Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force											Date: February 2020	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603199F / *Sustainment Science and Technology (S&T)*							
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	-	13.353	16.249	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
635351: *Technology Sustainment*	-	13.353	16.249	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program develops and demonstrates mature Air Force Research Laboratory (AFRL) sustainment technologies such as: materials, corrosion, maintenance/repair techniques, state awareness/non-destructive inspection, health management, life prediction, low observable materials and processes, composite materials and logistics for transition into fielded Air Force systems to reduce life cycle sustainment costs and increase readiness. Technologies matured and demonstrated impact affordability and availability of fielded aerospace weapon systems by reducing sustainment costs, extending service life, and maintaining mission readiness and capability. This program develops and demonstrates maintenance, life cycle management, and system/fleet decision making technologies that can be implemented to address operational sustainment issues and could influence future system sustainability decisions via risk reduction to support inclusion into new systems. Studies are conducted to analyze processes and methodologies for application of technologies to address sustainment issues across the force, identifying cross cutting applications for fielded systems, and opportunities for building in sustainability into future applications. This program also develops and demonstrates affordable advanced composites for aircraft structures of fielded and emerging systems. This includes studies, analysis, and tests for application of composites to address sustainment and affordability issues across the force. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) process to harmonize efforts and eliminate duplication.

In the FY 2021, the Air Force is consolidating its existing thirteen Advanced Technology Development (ATD), Research Development Test and Evaluation (RDT&E), Budget Activity 03 (BA 03) PEs into five new capability focused RDT&E BA 03 PEs to better align with the Air Force Science and Technology (S&T) Strategy signed by the SECAF in April 2019. This consolidation will improve and accelerate delivery of integrated transformational, multidisciplinary, collaborative technology solutions necessary to enable new Air Force warfighting capabilities that support of the National Defense Strategy. This new structure will provide the Air Force and Congress with a clearer understanding and increased transparency of integrated technology solutions and demonstrations key to enabling the Air Force future force design.

In FY 2021, the entirety of PE 0603199F, Sustainment Science and Technologies (S&T), and associated Project will be transferred to PE 0603030F, Air Force Foundational Development/Demos, as part of the Air Force RDT&E BA 03 PE consolidation in order to realign technology areas to better support the National Defense Strategy, Air Force Future Operating Concept, and Air Force S&T Strategy, April 2019. The Project and associated efforts will continue to be executed by the Air Force Research Laboratory Materials and Manufacturing Technology Directorate located in Wright-Patterson AFB, OH. This is an administrative realignment for consolidation, and not a new start.

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, 0602102F, 0602201F, 0602202F, 0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 1206601SF, and 0602298F.

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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.

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	15.150	16.249	16.938	0.000	16.938
Current President's Budget	13.353	16.249	0.000	0.000	0.000
Total Adjustments	-1.797	0.000	-16.938	0.000	-16.938
• 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	-0.471	0.000			
• Other Adjustments	-1.326	0.000	-16.938	0.000	-16.938

Change Summary Explanation

Decrease in FY 2019 in Other Adjustments of $1.326 million is due to realignment of funds to PE 0602212F to support Research and Development Projects, 10 U.S.C. Section 2363, an amendment to PL 110-417, 10 U.S.C. Section 2358 and 10 U.S.C. 2805(d)(1)(B).

Decrease in FY 2021 $16.938 million is due to the entirety of PE 0603199F, Sustainment Science and Technology (S&T), and associated Project being transferred to PE 0603030F, AF Foundational Development/Demos, as part of the Air Force RDT&E BA 03 PE consolidation to realign technology areas to better support the National Defense Strategy, Air Force Future Operating Concept, and the Air Force S&T Strategy, April 2019.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: System Health Management/Assessment Technologies	4.558	5.100	0.000
Description: Develop, demonstrate, and transition state awareness/system health management technologies. Conduct studies and analyses to design sustainability into future applications. The short-term tasks in this area are selected based on warfighter needs identified via a semi-annual, competitive process. ***FY 2020 Plans:*** Complete development of diagnostic system to assess aircraft wiring and avionics subsystems. Complete development of system to reduce maintenance requirements of carbon monoxide detection system. Continue health assessments capability development for fielded air/space/cyber systems and components. Continue development and demonstration of diagnostic technology airframe/			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
engine, launch vehicle, spacecraft, intercontinental ballistic missiles (ICBMs), and components. These efforts are in Air Force mission areas of Air, Space, and Cyber. Initiate new efforts based on competitive selection processes in FY 2019. ***FY 2021 Plans:*** In FY 2021, this work is performed under the System Health Management/ Assessment Technologies effort in PE 0603030F, AF Foundational Development/Demos, Project 635351, Technology Sustainment. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 decreased compared to FY 2020 by $5.100 million. Funding decreased due to the transfer and realignment of this work to the System Health Management/Assessment Technologies effort in PE 0603030F, AF Foundational Development/Demos, Project 635351, Technology Sustainment.			
Title: Prevention/Enhanced Maintainability Technologies	4.558	5.896	0.000
Description: Develop, demonstrate, and transition maintenance and sustainment technologies to improve component design, maintenance, replacement, and concepts for performance improvement and reduced maintenance burden. The short-term tasks in this effort are selected based on warfighter needs identified via a semi-annual, competitive process. ***FY 2020 Plans:*** Complete adaptive gaming concept development for maintainer training. Continue rapid repair requirements materials development for aircraft battle damage repair of advanced fighter aircraft. Continue advanced canopy technology development. Continue total body nondestructive evaluation system for outer mold line inspection of advanced fighter aircraft. Continue development of materials and processes to reduce maintenance burden on low observable systems. Continue efforts to demonstrate high reliability of repair and maintenance technologies to increase service time between maintenance actions. Continue to develop, demonstrate, and transition maintenance and sustainment technologies to improve component design, maintenance, repair, replacement, and concepts for maintainer training, extending part life, and reduced maintenance burden spanning Air Force mission areas of Air, Space, and Cyber. Initiate abrasion resistance coating development to protect composite material substrates for low observable systems. Initiate development on a flexible crack-blunting primer. Initiate development on a mid-temp flexible light weight radiation-absorbent material system. Initiate other new efforts based on competitive selection processes in FY 2019. ***FY 2021 Plans:*** In FY 2021, this work is performed under the Prevention/Enhanced Maintainability Technologies effort in PE 060303F, AF Foundational Development/Demos, Project 635351, Technology Sustainment. ***FY 2020 to FY 2021 Increase/Decrease Statement:***			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
FY 2021 decreased compared to FY 2020 by $5.896 million. Funding decreased due to the transfer and realignment of this work to the Prevention/Enhanced Maintainability Technologies effort in PE 060303F, AF Foundational Development/Demos, Project 635351, Technology Sustainment.			
Title: Management/Improved Reliability Technologies ***Description:*** Develop, demonstrate, and transition technologies to improve existing and new components, fleet management/ decision-making tools, and supply chain/sustainment infrastructure to decrease downtime and costs, and increase reliability. The short-term tasks in this effort are selected based on warfighter needs identified via a semi-annual, competitive process. ***FY 2020 Plans:*** Complete effort to assess and accurately determine B-2 exhaust liner thermal profile and structural environment, and demonstrate performance of exhaust structures coatings. Complete software development to increase speed and accuracy of solid rocket motor inspections to reduce sustainment costs and improve reliability. Continue system development to provide prognostic capabilities for avionics components and analysis techniques to extend engine component service life. Continue efforts to develop system fleet management decision-making tools, maintenance/repair data base technologies and techniques, and supply chain/ infrastructure approaches to reduce sustainment costs. These efforts span Air Force mission areas of Air, Space, and Cyber. Initiate new efforts based on competitive selection processes in FY 2019. ***FY 2021 Plans:*** In FY 2021, this work is performed under the Management/Improved Reliability Technologies in PE 0603030F, AF Foundational Development/Demos, Project 635351, Technology Sustainment. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 decreased compared to FY 2020 by $5.253 million. Funding decreased due to the transfer and realignment of this work to the Management/Improved Reliability Technologies effort in PE 0603030F, AF Foundational Development/Demos, Project 635351, Technology Sustainment.	3.547	5.253	0.000
Title: Composite Certification ***Description:*** Develop, demonstrate and transition reliability-based design of advanced composites for aircraft structures. This includes studies and analysis of processes and methodologies for application of composites to address sustainment and affordability issues across the force. ***FY 2020 Plans:***	0.690	0.000	0.000

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Starting in FY 2020, Composite Certification activities will be performed under the Advanced Aerospace Structure Technologies effort in PE 0603211F, Aerospace Technology Dev/Demo, Project 634920, Flight Vehicle Technology Integration in order to integrate engineering efforts for transition. ***FY 2021 Plans:*** Not applicable ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Not applicable			
Accomplishments/Planned Programs Subtotals	13.353	16.249	0.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A