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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0207253F / <i>Compass Call</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	15.228	91.266	49.054	0.000	49.054	87.991	81.747	130.615	119.848	Continuing	Continuing
674804: <i>Compass Call</i>	-	15.228	91.266	49.054	0.000	49.054	87.991	81.747	130.615	119.848	Continuing	Continuing
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 adversary's use of the electromagnetic battlespace and is a key active component in the information battlespace and prosecution of Overseas Contingency Operations (OCO). 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.

The Compass Call system was fielded in 1983 and employs an incremental development and fielding strategy that puts capability into the warfighter's hands as soon as practical and ensures each iteration of the weapon system is effective against the highest priority threats such as military and commercial communications, command and control operations, and new/emerging sensors. Due to the rapid advances in electronic attack techniques and technology, Compass Call was designed to be adaptable and must continuously modernize and evolve to keep pace with adversary tactics and emerging technologies. Development funding is required to perform trade studies, accomplish system upgrades and associated test activities, and develop and test Quick Reaction Capabilities (QRCs). The EC-130H Baseline 2 (BL2) configuration and the EC-130H mid-Baseline 2 (MBL2) enhancements are the latest in a line of fielded mission system upgrades to the EC-130H.

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 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. The EC-37B program is highly concurrent with developmental and procurement activities occurring in parallel.

The current Compass Call program of record as of end Q2 FY2022 includes the following resources: seven (7) Primary Mission Aircraft Inventory (PMAI), Combat Support coded (CA) EC-130H aircraft, one (1) Backup Aircraft Inventory (BAI), Training coded (TF) TC-130H trainer aircraft, one (1) EC-130H Weapon System Trainer (WST, flight deck simulator), and two (2) Compass Call Mission Crew Simulators (CCMCS). Seven (7) EC-130H aircraft have been divested between FY2018 and FY2022. One (1) EC-130H aircraft will retire in Q4 FY2023. One (1) more EC-130H is due to retire in Q1 FY2024. Due to the age of the EC-130H fleet (average is 47 years) the re-hosting of the Prime Mission Equipment (PME) is crucial to ensuring the survival of this critical capability.

EC-37B BL3 updates existing, fielded MBL2 capabilities, while significantly increasing operating altitude and standoff distances through re-host onto a new airframe. Incremental low band capability has been added to BL3 through the extension of an existing frequency band. BL4 transitions the software baseline to an agile software framework, implements System-Wide Open Reconfigurable Dynamic Architecture (SWORD-A) to enable rapid integration of new capabilities offering increased target capacity, and addresses diminishing manufacturing sources (DMS).

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RDT&E efforts concentrate on BL4 development and test activities, maturation of AEA technologies, and trade studies for future Baselines. Activities encompassed within the PME upgrade may include, but are not limited to: aircraft system integration, assembly, test and checkout, mission system upgrades, external communications 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 include studies and analyses for future capabilities and baselines; maturation of higher Technology Readiness Level (TRL) technologies for future insertion; QRC application development for integration onto the Compass Call Software Defined Radio (SDR) capability; power expansion; transmit and receive development; size, weight, power and cooling (SWAP-C) reductions; implementation of obsolescence and DMS/vanishing vendor items (VVI) that drive developmental redesign of impacted hardware; transition of Compass Call PME to open architecture complaint 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 quick-reaction capability prototypes/demonstrations to accelerate planning for technology transition, technology insertion, and future acquisition programs.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY2022 0.0M was expended for civilian pay expenses in this program element, and in FY2023 0.0M is forecasted for civilian pay expenses in this program element.”

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>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	15.825	91.266	0.000	0.000	0.000
Current President's Budget	15.228	91.266	49.054	0.000	49.054
Total Adjustments	-0.597	0.000	49.054	0.000	49.054
• 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	-0.017	0.000			
• SBIR/STTR Transfer	-0.580	0.000			
• Other Adjustments	0.000	0.000	49.054	0.000	49.054

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**Change Summary Explanation**

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

**C. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p><b>Title:</b> Baseline Upgrade Development</p> <p><b>Description:</b> Supports development of new PME baseline (BL), other subsystem, and platform upgrades in order to ensure Compass Call capabilities remain ahead of emerging adversary tactics and technologies.</p> <p><b>FY 2022 Plans:</b> Continues 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:</p> <ul style="list-style-type: none"> <li>• Expanding frequency coverage</li> <li>• Advanced Military &amp; Commercial Communications Offensive capabilities</li> <li>• Emerging and Modern Targets</li> <li>• Platform integration for future capabilities</li> <li>• Updates to PME infrastructure</li> <li>• Platform upgrades and associated non-recurring engineering</li> <li>• Studies and analysis for current/future baseline development planning</li> <li>• Open Mission System Architecture for rapid capability integration</li> <li>• Training system/simulator upgrades</li> <li>• Software Defined Receiver/Transmit</li> <li>• Containerized agile software development/implementation</li> <li>• QRCs</li> <li>• PME Integration and Testing</li> <li>• Hardware prototyping and integration analysis</li> <li>• Testing activities</li> <li>• External communications upgrades</li> <li>• Program Support Costs, advisory &amp; assistance service, and systems engineering support</li> </ul> <p><b>FY 2023 Base Plans:</b> Will continue PME development, integration, and test on an upgraded platform and associated simulators, address PME anomalies as required, and begin future baseline development activities.</p>	15.228	91.266	49.054	0.000	49.054

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Specific efforts may include but are not limited to the following:</p> <ul style="list-style-type: none"> <li>• Expanding frequency coverage</li> <li>• Advanced Military &amp; Commercial Communications Offensive capabilities</li> <li>• Emerging and Modern Targets</li> <li>• Platform integration for future capabilities</li> <li>• Updates to PME infrastructure</li> <li>• Platform upgrades and associated non-recurring engineering</li> <li>• Studies and analysis for current/future baseline development planning</li> <li>• Open Mission System Architecture for rapid capability integration</li> <li>• Training system/simulator upgrades</li> <li>• Software Defined Receiver/Transmit</li> <li>• Containerized agile software development/implementation</li> <li>• Software applications and QRCs</li> <li>• PME Integration and Testing</li> <li>• Hardware prototyping and integration analysis</li> <li>• Testing activities</li> <li>• External communications upgrades</li> <li>• Program Support Costs, advisory &amp; assistance service, and systems engineering support</li> </ul> <p><b>FY 2023 OCO Plans:</b> N/A</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> The FY2022 to FY2023 decrease is due to FY2022 up front BL4 developmental material, associated prototyping, software, and activities subsiding in FY2023.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	15.228	91.266	49.054	0.000	49.054

<b>D. Other Program Funding Summary (\$ in Millions)</b>											<b>Cost To</b>	
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Complete</u>	<u>Total Cost</u>	
• APAF 04 Line item CALL00: <i>Compass Call Aircraft</i>	159.867	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	159.867	

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 05 Line item CALL00: <i>Compass Call Mods</i>	180.983	195.098	16.630	0.000	16.630	144.266	93.806	101.417	193.098	0.000	925.298
• APAF 06 Line item CALL00: <i>Compass Call Mod Spares</i>	10.985	65.624	1.982	0.000	1.982	85.950	13.824	22.170	17.271	0.000	217.806

**Remarks**

**E. Acquisition Strategy**

Compass Call maintains operational relevancy through an incremental upgrade strategy in which a new Baseline mission system configuration fields approximately every 3-4 years. The re-hosting of PME onto the BL3 and BL4 EC-37B has temporarily lengthened the planned upgrade schedule. Future baselines are planned to return to this upgrade cycle for major hardware updates. Urgent upgrades between Baselines are accomplished via QRCs. These efforts are accomplished by the 645th Aeronautical Systems Group (645 AESG) in accordance with their Acquisition Strategy, Program Management Directive (PMD), Class Justification and Approval (J&A) document for acquisition of supplies and services using other than full and open competition criteria, and Life Cycle Management Plan (LCMP) and cover the full spectrum of system life cycle management ("cradle to grave" support concept).

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207253F / <i>Compass Call</i>	<b>Project (Number/Name)</b> 674804 / <i>Compass Call</i>
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	-	14.377	Dec 2020	80.971	Oct 2021	35.238	Oct 2022	-		35.238	Continuing	Continuing	-
<b>Subtotal</b>			-	14.377		80.971		35.238		-		35.238	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	SS/CPAF	Not specified. : TBD	-	0.584	Sep 2021	9.847	Nov 2021	13.293	Dec 2022	-		13.293	Continuing	Continuing	-
<b>Subtotal</b>			-	0.584		9.847		13.293		-		13.293	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	-	0.267	Apr 2021	0.448	Apr 2022	0.523	Apr 2023	-		0.523	Continuing	Continuing	-
<b>Subtotal</b>			-	0.267		0.448		0.523		-		0.523	Continuing	Continuing	N/A

			Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			-	15.228	91.266	49.054	-	49.054	Continuing	Continuing	N/A

**Remarks**  
 Program Support Costs have increased across FY2021 - FY2023 for A&AS support and program management needs associated with increased development and test activities.  
 Test and Evaluation have increased across FY2021-FY2022 for increased needs associated with development and test activities.  
 Product Development has fluctuated across FY2021-FY2023 due to FY2022 up front BL4 development material, associated prototyping, software development activities subsiding in FY2023.

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**Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207253F / <i>Compass Call</i>	<b>Project (Number/Name)</b> 674804 / <i>Compass Call</i>
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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

<b><i>Compass Call</i></b>	
Baseline 3 Development	
Baseline 4 Development	
Test and Evaluation	

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2023 Air Force **Date:** April 2022

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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Compass Call</i></b>				
Baseline 3 Development	1	2021	2	2022
Baseline 4 Development	1	2021	1	2026
Test and Evaluation	1	2021	4	2027