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 0603203F / *Advanced Aerospace Sensors*							
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	-	35.354	48.046	37.935	0.000	37.935	32.605	45.149	46.468	47.439	Continuing	Continuing
63665A: *Advanced Aerospace Sensors Technology*	-	15.108	29.373	31.268	0.000	31.268	25.771	38.303	39.372	40.195	Continuing	Continuing
6369DF: *Target Attack and Recognition Technology*	-	20.246	18.673	6.667	0.000	6.667	6.834	6.846	7.096	7.244	Continuing	Continuing

A. Mission Description and Budget Item Justification

The program develops and demonstrates advanced technologies for electro-optical sensors, radar sensors and electronic counter-countermeasures, and components and algorithms. It also develops and demonstrates radio frequency (RF) and electro-optical (EO) sensors for detecting, locating, and targeting airborne, fixed, and time-critical mobile ground targets obscured by natural or man-made means. This program develops the means to find, fix, target, track, and engage air and ground targets anytime, anywhere, and in any weather. This program creates and applies artificial intelligence toolsets to ensure an asymmetric advantage for the Department of the Air Force. The program demonstrates artificial intelligence enabled autonomy to augment cognitive capabilities of our Airmen and Guardians so they can keep up with the faster pace and increased complexity of warfare. This program has been coordinated through the Department of Defense Science and Technology Executive Committee 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 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 expenses to support the operation and maintenance of facilities to manage, execute, and deliver science and technology capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver science and 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, 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.

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 0603203F / *Advanced Aerospace Sensors*

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	37.917	48.046	49.880	0.000	49.880
Current President's Budget	35.354	48.046	37.935	0.000	37.935
Total Adjustments	-2.563	0.000	-11.945	0.000	-11.945
• 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	-1.083	0.000			
• Other Adjustments	-1.480	0.000	-11.945	0.000	-11.945

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: 6369DF: *Target Attack and Recognition Technology*		
Congressional Add: *Modular open autonomous software testing*	5.517	-
Congressional Add Subtotals for Project: 6369DF	5.517	-
Congressional Add Totals for all Projects	5.517	-

Change Summary Explanation

Decrease in FY 2025 funding is due to re-prioritization to meet the nation's future security needs.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603203F / *Advanced Aerospace Sensors*	Project (Number/Name) 63665A / *Advanced Aerospace Sensors Technology*	

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
63665A: *Advanced Aerospace Sensors Technology*	-	15.108	29.373	31.268	0.000	31.268	25.771	38.303	39.372	40.195	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project area develops and demonstrates aerospace sensor and processing technologies for intelligence, surveillance, reconnaissance, target, and attack radar applications in both manned and unmanned platforms, including electro-optical sensors and electronic counter-countermeasures for radars. It provides aerospace platforms with the capability to precisely detect, track, and target both airborne (conventional and low radar cross-section) and ground-based, high-value, time-critical targets in adverse clutter and jamming environments. Project activities include developing multi-function radio-frequency systems including radar and electronic warfare technology and the position and timing information to enable distributed sensing. Desired warfighting capabilities include the ability to detect concealed targets in difficult background conditions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Passive/Multi-Mode Sensing ***Description:*** Develop advanced techniques and prototype passive radio frequency sensors to intercept, collect, locate and track enemy radio frequency sensor systems for intelligence, surveillance and reconnaissance of air and ground targets. ***FY 2024 Plans:*** In FY 2024 technical work from this effort has been realigned to Program Advanced Aerospace Sensors, 0603203F; Project Advanced Aerospace Sensors Technology, 63665A; Multi-Spectrum Sensing Demonstration effort. ***FY 2025 Plans:*** Not Applicable ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Not Applicable	9.438	0.000	0.000
Title: Triple Raven Advanced Technology Demonstration ***Description:*** Advance, demonstrate, and transition innovative imaging and non-imaging optical sensing technologies for surveillance and reconnaissance of airborne and ground-based objects of interest in an anti-access/area denial environment. This effort includes the development of systems, subsystems, and components necessary to yield new capabilities. ***FY 2024 Plans:***	5.670	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603203F / *Advanced Aerospace Sensors*	**Project (Number/Name)** 63665A / *Advanced Aerospace Sensors Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
In FY 2024 technical work from this effort has been realigned to Program Advanced Aerospace Sensors, 0603203F; Project Advanced Aerospace Sensors Technology, 63665A; Multi-Spectrum Sensing Demonstration effort. ***FY 2025 Plans:*** Not Applicable ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Not Applicable			
Title: Multi-Spectrum Sensing Demonstration ***Description:*** Develop and demonstrate new techniques for finding and identifying critical mobile targets (both land and maritime) in a highly contested environment. Bring together multi-domain electro-optical/infrared and radio frequency technologies suitable for the contested environment, in conjunction with advanced processing and algorithms to provide for decision-making at the edge. Multiple sensing modalities may be deployed on the same platform or on separate platforms to improve survivability and flexibility. A focus is on providing actionable information to a user making a decision for future actions, such as strike. The effort will conduct a robust demonstration showing how the techniques enable combat operations, emphasizing resilience and tactically-relevant persistence. ***FY 2024 Plans:*** Initiate investigation of employment concepts for penetrating intelligence, surveillance and reconnaissance, and strike to bound platforms along with their costs and available payloads. Initiate definition of options for electro-optical/infrared sensors drawing on prior work on low cost, size, weight, and power sensors and algorithms. Initiate work on an attritable laser radar sensor based on prior multi-mode laser radar work. Initiate definition of options for radio frequency sensors and techniques drawing on prior work on low-cost multi-function radio frequency sensors and distributed radio frequency techniques. Initiate planning for experiments to refine distributed radio frequency techniques. Initiate investigation into paths to bring legacy sensors into compliance with Department of Defense and Department of the Air Force open interface standards. Initiate stand up a hardware/software integration lab to verify open standard compliance. Continue to leverage prior work on sensor fusion to initiate a focused effort on fusion in support of command and control to engage surface (ground and maritime) targets. ***FY 2025 Plans:*** - Continue to refine employment concepts for penetrating intelligence, surveillance and reconnaissance, and strike to bound platforms along with their costs and available payloads. - Continue development of electro-optical/infrared sensors and algorithms balancing performance with cost, size, weight, and power. - Continue development and packaging of an attritable laser radar sensor based on prior multi-mode laser radar work. - Continue development of radio frequency sensors and techniques.	0.000	14.373	10.995

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603203F / *Advanced Aerospace Sensors*	**Project (Number/Name)** 63665A / *Advanced Aerospace Sensors Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
- Continue to refine experiments that will demonstrate multi-phenomenology sensor capability. - Continue to refine distributed radio frequency techniques. - Continue sensor upgrades that bring them into compliance with Department of Defense and Department of Air Force open interface standards. - Continue open standard compliance verification effort through use of hardware/software integration labs. - Continue to leverage prior work on sensor fusion to initiate a focused effort on fusion in support of command and control to engage surface (ground and maritime) targets. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 decreased compared to FY 2024 by $3.378 million due to re-prioritization to meet the nation's future security needs.			
Title: Surface Targets Sense-Making	0.000	15.000	10.851
Description: Provides real-time multi-domain battlespace awareness in highly contested environments. Develops and demonstrates autonomous cross-domain, cross-platform integrated software and hardware capabilities that enables Intelligence, Surveillance, and Reconnaissance, against high value maritime targets, in unmanned airborne systems at the tactical edge in communications degraded and denied environments. Fusion of information from multiple sources with on-board and local sensors to provide higher fidelity battlespace awareness information to the joint force as part of the Sensing Grid feed to the Joint All Domain Command and Control capability. Leverages Open Mission Systems and Sensor Open Systems Architectures to maximize platform compatibility. ***FY 2024 Plans:*** Initiate assessment and selection of surface sensing and sense-making capabilities to provide multi-modal surface target classification. Initiate assessment and selection of sensing autonomy capabilities that will enable multi-modal and distributed sensor resource management that will optimize the tracking and identification of high value surface targets. Initiate the expansion of existing Modeling, Simulation, and Analysis products to represent the maritime scenario of interest and enable the necessary assessment of system design trades and associated Model Based System Engineering activities. Initiate algorithm development of mission autonomy solutions that would enable the orchestration of unmanned airborne systems for ISR support to maintain custody of high value maritime targets. Initiate the algorithm development of advanced analytics to forecast the behavior of priority surface targets. Initiate software and hardware integration of contributing algorithms into the Systems Integration Laboratory/Hardware Integration Laboratory. Initiate investigation into the optimization of existing interfaces with off-board systems connected to Joint All Domain Command and Control enterprise to enable the sharing of relevant Multi-Intelligence/Multi-Domain data sources. Initiate advanced hardware purchases for multi-platform Live, Virtual, and Constructive testing and operational experimentation. Initiate transition analysis, planning and documentation of the overall system to a transition partner. ***FY 2025 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603203F / *Advanced Aerospace Sensors*	**Project (Number/Name)** 63665A / *Advanced Aerospace Sensors Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
- Continue assessment and selection of surface sensing and sense-making capabilities of multi-modal surface target classification as appropriate, based on knowledge gained in the previous year. - Continue selection of sensing autonomy capabilities enabling multi-modal and distributed sensor resource management for optimized tracking and identification of high value surface targets. - Continue expansion of Modeling, Simulation, and Analysis products to represent the maritime scenario of current interest enabling the necessary assessment of system design trades. - Continue to capture knowledge and design information using Model Based System Engineering. - Continue algorithm development of mission autonomy solutions as appropriate enabling the orchestration of unmanned airborne systems for ISR support to maintain custody of critical maritime targets. - Continue development of advanced analytics to forecast the behavior of surface targets. - Continue software and hardware integration and test in the Systems Integration Laboratory/Hardware Integration Laboratory. - Continue investigation into existing interfaces with off-board systems connected to Joint All Domain Command and Control enterprise by focusing attention on the sharing of relevant Multi-Intelligence/Multi-Domain data sources in both directions. - Continue development of multi-platform Live, Virtual, and Constructive testing and operational experimentation. - Continue transition analysis, planning and documentation of the overall system to a relevant partner. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 decreased compared to FY 2024 by $4.149 million due to re-prioritization to meet the nation's future security needs.			
Title: Integrated Sensing Demonstration	0.000	0.000	9.422
Description: Integrate emerging technologies to demonstrate enhanced forward air-layer air base defense capabilities. Goal is to improve surveillance, shorten reaction time, and to apply a range of effects at precise points to provide early warning and enable defensive measures. FY 2025 funding for the technical work for this effort was realigned from Program Advanced Aerospace Sensors, 0603203F; Project Target Attack and Recognition Technology, 6369DF; Integrated Sensing Demonstration effort. ***FY 2024 Plans:*** In FY 2024, this effort was aligned to Program 0603203F, Advanced Aerospace Sensors, Project 6369DF, Target Attack and Recognition Technology, Integrated Sensing Demonstration effort. ***FY 2025 Plans:*** - Continue integration of chosen technologies onto demonstration platform. - Initiate experiments to characterize integrated technologies. - Continue use of mission level modeling and model-based systems engineering to provide quantifiable data to drive towards solution sets that provide leading capabilities. ***FY 2024 to FY 2025 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603203F / *Advanced Aerospace Sensors*	**Project (Number/Name)** 63665A / *Advanced Aerospace Sensors Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 increased compared to FY 2024 by $9.422 million. Funding increased as a result of the transfer of funding and technical effort from Program 0603203F, Advanced Aerospace Sensors, Project 6369DF, Target Attack and Recognition Technology, Integrated Sensing Demonstration effort to this effort.			
Accomplishments/Planned Programs Subtotals	15.108	29.373	31.268

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603203F / *Advanced Aerospace Sensors*	Project (Number/Name) 6369DF / *Target Attack and Recognition Technology*	

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
6369DF: *Target Attack and Recognition Technology*	-	20.246	18.673	6.667	0.000	6.667	6.834	6.846	7.096	7.244	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project area develops and demonstrates advanced technologies for closed-loop, multi-domain, multi-intelligence sources, multi-platform, multi-sensor automation and autonomy, providing capabilities in battle management, fire control, battlespace awareness and visualization, predictive analytics, target recognition, sensor and information fusion, and sensor / platform asset tasking. This project also conducts advanced investigations to determine solution credibility, in terms of underlying technology and in terms of consistency with future Air Force missions within highly contested environments. This project includes robust techniques to support intelligence, surveillance, and reconnaissance and targeting missions within adverse weather conditions and against adversaries employing deceptive techniques. This project includes development of software-intensive solutions suitable for cloud-based integration and for development/operations-like operational environments. This project develops technology for effective management of online and offline information sources incorporating both constrained and cooperative sensing. This project has been realigned to better reflect technical areas being emphasized such as autonomy, multi-domain and multi-sensor information processing, leverage of machine learning developments and enterprise-level modeling, simulation and analysis.

This project includes the initiation and development of programs addressing DAF capability gaps and provides technologies for transformational future force capabilities. Transformational efforts will be identified through a competitive process and be responsive to DAF design priorities. Selected efforts will be designated as transformational, indicating enterprise-level priority.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Multidomain Analytic Development - Evolution	13.006	0.000	0.000
Description: Develop enabling capabilities and technical know-how required for Department of the Air Force multi-domain command and control within highly contested environments through closed-loop central and decentralized sensing for battle management, automated onboard systems that use complex reasoning for situational awareness (SA) leading "intelligent" response, executive reasoning for selectable re-planners that provide task allocation. Use of shared models with both onboard reasoners and mission simulation and evaluation. Built with government-owned scalable closed-loop algorithms.			
FY 2024 Plans: FY 2024 funding the technical work from this effort has been realigned to Program Advanced Aerospace Sensors, 0603203F; Project Target Attack and Recognition Technology, 6369DF; Integrated Sensing Demonstration and Autonomous Capability for Air Defense efforts.			
FY 2025 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603203F / *Advanced Aerospace Sensors*	**Project (Number/Name)** 6369DF / *Target Attack and Recognition Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Not Applicable ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Not Applicable			
Title: Resilient & Agile Mission Systems Architecture ***Description:*** This project performs advanced development and demonstration of methods, technologies, and tools to enable resilience and protect mission systems against threats. This involves open and adaptable architectures for rapid integration and agile systems, cyber protections and resilience technologies to protect against threats. It integrates research efforts in electronic and cyber warfare to demonstrate novel operational capabilities through laboratory, field, and flight tests and experimentation. The goal is to reduce risk for rapid transition of novel operational capabilities into Air Force mission systems. ***FY 2024 Plans:*** FY 2024 funding and the technical work from this effort has been realigned to Program Advanced Aerospace Sensors, 0603203F; Project Target Attack and Recognition Technology, 6369DF; Integrated Sensing Demonstration and Autonomous Capability for Air Defense efforts. ***FY 2025 Plans:*** Not Applicable ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Not Applicable	1.723	0.000	0.000
Title: Integrated Sensing Demonstration ***Description:*** Integrate emerging technologies to demonstrate enhanced forward air-layer air base defense capabilities. Goal is to improve surveillance, shorten reaction time, and to apply a range of effects at precise points to provide early warning and enable defensive measures. ***FY 2024 Plans:*** Initiate development and integration of demonstrated Air Force Research Laboratory technologies, emerging commercial capabilities and program of record systems into a forward air-layer air base defense mission-focused capability. Employ mission level modeling and model-based systems engineering to provide quantifiable data to drive towards solution sets that provide leading capabilities. ***FY 2025 Plans:***	0.000	12.249	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603203F / *Advanced Aerospace Sensors*	**Project (Number/Name)** 6369DF / *Target Attack and Recognition Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
In FY 2025, this effort was realigned to Program 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, Integrated Sensing Demonstration effort. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 decreased compared to FY 2024 by $12.249 million. Funding decreased due to realignment of this effort to Program 0603203F, Advanced Aerospace Sensors, Project 63665A, Advanced Aerospace Sensors Technology, Integrated Sensing Demonstration effort.			
Title: Autonomous Capability for Air Defense ***Description:*** Design, develop and demonstrate an artificial intelligence tactical autopilot engaging in multi-ship/multi-role beyond visual range and intelligence, surveillance and reconnaissance combat operations with proficiency at or greater than Weapons School graduates. Design, develop and demonstrate an artificial intelligence-driven multi-platform/multi-domain sense-making, predictive analytics, and orchestration at the tactical edge to track/identify air and ground targets; Autonomous Air Combat Operations. ***FY 2024 Plans:*** Initiate integration and demonstration of edge sensing assets cued via centralized intelligence data on air threats. Initiate evaluation of on board fusion and predictive analytics to inform orchestration of attritable platforms into areas of interest. Initiate testing and evaluation of multi-platform resource managers to position assets for optimal sensing geometries. Initiate development of advanced autonomy algorithms using modern machine learning tools that control the aircraft, sensors, and weapons onboard manned and/or unmanned aircraft and perform operationally relevant combat tactics. ***FY 2025 Plans:*** - Continue demonstration of edge sensing assets cued via centralized intelligence data on air threats to support evaluation of performance via life flight tests. - Continue both evaluation and advancement of solution options for on board fusion and predictive analytics to inform orchestration of attritable platforms into areas of interest. - Continue testing and evaluation of multi-platform resource managers to position assets for optimal sensing geometries. - Continue development of advanced autonomy algorithms using modern machine learning tools that control the aircraft, sensors, and weapons onboard manned and/or unmanned aircraft and perform operationally relevant combat tactics. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 increased compared to FY 2024 by $0.243 million. Justification for this increase is described in plans above.	0.000	6.424	6.667
Accomplishments/Planned Programs Subtotals	14.729	18.673	6.667

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 3	**R-1 Program Element (Number/Name)** PE 0603203F / *Advanced Aerospace Sensors*	**Project (Number/Name)** 6369DF / *Target Attack and Recognition Technology*

	FY 2023	FY 2024
Congressional Add: Modular open autonomous software testing ***FY 2023 Accomplishments:*** Conduct Congressional directed efforts	5.517	-
Congressional Adds Subtotals	5.517	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable