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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 0604200F / <i>Future Advanced Weapon Analysis & Programs</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	-	22.478	18.499	9.879	0.000	9.879	9.735	9.653	36.459	250.749	0.000	357.452
653133: <i>Armament Subsystems</i>	-	22.478	18.499	9.879	0.000	9.879	9.735	9.653	36.459	250.749	0.000	357.452
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This program enables Air Force level capability planning activities by supporting requirements generation and executing requirements/cost tradespace analysis. These classified and unclassified activities provide studies or responsive design and development engineering infrastructure to address emerging gaps and technology insertion/technology needs on legacy systems, and supports analysis to develop new capability systems, or determine feasibility by conducting prototypes with advanced technology. In addition, activities explore new concept development and analysis in response to stakeholder engagements, technology transitions, experimentation, fieldable demonstrations, and the delivery of quick reaction solutions. Efforts will identify methods to improve system performance, develop potential future designs, mitigate evolving threats, reduce life cycle costs, develop/expand modeling/simulation and experimental platforms for weapon qualification activities, improve safety, identify technology gaps, and ensure both viability and durability of future tactical weapon acquisition programs. Results enable highly informed decisions on acquisition initiatives to develop, refine, and rapidly integrate emerging technologies into new weapons concepts or existing aircraft munitions which include, but are not limited to, multi-role missile development, advanced long-range weapon capabilities, advanced propulsion systems technologies, non-kinetic and directed energy technologies, warheads, fuzes, and tailkits to address warfighter, Air Staff and OSD initiatives and strategies.

This program transitions innovative ideas and technologies to the warfighter via the execution of experimentation campaigns, flight demonstrations and rapid response technology deliveries. This program implements the Digital Acquisition tenants of Open, Agile, and Digital in support of all Air Force weapons. Conduct high fidelity Modeling, Simulation and Analysis (MS&A) to support the development, testing and evaluating of future concept and legacy weapons. The MS&A work includes physics-level, engineering-level, and engagement/mission-level modeling, simulation and analysis.

In order to accomplish the above objectives, this program may accomplish pre-acquisition planning and systems engineering, risk reducing prototype missile design work, aircraft integration, prototype ground & flight tests, pre-planning and execution of Joint Capability Technology Demonstrations (JCTD), development and prototyping of threat emulations, simulations, presentation of evolving threat scenarios, target area environments to prepare for emerging weapons development activities, maintenance of appropriate IT and security constructs and program management support.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY21 \$0 was expended for civilian pay expenses in this program element, and in FY22 \$0 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. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	22.894	23.499	0.000	0.000	0.000
Current President's Budget	22.478	18.499	9.879	0.000	9.879
Total Adjustments	-0.416	-5.000	9.879	0.000	9.879
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-5.000			
• 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	-0.416	0.000			
• Other Adjustments	0.000	0.000	9.879	0.000	9.879

Change Summary Explanation

FY2022 Congressional reduction of \$5M for Execution

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

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

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Capability Strategy Development	13.790	9.475	5.913	-	5.913
Description: Plans and executes early Systems Engineering, concept studies, trade space analyses, modeling & simulation, portfolio acquisition planning, agile acquisition strategies, and risk reduction activities for future advanced weapon systems to defeat evolving threat scenarios and environments. Provides security, workspace/seating, and information technology capabilities to support mission needs. Collaborate with all program stakeholders to develop technical and investment strategies for future weapons.					
FY 2022 Plans: Conduct requirements analysis for Air Superiority, Global Precision Attack, and Base Defense efforts. Evaluate industry implementation of kinetic weapon open system architecture for a candidate initiative. Collaborate with OSD (R&E), Army, and Navy to develop a common directed energy weapon open system architecture. Begin Trade Space Analysis Framework to characterize operational context and desired material system attributes for					

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C. Accomplishments/Planned Programs (\$ in Millions)										
<p>weapon related capability gaps. Provide weapon effectiveness analyses and capability development strategies to senior leaders for future weapons investment planning and wargames.</p> <p>FY 2023 Base Plans: Conduct experiments and demonstrations of kinetic and directed energy weapon concepts to prove feasibility and facilitate transition in air to air, long range strike, maritime strike and airbase defense mission areas. Evaluate industrial base implementation of agile acquisition initiatives like open systems architecture and digital engineering for future capabilities.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased due to a re-prioritization of program requirements.</p>						FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Title: Rapid Prototyping</p> <p>Description: Enables the conduct of rapid acquisition/prototyping efforts and Modeling, Simulation, and Analysis (MS&A) validated through integration of empirical data derived from prototypes and demonstrations, while shaped by stakeholder engagements.</p> <p>FY 2022 Plans: Prototyping of Global Precision Attack and Base Defense weapon concepts to demonstrate feasibility of key attributes. Begin coordination of test planning with key MAJCOM and COCOM stakeholders.</p> <p>FY 2023 Base Plans: Prototyping weapon concepts to demonstrate feasibility of key attributes and initiate test planning with key stakeholders.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased due to a re-prioritization of program requirements.</p>						2.868	4.644	2.288	-	2.288
<p>Title: Digital Foundation</p> <p>Description: Provides model-based systems engineering, modeling & simulation (M&S), data analysis tool suites, and associated software engineering expertise to support weapons capability strategy development and rapid prototyping. Provides Validation & Verification (V&V) of contractor M&S models and tools. Develops Guidance, Navigation, and Control (GNC) and weapon survivability analysis capabilities. Creates and maintains a searchable electronic weapons database. Develops and evaluates future weapon open system architectures and the employment of digital engineering tools to create future acquisition strategies.</p>						2.911	2.378	0.539	-	0.539

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
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FY 2022 Plans:
Maintain weapons analysis repository database. Continue updates to trade space analysis framework to enable online collaboration with other government agencies. Maintain developed digital foundation to support weapon capability strategy development. Conduct weapon lethality and survivability analyses.

FY 2023 Base Plans:
Conduct lethality analysis to support the development, testing, and evaluation of legacy and future weapon concepts. Work includes physics, engineering, engagement/mission level Modeling, Simulation and Analysis (MS&A) and efforts to characterize complex systems, provide independent analysis in mission areas such as long range strike.

FY 2022 to FY 2023 Increase/Decrease Statement:
Funding decreased due to a re-prioritization of program requirements.

Title: Industry Connectivity
Description: Enables Air Force outreach to small and large businesses to solicit innovative material solutions for future weapon initiatives. This includes planning and execution activities for the development of campaign analysis, rapid innovation events, communicating technology needs at industry conferences (i.e. Weapons Conference, Air Force Association Symposium), and evaluating industry submissions for innovative technologies. Demonstrate potential utility of innovative technologies from Small Business Innovation Research (SBIR) contracts, campaign analyses, experiments, and prototypes. Ensure alignment of S&T activities, acquisition efforts, and warfighter requirements for air-delivered munitions with Air Force, government, and industry stakeholders.

FY 2022 Plans:
Conduct annual AF Armament Futures Workshop, Innovation and Industry Day events for small and large businesses, and Threat Day. Develop future agendas based on participant feedback and informed by capability strategy development weapons roadmap activities.

FY 2023 Base Plans:
Demonstrate utility of innovative technologies for Small Business Innovation Research (SBIR) contracts, campaign analysis and experiments, as well as management of the digital outreach required to meet these objectives. Examine how new digital acquisition programs can meet air to air, long range strike, maritime strike

	2.909	2.002	1.139	0.000	1.139

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
and airbase defense mission areas to fulfill urgent warfighter requirements focusing on network collaborative autonomous, guidance and control, test and training, and direct attack. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased due to a re-prioritization of program requirements.					
Accomplishments/Planned Programs Subtotals	22.478	18.499	9.879	0.000	9.879

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

Remarks

E. Acquisition Strategy
Accomplish studies, analyses, concept development and engineering; efforts will be conducted using contracting strategies deemed most appropriate, generally using competitive contracts.

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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 0604200F / <i>Future Advanced Weapon A nalysis & Programs</i>	Project (Number/Name) 653133 / <i>Armament Subsystems</i>
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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			
Directed Energy Studies	MIPR	AFRL : Various	-	0.400	Jul 2021	0.000		0.000		-		0.000	0.000	0.400	-
Prototype Vehicle Development & Integration	C/Various	AFLCMC/EB : Eglin AFB, FL	-	1.261	May 2022	0.000	Jul 2022	1.051	Mar 2023	-		1.051	0.000	2.312	-
Affordable Mass & Concept Studies	C/TBD	TBD : TBD	-	0.430	Aug 2021	2.819	May 2022	3.966	Nov 2022	-		3.966	Continuing	Continuing	-
Future Weapons Open System Architecture	TBD	TBD : Various	-	1.201	Apr 2021	6.512	Mar 2022	0.250	Dec 2022	-		0.250	Continuing	Continuing	-
Subtotal			-	3.292		9.331		5.267		-		5.267	Continuing	Continuing	N/A

Support (\$ 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			
Systems Engineering & Studies Support	C/Various	AFLCMC/EB : Eglin AFB, FL	-	8.250	Jun 2021	2.802	Apr 2022	0.625	Dec 2022	-		0.625	0.000	11.677	-
Modeling & Simulation Licenses & Support	C/Various	AFLCMC/EB : Eglin AFB, FL	-	0.513	May 2021	0.350	Apr 2022	0.178	Nov 2022	-		0.178	0.000	1.041	-
Subtotal			-	8.763		3.152		0.803		-		0.803	0.000	12.718	N/A

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			
Government Test and Evaluation	MIPR	Various : Various	-	3.995	Apr 2021	0.000	Feb 2022	0.000		-		0.000	0.000	3.995	-
Subtotal			-	3.995		0.000		0.000		-		0.000	0.000	3.995	N/A

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

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Management Services (\$ 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			
Government Program Management Administration	Various	Various : Eglin AFB, FL	-	6.428	Dec 2020	6.016	May 2022	3.809	May 2023	-		3.809	0.000	16.253	-
Subtotal			-	6.428		6.016		3.809		-		3.809	0.000	16.253	N/A

Remarks
Includes A&AS contract, IT requirements, travel, and office supplies.

	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	-	22.478	18.499	9.879	-	9.879	Continuing	Continuing	N/A

Remarks

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

Capability Strategy Development	
Air Superiority, Global Precision Attack, and Base Defense Requirements Analyses	
Future Weapons Open System Architecture	
Trade Space Analysis Framework	
Rapid Prototyping	
Global Precision Attack Weapon Demos	
Base Defense Weapon Demos	
Digital Foundation	
Lethality, GNC & Survivability Modeling, Simulation and Analysis	
Analysis Database Repository	
Model-Based Systems Engineering Foundation	
Weapon Open System Architecture Built-In	
Industry Connectivity	
Futures Workshops, Concepts Studies	
Threat Day Events, Innovation Days	

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

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Capability Strategy Development				
Air Superiority, Global Precision Attack, and Base Defense Requirements Analyses	2	2021	4	2027
Future Weapons Open System Architecture	3	2021	4	2027
Trade Space Analysis Framework	2	2021	4	2027
Rapid Prototyping				
Global Precision Attack Weapon Demos	2	2021	4	2027
Base Defense Weapon Demos	2	2021	4	2027
Digital Foundation				
Lethality, GNC & Survivability Modeling, Simulation and Analysis	1	2021	4	2027
Analysis Database Repository	2	2021	3	2027
Model-Based Systems Engineering Foundation	1	2021	4	2027
Weapon Open System Architecture Built-In	1	2021	2	2027
Industry Connectivity				
Futures Workshops, Concepts Studies	1	2021	4	2027
Threat Day Events, Innovation Days	2	2021	2	2027