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

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	44.788	28.043	23.076	0.000	23.076	9.183	6.705	6.825	6.950	Continuing	Continuing
653133: <i>Bombs & Fuzes</i>	-	39.742	19.054	18.011	0.000	18.011	4.010	1.440	1.466	1.492	Continuing	Continuing
655361: <i>Stores-Aircraft Interface</i>	-	5.046	8.989	5.065	0.000	5.065	5.173	5.265	5.359	5.458	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 position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.). This project also provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes. Bombs & Fuzes provides research, development, and testing of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality against area, mobile, hard and deeply buried, and fixed targets. This project provides for the development and testing necessary to provide a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions materiel handling equipment (MMHE).

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 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.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Armament/Ordnance Development weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in Program Elements 0605831F.

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	49.590	28.043	6.197	0.000	6.197
Current President's Budget	44.788	28.043	23.076	0.000	23.076
Total Adjustments	-4.802	0.000	16.879	0.000	16.879
• 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	-3.260	0.000			
• SBIR/STTR Transfer	-1.542	0.000			
• Other Adjustments	0.000	0.000	16.879	0.000	16.879

Change Summary Explanation

FY19: Reprogrammings of -\$8M and +\$4.740 were accomplished to balance resource requirements among the Cockpit-selectable Height of Burst Sensor (C-HOBS), M-Code, and the Advanced Medium Range Air-to-Air Missile (AMRAAM) programs.

FY21: AF provided C-HOBS \$21M to complete Engineering and Manufacturing Development.

The FY 2021 Armament/Ordnance funding request was reduced by \$4.1M to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>				Project (Number/Name) 653133 / <i>Bombs & Fuzes</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
653133: <i>Bombs & Fuzes</i>	-	39.742	19.054	18.011	0.000	18.011	4.010	1.440	1.466	1.492	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 position, navigation, and timing (PNT) capabilities (i.e. GPS, non-GPS, optical, passive, active, etc.). This project also provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes. Bombs & Fuzes provides research, development, and testing of conventional warheads, fuzing, HOBS modifications, and anti-personnel anti-materiel (APAM) weapons to improve lethality against area, mobile, hard and deeply buried, and fixed targets. This project provides for the development and testing necessary to provide a suitable manufacturing base of conventional warheads, fuzes, HOBS, and munitions materiel handling equipment (MMHE).

- 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) project supports 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 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 explores and develops IM solutions.

- 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.

- 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

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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 653133 / <i>Bombs & Fuzes</i>
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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).

- Joint Air-to-Ground Missile for Fixed Wing Aircraft (JAGM-F) is an improvement to the Army-led JAGM, which will allow the missile to be ejected from fixed wing aircraft in order to eliminate time sensitive moving targets and high value covered/sheltered targets. JAGM-F will be able to combat adverse weather/low visibility battlefield and countermeasure environments as well as austere communication environments. JAGM-F will have the ability to engage multiple target types near-simultaneously in multiple engagement modes. Efforts include but are not limited to capability demonstration design, testing, and qualification, and manufacture/build components to production standards. Intent is to investigate meeting all BRU-55, BRU-70, and BRU-61 environments.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Title: Munitions Materiel Handling Equipment (MMHE)</p> <p>Description: 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>FY 2020 Plans: Continue 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 the Defense Advanced Research Projects Agency (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. Continue support and sustainment engineering of all previously existing items developed by the MMHE program office. Continue to provide MMHE Sustainment office at Robins AFB, GA, with engineering support.</p> <p>FY 2021 Base Plans: Continue 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</p>	0.667	0.714	0.722	-	0.722

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>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. Continue support and sustainment engineering of all previously existing items developed by the MMHE program office. Continue to provide MMHE Sustainment office at Robins AFB, GA, with engineering support.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding increase is minimal.</p>					
<p>Title: Medium Caliber Ammunition</p> <p>Description: 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.</p> <p>FY 2020 Plans: Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Initiate development of the 30mm replacement round. Assess and mitigate Medium Caliber ammunition inventory health challenges.</p> <p>FY 2021 Base Plans: Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Initiate development of the 30mm replacement round. Assess and mitigate Medium Caliber ammunition inventory health challenges.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: N/A</p>	0.100	0.100	0.100	-	0.100
<p>Title: Insensitive Munitions (IM) and Emerging Technology</p> <p>Description: Model and validate current and Emerging Energetics munition performance; assess and correct IM deficiencies; explore and develop new IM and Energetics technology; conduct strategic IM and Emerging</p>	0.300	0.300	0.300	-	0.300

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B. Accomplishments/Planned Programs (\$ in Millions)					
Energetics planning for the AF; support Joint Service IM efforts; provide technical guidance and test expertise to AF IM and Emerging Energetics programs.					
FY 2020 Plans: Execute the Insensitive Munitions Strategic Plan (IMSP) and Plan of Action and Milestones (POAM). Begin Phase II of the Liner project for the BLU-117 which includes engineering passive venting using IM features. Once features are implemented, qualification testing will take place.					
FY 2021 Base Plans: Execute the Insensitive Munitions Strategic Plan (IMSP) and Plan of Action and Milestones (POAM). Continue Phase II of the Liner project for the BLU-117 which includes engineering passive venting using IM features. Once features are implemented, qualification testing will take place.					
FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Title: BLU-136/B Next Generation Area Attack Weapon Increment II					
Description: The Next Generation Area Attack Weapon Increment II (NGAAW II) continues development of anti-personnel anti-materiel (APAM) weapons to improve lethality against area targets via an accelerated acquisition strategy. This effort studies, designs, develops, and tests a warhead design and any variants which significantly improve lethality against APAM while meeting current DoD policy on cluster munitions and unintended harm to civilians.					
FY 2020 Plans: N/A					
FY 2021 Base Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Title: Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS)					
Description: 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					
	2.819	0.000	0.000	-	0.000
	14.362	1.761	16.889	-	16.889

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B. Accomplishments/Planned Programs (\$ in Millions)					
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 NGAAWs).					
FY 2020 Plans: Continue to mature development; design and qualification tests; and integration work. Conduct government/industry reviews working towards completion of Milestone C efforts. Evaluate production representative articles and complete Initial Product Baseline and Product Support Plan. Complete a CDR Assessment based on test results for the Milestone Decision Authority (MDA) in preparation of a LRIP Production Decision with a Full Rate Production Decision in FY21.					
FY 2021 Base Plans: Complete design and qualification tests; and integration work. Conduct government/industry reviews working towards completion of Milestone C efforts. Start LRIP and First Article Acceptance Testing with a Full-Rate Production Decision. Pending MDA approval of FRP, will start full-rate production.					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding increased due to added AF funding to complete C-HOBS Engineering and Manufacturing Development.					
Title: M-Code Receiver Development					
Description: Description: M-Code/EAJ receivers provide an enhanced anti-jam capability. M-Code/EAJ receivers provide the capability to operate in increasing adversarial A2/AD jamming environment. M-Code/EAJ receivers also provide increased accuracy, better signal acquisition, and advanced security.					
FY 2020 Plans: N/A					
FY 2021 Base Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Title: Joint Air-to-Ground Missile for Fixed Wing (JAGM-F)					
Description: Joint Air-to-Ground Missile for Fixed Wing Aircraft (JAGM-F) is an improvement to the Army-led JAGM, which will allow the missile to be ejected from fixed wing aircraft in order to eliminate time sensitive					
	4.469	0.000	0.000	-	0.000
	17.025	16.179	0.000	-	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>moving targets and high value covered/sheltered targets. JAGM-F will be able to combat adverse weather/low visibility battlefield and countermeasure environments as well as austere communication environments. JAGM-F will have the ability to engage multiple targets types near-simultaneously in multiple engagement modes. Efforts include but are not limited to capability demonstration design, testing, and qualification, and manufacture/build components to production standards. Intent is to investigate meeting all BRU-55, BRU-70, and BRU-61 environments.</p> <p>FY 2020 Plans: Continue to model the design and build, Jettison and Capture Analysis, Mechanical Design, Electronic Design and Testing, Electrical Packaging, software design and code development, weapons system integration, aircraft systems integration, test vehicle design and build, and test vehicle flight planning. Purchase additional government furnished equipment (GFE) and flight test support.</p> <p>FY 2021 Base Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding decreased due to evolving USAF requirements.</p>					
Accomplishments/Planned Programs Subtotals	39.742	19.054	18.011	-	18.011

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PAAF 01 Line Item 353020: <i>General Purpose Bombs</i>	811.170	631.194	0.000	369.566	369.566	394.673	692.700	414.356	370.988	Continuing	Continuing
• PAAF 01 Line Item 356120: <i>Fuzes</i>	180.272	154.214	40.983	107.855	148.838	223.309	188.781	105.411	142.917	Continuing	Continuing
• PAAF 01 Line Item 352010: <i>Cartridges</i>	188.227	193.091	123.365	40.434	163.799	161.666	145.812	109.608	122.330	Continuing	Continuing
Remarks	N/A										

D. Acquisition Strategy
- Fuzes (including C-HOBS) is a continuing effort with most activities performed through contracted services.

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<p>- Munitions Materiel Handling Equipment (MMHE) project activities are performed in-house with limited technical and analysis contract support.</p> <p>- 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).</p> <p>- Insensitive Munitions project activities are performed in-house with limited technical and analysis contract support.</p> <p>- The BLU-136/B NGAAW Inc II warhead design program will implement an accelerated acquisition program strategy. This strategy includes rapid development and prototyping of a warhead design resulting in a final, validated Technical Data Package (TDP). The TDP will be used to compete for initial production and follow on procurement to meet the warfighter requirement. The NGAAW program will continue to evaluate product improvements.</p> <p>- Joint Air-to-Ground Missile for Fixed Wing Aircraft (JAGM-F) utilizes the Defense Ordnance Technology Consortium (DOTC) contract combined with modeling and simulation contract support and government test support.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
IM	Various	Various : TBD	-	0.300	Mar 2019	0.300	Mar 2020	0.300	Mar 2021	-		0.300	Continuing	Continuing	-
MMHE - Prototypes	Various	Prototype Fabrication Shop : Eglin AFB, FL	-	0.198	Apr 2019	0.134	Apr 2020	0.172	Apr 2021	-		0.172	Continuing	Continuing	-
BLU-136 NGAAW Concept Development	Various	Various : Eglin AFB, FL	-	2.819		-		-		-		-	Continuing	Continuing	-
CHOBS - HW/SW	C/Various	Various : Eglin AFB, FL	-	13.112	Mar 2020	0.000	Jan 2020	6.574	Oct 2020	-		6.574	Continuing	Continuing	-
JAGM-F	C/FFP	DOTC : Huntsville, AL	-	16.202	Jun 2019	10.668	Mar 2020	-		-		-	Continuing	Continuing	-
M-Code Receiver Development	Various	Boeing: : St. Louis, MO	-	4.469	May 2019	-		-		-		-	Continuing	Continuing	-
Subtotal			-	37.100		11.102		7.046		-		7.046	Continuing	Continuing	N/A

Remarks
NGAAW concept development continues.

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Support	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
MMHE - Shipping/Supplies	Various	MMHE Program Office : Eglin AFB, FL	-	0.019	Mar 2019	0.130	Mar 2020	0.100	Mar 2021	-		0.100	Continuing	Continuing	-
JAGM-F - Test Vehicles	Various	Army : Huntsville, AL	-	0.000		0.880	Jun 2020	-		-		-	Continuing	Continuing	-
Subtotal			-	0.019		1.010		0.100		-		0.100	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

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Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
BLU-136 ILW - Test and Evaluation	PO	Various : Various	-	-		-		-		-		-	Continuing	Continuing	6.530
CHOBS - Test and Evaluation	C/Various	Various : Various	-	0.915	May 2020	1.555	Aug 2020	9.680	Oct 2020	-		9.680	Continuing	Continuing	-
MMHE - Test Support	PO	96 TW : Eglin AFB, FL	-	0.020	Apr 2019	0.050	Nov 2019	0.050	Nov 2020	-		0.050	Continuing	Continuing	-
JAGM-F - Test Support	Various	Various : Various	-	0.101	Nov 2019	3.878	Oct 2020	-		-		-	Continuing	Continuing	-
Subtotal			-	1.036		5.483		9.730		-		9.730	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Medium Caliber - PMA	Various	Various : Eglin AFB, FL	-	0.100	Jun 2019	0.100	Jun 2020	0.100	Jun 2021	-		0.100	Continuing	Continuing	-
MMHE - PMA	Various	Various : Eglin AFB, FL	-	0.430	Jun 2019	0.400	Jun 2020	0.400	Jun 2021	-		0.400	Continuing	Continuing	-
BLU-136/B - PMA	Various	Various : NV	-	-		-		-		-		-	Continuing	Continuing	-
CHOBS - PMA	Various	Various : Eglin AFB, FL	-	0.335	Oct 2018	0.206	Oct 2019	0.635	Oct 2020	-		0.635	Continuing	Continuing	-
JAGM-F - PMA	Various	Various : Eglin AFB, FL	-	0.722	Sep 2019	0.753	Aug 2020	-		-		-	Continuing	Continuing	-
Subtotal			-	1.587		1.459		1.135		-		1.135	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		39.742	19.054	18.011	-	18.011	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 653133 / <i>Bombs & Fuzes</i>

FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
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

Bombs and Fuzes	
MMHE: design, prototype, test priority efforts	[REDACTED]
Execute IMSP POAM	[REDACTED]
BLU-136/B: Warhead design/initial prototype	[REDACTED]
C-HOBS: RFP/Source selection	[REDACTED]
C-HOBS: Contract Award	[REDACTED]
C-HOBS: Design, build, test, and integrate	[REDACTED]
Medium Caliber Ammunition: Assess, refine, and develop	[REDACTED]
JAGM-F contract award	[REDACTED]
JAGM-F: Conduct demononstration	[REDACTED]
M-Code Receivers Development	[REDACTED]

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 653133 / <i>Bombs & Fuzes</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Bombs and Fuzes</i>				
MMHE: design, prototype, test priority efforts	1	2019	4	2025
Execute IMSP POAM	1	2019	4	2025
BLU-136/B: Warhead design/initial prototype	1	2019	4	2019
C-HOBS: RFP/Source selection	1	2019	2	2019
C-HOBS: Contract Award	2	2019	2	2019
C-HOBS: Design, build, test, and integrate	2	2019	4	2021
Medium Caliber Ammunition: Assess, refine, and develop	1	2019	4	2025
JAGM-F contract award	3	2019	3	2019
JAGM-F: Conduct demononstration	3	2019	4	2021
M-Code Receivers Development	3	2019	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>				Project (Number/Name) 655361 / <i>Stores-Aircraft Interface</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
655361: <i>Stores-Aircraft Interface</i>	-	5.046	8.989	5.065	0.000	5.065	5.173	5.265	5.359	5.458	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 an Air Force initiative to develop standardized software interfaces in aircraft weapons and mission planning. 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, Small Diameter Bomb (SDB) I and II, Joint Direct Attack Munition (JDAM), Laser JDAM, Joint Air-to-Surface Stand-off Missile (JASSM), and Precision Guided Munitions Planning Software (PGMPS). Planned implementation include Joint Strike Fighter (JSF/F-35), B-21, MQ-9, JASSM-Extended Range (JASSM-ER), F/A-18, Advanced Anti-Radiation Guided Missile - Extended Range (AARGM-ER), Combat Weapons Delivery Software (CWDS), SPEAR3, Joint Strike Missile (JSM), and the Turkish Stand Off Missile - Joint (SOM-J). The UAI program office is responsible for development and enhancement of the standard, support to coalition/allied/joint interoperability efforts for weapons-platform interface, provision of certification tools, and implementation support to aircraft and weapons.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Universal Armament Interface (UAI) Development	5.046	8.989	5.065	-	5.065
Description: Continue development and maintenance of the Air Force's mandated aircraft/weapon interface, to include UAI Mission Planning and Launch Acceptability Region (LAR) components.					
FY 2020 Plans: Evolving requirements force continued development and configuration management of UAI to support the SAF/AQ UAI mandate. All air-to-ground weapon and aircraft systems now require UAI support in multiple forms. Support and facilitate certification efforts, working groups, technical meetings, workshops, risk reduction assessments, common mission planning components, as well as platform- and weapon-specific implementations of UAI. Maintain and logistically support a fleet of UAI certification tools to meet current and future user system integration needs. The tools used among aircraft and weapons programs reduce time/cost of UAI integration efforts and provide a common means to certify a UAI compliant system. Support multinational Memorandum of Understanding system implementation of UAI including the Joint Strike Missile (JSM), SPEAR 3, and Stand Off Missile - Joint (SOM-J).					
FY 2021 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 655361 / <i>Stores-Aircraft Interface</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue development and configuration management of UAI in response to evolving requirements to include expanding capability to support air-to-air weapon integration. Ongoing air-to-ground integration support includes all USAF weapons, aircraft including USN and US Army customers. Support working groups, technical meetings and workshops, risk reduction assessments, common mission planning, and platform-specific implementation 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 weapons programs to reduce time and cost for UAI integration efforts. Support multinational Memorandum of Understanding including but not limited to Joint Strike Missile (JSM), SPEAR 3, and Stand Off Missile - Joint (SOM-J).					
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Funding decreased due to a return of funding at a historical level of effort.					
Accomplishments/Planned Programs Subtotals	5.046	8.989	5.065	-	5.065

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, these contracts expired. Under the authority of the 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. These new sole-source contracts were awarded in November 2015 and expired in November 2019. A new J&A was signed in December 2018 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 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 655361 / <i>Stores-Aircraft Interface</i>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Interface Control Document (ICD) Development/Updates/Maintenance	SS/ Various	Boeing Northrop Grumman Lockheed Martin Raytheon : Various	-	4.846	Nov 2018	8.787	Nov 2019	4.861	Nov 2020	-		4.861	Continuing	Continuing	-
Certification Tool	SS/CPFF	Boeing Northrop Grumman Lockheed Martin Raytheon : Various	-	-		-		-		-		-	Continuing	Continuing	-
Subtotal			-	4.846		8.787		4.861		-		4.861	Continuing	Continuing	N/A

Remarks
New 5 year Follow-on contract will be awarded in November 2019.

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
A&AS Contractor Support	Various	Various : Various	-	0.140		0.142		0.144		-		0.144	Continuing	Continuing	-
Program Office Travel	C/CPAF	Not specified. : TBD	-	0.060		0.060		0.060		-		0.060	Continuing	Continuing	-
Subtotal			-	0.200		0.202		0.204		-		0.204	Continuing	Continuing	N/A

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

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	5.046	8.989	5.065	-	5.065	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 655361 / <i>Stores-Aircraft Interface</i>

FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
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

Stores-Aircraft Interface																												
Governance (Super Joint Interface Control Working Group)																												
Certification Tools (CTs) Dev / Update																												
UAI (Msn Plng) Common Component																												
WPN Sustainment/Regression Efforts: JDAM, JASSM-ER, SDB I+II																												
A/C Sustainment/Regression Efforts: F-16 Blk 40/50, F-15E																												
WPN Dev: SiAW, JSM, SPEAR3, LRASM, AARGM-ER, JAGM-F, Golden Horde																												
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																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 655361 / <i>Stores-Aircraft Interface</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Stores-Aircraft Interface				
Governance (Super Joint Interface Control Working Group)	1	2019	4	2025
Certification Tools (CTs) Dev / Update	1	2019	4	2025
UAI (Msn Plng) Common Component	1	2019	4	2025
WPN Sustainment/Regression Efforts: JDAM, JASSM-ER, SDB I+II	1	2019	4	2025
A/C Sustainment/Regression Efforts: F-16 Blk 40/50, F-15E	1	2019	4	2025
WPN Dev: SiAW, JSM, SPEAR3, LRASM, AARGM-ER, JAGM-F, Golden Horde	1	2019	4	2025
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	1	2019	4	2025