Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Defense Advanced Research Projects Agency	Date: April 2022
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	189.051	294.792	314.502	-	314.502	263.612	286.862	267.969	266.433	-	-
SEN-01: *SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY*	-	22.753	36.785	35.838	-	35.838	31.201	21.301	9.568	8.568	-	-
SEN-02: *SENSORS AND PROCESSING SYSTEMS*	-	41.203	84.248	92.659	-	92.659	115.000	195.768	244.001	257.865	-	-
SEN-06: *SENSOR TECHNOLOGY*	-	125.095	173.759	186.005	-	186.005	117.411	69.793	14.400	0.000	-	-

A. Mission Description and Budget Item Justification

The Sensor Technology program element is budgeted in the Advanced Technology Development Budget Activity because it funds sensor efforts that will improve the accuracy and timeliness of our surveillance and targeting systems for improved battlefield awareness, strike capability and battle damage assessment.

The Surveillance and Countermeasures Technology project funds sensor efforts that will improve the accuracy and timeliness of our surveillance and targeting systems for improved battlefield awareness, strike capability, and battle damage assessment. Timely surveillance of enemy territory under all weather conditions is critical to providing our forces with the tactical information needed to succeed in future wars. This operational surveillance capability must continue to perform during enemy efforts to deny and deceive the sensor systems, and operate, at times, in a clandestine manner. This project will exploit recent advances in multispectral target phenomenology, signal processing, low-power high-performance computing, and low-cost microelectronics to develop advanced surveillance and targeting systems. In addition, this project encompasses several advanced technologies related to the development of techniques to counter advanced battlefield threats.

The Sensors and Processing Systems project develops and demonstrates the advanced sensor and processing technologies and systems necessary for Intelligence, Surveillance, and Reconnaissance (ISR) missions. Future battlefields will continue to be populated with targets that use mobility and concealment as key survival tactics, and high-value targets will range from specific individual insurgents and vehicles to groups of individuals and large platforms such as mobile missile launchers and artillery. The Sensors and Processing Systems project is primarily driven by four needs: (a) providing day-night ISR capabilities against the entire range of potential targets; (b) countering camouflage, concealment, and deception of mobile ground targets; (c) detecting and identifying objects of interest/targets across wide geographic areas in near-real-time; and (d) enabling reliable identification, precision fire control tracking, timely engagement, and accurate battle damage assessment of ground targets. The Sensors and Processing Systems project develops and demonstrates technologies and system concepts that combine novel approaches to sensing with emerging sensor technologies and advanced sensor and image processing algorithms, software, and hardware to enable comprehensive knowledge of the battlespace and detection, identification, tracking, engagement, and battle damage assessment for high-value targets in all weather conditions and combat environments.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Defense Advanced Research Projects Agency	Date: April 2022
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	190.220	294.792	0.000	-	0.000
Current President's Budget	189.051	294.792	314.502	-	314.502
Total Adjustments	-1.169	0.000	314.502	-	314.502
• 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	4.956	0.000			
• SBIR/STTR Transfer	-6.125	0.000			
• Adjustments to Budget Year	-	-	314.502	-	314.502

Change Summary Explanation

FY 2021: Decrease reflects SBIR/STTR transfer offset by reprogrammings.

FY 2022: N/A

FY 2023: FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603767E / *SENSOR TECHNOLOGY*	Project (Number/Name) SEN-01 / *SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
SEN-01: *SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY*	-	22.753	36.785	35.838	-	35.838	31.201	21.301	9.568	8.568	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surveillance and Countermeasures Technology project funds sensor efforts that will improve the accuracy and timeliness of our surveillance and targeting systems for improved battlefield awareness, strike capability, and battle damage assessment. Timely surveillance of enemy territory under all weather conditions is critical to providing our forces with the tactical information needed to succeed in future wars. This operational surveillance capability must continue to perform during enemy efforts to deny and deceive the sensor systems, and operate, at times, in a clandestine manner. This project will exploit recent advances in multispectral target phenomenology, signal processing, low-power high-performance computing, and low-cost microelectronics to develop advanced surveillance and targeting systems. In addition, this project encompasses several advanced technologies related to the development of techniques to counter advanced battlefield threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Moving Target Recognition (MTR)	4.500	15.862	19.073

Description: Based on technologies developed under the Automatic Target Recognition (ATR) Technology program (previously budgeted in 0603767E, SEN-02), the Moving Target Recognition (MTR) program seeks to enable the use of synthetic aperture radar (SAR) sensors to detect, track, image, and automatically recognize moving ground targets within an area of interest. SAR sensors provide the capability to detect and identify high-value targets in all weather conditions but only when the targets are stationary due to limitations in traditional SAR processing. Ground moving target indicator (GMTI) radars are capable of detecting and tracking moving targets, but they cannot form recognizable images of targets. MTR will overcome the limitations of traditional SAR and improve the operational utility of widely deployed SAR sensors on many different types of platforms. The recognition capability will enable new concepts of operation for maintaining persistent custody of high-value targets on the move. Unlike GMTI, which loses custody if the track is broken due to terrain or other factors, MTR-enabled SAR sensors will be able to tolerate coverage gaps by reacquiring and reestablishing identification of the moving targets. Technology developed under MTR will transition to the Services.

FY 2022 Plans:

- Develop novel MTR algorithms for ground moving target detection, tracking, and imaging with SAR sensors.
- Plan and conduct airborne data collect experiments involving ground-truthed moving military vehicles to test the MTR algorithms and collection techniques.
- Analyze MTR algorithm performance using the airborne experiment data.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*	**Project (Number/Name)** SEN-01 / *SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Determine system requirements for objective SAR sensors to support the MTR algorithms. ***FY 2023 Plans:*** - Continue to develop and refine novel algorithms for moving target detection, tracking, and imaging with SAR sensors. - Conduct independent assessment of algorithm performance using airborne SAR data with ground truth. - Optimize software implementations of MTR algorithms for speed, efficiency, and robustness. - Initiate development of ATR algorithms for the moving target images. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 increase reflects a shift from algorithm prototyping to mature and optimized software implementation and assessment.			
Title: All Source Combat Operations and Targeting (ASCOT) ***Description:*** The All Source Combat Operations and Targeting (ASCOT) program will allow maritime platforms to maintain robust battlespace awareness and survivability by combining data and coordinating operations using all available sensors. The program will create methods for optimal balancing of battlespace awareness and survivability by leveraging existing networked sensors and local platform sensors. The program builds upon technology developed as a part of the Resilient Synchronized Planning and Assessment Contested Environment (RSPACE) program, previously budgeted in PE 0603766E/Project NET-01. Key attributes of this program are survivability, information latency, reliability, and endurance. Demonstrations on relevant platforms in relevant environments will be used to validate the technology. Technologies from this program will transition to the Services. ***FY 2022 Plans:*** - Complete development of final payload and advanced targeting architecture. - Conduct performance evaluation and flight testing with final payload. - Perform sensor fusion, data analysis, and system integration development in support of a live demonstration in a joint exercise. ***FY 2023 Plans:*** - Integrate final flight payload with sensor fusion tool to create an organic battlespace awareness picture. - Perform sensor fusion, data analysis, and system integration to execute a real-time, at-sea demonstration. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 decrease reflects a shift from system testing to final technical integration and testing activities.	7.328	11.300	7.894
Title: Fiddler ***Description:*** The Fiddler program seeks to train an artificial intelligence (AI) algorithm to synthesize artificial Synthetic Aperture Radar (SAR) images at any arbitrary look angle, frequency, and polarization based on a few examples of real images. These artificial images will be used to train and improve the performance of Automatic Target Recognition (ATR) algorithms. This	-	-	8.871

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*	**Project (Number/Name)** SEN-01 / *SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
capability will allow the government to collect a small amount of SAR imagery on a desired target and then rapidly develop new SAR-based ATR algorithms which are effective at detecting that target. Technology developed under this program will transition to the Services. ***FY 2023 Plans:*** - Create baseline version of the Fiddler image generation software. - Develop standardized interfaces for training and producing Synthetic Aperture Radar (SAR) imagery of objects. - Conduct laboratory testing and evaluation of baseline version of the software to demonstrate it can successfully create synthetic SAR imagery that can be used to train Automatic Target Recognition (ATR) algorithms. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 increase reflects program initiation.			
Title: Aerial Dragnet ***Description:*** Aerial Dragnet seeks to detect multiple small Unmanned Aerial Systems (UAS) in complex and/or urban terrain before they are within Line-Of-Sight (LOS) of friendly assets. Unlike traditional air targets, small UASs pose a special threat in urban terrain for several reasons: they can fly at low altitudes between buildings, they are small making them difficult to sense, and they move at slow speeds making them difficult to differentiate from other moving objects. Moreover, the development of small UASs is driven by commercial technologies, which make them rapidly adaptable and very easy to use. Building upon research conducted in the System of Systems Integration Technology and Experimentation (SoSITE) program (budgeted in PE 0603766E, Project NET-01), Aerial Dragnet will perform surveillance using an architecture consisting of networked sensor payloads deployed on buildings, masts and aerial platforms. The ability to see over and into urban terrain allows Aerial Dragnet to detect, track, and classify UAS incursions rapidly, thus enabling multiple defeat options. Aerial Dragnet sensor payloads are low-cost and comprised of signal processing software, sensor hardware, and networking for distributed, autonomous operation. The system will be scalable to provide cost-effective surveillance coverage from neighborhood to city-sized areas. Aerial Dragnet technologies are expected to transition to the Army, Marine Corps, and Department of State. ***FY 2022 Plans:*** - Evaluate system performance, mission planning and modeling tools of the sensors in a persistent deployment (more than 30 days) within a dense urban environment. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 decrease reflects program completion.	3.847	3.568	-
Title: Shosty	7.078	6.055	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*	**Project (Number/Name)** SEN-01 / *SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: Shosty seeks to develop and demonstrate enhanced capabilities for high frequency (HF) over-the-horizon-radar (OTHR) systems. This program will develop techniques to characterize distributed skywave HF radar propagation channels and measure radar backscatter from the surface. System signal processing, modeling, analysis, and over-the-air experimentation will be conducted to assess performance. Technologies developed under the Shosty program will transition to the Services. ***FY 2022 Plans:*** - Update algorithms based on testing and needs of identified transition partners, and verify with modeling and simulation. - Perform end-to-end multi-site, multi-static over-the-horizon radar demonstration incorporating advanced waveforms. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 decrease reflects program completion.			
Accomplishments/Planned Programs Subtotals	22.753	36.785	35.838

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603767E / *SENSOR TECHNOLOGY*	Project (Number/Name) SEN-02 / *SENSORS AND PROCESSING SYSTEMS*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
SEN-02: *SENSORS AND PROCESSING SYSTEMS*	-	41.203	84.248	92.659	-	92.659	115.000	195.768	244.001	257.865	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Sensors and Processing Systems project develops and demonstrates the advanced sensor and processing technologies and systems necessary for Intelligence, Surveillance, and Reconnaissance (ISR) missions. Future battlefields will continue to be populated with targets that use mobility and concealment as key survival tactics, and high-value targets will range from specific individual insurgents and vehicles to groups of individuals and large platforms such as mobile missile launchers and artillery. The Sensors and Processing Systems project is primarily driven by four needs: (a) providing day-night ISR capabilities against the entire range of potential targets; (b) countering camouflage, concealment, and deception of mobile ground targets; (c) detecting and identifying objects of interest/targets across wide geographic areas in near-real-time; and (d) enabling reliable identification, precision fire control tracking, timely engagement, and accurate battle damage assessment of ground targets. The Sensors and Processing Systems project develops and demonstrates technologies and system concepts that combine novel approaches to sensing with emerging sensor technologies and advanced sensor and image processing algorithms, software, and hardware to enable comprehensive knowledge of the battlespace and detection, identification, tracking, engagement, and battle damage assessment for high-value targets in all weather conditions and combat environments.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Painter	-	15.354	25.597
Description: The Painter program seeks to create revolutionary advancements in laser technologies for future active optical systems. Painter will translate efficiency benefits from critical laser components into compact optical sources. The objective of Painter is to simultaneously increase the power and decrease the size of laser sources compared to state of the art. Aggressive packaging objectives will be met by overcoming the thermal management challenges of state-of-the-art lasers. Painter development is guided and constrained by spectral properties required to support multiple mission applications. Technologies from Painter will transition to the Services.			
FY 2022 Plans: - Conduct application studies for Painter-enabled active optical systems. - Perform architectural studies for critical Painter components and sub-systems. - Model Painter effectiveness over multiple concepts of employment.			
FY 2023 Plans: - Define architecture for Painter laser technology. - Construct test bench for Painter hardware experimentation. - Evaluate initial Painter hardware in lab environment.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*	**Project (Number/Name)** SEN-02 / *SENSORS AND PROCESSING SYSTEMS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Conduct preliminary design review for Painter laser technology. - Initiate construction of laboratory-based Painter laser. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 increase reflects shift from initial studies and modeling to construction of hardware for Painter technology.			
Title: Military Tactical Means (MTM) ***Description:*** The Military Tactical Means (MTM) program is developing sensors and exploitation techniques capable of performing wide-area search to detect high-value targets in order to task engagement systems to close effects-chains. Finding and prosecuting targets with distributed effects-chains requires the ability to detect, track, and maintain custody of targets across sensors with different modalities residing in various domains. This program will examine both the sensors and the exploitation needed to perform this wide-area search for missions in denied territories and maintain positive chain of custody hand-offs to one or more targeting sensors. The sensors developed under this program will concentrate on sensor modalities that are mostly geometry-invariant and have the potential to be used in highly proliferated systems, such as small satellite constellations and small terrestrial platforms (e.g., class-I or II unmanned aerial system). The exploitation portion of this program will develop algorithms to ensure consistency when passing chain of custody between sensors in different domains where there is the possibility of different sensing modalities and will also be designed to increase confidence and accuracy as targets are passed between sensors. Technology developed by this program will transition to the Services and other government agencies. ***FY 2022 Plans:*** - Integrate algorithms and sensors compatible with field experimentation. - Execute experiments to measure sensor and algorithm performance and effectiveness. - Evaluate both sensor and processor compatibility for objective platform size, weight, and power (SWaP). - Continue modeling and simulation of MTM capabilities against real world use cases developed jointly with operational stakeholders. - Perform objective system modeling to validate performance and effectiveness in military utilization. ***FY 2023 Plans:*** - Build and integrate a multi-modal sensor system following the design created in the brassboard demonstration. - Conduct detailed sensor performance testing on multi-modal sensor payload and processing. - Plan data collection campaigns to test airborne prototype sensor and processor. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 decrease reflects minor program repricing.	22.798	22.718	22.682
Title: Coho	7.582	16.534	15.683

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*	**Project (Number/Name)** SEN-02 / *SENSORS AND PROCESSING SYSTEMS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: The Coho program is developing advanced signal processing technologies and techniques for future Radio Frequency (RF) systems. These systems will create an asymmetric advantage for tactical operations in anti-access/area-denial environments by extending the real-time operating bandwidth of tactical signal processing, underpinning the ability of U.S. and Allied Forces to accurately orient and beneficially maneuver in the electromagnetic spectrum. Based on technologies developed under the All-Signal Tactical Real-time Analyzer (ASTRAL) program, previously budgeted in this PE and Project, the objective of Coho is to provide ultra wideband RF signal detection and recognition capabilities in a form factor suitable for tactical platforms. Coho seeks to provide capabilities for multiple mission areas. These capabilities include (1) surveillance: combining wide operating bandwidth with noise isolation for background electromagnetic search in the low signal to noise ratio environment, (2) filtering: isolating signals based on modulation features to process signals in the presence of co-channel interference, and (3) localization: supporting low-latency execution of multi-aperture processing for discrimination of signals based on angle of bearing. Technology from Coho will transition to the Services. ***FY 2022 Plans:*** - Conduct Conceptual Design Review for the Coho system. - Continue development of algorithms for signal recognition. - Develop brassboard Coho system. - Conduct initial testing of the brassboard system to determine efficacy of the technology. - Conduct Critical Design Review for final prototype system. ***FY 2023 Plans:*** - Conduct final evaluations of Coho signal recognition algorithms. - Optimize Coho system via hardware calibration and software interface revision. - Test prototype Coho system to verify performance. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 decrease reflects a shift from brassboard hardware development to final evaluation and testing.			
Title: Distributed Radar Image Formation Technology (DRIFT)	-	3.000	13.054
Description: Based on recent developments in small synthetic aperture radar (SAR) satellites in commercial industry, there are new opportunities to experiment with novel SAR-related concepts. Based on technologies developed in the Resilient Networked Distributed Mosaic Communications (RNDMC) program (budgeted in PE 0603760E/ Project CCC-02), the goal of the Distributed Radar Image Formation Technology (DRIFT) program is to demonstrate advanced capabilities enabled by a cluster of SAR satellites flown in formation. DRIFT seeks to acquire data from SAR satellites flown in formation and to demonstrate novel			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*	**Project (Number/Name)** SEN-02 / *SENSORS AND PROCESSING SYSTEMS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
processing algorithms on this data. This will expand the utility of small SAR satellites, including commercial satellites, for military applications. Technology developed under this program will transition to the Services. ***FY 2022 Plans:*** - Establish conceptual design for DRIFT formation flying satellite data collection. ***FY 2023 Plans:*** - Create prototype DRIFT algorithms and test on simulated data. - Prepare satellites for on-orbit testing, including finalizing the hardware, ground software, and maneuver strategy. - Conduct modeling and simulation to develop detailed plans for satellite formation configurations and radar operations to be tested on orbit. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY2023 increase reflects a shift from conceptual design to prototyping and testing.			
Title: Thermal Imaging Technology Experiment-Recon (TITE-R) ***Description:*** The Thermal Imaging Technology Experiment-Recon (TITE-R) leverages and expands upon the successful technology demonstrations associated with the Small Satellite Sensors program, previously budgeted in this PE/Project. TITE-R will develop and demonstrate complimentary sensing modalities, advanced processing, and low size, weight, and power cross and downlinks which will more closely represent an objective tactical capability. TITE-R will develop sensors and software automation capable of supporting future tactical targeting operations implemented on small (< 250 kg) satellites. TITE-R will also develop mission software to support automated on-board processing and simplified operator tasking. This scalable tactical targeting approach will directly support tactical operations. TITE-R aims to rapidly develop and test an early-to-space prototype system to be made available to transition partners to integrate with space vehicles and conduct experimentation. Technology developed by this program will transition to the Services and other government agencies. ***FY 2022 Plans:*** - Complete payload design and build. - Conduct system-level preliminary design review (PDR) and critical design review (CDR). - Complete payload testing of all hardware components. - Implement a baseline set of mission software demonstrating mission feasibility. - Develop testing environment. ***FY 2023 Plans:*** - Perform detailed testing of mission software integrated with payload hardware within emulation environment. - Analyze technology utility for tactical use within operational constellations.	4.836	20.742	15.643

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency		Date: April 2022
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603767E / *SENSOR TECHNOLOGY*	**Project (Number/Name)** SEN-02 / *SENSORS AND PROCESSING SYSTEMS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Begin transition of integrated software and hardware capability to transition partners. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 decrease reflects a shift from development, validation, and experimentation to systems integration and testing.			
Title: Dynamically Composed RF Systems ***Description:*** Dominance of the Radio Frequency (RF) spectrum is critical to successful U.S. military operations. Radar systems, electronic warfare (EW) systems, and communication systems require custom software and hardware that is costly and time-consuming to build and integrate onto platforms. The Dynamically Composed RF Systems program addresses these challenges by developing adaptive, converged RF array systems. This enables enhanced operational capability by dynamically adapting the system for tasks to support radar, communications, and EW in a converged manner. This program will design and develop: (1) a modular architecture for collaborative, agile RF systems; (2) advanced techniques for RF apertures and airframe integration and the associated wide-band agile electronics to support converged missions over those apertures; (3) a heterogeneous signal processing complex implementing hardware-agnostic RF operating modes (the RF Virtual Machine); (4) software tools for the control, coordination, and scheduling of RF functions and payloads at the element level to maximize overall task performance (a System and Sensor Resource Manager (SSRM)). This capability can be adapted to address diverse missions. Technology developed under this program will transition to the Services. ***FY 2022 Plans:*** - Conduct ground testing of SSRM on testbed aircraft and demonstrate ability to control both payloads on the ground. - Conduct flight tests of the SSRM controlling two third-party payloads and demonstrate ability to control those payloads in flight. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The FY 2023 decrease reflects program completion.	5.987	5.900	-
Accomplishments/Planned Programs Subtotals	41.203	84.248	92.659

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Defense Advanced Research Projects Agency			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603767E / *SENSOR TECHNOLOGY*	Project (Number/Name) SEN-06 / *SENSOR TECHNOLOGY*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
SEN-06: *SENSOR TECHNOLOGY*	-	125.095	173.759	186.005	-	186.005	117.411	69.793	14.400	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds classified DARPA programs that are reported in accordance with Title 10, United States Code, Section 119(a)(1) or its successor.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Classified DARPA Program	125.095	173.759	186.005
Description: This project funds Classified DARPA Programs. Details of this submission are classified. ***FY 2022 Plans:*** Details will be provided under separate cover. ***FY 2023 Plans:*** Details will be provided under separate cover. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Details will be provided under separate cover.			
Accomplishments/Planned Programs Subtotals	125.095	173.759	186.005

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A