardware obsolescence and DMS/Vanishing Vendor Items (VVIs) • White papers and technical reports • Technology roadmap development • Program Support Costs (PSC), advisory & assistance service, and systems engineering support <p>FY 2023 to FY 2024 Increase/Decrease Statement: The FY2023 to FY2024 increase is due to beginning key BL4 integration and test activities, as well as continuing ongoing BL4 development. Additionally, significant BL3 test/range activities will be occurring.</p> | | | | |
| Accomplishments/Planned Programs Subtotals | | 87.925 | 50.000 | 66.932 |

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

| <u>Line Item</u> | <u>FY 2022</u> | <u>FY 2023</u> | <u>FY 2024</u> <u>Base</u> | <u>FY 2024</u> <u>OCO</u> | <u>FY 2024</u> <u>Total</u> | <u>FY 2025</u> | <u>FY 2026</u> | <u>FY 2027</u> | <u>FY 2028</u> | <u>Cost To</u> <u>Complete</u> | <u>Total Cost</u> |
|---|----------------|----------------|-------------------------------|------------------------------|--------------------------------|----------------|----------------|----------------|----------------|-----------------------------------|-------------------|
| • APAF 04 Line item CALL00: <i>Compass Call Aircraft</i> | 0.000 | 553.700 | 0.000 | - | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 553.700 |
| • APAF 05 Line item CALL00: <i>Compass Call Mods</i> | 195.098 | 327.330 | 144.686 | - | 144.686 | 94.480 | 102.262 | 194.909 | 198.965 | 0.000 | 1,257.730 |
| • APAF 06 Line item CALL00: <i>Compass Call Mod Spares</i> | 119.265 | 11.343 | 68.555 | - | 68.555 | 13.824 | 22.170 | 17.271 | 17.616 | 0.000 | 270.044 |

Remarks

E. Acquisition Strategy

Due to rapid advances in Electromagnetic Attack (EA) techniques and technology, Compass Call was designed to be adaptable, making it well-suited to a continuous modernization strategy. Such a strategy ensures Compass Call techniques evolve at a pace capable of addressing adversary tactics and emerging technologies. The Compass Call weapon system is continuously improved using a rapid development and acquisition process supporting a Baseline upgrade strategy. User needs and technology insertion opportunities are continuously revised. As a result of technology refresh initiatives, including incorporation of open architectures, "plug and play" systems, software defined radios, and modular software development, Compass Call is implementing agile processes to support weapon system development activities. QRCs are used to address urgent warfighter requests that must be delivered prior to a Baseline release. The 645th Aeronautical System Group (645 AESG) has cradle to grave lifecycle management responsibility of Compass Call and rapid acquisition authorities are executed in accordance with the 645 AESG's Program Management Directive (PMD), Class Justification and Approval (J&A), and Life Cycle Management Plan (LCMP). Due to rapidly changing threat environment and operational demand leveraging Compass Call capabilities, the acquisition program manager may redirect funding as necessary to meet current stated and emerging/evolving Combatant Commander requirements.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force **Date:** March 2023

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| Appropriation/Budget Activity 3600 / 7 | R-1 Program Element (Number/Name) PE 0207253F / <i>Compass Call</i> | Project (Number/Name) 674804 / <i>Compass Call</i> |
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| Product Development (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Baseline Upgrade Development Primary Mission Equipment | SS/CPFF | BAE Systems : Nashua, NH | - | 80.015 | Oct 2021 | 34.062 | Oct 2022 | 40.798 | Oct 2023 | - | | 40.798 | Continuing | Continuing | - |
| Subtotal | | | - | 80.015 | | 34.062 | | 40.798 | | - | | 40.798 | Continuing | Continuing | N/A |

| Support (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Sim & Trainer | TBD | Not specified. : TBD | - | - | | 0.946 | Sep 2023 | - | | - | | - | Continuing | Continuing | - |
| Subtotal | | | - | - | | 0.946 | | - | | - | | - | Continuing | Continuing | N/A |

| Test and Evaluation (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Test and Evaluation | Various | Not specified. : TBD | - | 7.462 | Nov 2021 | 14.469 | Dec 2022 | 25.545 | Dec 2023 | - | | 25.545 | Continuing | Continuing | - |
| Subtotal | | | - | 7.462 | | 14.469 | | 25.545 | | - | | 25.545 | Continuing | Continuing | N/A |

| Management Services (\$ in Millions) | | | | FY 2022 | | FY 2023 | | FY 2024 Base | | FY 2024 OCO | | FY 2024 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 | | | |
| Program Support Costs (PSC) | Various | AFLCMC : WPAFB, OH | - | 0.448 | Apr 2022 | 0.523 | Apr 2023 | 0.589 | Apr 2024 | - | | 0.589 | Continuing | Continuing | - |
| Subtotal | | | - | 0.448 | | 0.523 | | 0.589 | | - | | 0.589 | Continuing | Continuing | N/A |

| | | | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total | Cost To Complete | Total Cost | Target Value of Contract |
|----------------------------|--|--|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|
| Project Cost Totals | | | - | 87.925 | 50.000 | 66.932 | - | 66.932 | Continuing | Continuing | N/A |

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|--|---|--|

| | Prior Years | FY 2022 | FY 2023 | FY 2024 Base | FY 2024 OCO | FY 2024 Total | Cost To Complete | Total Cost | Target Value of Contract |
|--|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|
|--|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|

Remarks
 Test and Evaluation costs have increased across FY2022-FY2024 due to the Program entering into Baseline 3 Developmental and Operational Test, with the bulk of testing occurring in the FY24 timeframe.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force **Date:** March 2023

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| | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | | FY 2027 | | | | FY 2028 | | | |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 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 |

| | |
|------------------------------------|--|
| <i>Compass Call</i> | |
| Baseline 4 Development/Integration | |
| Test and Evaluation | |

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force **Date:** March 2023

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|--|---|--|

Schedule Details

| Events by Sub Project | Start | | End | |
|------------------------------------|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Compass Call</i> | | | | |
| Baseline 4 Development/Integration | 1 | 2022 | 2 | 2028 |
| Test and Evaluation | 1 | 2022 | 4 | 2028 |