Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force												Date: May 2021
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	14.376	16.902	21.057	0.000	21.057	-	-	-	-	-	-
635351: *Technology Sustainment*	-	14.376	16.902	21.057	0.000	21.057	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 Department of the 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.

The Department of the Air Force technologies in this program are both enabling and enduring as we invest in maturing emerging technologies that address established mission gaps, and transformational technologies that address integrated enterprise capabilities intended to reshape the future force across air, space, and cyber warfighting domains. Development of transformational operational capabilities through advanced technology solutions focuses on five strategic capabilities: Global Persistent Awareness; Resilient Information Sharing; Rapid, Effective Decision-Making; Complexity, Unpredictability, and Mass; and Speed and Reach of Disruption and Lethality.

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.

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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	16.249	0.000	0.000	0.000	0.000
Current President's Budget	14.376	16.902	21.057	0.000	21.057
Total Adjustments	-1.873	16.902	21.057	0.000	21.057
• Congressional General Reductions	0.000	-0.031			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	16.933			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.571	0.000			
• Other Adjustments	-1.302	0.000	21.057	0.000	21.057

Change Summary Explanation

Increase in FY 2022 is due to increase emphasis in transformational sustainment technologies for fielded and future systems.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: System Health Management/Assessment Technologies	4.512	5.510	0.000
Description: Develop, demonstrate, and transition state awareness/system health management technologies. Conduct studies and analyses to design sustainability into future Department of the Air Force applications. The short-term tasks in this area are selected based on warfighter needs identified via a semi-annual, competitive process. ***FY 2021 Plans:*** Completed the development of a system to reduce maintenance requirements of carbon monoxide detection system. Completed health assessments and capability development for fielded air/space/cyber systems and components. Completed development and demonstration of diagnostic technology airframe/engine, launch vehicle, spacecraft, intercontinental ballistic missiles (ICBMs), and components. ***FY 2022 Plans:*** Technical work on this effort completed in FY 2021. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding decreased compared to FY 2021 by $5.510 million. Funding decreased due to completion of effort and an increased emphasis on transformational technologies.			
Title: Prevention/Enhanced Maintainability Technologies	5.216	5.885	5.854

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Develop, demonstrate, and transition maintenance and sustainment technologies to improve component design, maintenance, replacement, and concepts for performance improvement and reduced maintenance burden for the Department of the Air Force. Short term tasks in this effort are selected based on warfighter needs identified via a semi-annual, competitive process. ***FY 2021 Plans:*** Continue rapid repair and 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. Continue to develop abrasion resistance coating to protect composite material substrates for low observable systems. Continue to develop a flexible crack-blunting primer. Initiate other new efforts based on competitive selection processes in FY 2020. ***FY 2022 Plans:*** Continue rapid repair and 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 Department of the Air Force mission areas of Air, Space, and Cyber. Continue to develop abrasion resistance coating to protect composite material substrates for low observable systems. Continue to develop a flexible crack-blunting primer. Initiate other new efforts based on competitive selection processes in FY 2021. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decreased compared to FY 2021 by $0.031 million. Funding decreased due to plans described above.			
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.	4.648	5.507	5.477

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: 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 2020. ***FY 2022 Plans:*** 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 database technologies and techniques, and supply chain/infrastructure approaches to reduce sustainment costs. These efforts span Department of the Air Force mission areas of Air, Space, and Cyber. Initiate new efforts based on competitive selection processes in FY 2021. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 decreased compared to FY 2021 by $0.030 million. Funding decreased due to the plans described above.			
Title: Transformational Technology Development ***Description:*** Continually funded effort. This funding allocation is to provide funding to start new and continue Transformational Technology Developments. The Transformational Technology Development program will select new projects, in alignment with mission focused areas which include, but are not limited to: Intelligent Planning and Wargaming; Battlespace Awareness; Integrated Base Defense; and Hypersonic Multi-Mission Aircraft. Investments focus on technology development efforts including, but are not limited to: materials, corrosion, maintenance/repair techniques, state awareness/non-destructive inspection, health management, life prediction, low observable materials and processes, composite materials and logistics technologies that affect mission availability. This investment is overseen by senior representatives from Air and Space Forces who participate in the submission, initial review, and down-selection of Transformational Technology Development proposed efforts. Final selections will be reviewed by the Air Force Deputy Assistant Secretary for Science, Technology, and Engineering before a final recommendation for Congressional approval is made. ***FY 2021 Plans:*** Not applicable ***FY 2022 Plans:*** Fund the follow-on efforts for projects started in FY 2021. Select Transformational Technology Development efforts that support the National Defense Strategy and Department of the Air Force priorities. ***FY 2021 to FY 2022 Increase/Decrease Statement:***	-	0.000	9.726

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2022 increased compared to FY 2021 by 9.726 million. Funding is increased due to additional emphasis in transformational activities.			
Accomplishments/Planned Programs Subtotals	14.376	16.902	21.057

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A