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

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 0701212F / <i>Automated Test Systems</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	-	12.418	15.445	16.664	0.000	16.664	0.000	25.538	34.329	35.092	Continuing	Continuing
6506TE: <i>Test And Evaluation Support Budget Authority</i>	-	12.418	15.445	16.664	0.000	16.664	0.000	25.538	34.329	35.092	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 6506

A. Mission Description and Budget Item Justification

The Automatic Test Systems (ATS) program office is responsible for developing, acquiring, delivering and sustaining ATS war-fighting capabilities for the United States Air Force (USAF). ATS is responsible for developing, modernizing, acquiring, and sustaining ATS to meet the user's operational needs.

ATS Product Group consists of the following:

- Armament and Stores
- Avionics
- Electronic Warfare
- Software Loader/Verifier and Built-in-Test
- Radar and Identification Friend or Foe
- Specialized

Development, modernization and technology insertion for over 8K testers across all major commands and Joint Force. Accelerates developing and modernizing cyber-resilient, nuclear-certified ATS supporting USAF Armament, Bomber, Fighter/Advance Aircraft, Mobility, Training, ISR & SOF.

The Bomber Armament Tester (BAT) is replacing six legacy testers and combining their capabilities into one tester. The Bomber Armament Tester will support the B-2, B-1 and B-52 platforms. It will ensure the USAF bomber fleet can conduct nuclear deterrence, global power projection and global strike operations to support the President of the United States and Combatant Commanders by providing a reliable, cyber secure, and sustainable tester. The tasks are to develop a common bomber armament tester and the Test Program Sets (Software, Hardware, and Documentation) to test the armament release equipment on the bombers.

RDT&E efforts support development, testing, and producibility of the Bomber Armament Tester and Test Program Sets. The program will utilize an incremental development approach with B-2 as Increment 1, B-1 as Increment 2, and B-52 as Increment 3.

The Common Aircraft Portable Reprogramming Equipment (CAPRE) Secure Memory Loader Verifier (SMLV) loads operational flight programs to the weapon systems. CAPRE SMLV leads the fleet on Cyber initiatives and is government owned and developed. CAPRE SMLV supports 45 Mission Design Series (MDS) including but not limited to A-10, B-1, B-52, C-5, C-17, C-130, CV-22, F-15, F-16, H-60 and KC-46.

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This RDT&E effort includes developing a Network Interface Module (NIM) that provides additional cyber hardening to the CAPRE system and redesigning the current CAPRE system to adapt to the NIM. Additionally this RDT&E effort includes software development for NIM interfaces and new weapons systems moving to the CAPRE system from other MLV systems. The goal is to provide one common cyber secure MLV for the Air Force to minimize cyber vulnerabilities in weapon systems.

RDT&E efforts support prototype development and testing of the Common Armament Tester Fighter and Test Program Sets.

This program element also includes program administrative cost for the Automatic Test Systems program office and funds the cost of studies and research to support the Automatic Test Systems fleet.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Automatic Test Systems Program Office weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 0.000M was expended, and in FY22 0.000M is forecast 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.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	10.654	15.445	0.000	0.000	0.000
Current President's Budget	12.418	15.445	16.664	0.000	16.664
Total Adjustments	1.764	0.000	16.664	0.000	16.664
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	1.764	0.000	16.664	0.000	16.664

Change Summary Explanation

No significant changes

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Bomber Armament Tester	10.029	4.438	0.000	0.000	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)					
Description: New Common Bomber Armament Tester for B-1, B-2, and B-52. RDT&E efforts support development, testing, and producibility of the Bomber Armament Tester and Test Program Sets.					
FY 2022 Plans: RDT&E efforts supporting development, testing, and producibility of the Bomber Armament Tester and Test Program Sets.					
FY 2023 Base Plans: N/A					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement: Development planned to be completed					
Title: Common Aircraft Portable Reprogramming Equipment (CAPRE)					
Description: Development of a common cyber secure Memory Loader Verifier for the Air Force.					
FY 2022 Plans: FY21/22 3600 RDT&E funds needed to complete the development of the CAPRE SMLV that allows secure transfer of operational flight program (OFP) on 32 supported aircraft. This includes software development and interfaces for the CAPRE SMLV.					
Funds are also needed to continue the development efforts and all costs associated with the development of this program, which is phased and funded incrementally.					
FY 2023 Base Plans: Funding will be utilized for approximately 200 air adapter groups (AAG) that will allow the 18 platforms currently utilizing CAPRE legacy to transition over to utilizing CAPRE SMLV system.					
FY 2023 OCO Plans: N/A					
FY 2022 to FY 2023 Increase/Decrease Statement:					
	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
	2.389	11.007	16.664	0.000	16.664

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Increase in requirement					
Accomplishments/Planned Programs Subtotals	12.418	15.445	16.664	0.000	16.664

D. Other Program Funding Summary (\$ in Millions)											
<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>Cost To Complete</u>	<u>Total Cost</u>
• APAF 07 00071: <i>Replacement Support Equipment</i>	27.311	27.392	23.677	-	23.677	19.182	23.948	-	-	0.000	121.510

Remarks
 Other program funding includes procurement funds for Bomber Armament Tester Program, the Common Aircraft Portable Reprogrammable Equipment Secure Memory Loader Verifier and Aircraft Smart Weapons Test Set (ASWTS).

E. Acquisition Strategy
 Acquisition Strategy for ATS modernization and technology insertion projects are evaluated for priority, feasibility, Return on Investment, and cost then sorted into Tiers for ease of classification:

- Tier I: Stars-Highest priority projects that are both achievable and provide significant benefits to the Air Force.
- Tier II: Rising Stars-Projects that are high priority, meet modernization goals, and will deliver needed capabilities.
- Tier III: Innovation Opportunities-Low TRL projects that require small investments to begin development.
- Tier IV: Sustainment Efforts-Lower cost efforts targeted at improving existing systems. Typically sustaining engineering funds (583), rather than R&D funds (3600)
- Tier V: Watch List-Low priority and/or immature concepts that require significant investment or technology development

Acquisition Strategy for the Bomber Armament Tester (BAT) was approved by AFPEO/ Agile Combat Support on 12 November 2015. The BAT program will use an incremental approach based on customer needs to satisfy this requirement. Increment 1 includes the development of the core test set, the B-2A requirements and development of the most complex B-1B and B-52 test program sets. Increment 2 consist of the B-1B development and Increment 3 consists of the B-52H requirements. The BAT program will utilize full and open competition to award the contract. Contract awarded September 28, 2017.

The Acquisition strategy for Common Aircraft Portable Reprogrammable Equipment (CAPRE) Secure Memory Loader Verifier (SMLV) is to use the original government manufacturer to develop the NIM, software and hardware development. Acquisition Strategy for CAPRE was approved by the Milestone Decision Authority in June 2017.

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

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0701212F / Automated Test Systems	Project (Number/Name) 6506TE / Test And Evaluation Support Budget Authority
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Product Development (\$ in Millions)				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			
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
CAPRE/CAPRE SMLV Development	PO	309th OO-ALC : UT	-	2.389	Jan 2021	-		16.664	Nov 2023	-		16.664	Continuing	Continuing	-
BAT Development / Cost Overruns	C/CPAF	Not specified. : CA	-	10.029	Oct 2020	3.450	Oct 2021	-		-		-	Continuing	Continuing	-
Subtotal			-	12.418		3.450		16.664		-		16.664	Continuing	Continuing	N/A

Remarks
 Product Development Cost include all ATS modernization and technology insertion to include but not limited to the development of the Bomber Armament Test Sets (Units under test Software, hardware and Technical Data), Technical Data and maintenance of Government Furnished Equipment.

Development efforts include developing a Network Interface Module (NIM) that provides additional cyber hardening to the CAPRE system and redesigning the current CAPRE system to adapt to the NIM. Development effort also include software development for NIM interfaces and new weapons systems moving to the CAPRE system from other MLV systems. The goal is to provide one common cyber secure MLV for the Air Force.

Test and Evaluation (\$ in Millions)				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	C/CPAF	Not specified. : TBD	-	-		3.062	Oct 2021	-		-		-	Continuing	Continuing	-
Development and Operation Testing support	C/CPIF	Not specified. : NV	-	-		8.933	Oct 2021	-		-		-	Continuing	Continuing	-
Subtotal			-	-		11.995		-		-		-	Continuing	Continuing	N/A

Remarks
 Test and Evaluation Cost include all ATS modernization and technology insertion to include but not limited to the environmental testing of the Bomber Armament Tester and operational testing of the test program sets for the B-2 and most complex B-1 and B-52.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.418	15.445	16.664	-	16.664	Continuing	Continuing	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0701212F / <i>Automated Test Systems</i>	Project (Number/Name) 6506TE / <i>Test And Evaluation Support Budget Authority</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Automatic Test Systems</i>				
BAT Milestone C Decision	4	2022	4	2022
Inc 2 EMD B-1B TPS	3	2021	1	2023
Inc 3 EMD B-52 TPS	1	2023	1	2025
TPS FIAT (PCA/FCA)	3	2021	2	2022
CAPRE Block 40/50 Design Development Gates	1	2021	3	2021
DT/OT	1	2021	4	2021
CAPRE Block 30 Design Development Gates	1	2021	1	2021
CAPRE DT/OT AAG LEGACY PLATFORMS	1	2024	4	2025
CAPRE LEGACY AAG DEVELOPMENT GATE	1	2024	4	2025
Test System Modernization	1	2026	4	2027

Note

Bomber Armament Tester (BAT) is a nuclear certified common tester capable of testing on-aircraft Stores Management Systems and Line Replacement Units both on- and off-aircraft. The BAT System will test functionality of the Armament Mission Equipment (AME) that is required for B-2A, B-1B, and B-52H weapons delivery. The BAT schedule reflects Increments I, II, AND III. Due to an increase in material cost and lack of access to needed Government Furnished Property (GFP) to the Original Equipment Manufacturer (OEM), the BAT program is experiencing major schedule delays which is causing the program to overrun the projected cost. Program re-baselined at the beginning of FY21 to stabilize program costs and schedule.

FY22 funds will be used for Engineering & Manufacture Design (EMD) phases for Increments I, II, and III. Without FY22 3600 funding, EMD and integration will be stopped, and BAT development and integration will be further delayed.

The Common Aircraft Portable Reprogramming Equipment (CAPRE) Secure Memory Loader Verifier (SMLV) a is government designed and developed memory loader verifier (MLV) to replace the aging F-16 unique MLV and legacy CAPRE equipment. FY22 funds will be used for Engineering & Manufacture Design (EMD) of the CAPRE SMLV to ensure a cyber-secure MLV to maximize readiness for 18 platforms.