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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2024 Defense Advanced Research Projects Agency **Date:** March 2023

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603767E / <i>SENSOR 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	-	286.705	308.442	358.580	-	358.580	334.971	367.752	368.133	371.812	-	-
SEN-01: <i>SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY</i>	-	30.212	29.778	62.563	-	62.563	65.874	71.839	80.439	90.439	-	-
SEN-02: <i>SENSORS AND PROCESSING SYSTEMS</i>	-	94.391	92.659	62.067	-	62.067	66.428	159.602	214.517	272.915	-	-
SEN-06: <i>SENSOR TECHNOLOGY</i>	-	162.102	186.005	233.950	-	233.950	202.669	136.311	73.177	8.458	-	-

**A. Mission Description and Budget Item Justification**

The efforts described in this Program Element (PE) address the Advanced Technology Development associated with the Sensor Technology Program focused on 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.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>
Previous President's Budget	294.792	314.502	263.612	-	263.612
Current President's Budget	286.705	308.442	358.580	-	358.580
Total Adjustments	-8.087	-6.060	94.968	-	94.968
• Congressional General Reductions	0.000	-6.060			
• 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	1.056	0.000			
• SBIR/STTR Transfer	-9.143	0.000			
• TotalOtherAdjustments	-	-	94.968	-	94.968

**Change Summary Explanation**

FY 2022: Decrease reflects SBIR/STTR transfer offset by reprogrammings.

FY 2023: Decrease reflects Congressional reduction to Reduce Growth.

FY 2024: Increase reflects initiation of the Archie and Cancun programs as well as the scaling up of efforts in the Ouija and classified programs.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Defense Advanced Research Projects Agency										<b>Date:</b> March 2023		
<b>Appropriation/Budget Activity</b> 0400 / 3					<b>R-1 Program Element (Number/Name)</b> PE 0603767E / SENSOR TECHNOLOGY				<b>Project (Number/Name)</b> SEN-01 / SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
SEN-01: SURVEILLANCE AND COUNTERMEASURES TECHNOLOGY	-	30.212	29.778	62.563	-	62.563	65.874	71.839	80.439	90.439	-	-
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)**

	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> Moving Target Recognition (MTR)	14.862	15.013	17.909
<p><b>Description:</b> 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.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue to develop and refine novel algorithms for moving target detection, tracking, and imaging with SAR sensors.</li> <li>- Conduct independent assessment of algorithm performance using airborne SAR data with ground truth.</li> <li>- Optimize software implementations of MTR algorithms for speed, efficiency, and robustness.</li> <li>- Initiate development of ATR algorithms for the moving target images.</li> </ul> <p><b>FY 2024 Plans:</b></p>			

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<ul style="list-style-type: none"> <li>- Execute a ground-truth experiment using an airborne SAR to gather moving target data suitable for training and testing ATR algorithms on militarily relevant targets.</li> <li>- Continue to develop and mature moving target ATR algorithms and characterize their performance using ground-truth data.</li> <li>- Tailor the moving target imaging algorithms to create optimal inputs to the ATR algorithms.</li> <li>- Perform independent verification and validation of ATR algorithm performance.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 increase reflects a shift from image formation software engineering to ATR algorithm development and testing.</p>				
<p><b>Title:</b> Fiddler</p> <p><b>Description:</b> 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 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.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Create baseline version of the Fiddler image generation software.</li> <li>- Develop standardized interfaces for training and producing SAR imagery of objects.</li> <li>- Conduct laboratory testing and evaluation of baseline version of the software to demonstrate it can create synthetic SAR imagery.</li> </ul> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Demonstrate that the baseline software-generated images can effectively train an ATR algorithm.</li> <li>- Demonstrate that the baseline software can meet the specified time requirements for generating new images.</li> <li>- Conduct laboratory testing and evaluation of the baseline software to demonstrate it can successfully create synthetic SAR imagery for a wide range of viewing angles.</li> <li>- Implement algorithm improvements to enable software to meet requirements for a wide range of conditions.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY2024 increase reflects a shift from design and development to performance testing of real time software.</p>		-	6.871	12.295
<p><b>Title:</b> Ouija</p> <p><b>Description:</b> The goal of the Ouija program is to quantify the High Frequency (HF) noise environment in space and improve the characterization of the ionosphere in support of warfighter capabilities. Building upon technologies developed in the</p>		-	3.000	19.859

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p>Small Satellite Sensors program, previously budgeted in PE 0603767E/Project SEN-02, Ouija intends to make ionospheric measurements of unprecedented granularity using ground equipment and satellites in very low earth orbit (VLEO) to improve ionospheric models and better predict long-range HF propagation. Ouija technology will result in improved performance and characterization of radars and communication systems that operate in the HF band. Technology developed under this program will transition to the Services.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Develop Ouija satellite preliminary designs.</li> <li>- Conduct satellite HF Antenna deployment demonstration and evaluate ionospheric modeling.</li> </ul> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Build and launch Ouija satellite and operations.</li> <li>- Conduct test and measurement campaign using satellite and ground assets.</li> <li>- Develop assimilative HF propagation models.</li> <li>- Validate HF modeling using Ouija data.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 increase reflects a shift from initial development to building and launching the Ouija satellite.</p>			
<p><b>Title:</b> Archie</p> <p><b>Description:</b> The Archie program seeks to develop techniques to characterize the electromagnetic spectrum to enhance radio frequency (RF) situational awareness, maneuverability, and countermeasures in Anti-Access/Area Denial (A2/AD) environments. Based on technologies developed in the Resilient Networked Distributed Mosaic Communications (RNDMC) program (budgeted in PE 0603760E, Project CCC-02), Archie will leverage distributed communication advancements to enhance distributed electromagnetic warfare (EW) capabilities making them more robust and effective. Current radar and EW systems face the challenge of operating in a more congested and contested RF environment. At present, traditional EW systems do not have the capability to characterize this environment leading to performance degradation. Archie will overcome this by characterizing the electromagnetic spectrum and determining the optimal means by which to deploy radar and EW capabilities. Archie will provide novel and new ways for massive characterization, measuring RF signals of opportunity to aid in the placement and transmission of radar and EW signals. Technology developed under this program will transition to the Services.</p> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Identify and develop the RF architecture for massive RF characterization.</li> <li>- Initiate technique development and testing.</li> </ul>	-	-	12.500

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
- Initiate radar and EW enhanced capability development.				
<b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 increase reflects program initiation.				
<b>Title:</b> All Source Combat Operations and Targeting (ASCOT) <b>Description:</b> 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. 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.		12.300	4.894	-
<b>FY 2023 Plans:</b> - 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.				
<b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 decrease reflects program completion.				
<b>Title:</b> Shosty <b>Description:</b> Shosty developed and demonstrated enhanced capabilities for high frequency (HF) over-the-horizon-radar (OTHR) systems. This program developed 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 were conducted to assess performance. Technologies developed under the Shosty program transitioned to the Services.		3.050	-	-
<b>Accomplishments/Planned Programs Subtotals</b>		30.212	29.778	62.563
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024 Base</b>	<b>FY 2024 OCO</b>	<b>FY 2024 Total</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>FY 2028</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
SEN-02: <i>SENSORS AND PROCESSING SYSTEMS</i>	-	94.391	92.659	62.067	-	62.067	66.428	159.602	214.517	272.915	-	-
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)**

	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<b>Title:</b> Thermal Imaging Technology Experiment-Recon (TITE-R)	24.269	20.643	8.081
<p><b>Description:</b> The Thermal Imaging Technology Experiment-Recon (TITE-R) program 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 which will more closely represent an objective capability. TITE-R will develop sensors and software automation capable of supporting future operations implemented on small (&lt; 250 kg) satellites. TITE-R will also develop mission software to support automated on-board processing and simplified operator tasking. TITE-R aims to rapidly develop and test early-to-space prototype system payloads 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.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete critical design review (CDR).</li> <li>- Perform payload testing of all hardware components and detailed testing of mission software integrated with payload hardware within emulation environment.</li> <li>- Analyze technology utility for use within operational constellations.</li> </ul>			

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<ul style="list-style-type: none"> <li>- Begin transition of integrated software and hardware capability to transition partners.</li> </ul> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Build, deliver and test payloads.</li> <li>- Continue transition of integrated software and hardware capability to transition partners.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 decrease reflects a shift from component testing to final build and delivery.</p>				
<p><b>Title:</b> Painter</p> <p><b>Description:</b> 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.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Define architecture for Painter laser technology.</li> <li>- Construct test bench for Painter hardware experimentation.</li> <li>- Evaluate initial Painter hardware in lab environment.</li> <li>- Conduct preliminary design review for Painter laser technology.</li> <li>- Initiate construction of laboratory-based Painter laser.</li> </ul> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Conduct critical design review for Painter laser technology.</li> <li>- Complete construction of laboratory-based Painter laser.</li> <li>- Create Painter laser technology breadboard demonstration system.</li> <li>- Evaluate breadboard and rack-mounted Painter hardware in lab and operationally relevant environments.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 decrease reflects a shift from hardware construction to hardware integration and evaluation.</p>		19.970	25.597	21.362
<p><b>Title:</b> Coho</p> <p><b>Description:</b> 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</p>		18.534	17.683	4.647

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<p>U.S. and Allied Forces to accurately orient and beneficially maneuver in the electromagnetic spectrum. 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.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Conduct evaluations of Coho signal recognition algorithms.</li> <li>- Optimize Coho system via hardware calibration and software interface revision.</li> <li>- Test prototype Coho system to verify performance.</li> </ul> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Conduct independent verification and validation (IV&amp;V) of Coho hardware performance.</li> <li>- Conduct IV&amp;V of Coho signal processing applications running on hardware system.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 decrease reflects a shift from component evaluation to IV&amp;V of the Coho hardware and applications.</p>			
<p><b>Title:</b> Distributed Radar Image Formation Technology (DRIFT)</p> <p><b>Description:</b> 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. 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 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.</p> <p><b>FY 2023 Plans:</b></p> <ul style="list-style-type: none"> <li>- Create prototype DRIFT algorithms and test on simulated data.</li> <li>- Prepare satellites for on-orbit testing, including finalizing the hardware, ground software, and maneuver strategy.</li> <li>- Conduct modeling and simulation to develop detailed plans for satellite formation configurations and radar operations to be tested on orbit.</li> </ul> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Perform on-orbit data collection to demonstrate formation flying and joint radar operation.</li> </ul>	3.000	13.054	12.977

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
<ul style="list-style-type: none"> <li>- Test and validate performance of DRIFT algorithms using real data from on-orbit collections.</li> <li>- Begin to optimize algorithms and software to run on tactically relevant timescales.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 decrease reflects minor program repricing.</p>				
<p><b>Title:</b> Cancun</p> <p><b>Description:</b> The Cancun program will create distributable nodes to measure the radio high frequency (HF) environment for improved war fighter situational awareness. Built on technologies developed in the Shosty program (budgeted in PE 0603767E, project SEN-01), Cancun will enable cost-effective wide-area deployment of low size, weight, power, and cost (SWaP-C) nodes. Cancun will also develop the command and control (C2) network and planning tools required to address the challenge of coordinating large numbers of Cancun nodes deployed over distances of well over 1000 kilometers. The Cancun nodes will measure the state of the ionosphere using a sounding function, as well as record and relay portions of the HF radio band for analysis. The mission planning tool will be developed with war fighter input to optimize functionality. Technologies developed under the Cancun program will transition to the Services.</p> <p><b>FY 2024 Plans:</b></p> <ul style="list-style-type: none"> <li>- Design, build, and deliver Cancun hardware nodes and functional software.</li> <li>- Integrate the hardware and software for fully functional Cancun nodes.</li> <li>- Design, build, and deliver Cancun command and control software.</li> <li>- Field test integrated Cancun nodes.</li> </ul> <p><b>FY 2023 to FY 2024 Increase/Decrease Statement:</b> The FY 2024 increase reflects program initiation.</p>		-	-	15.000
<p><b>Title:</b> Military Tactical Means (MTM)</p> <p><b>Description:</b> 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</p>		22.718	15.682	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2024 Defense Advanced Research Projects Agency		<b>Date:</b> March 2023
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603767E / <i>SENSOR TECHNOLOGY</i>	<b>Project (Number/Name)</b> SEN-02 / <i>SENSORS AND PROCESSING SYSTEMS</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>
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.			
<p><b><i>FY 2023 Plans:</i></b></p> <ul style="list-style-type: none"> <li>- Complete algorithm development activities.</li> <li>- Distribute field experimentation data to other DoD agencies for future research.</li> <li>- Finalize, test, and transition MTM hardware to the Air Force Research Laboratory.</li> </ul> <p><b><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i></b> The FY 2024 decrease reflects program completion.</p>			
<p><b><i>Title:</i></b> Dynamically Composed RF Systems</p> <p><b><i>Description:</i></b> 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 addressed these challenges by developing adaptive, converged RF array systems. This enabled enhanced operational capability by dynamically adapting the system for tasks to support radar, communications, and EW in a converged manner. This program designed and developed: (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 transitioned to the Air Force.</p>	5.900	-	-
<b>Accomplishments/Planned Programs Subtotals</b>	94.391	92.659	62.067

<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A
<b>Remarks</b>
<b>D. Acquisition Strategy</b> N/A

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2024 Defense Advanced Research Projects Agency **Date:** March 2023

<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603767E / <i>SENSOR TECHNOLOGY</i>	<b>Project (Number/Name)</b> SEN-06 / <i>SENSOR 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
SEN-06: <i>SENSOR TECHNOLOGY</i>	-	162.102	186.005	233.950	-	233.950	202.669	136.311	73.177	8.458	-	-
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 2022	FY 2023	FY 2024
<b><i>Title:</i></b> Classified DARPA Program	162.102	186.005	233.950
<b><i>Description:</i></b> This project funds Classified DARPA Programs. Details of this submission are classified.			
<b><i>FY 2023 Plans:</i></b> Details will be provided under separate cover.			
<b><i>FY 2024 Plans:</i></b> Details will be provided under separate cover.			
<b><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i></b> Details will be provided under separate cover.			
<b>Accomplishments/Planned Programs Subtotals</b>	162.102	186.005	233.950

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A