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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

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 0603270F / <i>Electronic Combat Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	41.869	31.037	32.510	0.000	32.510	36.372	37.300	37.352	38.715	Continuing	Continuing
633720: <i>EW Quick Reaction Capabilities</i>	-	28.491	17.877	19.552	0.000	19.552	22.081	22.651	22.694	23.522	Continuing	Continuing
63431G: <i>RF Warning & Countermeasures Tech</i>	-	8.109	7.896	12.876	0.000	12.876	14.178	14.488	14.527	15.057	Continuing	Continuing
634335: <i>Cyber Concepts</i>	-	3.068	3.021	0.043	0.000	0.043	0.045	0.090	0.053	0.055	Continuing	Continuing
63691X: <i>EO/IR Warning & Countermeasures Tech</i>	-	2.201	2.243	0.039	0.000	0.039	0.068	0.071	0.078	0.081	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program develops and demonstrates technologies to support Air Force electronic combat warfighting capabilities. The program focuses on developing components, subsystems, and technologies with potential aerospace, special operations, and airlift electronic combat applications. It develops and demonstrates technologies for integrating electronic combat sensors and systems into a fused and seamless whole. It integrates and focuses research efforts in electronic warfare and cyber warfare to rapidly demonstrate a capability for rapid fielding. It develops and demonstrates technologies for navigation and timing in radio frequency (RF) contested and denied environments. It develops and demonstrates advanced technologies for radio frequency electronic combat suites and advanced warning and countermeasure technologies to defeat electro-optical, infrared, and laser threats to aerospace platforms. It also develops and demonstrates technologies that will enable mission systems to be more resilient, agile, autonomous, and be able to operate in multiple domains. This program has 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 & technology capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0601102F, 0602102F, 0602201F, 0602202F, 0602203F, 0602204F, 0602602F, 0602605F, 0602788F, 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 2024 Air Force	Date: March 2023
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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 0603270F / <i>Electronic Combat Technology</i>
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B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	44.938	33.380	39.964	0.000	39.964
Current President's Budget	41.869	31.037	32.510	0.000	32.510
Total Adjustments	-3.069	-2.343	-7.454	0.000	-7.454
• 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	-2.343			
• Reprogrammings	-0.004	0.000			
• SBIR/STTR Transfer	-3.065	0.000			
• Other Adjustments	0.000	0.000	-7.454	0.000	-7.454

Change Summary Explanation

In FY 2023, Congressional Directed Reductions were due to realignment into Program 0603032F, Future AF Integrated Technology Demos, Project 0603030, Air Force Vanguard, in order to more appropriately categorize the funding according to purpose

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force										Date: March 2023		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>				Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
633720: <i>EW Quick Reaction Capabilities</i>	-	28.491	17.877	19.552	0.000	19.552	22.081	22.651	22.694	23.522	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project establishes a capability to rapidly assess, develop and demonstrate new electronic warfare concepts, techniques, and capabilities as well as the required position navigation and timing technologies and capabilities in the context of systemic electronic warfare effects (electronic warfare threat interactions) in a congested/contested electromagnetic spectrum, system-of-systems environment of the future. It develops disruptive electronic warfare and countermeasures concepts specifically selected for high-impact, game-changing effects; evaluates them in high fidelity virtual and hardware evaluation settings; and demonstrates them in an operationally relevant environment. It establishes and maintains an all-source, physics-based, threat-to-countermeasures electronic warfare systems engineering methodology. It develops a core analytic function, supported by simulation-based wargaming and interactive engineering modeling capabilities to evaluate advanced countermeasures concepts.

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

	FY 2022	FY 2023	FY 2024
Title: Radio Frequency Electronic Warfare	3.559	3.432	0.000
Description: Develop electronic warfare focused knowledge databases, engineering models, mission simulations, analysis tools and assessment environments which enable the development of multi-domain electronic warfare technologies. The primary focus is on emulating complex battlespace radio frequency environments, electronic attack effects against emerging, networked weapon systems, and assessing flexible, software-defined electronic warfare systems with non-deterministic performance (for example, utilizing cognitive algorithms).			
FY 2023 Plans: Continue the implementation of emerging electromagnetic attack and support capabilities into open architectures to support electromagnetic spectrum operations. Continue conducting technology demonstrations to support transition into Air Force platforms and electromagnetic spectrum operations units. Continue using agile software defined process to demonstrate the capability to rapidly respond to new and unexpected complex emitters in realistic radio frequency environments. Continue expansion and maturation of modeling, simulation and laboratory assessment environments commensurate with technologies being researched, developed and tested including cognitive and autonomous electronic warfare technologies for multi-spectral treats in a complex electromagnetic environment.			
FY 2024 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023		
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>FY 2024 funding and technical work from this effort has been realigned to Program Electronic Combat Technology, 0603270F; Project EW Quick Reaction Capabilities, 633720; Integrated EW Demonstration effort.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding decreased compared to FY 2023 by \$3.432 million. Decrease is a result of realignment of funding and technical work to Program Electronic Combat Technology, 0603270F; Project EW Quick Reaction Capabilities, 633720; Integrated EW Demonstration effort.</p>				
<p>Title: Resilient Positioning, Navigation and Timing</p> <p>Description: Develop and transition robust Global Navigation Satellite System capabilities; resilient complementary position, navigation and timing techniques; precise position, navigation and timing technologies for distributed sensing/effects; position, navigation and timing technology to provide position, navigation and timing electronic warfare situational awareness and training; and position, navigation and timing architectures to enable resiliency against the rapidly evolving threat. Efforts will include prototypes and relevant Open Architecture standards where applicable to enable timely technology transition.</p> <p>FY 2023 Plans: Continue developing systems and transition technologies for geolocation of sources interfering with navigational satellite signals. Continue developing and demonstrate a transcoder that converts modernized Global Positioning System military signals into military signals useable by legacy Department of Defense GPS receivers. Continue software defined radio technology efforts to authenticate signals from foreign satellite navigation systems. Continue developing, demonstrating, and promulgating navigational open architecture standards to permit integration of alternative/complementary position, navigation and timing approaches into future Department of Defense systems, such as the resilient embedded Global Positioning System-inertial program of record.</p> <p>FY 2024 Plans: Continue maturation and transition of technologies for characterization of geolocation of sources interfering with navigational satellite signals. Continue developing and flight demonstrate a transcoder that converts trusted navigation sources such as modernized military Global Positioning System signals into synthesized radio frequency directly injected and useable by legacy Department of Defense Global Positioning System receivers. Continue algorithm efforts to authenticate signals as emanating directly from foreign navigation satellites. Continue developing, demonstrate, and promulgate navigational open architecture standards to permit integration of alternative/complementary position, navigation and timing approaches into future Department of Defense systems, such as the resilient embedded Global Positioning System-inertial program of record.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		15.305	10.098	11.108

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Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
FY 2024 funding increased compared to FY 2023 by \$1.010 million, due to increased emphasis in Resilient Position, Navigation, and Timing technologies.				
<p>Title: Electro-Optical/Infrared Warfare Demonstrator</p> <p>Description: Develop next generation countermeasure techniques to address the complete range of multispectral (for example, dual band infrared) threats including advanced techniques versus advanced man portable air defense system and air-to-air threats with multimode capabilities. Develop capabilities for situational awareness and countermeasure to integrated air defense systems and associated multispectral threats.</p> <p>FY 2023 Plans: Complete assessment of developed low cost, integrated missile and laser warning capability to identify, geo-locate, and counter, using both laser and expendable countermeasure response techniques, advanced laser and electro-optical/infrared guided missile threats to aircrews. Continue iterating and refreshing techniques for in-house at range data collection capabilities. Continue analysis from field test to develop requirements for proactive detection and situation awareness for multiple Department of the Air Force platforms. Continue efforts to develop multi-spectral electro-optical/radio frequency countermeasures and insert capabilities into existing and developing engagement modeling and simulation tools.</p> <p>FY 2024 Plans: FY 2024 funding and technical work from this effort has been realigned to Program Electronic Combat Technology, 0603270F; Project EW Quick Reaction Capabilities, 633720; Integrated EW Demonstration effort.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding decreased compared to FY 2023 by \$4.347 million. Decrease is a result of realignment of funding and technical work to Program Electronic Combat Technology, 0603270F; Project EW Quick Reaction Capabilities, 633720; Integrated EW Demonstration effort.</p>		3.559	4.347	0.000
<p>Title: Integrated EW Demonstration</p> <p>Description: Integrate emerging technologies to develop and demonstrate electromagnetic warfare spectrum dominance concepts, technologies and techniques. Goal is to counter advanced complex electromagnetic threats in contested environments across radio frequency and electro-optic/infrared spectrums.</p> <p>FY 2023 Plans: Not Applicable</p> <p>FY 2024 Plans:</p>		0.000	0.000	8.444

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Continue the implementation of emerging electromagnetic attack and support capabilities into open architectures to support electromagnetic spectrum operations. Continue using agile development processes to demonstrate the capability to rapidly respond to new and unexpected complex emitters in realistic radio frequency environments. Continue expansion and maturation of modeling, simulation and laboratory assessment environments commensurate with technologies being researched, developed and tested including cognitive and autonomous electronic warfare technologies for multi-spectral treats in a complex electromagnetic environment. Continue iterating and refreshing techniques for data collection capabilities to enhance research and development efforts. Continue analysis from field test to develop requirements for proactive detection and situation awareness for multiple Department of the Air Force platforms.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase compared to FY 2023 by \$8.444 million. Increase is described in the plans above. This is a result of realignment of funding and technical work from "Program Electronic Combat Technology, 0603270F; Project EW Quick Reaction Capabilities, 633720; Radio Frequency Electronic Warfare" effort and "Program Electronic Combat Technology, 0603270F; Project EW Quick Reaction Capabilities, 633720; Electro-Optical/Infrared Warfare Demonstrator" effort, in order to more effectively support converging efforts in the Multi-Spectral Warfare domain.</p>			
<p>Title: Transformational Technology Development</p> <p>Description: Continually funded effort. This funding allocation will initiate new and continue existing Transformational Technology Development efforts. 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 technologies to enhance survivability, operability and performance of personnel, sensors, and structures in a threat environment through new electronic warfare concepts, techniques and capabilities as well as new positioning, navigation and timing technologies and capabilities. 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.</p> <p>FY 2023 Plans: In FY 2023 work in this effort will be accomplished under Program 0603032F Future AF Integrated Technology Demos, Project 630320: Air Force Vanguard, effort Vanguard Prospect - Resolute Sentry.</p> <p>FY 2024 Plans: Not Applicable</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>	6.068	0.000	0.000

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Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 633720 / <i>EW Quick Reaction Capabilities</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Not Applicable			
Accomplishments/Planned Programs Subtotals	28.491	17.877	19.552

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 2024 Air Force										Date: March 2023		
Appropriation/Budget Activity 3600 / 3					R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>			Project (Number/Name) 63431G / <i>RF Warning & Countermeasures Tech</i>				
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
63431G: <i>RF Warning & Countermeasures Tech</i>	-	8.109	7.896	12.876	0.000	12.876	14.178	14.488	14.527	15.057	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates advanced technologies for radio frequency electronic combat suites, including the required navigation technologies and capabilities, to enhance the survivability of aerospace vehicles and to provide crew situational awareness. The research addresses technologies for missile/threat warning, radio frequency receivers, electronic combat pre-processors, advanced sorting/pre-processing algorithms, and expert software for applications on existing and future electronic combat systems. The research also focuses on the development and demonstration of subsystems and components for generating on-board/off-board radio frequency countermeasure techniques. This includes the development of electronic countermeasures techniques, as well as advanced electronic countermeasures technologies such as antennas, power amplifiers, and preamplifiers.

In FY 2024 in order to better execute these converging efforts in the Multi-Spectral domain, funding and technical work was transferred into this BPAC from "Program 0603270F Electronic Combat Technology, Project 634335: Cyber Concepts, effort Resilient and Agile Mission Systems Architecture" and "Program 0603270F Electronic Combat Technology, Project 63691X: EO/IR Warning & Countermeasures Tech, effort Advanced Electro-Optical/Infrared Warning and Countermeasure Technologies"

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

	FY 2022	FY 2023	FY 2024
Title: Spectrum Dominance Technology Demonstrations	7.625	7.896	12.876
Description: Develop aerospace platform jamming concepts, technologies and techniques to counter advanced radio frequency threats associated with current and future aerospace weapon systems. Provide position, navigation and system resilience via open architecture solutions.			
Note: In FY 2023 and prior this Thrust was titled "Radio Frequency Electronic Warfare Demonstrator" This change was made to accommodate the transfer of funding and technical work to this Effort from "Program 0603270F Electronic Combat Technology, Project 634335: Cyber Concepts, effort Resilient and Agile Mission Systems Architecture" and "Program 0603270F Electronic Combat Technology, Project 63691X: EO/IR Warning & Countermeasures Tech, effort Advanced Electro-Optical/Infrared Warning and Countermeasure Technologies" in order to better execute these converging efforts in the Multi-Spectral domain.			
FY 2023 Plans: Continue the implementation of emerging electromagnetic attack and support capabilities into open architectures to support electromagnetic spectrum operations. Continue conducting technology demonstrations to support transition into Air Force			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 63431G / <i>RF Warning & Countermeasures Tech</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>platforms and electromagnetic spectrum operations units. Use agile software defined process to demonstrate the capability to rapidly respond to new and unexpected complex emitters in realistic radio frequency environments. Continue expansion and maturation of modeling, simulation and laboratory assessment environments commensurate with technologies being researched, developed and tested including cognitive and autonomous electronic warfare technologies for multi-spectral treats in a complex electromagnetic environment.</p> <p>FY 2024 Plans: Complete the Radio Frequency Electronic Warfare Demonstrator effort and deliver a software-centric cognitive electromagnetic warfare-based rapid reprogramming system to the 350th Spectrum Warfare Wing to improve next sortie reprogramming capability against complex emitters. These deliverables include cognitive electromagnetic warfare applications integrated into an on-station system to support electromagnetic spectrum maneuverability and data analytics and visualization tools to assess system performance for reprogramming.</p> <p>Continue expansion and maturation of modeling, simulation and laboratory assessment environments commensurate with technologies being researched, developed and tested including cognitive and autonomous electronic warfare technologies for multi-spectral treats in a complex electromagnetic environment. Continue the implementation and development of spectrum warfare's integration into Reference Architecture Implementations and open architectures standards to support modeling and simulation analysis. Continue conducting technology demonstrations to support transition into Air Force platforms and electromagnetic spectrum operations units. Continue maturing the process for threat characterization and countermeasures development and field testing of new advanced threats to include laser jam codes and techniques. Continue effectiveness assessment of laser and missile warning technologies and techniques for a variety of Air Force platforms. Continue development of advanced networking, processing, advanced computing paradigms, and cybersecurity technologies for next-generation avionics mission system capabilities. Continue utilizing agile development processes and digital engineering techniques for rapid and affordable development, integration, and demonstrations to rapidly respond to new and unexpected complex emitters in realistic radio frequency environments.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 increased compared to FY 2023 by \$4.980 million, due to increased emphasis of close collaboration with the 350th Spectrum Warfare Wing for Electronic Warfare efforts .</p>			
<p>Title: Transformational Technology Development</p> <p>Description: Continually funded effort. This funding allocation will initiate new and continue existing Transformational Technology Development efforts. 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 technologies to enhance survivability, operability and performance of personnel, sensors, and structures in a threat</p>	0.484	0.000	0.000

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Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 63431G / <i>RF Warning & Countermeasures Tech</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>environment through development and demonstration of advanced technologies for radio frequency electronic combat suites. 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.</p> <p>FY 2023 Plans: In FY 2023 this effort will be realigned under Program 0603032F Future AF Integrated Technology Demos, Project 630320: Air Force Vanguard, effort Vanguard Prospect - Resolute Sentry.</p> <p>FY 2024 Plans: Not Applicable</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Not Applicable</p>				
Accomplishments/Planned Programs Subtotals		8.109	7.896	12.876
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 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 634335 / <i>Cyber Concepts</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
634335: <i>Cyber Concepts</i>	-	3.068	3.021	0.043	0.000	0.043	0.045	0.090	0.053	0.055	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates methods to discover cyber susceptibilities, assess avionics systems, formulate mitigation strategies, and investigate use of tools and technologies to automate this process. It is designed to apply developed vulnerability discovery, vulnerability mitigation, and cyber protection technology to avionics systems and components and embedded systems. This involves technologies for trusted sensors and trusted systems that deter exploitation of our critical hardware and software. This project aims to develop cyber resilience and protect systems through adaptation of the system to the threat. It demonstrates these technologies in open and adaptable architectures for system integration in field demonstrations and proves out the technologies through rapid integration of sensors and architectures for technology transition. It integrates research efforts in electronic and cyber warfare to rapidly demonstrate a capability for rapid fielding.

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

	FY 2022	FY 2023	FY 2024
Title: Resilient and Agile Mission Systems Architecture	2.412	3.021	0.043
<p>Description: This effort 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 Department of the Air Force mission systems.</p> <p>FY 2023 Plans: Continue investigations to evolve and mature open architecture standards. Continue development of advanced networking, processing, advanced computing paradigms, and cybersecurity technologies for next-generation avionics mission system capabilities. Initiate using agile software technologies and digital engineering techniques for rapid and affordable development, integration, and prototype capability demonstrations. Initiate development of Reference Architecture Implementation for resilient mission systems.</p> <p>FY 2024 Plans: Continue transfer of technical work while it realigns under Program 0603270F Electronic Combat Technology, Project 63431G: RF Warning & Countermeasures Tech, effort Spectrum Dominance Technology Demonstrations.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>			

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Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 634335 / <i>Cyber Concepts</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
FY 2024 decreased compared to FY 2023 by \$2.978 million. Justification for this decrease is described in plans above. In FY 2024 technical effort will be realigned under Program 0603270F Electronic Combat Technology, Project 633720: EW Quick Reaction Capabilities, effort Spectrum Dominance Technology Demonstrations.				
<p>Title: Transformational Technology Development</p> <p>Description: Continually funded effort. This funding allocation will initiate new and continue existing Transformational Technology Development efforts. 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 technologies to enhance survivability, operability and performance of personnel, sensors, and structures in a threat environment through vulnerability discovery, vulnerability mitigation, and cyber protection technology to avionics systems and components and embedded systems. 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.</p> <p>FY 2023 Plans: In FY 2023 this effort will be realigned under Program 0603032F Future AF Integrated Technology Demos, Project 630320: Air Force Vanguard, effort Vanguard Prospect - Resolute Sentry.</p> <p>FY 2024 Plans: Not Applicable</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Not Applicable</p>		0.656	0.000	0.000
Accomplishments/Planned Programs Subtotals		3.068	3.021	0.043
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 0603270F / <i>Electronic Combat Technology</i>				Project (Number/Name) 63691X / <i>EO/IR Warning & Countermeasures Tech</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
63691X: <i>EO/IR Warning & Countermeasures Tech</i>	-	2.201	2.243	0.039	0.000	0.039	0.068	0.071	0.078	0.081	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates the advanced warning and countermeasure technologies required to negate electro-optical/infrared and laser threats to aerospace platforms. Develops off-board (decoys and expendables) and on-board countermeasure technologies for aircraft self-protection to provide robust, affordable solutions for protection against infrared missiles with autonomous seekers, multi-spectral threats, laser-guided weapons, and electro-optical/infrared tracking systems used to direct electro-optical/infrared and radar-guided missiles.

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

	FY 2022	FY 2023	FY 2024
Title: Advanced Electro-Optical/Infrared Warning and Countermeasure Technologies	1.658	2.243	0.039
Description: Analyze the vulnerabilities of current infrared missile systems and future imaging infrared sensors. Develop advanced countermeasure system techniques to exploit vulnerabilities for use against infrared and electro-optical guided missile threats. Develop advanced optical and infrared sensor systems for airborne and space situational awareness and threat warning.			
FY 2023 Plans: Continue maturing the process for threat characterization and countermeasures development and field testing of new advanced threats to include laser jam codes and techniques. Continue effectiveness assessment of laser and missile warning technologies and techniques for a variety of Air Force platforms. Continue providing electro-optical/infrared models to be combine with radio frequency models to further enhance the overarching Advanced Framework for Simulation, Integration and Modeling software environment to address multi-spectral threats.			
FY 2024 Plans: Continue transfer of technical work while it realigns under Program 0603270F Electronic Combat Technology, Project 63431G: RF Warning & Countermeasures Tech, effort Spectrum Dominance Technology Demonstrations.			
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 decreased compared to FY 2023 by \$2.204 million. Justification for this decrease is described in plans above. In FY 2024 technical effort will be realigned under Program 0603270F Electronic Combat Technology, Project 633720: EW Quick Reaction Capabilities, effort Spectrum Dominance Technology Demonstrations.			
Title: Transformational Technology Development	0.543	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 3	R-1 Program Element (Number/Name) PE 0603270F / <i>Electronic Combat Technology</i>	Project (Number/Name) 63691X / <i>EO/IR Warning & Countermeasures Tech</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
<p>Description: Continually funded effort. This funding allocation will initiate new and continue existing Transformational Technology Development efforts. 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 technologies to enhance survivability, operability and performance of personnel, sensors, and structures in a threat environment through development and demonstration of advanced warning and countermeasure technologies required to negate electro-optical/infrared and laser threats to aerospace platforms. 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.</p> <p>FY 2023 Plans: In FY 2023 and beyond, this work is performed under PE 0603032F, Future AF Integrated Technology Demos, Project 630320, Air Force Vanguard.</p> <p>FY 2024 Plans: Not Applicable</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Not Applicable</p>			
Accomplishments/Planned Programs Subtotals	2.201	2.243	0.039

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy Not applicable