

**UNCLASSIFIED**

**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 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</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	-	20.199	9.047	5.279	0.000	5.279	6.973	7.102	7.254	7.415	Continuing	Continuing
653133: <i>Bombs &amp; Fuzes</i>	-	15.134	3.950	1.134	0.000	1.134	1.498	1.525	1.558	1.592	Continuing	Continuing
655361: <i>Stores-Aircraft Interface</i>	-	5.065	5.097	4.145	0.000	4.145	5.475	5.577	5.696	5.823	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Armament Ordnance Development program provides for the initial and continuing development of weapons, munitions, and munitions equipment for aircraft integration, support, and operational use. This program develops, characterizes, and improves current, future, and legacy munitions, ammunitions, and subsystems.

653133: The Bombs & Fuzes project improves conventional weapons/munitions (kinetic and non-kinetic), fuzes, and height-of-burst sensors (HOBS), and develops and integrates complementary common weapon components, data links, position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.) using modern acquisition best practices, to include digital acquisition practices (e.g. government-owned open system architectures, Model Based Systems Engineering (MBSE) and agile software development). It also provides for the development and testing necessary for a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions material handling equipment (MMHE). Bombs & Fuzes also provides research, development, testing and guidance of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality and survivability against area, mobile, hard and deeply buried, and fixed targets. Finally, this project provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes and supports strategic planning to achieve compliance of AF munitions with Department of Defense insensitive munitions (IM) standards

655361: The Stores-Aircraft Interface project is home to the Universal Armament Interface (UAI). UAI is the Air Force's common standard aircraft/weapon interface and is an acquisition requirement, to be used by all weapons and combat aircraft as practicable. The UAI program continues development and maintenance of the standardized interface including mission planning components. Users include Air Force, Army, and Navy customers. The UAI program office is also responsible for development, enhancement, and maintenance of the standard to support coalition, allied, and joint interoperability efforts for weapons-platform interface. These responsibilities include acquisition, upgrade, repair and provision of UAI certification tools, and implementation support to US Air Force, Army, Navy and allied aircraft and weapons systems. UAI provides cost/schedule savings over traditional integration efforts. This is accomplished by enabling integration of weapons independent of aircraft Operational Flight Programs (OFP) cycles. UAI incorporates complex info such as: power management, target info, waypoints, flight/trajectory profile, fusing, launch parameters, verification of data sent/received, sensor info, and propulsion profiles.

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 0605831F. In FY22 0.186M was expended for civilian pay expenses in this program element, and in FY23 0.240M is forecasted for civilian pay expenses in this program element.

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>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2023 Air Force	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>
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<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	23.034	9.047	0.000	0.000	0.000
Current President's Budget	20.199	9.047	5.279	0.000	5.279
Total Adjustments	-2.835	0.000	5.279	0.000	5.279
• 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	-2.000	0.000			
• SBIR/STTR Transfer	-0.835	0.000			
• Other Adjustments	0.000	0.000	5.279	0.000	5.279

**Change Summary Explanation**

The FY2022 President's Budget submittal did not reflect FY2023 through FY2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

\$2M below-threshold-reprogramming to Hard and Deeply Buried Target Defeat System (PE 0604327F)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>				<b>Project (Number/Name)</b> 653133 / <i>Bombs &amp; Fuzes</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
653133: <i>Bombs &amp; Fuzes</i>	-	15.134	3.950	1.134	0.000	1.134	1.498	1.525	1.558	1.592	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Bombs & Fuzes project improves conventional weapons/munitions (kinetic and non-kinetic), fuzes, and height-of-burst sensors (HOBS), and develops and integrates complementary common weapon components, data links, position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.) using modern acquisition best practices, to include digital acquisition practices (e.g. government-owned open system architectures, Model Based Systems Engineering (MBSE) and agile software development). It also provides for the development and testing necessary for a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions materiel handling equipment (MMHE). Bombs & Fuzes also provides research, development, testing and guidance of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality and survivability against area, mobile, hard and deeply buried, and fixed targets. Finally, this project provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes and supports strategic planning to achieve compliance of AF munitions with Department of Defense insensitive munitions (IM) standards

- Munitions Materiel Handling Equipment (MMHE): MMHE is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project.

- Medium Caliber Ammunition project assesses, refines, and develops medium caliber ammunition, to include, but not limited to, conducting 25mm (F-35) qualification testing, comparative testing, and mitigating ammunition inventory health issues.

- Insensitive Munitions (IM) and Emerging Technologies: IM projects support AF IM strategic planning to achieve IM compliance IAW U.S. Code, Title 10, Subtitle A, Part N, Chapter 141, Section 2389, ensuring safety regarding insensitive munitions. Models and validates current munition performance, integrates less sensitive explosive fills, addresses IM explosive fill deficiencies, and develops bomb case modifications to improve the response of conventional weapons to unplanned stimuli. This project also explores and develops IM and Energetics technology, assessing, analyzing, and evaluating emerging and developed technologies for future and existing weapon and fuze capabilities to improve lethality, accuracy, and reliability in accordance with the National Defense Strategy roadmap.

- Next Generation Area Attack Weapons (NGAAWs) are a family of unitary area attack weapon capabilities to meet the DoD policy regarding cluster munitions and unintended harm to civilians. They consist of BLU-134/B and BLU-136/B warheads with a height of burst sensor. BLU-134/B Improved Lethality Warhead (ILW), NGAAW Increment I, is a near-term solution for area attack as an anti-personnel anti-materiel (APAM) weapon that improves lethality using a 500 lb warhead design and any variants. The BLU-136/B NGAAW Increment II continues development to provide significantly increased capability and lethality against area targets as an APAM weapon. This effort is being executed using an accelerated acquisition strategy to study, design, develop, and test a 2,000 lb unitary warhead design and any variants based on target sets.

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

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 653133 / <i>Bombs &amp; Fuzes</i>
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- DSU-43/B Cockpit-selectable Height-Of-Burst Sensor (C-HOBS): The C-HOBS will be a replacement for the current DSU-33D/B proximity sensor. C-HOBS will replace the single factory height-of-burst setting with the addition of multiple height-of-burst options selectable via both manual switches and a cockpit interface. These selection options allow flexibility during flight to address a wide array of targets. The C-HOBS is intended to interface with Combat Air Forces (CAF) aircraft and provide proximity height-of-burst functionality to general and special purpose weapons (to include NGAAWs).

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 0605831F. In FY21 0.186M was expended for civilian pay expenses in this program element, and in FY22 0.240M is forecasted for civilian pay expenses in this program element.

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

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p><b>Title:</b> Munitions Materiel Handling Equipment (MMHE)</p> <p><b>Description:</b> Armament Standardization/Control/Munitions Materiel Handling Equipment (MMHE) is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project.</p> <p><b>FY 2022 Plans:</b> MMHE support projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricate prototypes for test and evaluation purposes. Continue first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provide support to all system program offices with new weapons and aircraft configurations, as needed. Continue support to the F-35 with designs and manufacturing of equipment to aid safe munitions loading and handling of various pylons and adapters. Continue to support the B-21 program office with evaluations and recommendations for equipment to aid safe munitions loading and handling of various pylons and adapters. Continue support to DARPA with designs and manufacturing of equipment to aid safe munitions loading and handling of hypersonic weapons. Continue support for Air Force Research Laboratory on future munition concept demonstrators.</p> <p><b>FY 2023 Base Plans:</b> Continuation of MMHE support projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricate prototypes for test and evaluation purposes. Continue first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provide support to all system program offices with new weapons and aircraft configurations, as needed. Continue support to the F-35 with designs and manufacturing of equipment to aid safe munitions loading and</p>	4.741	0.664	0.700	0.000	0.700

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force				<b>Date:</b> April 2022	
<b>Appropriation/Budget Activity</b> 3600 / 5		<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>		<b>Project (Number/Name)</b> 653133 / <i>Bombs &amp; Fuzes</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>					
handling of various pylons and adapters. Continue to support the B-21 program office with evaluations and recommendations for equipment to aid safe munitions loading and handling of various pylons and adapters. Continue support to DARPA with designs and manufacturing of equipment to aid safe munitions loading and handling of hypersonic weapons. Continue support for Air Force Research Laboratory on future munition concept demonstrators.					
<b>FY 2023 OCO Plans:</b> N/A					
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding increase due to an increase of projects, design and/or re-design of drawings will increase the overall number of active projects during this FY and an increase of cost to metal and distribution.					
<b>Title:</b> Medium Caliber Ammunition					
<b>Description:</b> The Medium Caliber Ammunition efforts support the warfighter's medium caliber ammunition research, development, test, and evaluation (RDT&E) requirements, DoN/USAF collaboration for the medium caliber family of ammunition, foreign comparative testing, inventory health challenges, procurement of ammunition, and other emerging technologies.					
<b>FY 2022 Plans:</b> Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Assess and mitigate Medium Caliber ammunition inventory health challenges.					
<b>FY 2023 Base Plans:</b> Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Assess and mitigate Medium Caliber ammunition inventory health challenges.					
<b>FY 2023 OCO Plans:</b> N/A					
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> N/A					
<b>Title:</b> Insensitive Munitions (IM) and Emerging Technology					
	0.100	0.100	0.100	0.000	0.100
	0.986	0.300	0.334	0.000	0.334

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022
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<b>B. Accomplishments/Planned Programs (\$ 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>
<p><b>Description:</b> Model and validate current munition performance; explore and develop IM and Energetics technology; assess, analyze, and evaluate emerging and developed technologies for future and existing weapon and fuze capabilities to improve lethality, accuracy, and reliability in accordance with the National Defense Strategy roadmap.</p> <p><b>FY 2022 Plans:</b> Provide modeling and engineering technical guidance to ensure munitions are as safe as practical; evaluate, explore, and appraise evolving and improve these technologies for future and existing weapons, fuze capabilities, and strategic planning.</p> <p><b>FY 2023 Base Plans:</b> Continue to provide guidance to ensure munitions are as safe as practical to include; assessing, analyzing, and evaluating emerging and future development of technologies in our weapons. Enhance and evolve direct attack weapon capabilities by identifying new technology through collaboration with industry, academia, and other government stakeholders and uniting specialized expertise.</p> <p><b>FY 2023 OCO Plans:</b> N/A</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding increase due to variations development costs, increases to support to include direct cite authorization assigned to the program and continued emerging technology requirements.</p>					
<p><b>Title:</b> Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS)</p> <p><b>Description:</b> DSU-43/B Cockpit-selectable Height-Of-Burst Sensor (C-HOBS). The C-HOBS will be a replacement for the legacy DSU-33D/B proximity sensor. C-HOBS will replace the single factory height-of-burst setting with the addition of multiple height-of-burst options selectable via both manual switches and a cockpit interface. These selection options allow flexibility during flight to address a wide array of targets. The C-HOBS is intended to interface with the weapon via the cockpit and provide a cockpit-selectable proximity function for general and special purpose weapons (to include Next Generation Area Attack Weapons, NGAAWs).</p> <p><b>FY 2022 Plans:</b></p>	9.249	2.886	0.000	0.000	0.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force				<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 5		<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>		<b>Project (Number/Name)</b> 653133 / <i>Bombs &amp; Fuzes</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>						
Complete design and qualification tests; and integration work. Conduct government/industry reviews working towards completion of Milestone C efforts. Start Low Rate Initial Production and First Article Acceptance Testing with a Full-Rate Production Decision. Pending MDA approval of FRP, will start full-rate production.						
<b>FY 2023 Base Plans:</b> N/A						
<b>FY 2023 OCO Plans:</b> N/A						
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding decreased because CHOBS will complete EMD and transition to production.						
<b>Title:</b> Next Generation Area Attack Weapons (NGAAWs)						
<b>Description:</b> Next Generation Area Attack Weapons (NGAAWs) are a family of unitary area attack weapon capabilities to meet the DoD policy regarding cluster munitions and unintended harm to civilians. They consist of BLU-134/B and BLU-136/B warheads with a height of burst sensor. BLU-134/B Improved Lethality Warhead (ILW),NGAAW Increment I, is a near-term solution for area attack as an anti-personnel anti-materiel (APAM) weapon that improves lethality using a 500 lb warhead design and any variants. The BLU-136/B NGAAW Increment II continues development to provide significantly increased capability and lethality against area targets as an APAM weapon. This effort is being executed using an accelerated acquisition strategy to study, design, develop, and test a 2,000 lb unitary warhead design and any variants based on target sets.						
<b>FY 2022 Plans:</b> N/A						
<b>FY 2023 Base Plans:</b> N/A						
<b>FY 2023 OCO Plans:</b> N/A						
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> N/A						
<b>Accomplishments/Planned Programs Subtotals</b>						
		0.058	0.000	0.000	0.000	0.000
		15.134	3.950	1.134	0.000	1.134

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 653133 / <i>Bombs &amp; Fuzes</i>
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**C. 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>
• PAAF 01 Line Item 353020: <i>General Purpose Bombs</i>	369.566	176.565	156.385	0.000	156.385	135.827	133.749	164.925	169.000	Continuing	Continuing
• PAAF 01 Line Item 356120: <i>Fuzes</i>	102.918	50.795	121.528	0.000	121.528	108.824	146.904	149.869	152.938	Continuing	Continuing
• PAAF 01 Line Item 352010: <i>Cartridges</i>	157.799	169.163	119.698	10.825	130.523	97.062	109.630	112.163	114.650	Continuing	Continuing

**Remarks**

N/A

**D. Acquisition Strategy**

- Fuzes (including C-HOBS) is a continuing effort with most activities performed through contracted services.
- Munitions Materiel Handling Equipment (MMHE) project activities are performed in-house with limited technical and analysis contract support.
- Medium Caliber Ammunition project activities are performed in-house with technical and analysis contract support, organic government test support, and possible contracted services (small contracts).
- Insensitive Munitions project activities are performed in-house with limited technical and analysis contract support
- Emerging Technologies are innovative efforts with most activities performed through various contracted services such as OTA's and DOTC; a limited number of activities such as technical analysis and test are performed by organic resources and support contractors.

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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 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / Armament/Ordnance Development	<b>Project (Number/Name)</b> 653133 / Bombs & Fuzes
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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			
Emerging Technology/IM	Various	Various : Eglin AFB, FL	-	0.740	Mar 2021	0.000	Mar 2022	0.029	Mar 2023	-		0.029	Continuing	Continuing	-
MMHE - Prototypes	Various	Prototype Fabrication Shop : Eglin AFB, FL	-	4.544	Apr 2021	0.359	Jan 2022	0.428	Jan 2023	-		0.428	Continuing	Continuing	-
CHOBS - HW/SW	C/Various	Various : Eglin AFB, FL	-	5.897	Oct 2020	0.000	Oct 2021	-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	11.181		0.359		0.457		-		0.457	Continuing	Continuing	N/A

<b>Support (\$ 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			
MMHE - Shipping/Supplies	Various	MMHE Program Office : Eglin AFB, FL	-	0.034	Mar 2021	0.032	Nov 2021	0.042	Nov 2022	-		0.042	Continuing	Continuing	-
DCA Civ Pay (653133)	Allot	AFLCMC/EBD : Eglin AFB, FL	-	0.186	Oct 2020	0.240	Oct 2021	0.240	Oct 2022	-		0.240	Continuing	Continuing	-
<b>Subtotal</b>			-	0.220		0.272		0.282		-		0.282	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			
CHOBS - Test and Evaluation	C/Various	Various : Various	-	1.065	Oct 2020	2.886	Oct 2021	-		-		-	Continuing	Continuing	-
MMHE - Test Support	PO	96 TW : Eglin AFB, FL	-	0.062	Nov 2020	0.030	Nov 2021	0.025	Nov 2022	-		0.025	Continuing	Continuing	-
Emerging Technology - Test Wing	PO	96 TW : Eglin AFB, FL	-	0.040	Sep 2021	-		-		-		-	Continuing	Continuing	-
NGAAW- Test and Evaluation	PO	96 TW : Eglin AFB, FL	-	0.058	Nov 2020	-		-		-		-	Continuing	Continuing	-



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 653133 / <i>Bombs &amp; Fuzes</i>

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>Bombs and Fuzes</i></b>	
MMHE: design, prototype, test priority efforts	
IM and Emerging Technologies	
Medium Caliber Ammunition: Assess, refine, and develop	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 653133 / <i>Bombs &amp; Fuzes</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Bombs and Fuzes</i></b>				
MMHE: design, prototype, test priority efforts	1	2021	4	2027
IM and Emerging Technologies	1	2021	4	2027
Medium Caliber Ammunition: Assess, refine, and develop	1	2021	4	2027

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 3600 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>				<b>Project (Number/Name)</b> 655361 / <i>Stores-Aircraft Interface</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
655361: <i>Stores-Aircraft Interface</i>	-	5.065	5.097	4.145	0.000	4.145	5.475	5.577	5.696	5.823	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

655361: The Stores-Aircraft Interface conducts stores-aircraft interface upgrades and standards development to include the Universal Armament Interface (UAI). UAI is the Air Force's standardized interface for aircraft weapons and mission planning, and its use is mandated by SAF/AQ. The savings realized from this effort is on average 6 years of schedule and \$22M per aircraft/weapon combination. This is accomplished by enabling integration of weapons independent of aircraft Operational Flight Programs (OFP) cycles. UAI is currently implemented on the F-15E, F-16 Block 40/50 and European Participating Air Forces (EPAF) F-16 aircraft, F/A-18, Small Diameter Bomb (SDB) I and II, Joint Direct Attack Munition (JDAM)(all variants), Laser JDAM, Joint Air-to-Surface Stand-off Missile (JASSM), Enhanced Paveway II, Joint Mission Planning System (JMPS) and Precision Guided Munitions Planning Software (PGMPS). Planned implementations include Joint Strike Fighter (JSF/ F-35), B-21, B-52, AC-130J, F-15EX, MQ-9, JASSM-Extended Range (JASSM-ER), Advanced Anti-Radiation Guided Missile - Extended Range (AARGM-ER), Stand-in Attack Weapon (SiAW), Long Range Anti-Ship Missile (LRASM), Grey Wolf, Combat Weapons Delivery Software (CWDS), Select Precision Effects At Range Capability 3 (SPEAR3), Joint Strike Missile (JSM), Navy Open Mission Systems (NOMS) for mission planning. The UAI program office is responsible for development and enhancement of the UAI standard to maintain technical currency, support to coalition/allied/joint interoperability efforts for weapons-platform interface, provision of certification tools, and implementation support to aircraft and weapons.

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 0605831F. In FY21 0.183M was expended for civilian pay expenses in this program element, and in FY22 0.195M is forecasted for civilian pay expenses in this program element.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
<b>Title:</b> Universal Armament Interface (UAI) Development	5.065	5.097	4.145	0.000	4.145
<b>Description:</b> Continue development and maintenance of the Air Force's mandated aircraft/weapon interface, to include UAI Mission Planning and Launch Acceptability Region (LAR) components.					
<b>FY 2022 Plans:</b> Continue development and configuration management of UAI in response to evolving requirements including ongoing transition of mission planning to Navy Open Mission Systems (NOMS) operating environment. Ongoing air-to-ground integration support includes all USAF weapons and aircraft, and includes USN and US Army customers. Development support will include advanced carriage systems, certification tool software upgrades and initial requirements investigation for hypersonic based systems. Support working groups, technical					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 655361 / <i>Stores-Aircraft Interface</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>meetings and workshops, risk reduction assessments, common mission planning, and platform-specific implementation of UAI. Maintain and logistically support existing certification tools (within program budgetary limits) to meet current and future user system integration lab test certification needs. These tools are shared among aircraft and weapons programs to reduce time and cost for UAI integration efforts. Support international efforts including but not limited to Joint Strike Missile (JSM), and Select Precision Effects At Range Capability 3 (SPEAR3), and ongoing efforts to develop/implement a multinational Memorandum of Understanding.</p> <p><b>FY 2023 Base Plans:</b> Continue development and fielding of UAI software improvements including updates to enhance and standardize geospatial zones implementation, GPS and M-code improvements, and smart carriage system interactions. In addition, the program will continue to develop the Mission Planning UAI Common Component with the transition from the Joint Mission Planning System (JMPS) to the Navy Open Mission Systems (NOMS) operating environment. UAI updates will include continued development of the Launch Acceptability Region (LAR) tool-set required by weapon systems and mission planning developers for generation of weapon performance truth data, engagement envelopes, training tools, and support way-point flying munitions. FY23 includes funding for ongoing air-to-ground integration support across USAF, USN, and Army customers, including development support for advanced carriage systems as store quantities and management capabilities increase, hypersonic weapons, and certification tool software updates. Support working groups, technical meetings and workshops, risk reduction assessments, common mission planning, and system-specific implementations of UAI. Maintain and logistically support existing certification tools to meet current and future user system integration lab test certification needs. These tools are shared among aircraft and weapon programs to reduce time and cost for UAI integration efforts. Support international efforts including but not limited to Joint Strike Missile (JSM) and Select Precision Effects At Range - Capability 3 (SPEAR3), both of which are integrating on the F-35 using UAI Platform Store Interface Control Document Rev 05, and implementing the multinational Memorandum of Understanding.</p> <p><b>FY 2023 OCO Plans:</b> N/A</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding decreased due to availability of prior year funds across the program element.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	5.065	5.097	4.145	0.000	4.145

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 655361 / <i>Stores-Aircraft Interface</i>

**C. Other Program Funding Summary (\$ in Millions)**  
N/A

**Remarks**  
N/A

**D. Acquisition Strategy**  
In December 2004, under the authority of a class Justification and Approval (J&A), the UAI program office awarded individual Cost Plus Fixed Fee (CPFF) contracts to Boeing, Lockheed Martin, Northrop Grumman, and Raytheon. Each Original Equipment Manufacturer is responsible for a different piece of the total UAI requirement based on its product-specific (platform/weapon) expertise. During FY10, the original contracts expired. Under the authority of a class J&A, Cost Plus Incentive Fee (CPIF) contracts were awarded to the four UAI vendors in August 2010. Follow-on period of performance was awarded in March 2014 for 16 months to better align future contract awards with funding through the Future Years Defense Program. The period of performance was extended to 1 November 2015 to allow immediate start of the effort on F-35/JSF request for changes. A new J&A was approved in January 2015 for the follow-on sole-source contracts to the original equipment manufacturers (OEMs). These new sole-source contracts were awarded in November 2015 and expired in November 2019. A new J&A was signed in December 2018, prior to contract expiration, and four new five-year sole-source contracts (CPFF) were awarded in November 2019.

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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 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / Armament/Ordnance Development	<b>Project (Number/Name)</b> 655361 / Stores-Aircraft Interface
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<b>Product Development (\$ 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>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Interface Control Document (ICD) Development/Updates/Maintenance	SS/ Various	Boeing Northrop Grumman Lockheed Martin Raytheon : Various	-	4.861	Nov 2020	4.891	Nov 2021	3.940	Nov 2022	-		3.940	Continuing	Continuing	-
<b>Subtotal</b>			-	4.861		4.891		3.940		-		3.940	Continuing	Continuing	N/A

**Remarks**  
New 5 year Follow-on contract was awarded in November 2019.

<b>Management Services (\$ 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>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
A&AS Contractor Support	Various	Various : Various	-	0.144	Dec 2020	0.146	Jun 2022	0.148	Jun 2023	-		0.148	Continuing	Continuing	-
Program Office Travel	C/CPAF	Not specified. : TBD	-	0.060		0.060		0.057		-		0.057	Continuing	Continuing	-
<b>Subtotal</b>			-	0.204		0.206		0.205		-		0.205	Continuing	Continuing	N/A

**Remarks**  
PE Systems Contractor provides support to the Program Office for financial services.

<b>Project Cost Totals</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
	-	5.065	5.097	4.145	-	4.145	Continuing	Continuing	N/A

**Remarks**

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

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / Armament/Ordnance Development	<b>Project (Number/Name)</b> 655361 / Stores-Aircraft Interface
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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>Stores-Aircraft Interface</b>																												
Governance (Super Joint Interface Control Working Group)																												
SJICWG Meeting - CY 2nd quarter 2022 Update																												
SJICWG Meeting - CY 4th quarter 2022 Update																												
SJICWG Meeting - CY 4th quarter 2023 Update																												
SJICWG Meeting - CY 3rd quarter 2024 Update																												
SJICWG Meeting - CY 3rd quarter 2025 Update																												
SJICWG Meeting - CY 2nd quarter 2026 Update																												
SJICWG Meeting - CY 2nd quarter 2027 Update																												
Platform-Store Interface Control Document (PS ICD) Change Notices - M-Code Update																												
Platform-Store Interface Control Document (PS ICD) Change Notices - GeoZone Conops																												
Platform-Store Interface Control Document (PS ICD) Change Notices - Advanced Carriage Systems																												
Platform-Store Interface Control Document (PS ICD) Change Notices - M-Code Update																												
Certification Tools (CTs) Dev/ Update																												

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

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 655361 / <i>Stores-Aircraft Interface</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
System Integration Lab (SIL) Certification Tool (CT) software 3rd quarter 2022 updates							■																					
System Integration Lab (SIL) Certification Tool (CT) software 2nd quarter 2023 updates											■																	
System Integration Lab (SIL) Certification Tool (CT) software 4th quarter 2023 updates												■																
System Integration Lab (SIL) Certification Tool (CT) software 2nd quarter 2024 updates															■													
System Integration Lab (SIL) Certification Tool (CT) software 1st quarter 2025 updates																■												
System Integration Lab (SIL) Certification Tool (CT) software 4th quarter 2025 updates																				■								
Mission Planning CT software 3rd quarter 2022 updates							■																					
Mission Planning CT software 1st quarter 2024 updates												■																
Mission Planning CT software 3rd quarter 2025 updates																				■								
UAI (Mission Planning) Common Component (CC)																												
CC software 3rd quarter 2022 updates							■																					
CC software 4th quarter 2023 updates												■																
CC software 4th quarter 2024 updates																■												
CC software 2nd quarter 2025 updates																				■								
Weapon Sustainment/Regression Efforts: JDAM, JASSM-ER, SDB I+II																												
A/C Sustainment/Regression Efforts: F-16 Blk 40/50, F-15E																												

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

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 655361 / <i>Stores-Aircraft Interface</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
Weapon Dev: SiAW, JSM, SPEAR3, LRASM, AARGM-ER, JAGM-F, Golden Horde, hypersonics, advanced carriage systems																												
A/C Dev: F-16 Foreign Military Sales, F-35, B-21, B-1, A-10, F-22, F-18, MQ-9, F-15EX, MQ-IC, AC-130J, B-52																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Air Force		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 655361 / <i>Stores-Aircraft Interface</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Stores-Aircraft Interface</b>				
Governance (Super Joint Interface Control Working Group)	1	2021	4	2027
SJICWG Meeting - CY 2nd quarter 2022 Update	2	2022	2	2022
SJICWG Meeting - CY 4th quarter 2022 Update	4	2022	4	2022
SJICWG Meeting - CY 4th quarter 2023 Update	4	2023	4	2023
SJICWG Meeting - CY 3rd quarter 2024 Update	3	2024	3	2024
SJICWG Meeting - CY 3rd quarter 2025 Update	3	2025	3	2025
SJICWG Meeting - CY 2nd quarter 2026 Update	2	2026	2	2026
SJICWG Meeting - CY 2nd quarter 2027 Update	2	2027	2	2027
Platform-Store Interface Control Document (PS ICD) Change Notices - M-Code Update	3	2022	3	2022
Platform-Store Interface Control Document (PS ICD) Change Notices - GeoZone Conops	2	2023	2	2023
Platform-Store Interface Control Document (PS ICD) Change Notices - Advanced Carriage Systems	2	2023	2	2023
Platform-Store Interface Control Document (PS ICD) Change Notices - M-Code Update	1	2024	1	2024
Certification Tools (CTs) Dev/ Update	1	2021	4	2027
System Integration Lab (SIL) Certification Tool (CT) software 3rd quarter 2022 updates	3	2022	3	2022
System Integration Lab (SIL) Certification Tool (CT) software 2nd quarter 2023 updates	2	2023	2	2023
System Integration Lab (SIL) Certification Tool (CT) software 4th quarter 2023 updates	4	2023	4	2023
System Integration Lab (SIL) Certification Tool (CT) software 2nd quarter 2024 updates	2	2024	2	2024

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

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604602F / <i>Armament/Ordnance Development</i>	<b>Project (Number/Name)</b> 655361 / <i>Stores-Aircraft Interface</i>
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<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
System Integration Lab (SIL) Certification Tool (CT) software 1st quarter 2025 updates	1	2025	1	2025
System Integration Lab (SIL) Certification Tool (CT) software 4th quarter 2025 updates	4	2025	4	2025
Mission Planning CT software 3rd quarter 2022 updates	3	2022	3	2022
Mission Planning CT software 1st quarter 2024 updates	1	2024	1	2024
Mission Planning CT software 3rd quarter 2025 updates	3	2025	3	2025
UAI (Mission Planning) Common Component (CC)	1	2021	4	2027
CC software 3rd quarter 2022 updates	3	2022	3	2022
CC software 4th quarter 2023 updates	4	2023	4	2023
CC software 4th quarter 2024 updates	4	2024	4	2024
CC software 2nd quarter 2025 updates	2	2025	2	2025
Weapon Sustainment/Regression Efforts: JDAM, JASSM-ER, SDB I+II	1	2021	4	2027
A/C Sustainment/Regression Efforts: F-16 Blk 40/50, F-15E	1	2021	4	2027
Weapon Dev: SiAW, JSM, SPEAR3, LRASM, AARGM-ER, JAGM-F, Golden Horde, hypersonics, advanced carriage systems	1	2021	4	2027
A/C Dev: F-16 Foreign Military Sales, F-35, B-21, B-1, A-10, F-22, F-18, MQ-9, F-15EX, MQ-IC, AC-130J, B-52	1	2021	4	2027