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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>
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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	-	29.250	15.593	19.568	0.000	19.568	19.849	20.252	20.903	21.341	Continuing	Continuing
635323: <i>Directed Energy Bioeffects Parameters</i>	-	6.658	7.290	6.316	0.000	6.316	4.975	4.915	5.070	5.176	Continuing	Continuing
635324: <i>Biosciences Performance Demonstration</i>	-	3.613	0.346	2.979	0.000	2.979	4.231	3.935	5.046	5.152	Continuing	Continuing
635325: <i>Mission Effective Performance</i>	-	6.284	4.134	3.922	0.000	3.922	6.177	7.470	7.683	7.844	0.000	43.514
635327: <i>Warfighter Interfaces</i>	-	12.695	3.823	6.351	0.000	6.351	4.466	3.932	3.104	3.169	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program develops and demonstrates technologies to enhance Airman performance and effectiveness. State-of-the-science advances are made in warfighter training, warfighter system interfaces, directed energy bioeffects, deployment and sustainment of warfighters in extreme environments, and understanding and shaping adversarial behavior. The Directed Energy Bioeffects Parameters project develops, demonstrates, and transitions technologies to predict, evaluate, and mitigate the effects of directed energy on personnel and mission performance, and exploits the offensive capabilities of directed energy systems. The Biosciences Performance Demonstration develops, demonstrates, and transitions technologies to sustain airman performance in adverse operational and/or training environments, monitor and mitigate in-flight unexplained physiological events, and prevent human performance related mishaps through real-time monitoring and mitigation—particularly through highly automated or autonomous systems. The Mission Effective Performance project develops, demonstrates, and transitions advanced training, simulation, mission rehearsal, and other performance-aiding methods and technologies to enhance warfighter readiness. The Warfighter Interfaces project develops, demonstrates, and transitions technologies to revolutionize the way airmen synergistically use Air Force systems, including autonomous machines and adaptive teams of airmen and machines. Efforts in this program have been coordinated through the Department of Defense (DoD) Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

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 program element 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 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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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force **Date:** March 2024

Appropriation/Budget Activity	R-1 Program Element (Number/Name)
3600: <i>Research, Development, Test & Evaluation, Air Force I BA 3: Advanced Technology Development (ATD)</i>	PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>

B. Program Change Summary (\$ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	15.440	15.593	19.528	0.000	19.528
Current President's Budget	29.250	15.593	19.568	0.000	19.568
Total Adjustments	13.810	0.000	0.040	0.000	0.040
• 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	15.184	0.000			
• SBIR/STTR Transfer	-0.756	0.000			
• Other Adjustments	-0.618	0.000	0.040	0.000	0.040

Congressional Add Details (\$ in Millions, and Includes General Reductions)

	FY 2023	FY 2024
Project: 635324: <i>Biosciences Performance Demonstration</i>		
Congressional Add: <i>Critical Air Transport Technology Demonstration</i>	0.000	-
Congressional Add Subtotals for Project: 635324	0.000	-
Project: 635327: <i>Warfighter Interfaces</i>		
Congressional Add: <i>Automated Geospatial Intelligence Detection Algorithms</i>	5.000	0.000
Congressional Add Subtotals for Project: 635327	5.000	0.000
Congressional Add Totals for all Projects	5.000	0.000

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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 0603456F / <i>Human Effectiveness Advanced Technology Development</i>				Project (Number/Name) 635323 / <i>Directed Energy Bioeffects Parameters</i>			
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
635323: <i>Directed Energy Bioeffects Parameters</i>	-	6.658	7.290	6.316	0.000	6.316	4.975	4.915	5.070	5.176	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, demonstrates, and transitions technologies to predict, evaluate, and mitigate the effects of novel weapon systems on personnel and mission performance, and exploits the offensive capabilities of directed energy systems. This project develops the human components of the guidelines for testing, deployment, and protection from high-power microwave and high-energy laser systems and uses this information to inform design and enhance the effectiveness of these weapon systems in air, space, and cyber operations. This project develops tools and plug-ins that enhance mission and engagement models, provide predictive risk analysis for deployment of Directed Energy systems, and analyzes systems for use. This project develops tools and analysis techniques for counter directed energy weapon technologies. The effort also develops modeling and simulation tools to unite bioeffects and human performance models from across the Department of the Air Force in support of Digital Transformation initiatives.

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

	FY 2023	FY 2024	FY 2025
Title: Directed Energy Bioeffects	6.658	7.290	6.316
Description: This project combines two efforts into a single effort to better align the directed energy modeling simulation and analysis supporting both radio-frequency and laser bioeffects advanced demonstration. Develop and demonstrate modeling capabilities to assess collateral hazards from high power directed energy systems, including the use of probabilistic risk assessment techniques and analysis of system-level effects on the Airman. Develop and demonstrate counter directed energy weapons technologies for aircrew and ground personnel to provide protection against directed energy threats. United bioeffects and human performance models from across the Department of the Air Force in support of Digital Transformation initiatives.			
FY 2024 Plans: Continue to provide hazard analysis for directed energy and novel weapon systems under development. Continue maturation of high peak power radio frequency and laser human effects assessment models and tools to address real world concerns. Provide human based design requirements optimizing operational and mission performance for counter directed energy weapon technologies. Continue integration of radio frequency and optical radiation hazards and behavioral analysis into engagement-level modeling, simulation, and analysis tools for future transitions in mission-level tool suites to support formal studies and analyses. Continue development of integrated vision modeling libraries to optimize agile laser eye protection technologies. Integrate modeling and simulation capabilities into existing architectures for weaponeering and mission level analyses to enable holistic human performance modeling.			
FY 2025 Plans:			

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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 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635323 / <i>Directed Energy Bioeffects Parameters</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<ul style="list-style-type: none"> - Continue to provide hazard analysis for directed energy and novel weapon systems under development, demonstrating new validated capabilities for personnel hazard assessments. - Continue to demonstrate and integrate high peak power radio frequency and laser human effects assessment models and tools to address real world concerns. - Continue to provide human-based design requirements optimizing operational and mission performance for counter-directed energy weapon technologies. - Continue the integration of radio frequency and optical radiation hazards and behavioral analysis into engagement-level modeling, simulation, and analysis tools for future transitions in mission-level tool suites to support formal studies and analyses. - Continue development of integrated vision modeling libraries to optimize agile laser eye protection technologies. Integrate modeling and simulation capabilities into existing architectures for weaponeering and mission level analyses to enable holistic human performance modeling. - Continue Agile Laser Eye Protection analysis tool to develop and deliver an integrated modeling environment for optimizing devices for protecting eyes against optical radiation and mitigating the visual impact of those devices on airman interfaces, visual performance & operational effectiveness. - Complete directed energy human effects modules for wargaming scenarios and weaponeering tools. - Initiate Virtual Reality component for vision effects (Glare/Dazzle) through transition of laser dazzle simulations into operational applications. - Initiate development of library of Model-based Systems Engineering and constructive modules for building human digital twins and vulnerability models for host simulation environments, mission level models and wargame toolsets. <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 decreased compared to FY 2024 by \$0.974 million. Funding decrease due to reduced emphasis in directed energy human effects modules for wargaming scenarios and weaponeering tools.</p>				
Accomplishments/Planned Programs Subtotals		6.658	7.290	6.316
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Not applicable				

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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 0603456F / <i>Human Effectiveness Advanced Technology Development</i>				Project (Number/Name) 635324 / <i>Biosciences Performance Demonstration</i>			
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
635324: <i>Biosciences Performance Demonstration</i>	-	3.613	0.346	2.979	0.000	2.979	4.231	3.935	5.046	5.152	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project objective is to develop, demonstrate, and transition products that provide Airman-integrated capabilities to sustain, enhance, and augment airmen physical and cognitive performance under challenging and adverse operational and training mission environments. Integrate technical advances in molecular and synthetic biology, multi-omics, cognitive performance optimization, brain-machine interface, and application of non-invasive physiological and cognitive performance monitoring devices. Develop solutions to sense, assess, and mitigate impacts to airmen performance degradation including, but not limited to, unexplained physiological events, fatigue, injury, stressors (i.e. environmental, occupational, personal), and cognitive overload. Develop technologies to enhance and accelerate individual physical and cognitive ability to rapidly learn and acquire new mission skills and maintain proficiency of acquired skills. Develop technologies providing commanders real time status monitoring and assessment of individual's mission ready status and intervention protocols to accelerate restoral to combat readiness.

In FY 2025 Project 635324, Biosciences Performance Demonstration, changed from Human Dynamics and Terrain Demonstration.

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

	FY 2023	FY 2024	FY 2025
Title: Sensing and Assessment	1.941	0.000	0.000
Description: Develop advanced systems integrating biological, physiological, neural, environmental, and behavioral sensing capabilities with validated analytics and assessments to sustain and enhance Airman performance. Resulting products fall within three operational mission environments: (1) maintenance, (2) special operations/dismount forces, and (3) aircrew (cockpit). Emphasis is on maturing and transitioning platform integrated technologies that provide operator mission-specific performance sustainment and enhancement.			
FY 2024 Plans: There are no planned FY 2024 activities for the Sensing and Assessment Project. The project will complete all planned activities by end of FY 2023 and close out.			
FY 2025 Plans: Not Applicable			
Title: Human Performance Augmentation and Development	1.672	0.346	2.979
Description: Develop and demonstrate advanced prototype products that provide Air-integrated capabilities to provide decision advantage and enable Airman performance under cognitive and physiological stressors associated with prolonged, high tempo,			

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Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635324 / <i>Biosciences Performance Demonstration</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>and demanding mission scenarios as well as stressors associated with operations in adverse environments (i.e. high altitude, Arctic). Provide capabilities to assess in real-time the physical and cognitive state of operators and provide feedback and intervention capabilities to restore and enhance operator performance.</p> <p>FY 2024 Plans: Continue system development of a fatigue management system, Fatigue Optimized Cognition Under Stress (FOCUS). Integrate the FOCUS mobile device app with sensors monitoring both physical/cognitive biometrics and molecular biomarkers indicative of fatigue. Develop and fine tune models/algorithms utilizing the sensor data and self-assessment inputs to provide real-time feedback and intervention protocols to sustain and optimize cognitive performance per mission needs. Initiate testing, evaluation, and validation of a recommended caffeine dosing algorithm. Initiate initial field testing of the Gen 1 FOCUS app, integrated sensors, and data analytics. Complete interstitial fluid sensing analysis of operational and mission stressors.</p> <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue system development of a fatigue management system, Fatigue Optimized Cognition Under Stress. - Continue to refine the eye tracking-based fatigue assessment algorithm. - Continue integrating eye tracking-based fatigue assessment algorithm with the mobile/console mission application software. - Continue development of a secure, cloud-based data managements system to collect and analyze in-flight human performance physiologic data. - Initiate lab validation study of an initial eye tracking fatigue algorithm and a non-invasive form of neuromodulation, transcutaneous vagal nerve stimulation, as a counter-measure intervention for fatigue symptoms. <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$2.633 million. Funding increase due to added emphasis in fatigue and cognitive monitoring and counter-measure fatigue interventions.</p>			
Accomplishments/Planned Programs Subtotals	3.613	0.346	2.979

	FY 2023	FY 2024
Congressional Add: Critical Air Transport Technology Demonstration	0.000	-
FY 2023 Accomplishments: Congressionally directed effort (Critical Air Transport Technology Expansion) was moved from PE 0602202F / Human Effectiveness Applied Research, BPAC 625328 Biosciences Performance for execution.		
Congressional Adds Subtotals	0.000	-

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Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635324 / <i>Biosciences Performance Demonstration</i>

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable

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Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>				Project (Number/Name) 635325 / <i>Mission Effective Performance</i>			
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
635325: <i>Mission Effective Performance</i>	-	6.284	4.134	3.922	0.000	3.922	6.177	7.470	7.683	7.844	0.000	43.514
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, demonstrates, and transitions advanced training, simulation, mission rehearsal, and other performance-aiding methods and technologies to enhance warfighter readiness. This project also develops advanced methods and technologies to enable interactive Live-Virtual-Constructive blended environments for performance-aiding methods and technologies. Focus areas include integrated high-fidelity weapon systems training technologies for air, space, and cyber; tailored immersive simulation environments for airmen at the tactical and operational levels; and incorporation of performance assessment and feedback tools. These methods and technologies facilitate the development of mission-essential competencies.

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

	FY 2023	FY 2024	FY 2025
Title: Readiness	6.284	4.134	3.922
Description: Develop and demonstrate a secure, persistent, and standardized blended live-virtual-constructive operational test and training enterprise. Utilize modeling capabilities for technology demonstration efforts focused on developing software-based tools for managing training, tracking proficiency and readiness, and for training that would replace the human as adversaries and instructors.			
FY 2024 Plans: Continue using encrypted data specifications as part of the migration and integration of those data into an operational readiness data with user-specified data extraction and reporting formats. Continue integration of readiness measurement tools in all current training and readiness environments, to include augmented and virtual reality, part-task, full fidelity simulators, the Joint Simulation Environment, and operational range infrastructure. Continue conducting evaluations of higher fidelity software agent models integrated with live and virtual systems and their impact on the quality of training and exercise for a peer fight. Continue work to integrate, evaluate and demonstrate technologies to support multi-capable airmen with just-in-time-training and readiness support in deployed and austere mission contexts and locations. Initiate work integrating training management and data tracking tools and interfaces into the Synthetic Operational Test and Training Infrastructure. Continue field evaluations connecting big data and proficiency-based training infrastructure with operational event-based tracking and reporting systems. Continue systematic evaluations of proficiency-based live-virtual-constructive on operational readiness and more optimal mixes of live and virtual training and exercise. Initiate demonstrations of secure fighter integration blended training events in both research and operational locations, including The Five Eyes coalition partner venues. Initiate work to integrate Distributed Mission operations-and Joint			

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Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635325 / <i>Mission Effective Performance</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p>Simulation Environment-based architectures to support interoperable, peer-level training and rehearsal across 4th, 5th, and beyond generation mission sets.</p> <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Complete using encrypted data specifications as part of the migration and integration of those data into an operational readiness data with user-specified data extraction and reporting formats. - Complete integration of readiness measurement tools in all current training and readiness environments, to include augmented and virtual reality, part-task, full fidelity simulators, the Joint Simulation Environment, and operational range infrastructure. - Complete evaluations of higher fidelity software agent models integrated with live and virtual systems and their impact on the quality of training and exercise for a peer fight. - Continue work to integrate, evaluate, and demonstrate technologies to support multi-capable airmen with just-in-time-training and readiness support in deployed and austere mission contexts and locations. - Continue work integrating training management and data tracking tools and interfaces into the Synthetic Operational Test and Training Infrastructure. Continue field evaluations connecting big data and proficiency-based training infrastructure with operational event-based tracking and reporting systems. - Continue systematic evaluations of proficiency-based live-virtual-constructive on operational readiness and more optimal mixes of live and virtual training and exercise. Initiate demonstrations of secure fighter integration blended training events in both research and operational locations, including The Five Eyes coalition partner venues. - Continue work to integrate Distributed Mission operations-and Joint Simulation Environment-based architectures to support interoperable, peer-level training and rehearsal across 4th, 5th, and beyond generation mission sets. - Initiate Modeling and Simulation Integration Lab innovation integration work supporting the Effects Based Simulator and Joint Simulation Environment advancements. - Initiate Effects Based Simulator and Joint Simulation Environment integration and interoperability development supporting Synthetic Operational Test and Training for Command, Control, Communications and Battle Management. <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 decreased compared to FY 2024 by \$0.212 million. Funding decrease due to reduced emphasis in readiness measurement tools for training and readiness environments.</p>			
Accomplishments/Planned Programs Subtotals	6.284	4.134	3.922

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

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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 0603456F / <i>Human Effectiveness Advanced Technology Development</i>	Project (Number/Name) 635325 / <i>Mission Effective Performance</i>

D. Acquisition Strategy
Not applicable

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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 0603456F / <i>Human Effectiveness Advanced Technology Development</i>				Project (Number/Name) 635327 / <i>Warfighter Interfaces</i>			
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
635327: <i>Warfighter Interfaces</i>	-	12.695	3.823	6.351	0.000	6.351	4.466	3.932	3.104	3.169	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, demonstrates, and readies the transition of technologies to revolutionize the way airmen optimize the capabilities of Air Force systems, including autonomous machines and adaptive teams of Airmen and machines. Improvements in the presentation of operational information to the community of users, from the system operator to the commander, must be developed in step with advancements in the acquisition, storage, and retrieval of information. This project provides the advances in understanding of human cognitive abilities, as well as the utilization of human interfaces, multisensory fusion, high-resolution image displays, and three-dimensional audio to customize communications and enhance shared understanding across a diverse user community in air, space, and cyber for maximum situational awareness.

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

	FY 2023	FY 2024	FY 2025
Title: Airman Machine Interfaces	2.645	1.338	6.351
<p>Description: Develops advanced, situationally-adaptive and scalable interface technology and decision aiding tools for more rapid and accurate battlefield awareness, decision making and maximized collaborative, distributed human-machine team performance. This is accomplished through integrated solutions that manage Airman cognitive workload in complex, distributed, and degraded environments.</p> <p>FY 2024 Plans: Continue advanced command and control (C2) technologies for operators in multiple domains (to include cyber and space domains), as well as enabling Air Battle Management System capabilities for distributed C2. Continue expanding the library of user interfaces for Autonomous Collaborative Enabling Technologies, and initiate multiple autonomous behaviors developed by Defense Advanced Research Projects Agency and the Air Force Strategic Development Planning and Experimentation in order to meet demands of strategic, operational and tactical environments for manned-unmanned teaming. Continue development of collaborative interfaces, leveraging intelligent agents and autonomy for cognitive workload reduction, and optimization of distributed human-human and human-machine teaming. Continue the transition of open and interoperable software to Air Battle Management System-supported platforms. Continue the transition of interface technologies and battle management C2 systems for base defense and protection of the tactical airspace from small unmanned aerial systems. Complete wearable communication management system prototypes for mission recording and intelligibility enhancement. Continue automation of mission planning and debrief for assets with unique capabilities and include intelligent agent aided decision making. Initiate the development</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2023	FY 2024	FY 2025
<p>of mission planning for Intelligence, Surveillance, Reconnaissance optimization and battle damage assessment. Initiate the enhancement of map drawing capabilities for mission planning and debrief.</p> <p>FY 2025 Plans:</p> <ul style="list-style-type: none"> - Continue advanced command and control technologies for operators in multiple domains, as well as enabling Air Battle Management System capabilities for distributed command and control. - Continue expanding the library of user interfaces for Autonomous Collaborative Enabling Technologies, and initiate multiple autonomous behaviors developed by Defense Advanced Research Projects Agency and the Air Force Strategic Development Planning and Experimentation in order to meet demands of strategic, operational, and tactical environments for manned-unmanned teaming. - Continue development of collaborative interfaces, leveraging intelligent agents and autonomy for cognitive workload reduction, and optimization of distributed human-human and human-machine teaming. - Continue the transition of open and interoperable software to Air Battle Management System-supported platforms. - Complete the transition of interface technologies and battle management command and control systems for base defense and protection of the tactical airspace from small unmanned aerial systems. - Continue automation of mission planning and debrief for assets with unique capabilities and include intelligent agent aided decision making. - Continue the development of mission planning for Intelligence, Surveillance, Reconnaissance optimization and battle damage assessment. - Complete the enhancement of map drawing capabilities for mission planning and debrief. - Initiate human-machine teaming development and integration with mission planning and debrief for Collaborative Combat Aircraft. <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY 2025 increased compared to FY 2024 by \$5.013 million. Funding increase due to added emphasis in command and control technologies and human-machine teaming integration with mission planning and debriefing.</p>				
<p>Title: Analytic Tools</p> <p>Description: Develop, demonstrate, and transition software and hardware tools that help conventional Department of Defense, Special Operations, and Intelligence customers to rapidly identify, analyze, shape, and operationalize all types of information without succumbing to "analysis paralysis." In addition to delivering stand-alone tools, supports other Air Force Research Laboratory Technical Directorates. Build human-centric training solutions to: triage data-at-scale, automate mundane processes, optimize workflow, identify obscured patterns, mitigate cognitive overload, expedite logical decision-making, quantify performance metrics, accelerate human interpretation of information, and autonomously cue humans in live-virtual-constructive environments. These tools mitigate the scale and complexity in Joint All Domain Operations environments.</p>		5.050	2.485	0.000

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2023	FY 2024	FY 2025
<p><i>FY 2024 Plans:</i> Continue in-house Live-Virtual-Constructive simulation architecture to address training deficiencies across the Department of the Air Force. Initiate the integration of augmented reality, virtual reality, and mixed reality tools into Live-Virtual-Constructive environments, improving upon the current simulation ecosystems. Complete automation and real-time feedback of single simulator environments, and proactive cueing in multisimulator, team environments. Continue expansion of in-house Live-Virtual-Constructive simulation architecture to include the Space, Cyber, and/or Maritime domains. Continue the production and maturation of software to operationalize existing, in-house Live-Virtual-Constructive architecture, to include autonomy-enabled intelligence, Surveillance, and Reconnaissance applications. Initiate integration of data analysis tools into the emerging Synthetic Operational Test and Training Infrastructure, with emphasis on software that detect patterns in: friend/enemy verbal communications, multi-sensor data extraction/correlation, and automated cueing for complex, high-stress, and/or time-sensitive tasks. Continue Artificial Intelligence/Machine Learning analytic tools from "canned" frameworks to explainable architectures and interfaces that leverage the psychology of human trust. Initiate object-based Graphical User Interfaces that are highly customizable by military users with limited software skills.</p> <p><i>FY 2025 Plans:</i> There are no planned FY 2025 activities for the Analytic Tools Project. The project will complete all planned activities by end of FY 2024 and close out.</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY 2025 decreased compared to FY 2024 by \$2.485 million. Funding decrease due to a reduced emphasis in analytic tools efforts, and the close out and completion of all planned activities by end of FY 2024.</p>			
Accomplishments/Planned Programs Subtotals	7.695	3.823	6.351

	FY 2023	FY 2024
<i>Congressional Add:</i> Automated Geospatial Intelligence Detection Algorithms	5.000	0.000
<i>FY 2023 Accomplishments:</i> Conduct Congressionally directed efforts		
<i>FY 2024 Plans:</i> Not applicable		
Congressional Adds Subtotals	5.000	0.000

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

Remarks

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D. Acquisition Strategy
Not applicable