Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force											Date: March 2024	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603680F / *Manufacturing Technology Program*							
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	-	261.998	44.422	34.730	0.000	34.730	38.494	44.345	46.978	47.293	Continuing	Continuing
635280: *Manufacturing Technologies*	-	261.998	44.422	34.730	0.000	34.730	38.494	44.345	46.978	47.293	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program executes technical efforts to develop and maintain an affordable and reliable industrial base and manufacturing capability responsive to Department of the Air Force warfighter needs. The program develops and improves manufacturing technologies and processes to reduce transition risk, enable cost reduction, improve component and system quality, increase readiness and affordable mission availability, enhance industrial capability, and promote transformation through the industrial base. Value stream modifications and manufacturing throughput improvements are implemented to shorten weapon system cycle times during design, development, production, and sustainment. Cost savings are realized through early engagement with stakeholders to promote producible designs, ensuring the industrial base will be ready to manufacture at the needed quantities. Manufacturing technologies objectives are conducted through industrial partnerships that enable targeted investment of manufacturing technologies and reduce risk in the industrial supply chain for existing weapon system upgrades and new warfighter systems. Efforts in the program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver science & technology capabilities. The use of program funds in this PE would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602020F, 0602102F, 0602201F, 0602202F, 0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 1206601SF, and 0602298F.

This program element may include necessary expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

This program is in Budget Activity 3, Advanced Technology Development because this budget activity includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.

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B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	270.959	44.422	44.256	0.000	44.256
Current President's Budget	261.998	44.422	34.730	0.000	34.730
Total Adjustments	-8.961	0.000	-9.526	0.000	-9.526
• 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	-7.051	0.000			
• Other Adjustments	-1.910	0.000	-9.526	0.000	-9.526

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: 635280: *Manufacturing Technologies*		
Congressional Add: *Program increase - technologies to repair fastener holes*	4.870	0.000
Congressional Add: *Program increase - manufacturing technology for reverse engineering*	4.870	0.000
Congressional Add: *Program increase - thermal protection systems for hypersonics*	9.740	0.000
Congressional Add: *Program increase - academic-industry partnerships for advanced materials and manufacturing processes*	5.844	0.000
Congressional Add: *Program increase - adaptive modeling for low-cost titanium*	4.870	0.000
Congressional Add: *Program increase - beryllium additive manufacturing*	2.922	0.000
Congressional Add: *Program increase - MRO advanced process technology development*	9.740	0.000
Congressional Add: *Program increase - virtual augmented mixed reality readiness*	7.792	0.000
Congressional Add: *Program increase - affordable manufacture of resistive films*	9.740	0.000
Congressional Add: *Program increase - rapid large format metal additive manufacturing to optimize scramjet production*	7.305	0.000
Congressional Add: *Program increase - additive manufacturing qualification*	4.870	0.000
Congressional Add: *Program increase - composites for advanced air mobility*	9.740	0.000
Congressional Add: *Program increase - digital engineering work cell*	4.870	0.000
Congressional Add: *Program increase - gallium oxide for high power electronics*	4.870	0.000
Congressional Add: *Program increase - vertical integration of scramjet supply chain*	9.740	0.000

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Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Congressional Add: *Program increase - low-cost rapid aerospace fabrication technology*	6.331	0.000
Congressional Add: *Program increase - smart manufacturing digital thread initiative*	9.740	0.000
Congressional Add: *Program increase - trusted metal additive manufacturing*	9.740	0.000
Congressional Add: *Program increase - additive manufacturing industrial base and capability expansion*	9.740	0.000
Congressional Add: *Program increase - agile factory floor for depot sustainment*	5.162	0.000
Congressional Add: *Program increase - F-35 agnostic battery development*	9.545	0.000
Congressional Add: *Program increase - high temperature hypersonic aeroshell*	5.844	0.000
Congressional Add: *Program increase - large -scale metal 3D printing*	9.740	0.000
Congressional Add: *Program increase - low cost manufacturing methods for hypersonic vehicle components*	4.870	0.000
Congressional Add: *Program increase - tools and processes for affordable high temperature composites*	8.766	0.000
Congressional Add: *Program increase - nanocomposite coatings advanced research*	9.740	0.000
Congressional Add: *Program increase - digital engineering enabled workforce development*	6.818	0.000
Congressional Add: *Program increase - alternative domestic rubber production*	4.967	0.000
Congressional Add: *Program increase - hypersonic manufacturing capability and supply*	4.870	0.000
Congressional Add: *Program increase - advanced air mobility in NEO environment*	9.740	0.000
Congressional Add Subtotals for Project: 635280	217.396	0.000
Congressional Add Totals for all Projects	217.396	0.000

Change Summary Explanation

Decrease in FY 2025 funding is due to movement of some work to Unites States Space Force Research, Development, Test & Evaluation and re-prioritization to meet the nation's future security and due to re-prioritization to meet the nation's future security needs.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Affordable Mission Availability	14.328	13.327	11.088
Description: Develop and transition pervasive manufacturing technologies for affordable mission availability of Department of the Air Force components and systems.			
FY 2024 Plans:			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Continue advancing high demand specialized manufacturing technologies to develop cost effective conventional production, overhaul, and specialty material repair technologies to enable affordable sustainment of aircraft systems. Continue developing cost-effective manufacturing and repair processes to meet specific needs of Programs of Record and depots. Continue developing manufacturing methods to meet the needs of next generation hypersonic platforms. Continue developing and demonstrating the manufacturability of materials, processes and devices for command and control communication technologies, intelligence, surveillance and reconnaissance systems, and RF, digital and power management components. Continue manufacturing repair technologies for turbine engine components. Continue manufacturing technologies for high temperature sensors and windows. ***FY 2025 Plans:*** - Continue advancing high demand specialized manufacturing technologies to develop cost effective conventional production, overhaul, and specialty material repair technologies to enable affordable sustainment of aircraft systems. - Continue developing cost-effective manufacturing and repair processes to meet specific needs of Programs of Record and depots. - Continue developing manufacturing methods to meet the needs of next generation hypersonic platforms. - Continue developing and demonstrating the manufacturability of materials, processes and devices for command and control communication technologies, intelligence, surveillance and reconnaissance systems, and RF, digital and power management components. - Continue manufacturing repair technologies for turbine engine components. - Continue manufacturing technologies for high temperature sensors and windows. - In FY 2025 and beyond work in manufacturing for intelligence, surveillance and reconnaissance systems and high temperature components for space-based platforms will be accomplished in 3620F: Research, Development, Test & Evaluation, Space Force; Program 1206616SF: Space Advanced Technology Development/Demo; Project 633834: Project Integrated Space Technology Demonstrations; Effort: Manufacturing for Space Systems ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 decreased compared to FY 2024 by $2.239 million due to movement of $2.194 million of research to USSF program as shown in FY 2025 plans and due to decreased emphasis on repair technologies for turbine engines.			
Title: Advanced Manufacturing Technologies	20.723	22.211	14.787
Description: Develop and transition affordable advanced manufacturing for Department of the Air Force fielded and future platforms. ***FY 2024 Plans:*** Continue enabling and promoting advanced manufacturing processes, techniques, and equipment availability for reducing materiel acquisition, maintenance and repair costs. Continue developing and demonstrate intelligent robotics and digital			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
engineering concepts into manufacturing processes. Continue developing, demonstrating and evaluating additively manufactured aerospace components and subcomponents. Continue developing and demonstrating technologies enabling factory of the future, digital supply chain management, and industrial internet of things to provide improvements in production, delivery and support of warfighter capabilities. ***FY 2025 Plans:*** - Continue enabling and promoting advanced manufacturing processes, techniques, and equipment availability for reducing materiel acquisition, maintenance and repair costs. - Continue developing and demonstrating digital engineering concepts into manufacturing processes. - Continue developing, demonstrating and evaluating additively manufactured aerospace components and subcomponents. - Continue developing and demonstrating technologies enabling factory of the future, digital supply chain management, and industrial internet of things to provide improvements in production, delivery and support of warfighter capabilities. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 funding decreased compared to FY 2024 by $7.424 million. Funding decrease is due to re-prioritization to meet the nation's future security needs.			
Title: Manufacturing for the Future Force ***Description:*** Develop and transition manufacturing technologies that enable advanced technology solutions that will shape the future force across the air, space and cyberspace domains. Prior to FY2024 this effort was titled, "Manufacturing for Transformational Technologies." ***FY 2024 Plans:*** Continue development of high demand manufacturing technologies including low cost and attritable systems, thermal protection materials for high temperature applications and other manufacturing technologies geared toward realizing the future force and to provide a cost-imposing strategy against adversarial forces. ***FY 2025 Plans:*** - Continue development of high demand manufacturing technologies including low cost and attritable systems, thermal protection materials for high temperature applications and other manufacturing technologies geared toward realizing the future force and to provide a cost-imposing strategy against adversarial forces. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 funding decreased compared to FY 2024 by $0.029 million due to re-prioritization to meet the nation's future security needs.	9.551	8.884	8.855
Accomplishments/Planned Programs Subtotals	44.602	44.422	34.730

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	FY 2023	FY 2024
Congressional Add: Program increase - technologies to repair fastener holes ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	4.870	0.000
Congressional Add: Program increase - manufacturing technology for reverse engineering ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	4.870	0.000
Congressional Add: Program increase - thermal protection systems for hypersonics ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - academic-industry partnerships for advanced materials and manufacturing processes ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	5.844	0.000
Congressional Add: Program increase - adaptive modeling for low-cost titanium ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	4.870	0.000
Congressional Add: Program increase - beryllium additive manufacturing ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	2.922	0.000
Congressional Add: Program increase - MRO advanced process technology development ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - virtual augmented mixed reality readiness	7.792	0.000

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	FY 2023	FY 2024
FY 2023 Accomplishments: Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable		
Congressional Add: Program increase - affordable manufacture of resistive films ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - rapid large format metal additive manufacturing to optimize scramjet production ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	7.305	0.000
Congressional Add: Program increase - additive manufacturing qualification ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	4.870	0.000
Congressional Add: Program increase - composites for advanced air mobility ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - digital engineering work cell ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	4.870	0.000
Congressional Add: Program increase - gallium oxide for high power electronics ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	4.870	0.000
Congressional Add: Program increase - vertical integration of scramjet supply chain ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - low-cost rapid aerospace fabrication technology	6.331	0.000

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	FY 2023	FY 2024
FY 2023 Accomplishments: Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable		
Congressional Add: Program increase - smart manufacturing digital thread initiative ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - trusted metal additive manufacturing ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - additive manufacturing industrial base and capability expansion ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - agile factory floor for depot sustainment ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	5.162	0.000
Congressional Add: Program increase - F-35 agnostic battery development ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.545	0.000
Congressional Add: Program increase - high temperature hypersonic aeroshell ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	5.844	0.000
Congressional Add: Program increase - large -scale metal 3D printing ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - low cost manufacturing methods for hypersonic vehicle components	4.870	0.000

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	FY 2023	FY 2024
FY 2023 Accomplishments: Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable		
Congressional Add: Program increase - tools and processes for affordable high temperature composites ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	8.766	0.000
Congressional Add: Program increase - nanocomposite coatings advanced research ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Add: Program increase - digital engineering enabled workforce development ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	6.818	0.000
Congressional Add: Program increase - alternative domestic rubber production ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	4.967	0.000
Congressional Add: Program increase - hypersonic manufacturing capability and supply ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts ***FY 2024 Plans:*** Not applicable	4.870	0.000
Congressional Add: Program increase - advanced air mobility in NEO environment ***FY 2023 Accomplishments:*** Conducted Congressionally directed efforts. ***FY 2024 Plans:*** Not applicable	9.740	0.000
Congressional Adds Subtotals	217.396	0.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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E. Acquisition Strategy

N/A