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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	137.157	123.287	71.791	0.000	71.791	-	-	-	-	-	-
672001: <i>Next-Generation Sensors</i>	-	0.000	46.263	20.184	0.000	20.184	-	-	-	-	-	-
672002: <i>Agile ISR</i>	-	0.000	5.342	5.413	0.000	5.413	-	-	-	-	-	-
672003: <i>Sensors Open System Architecture</i>	-	0.000	13.891	0.734	0.000	0.734	-	-	-	-	-	-
674818: <i>Imaging and Targeting Support</i>	-	29.729	0.000	0.000	0.000	0.000	-	-	-	-	-	-
674820: <i>Sensor Development</i>	-	81.972	44.689	30.344	0.000	30.344	-	-	-	-	-	-
675092: <i>JTC/SIL MUSE</i>	-	3.521	3.574	3.593	0.000	3.593	-	-	-	-	-	-
675291: <i>Gorgon Stare</i>	-	15.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
676025: <i>Data Compression</i>	-	6.935	9.528	11.523	0.000	11.523	-	-	-	-	-	-

Note

In FY2021 all funding in PE 0305206, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) will be realigned to provide greater visibility and transparency of funding into the projects.

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to Next-Generation Sensors were transferred to Project 672001, (Next-Generation Sensors) in order to provide mission critical technology more quickly and cost effectively.

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to Agile ISR were transferred to Project 672002, (Agile ISR) in order to provide greater visibility and transparency.

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to System Open System Architecture were transferred to Project 672003, (Sensor Open System Architecture) in order to provide greater visibility and transparency.

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related ASARS-2B were transferred to Project 674820, (Sensors Development) in order to provide greater visibility and transparency.

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674820, (Sensor Development) funds were transferred from PE 0604257F (Advanced Technology and Sensors), Project 645148, (Common Airborne Sense and Avoid), in order to align funding with Air Force project priorities and requirements.

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 672001, (Next Generation Sensor) received 18M in funds that were intended for PE 0305202F (Dragon U-2), Project 674820, (Sensor Development), per FY21 PBD. Funds will be executed against U-2 avionics and sensor efforts under PE 0305202F (Dragon U-2).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>	
A. Mission Description and Budget Item Justification <p>The Airborne Reconnaissance System (ARS) Program develops and integrates next generation intelligence, surveillance, and reconnaissance (ISR) capabilities. ARS includes platform agnostic sensor data processing; sensor products aiding assisted target recognition algorithms and other artificial intelligence activities (e.g. geolocation models, sensor-base exploitation tools, sensor networking capabilities); and implementation of Sensor open architecture standards. The ARS Program includes the following efforts: Next-Generation Sensors (672001), Agile ISR (672002), Sensors Open System Architecture (672003), Imaging and Targeting Support (674818), Sensor Development (674820), JTS/SIL MUSE (675092), Gorgon Stare (675291), and Data Compression (676025).</p> <p>The ARS PE is integral to developing multi-domain, multi-Intelligence (multi-INT) research, development, test and evaluation (RDT&E) Program of Record (PoR) efforts in support of the National Defense Strategy (NDS) and 2018 DoD Artificial Intelligence Strategy, as applied by the Air Force in the Next Generation ISR Dominance Flight Plan. Specifically, Program 0305206F provides authorized and appropriated funding to multi-INT RDT&E efforts for utilization on airborne platforms. This program traditionally provides a multi-INT venue for integration of technologies matured in both the Advanced Technology Sensors (0604257F) and Airborne SIGINT Enterprise (0304260F) programs. Additionally, with the creation and maturation of the Advanced Battle Management System (ABMS), the multi-INT efforts will also be integrated and executed using the openIntONE product line under Sensor Integration category within Advanced Battle Management System (ABMS). ABMS/openIntONE mission and funding is dedicated to integrating PoR capabilities into ABMS On Ramps, then those ABMS fused efforts will then be transitioned back to the PoR to sustain and field. Next Generation Sensors (NGS) PoR is specifically tied to the openIntONE product line and supporting its directives.</p> <p>NGS is a platform-agnostic suite of sensors defined for the best flexibility and capability for an ever-changing scale of ISR missions. Execution of the NGS activities are founded upon three pillars: Open Standards, Artificial Intelligence (AI)/Machine Learning(ML) algorithms, and Advanced Platform-Agnostic Sensors. The power behind the NGS program is an open architectural system design that enables rapid third party model and LRU insertion/replacement allowing for DevSecOps execution, onboard multi-modal and multi-INT processing, sensor cross-cueing, and AI/ML application. The AI/ML algorithms will be used to enable assisted target detection and identification. NGS will anticipate and more quickly counter our adversaries' future improvements in their abilities to hide from and defeat our ISR sensors. NGS efforts include, but are not limited to: Triple Raven multi-GEOINT Advance Technology Demonstration (ATD), Multi-Intelligence Common Open Architecture Reconnaissance Programs Standard (MI-COARPS), Raging Parakeet Joint Capability Technology Demonstration (JCTD), and Assisted Target Recognition for ISR (ATRI).</p> <p>The Open Standards pillar of next generation capabilities is supported through MI-COARPS and Sensors Open Systems Architecture (SOSA) which coordinates advanced technologies, and open architecture development for multi-INT sensor modalities. The AI/ML algorithm pillar of next generation capabilities will be supported by the Agile ISR and Data Compression efforts. Detection, Removal and Characterization Operations (DRACO) supports the development of a robust image quality improvement capability for airborne synthetic aperture radar (SAR) products. Additionally, the Reduction of Data Using Compression Enhancement (RDUCE) develops data compression algorithms, addressing current and future date dissemination systems' bandwidth limitations. Consistent with NDS, algorithms are multi-INT sensor agnostic that are submitted for formal adoption by the DOD-Intelligence Community (IC) Joint Enterprise Standards Committee (JESC) GEOINT and SIGINT standards groups. Platform Agnostic Sensors pillar of next generation capabilities will be supported by the Sensor Development effort, which includes the Advanced Synthetic Aperture Radar System (ASARS) front end antenna array and receiver exciter advancements (ASARS-2B). ASARS-2B follow-on RDT&E extends range, enhances Ground Moving Target Indicator (GMTI) and SAR performance and introducing maritime capability, while laying the framework for future use of open architectures. Additional efforts that support the next generation capabilities include continuation of Gorgon Stare Wide Area Motion Imagery (WAMI) RDT&E and the Multiple Unified Simulation Environment (MUSE) Joint Technology Center/Systems Integration Lab (JTC/SIL) by supporting ISR Training.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force	Date: May 2021
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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>
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This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 0.857M expended and in FY21 1.742M is estimated for civilian pay expenses in this program element.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	137.909	121.512	66.358	0.000	66.358
Current President's Budget	137.157	123.287	71.791	0.000	71.791
Total Adjustments	-0.752	1.775	5.433	0.000	5.433
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.752	1.775	5.433	0.000	5.433

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

Project: 674818: *Imaging and Targeting Support*

Congressional Add: *Sensor Open System Architecture (SOSA)*

Congressional Add Subtotals for Project: 674818

Project: 675291: *Gorgon Stare*

Congressional Add: *Gorgon Stare*

Congressional Add Subtotals for Project: 675291

Congressional Add Totals for all Projects

	FY 2020	FY 2021
Congressional Add Subtotals for Project: 674818	0.000	-
Congressional Add Subtotals for Project: 675291	15.000	0.000
Congressional Add Totals for all Projects	15.000	0.000

Change Summary Explanation

FY20 decrease (-720K) due to Below Threshold Reprogramming to support approved TENCAP efforts.

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FY21 Congressional markup (+1.775M)		

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672001 / Next-Generation Sensors
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
672001: <i>Next-Generation Sensors</i>	-	0.000	46.263	20.184	0.000	20.184	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to Next Generation Sensors were transferred to Project 672001, (Next Generation Sensors) in order to provide greater visibility and transparency for integration into the sensor suite. This project is not a new start.

A. Mission Description and Budget Item Justification

The Next Generation Sensors (NGS) program seeks to change the paradigm of Intelligence, Surveillance, and Reconnaissance (ISR) sensor acquisitions to deliver mission critical technology more quickly and cost effectively. NGS is a platform-agnostic suite of sensors defined for the best flexibility and capability for an ever-changing scale of ISR missions. Designated as a Middle Tier Acquisition, Section 804 program of record, the power behind the NGS program is an open architectural system design that enables individual sensor upgrades and enhancements and mission-specific mode and algorithm application, establishing a path to on-board multimodal and multi-INT processing, sensor cross-cueing, and artificial intelligence application. NGS efforts include, but are not limited to: Triple Raven multi-GEOINT Advance Technology Demonstration (ATD), multi-INT Common Open Architecture Reconnaissance Programs Standard (MI-COARPS), Raging Parakeet JCTD, Assisted Target Recognition for ISR (ATRI). Additionally, with the creation and maturation of the Advanced Battle Management System (ABMS), the multi-INT efforts will also be integrated and executed using the openIntONE product line under Sensor Integration category within ABMS. ABMS/openIntONE mission and funding is dedicated to integrating PoR capabilities into ABMS On Ramps, then those ABMS fused efforts will then be transitioned back to the PoR to sustain and field. Next Generation Sensors (NGS) PoR is specifically tied to the openIntONE product line and supporting its directives.

NGS program efforts are set by capability gaps within the Challenging Targets Initial Capabilities Document and as approved by the Capabilities Decision Memorandum (Signed Jan 2019). These requirements have been further verified, modeled, and developed through the Airborne Sensors for ISR (ASI) Analysis of Alternatives (AoA) and the Triple Raven ATD, which was approved by the Advanced Technology Council (ATC) in FY19.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to civilian pay expenses budgeted in program element 0605831F.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Next Generation Sensors	0.000	46.263	20.184	-	20.184

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) 672001 / <i>Next-Generation Sensors</i>

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Description: Mold current and future ISR into a platform agnostic, non-proprietary, autonomous multi-INT cross cueing solution that is designed based on mission requirements. Sensors will have to penetrate up to highly contested domains and survive to operate. This project will also increase interoperability by developing common standards and interfaces for mission and sensor systems.</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Transition projects from AFRL and Imaging & Targeting Support into programs of record to include new technologies in sensors and ISR technologies. - Triple Raven Advanced Technology Demonstration - Execute prototyping and requirements development for next generation platform agnostic, dual-band EO/IR and multi-mode LiDAR prototype sensors. - Design and develop government owned, standards compliant sensor pods. - Develop specific Artificial Intelligence Target Recognition Algorithms for multi-mode, ISR platforms. Develop synthetic data sets to increase algorithm effectiveness. Maintain database of labeled data for assisted target recognition (ATR) community. Develop multi-INT Open Architecture processors and standards. - Mature open architectures for ISR systems including cybersecurity analysis, industry standardization, and open architecture demonstrations. - Begin integration of the dual-band EO/IR system, open architecture ISR standards, and an open architecture aircraft. <p>FY 2022 Base Plans:</p> <ul style="list-style-type: none"> - Will mature sensor technology for electro-optical/infrared (EO/IR) and radar sensor modalities - Will develop, integrate, and test Triple Raven Prototype System (dual-band EO/IR and multi-mode LiDAR prototype sensor) - Will develop edge artificial intelligence (AI)/machine learning (ML) algorithms to ID critical mobile targets (CMTs) - Will develop multi-INT, open architecture (OA) processor and standards. Mature open architectures for ISR systems including cybersecurity analysis, industry standardization, and open architecture demonstrations - Will integrate cross-cueing, fusion algorithms, and edge AI/ML algorithm suite with sensors and processing open architecture (OA) standards into a penetrating aircraft (Raging Parakeet JCTD) - Will begin integration of Next Generation Sensors into relevant platforms <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
The increase from FY21 to FY22 accounts for increased support in Standards efforts (MI-COARPS) and inflation.					
Accomplishments/Planned Programs Subtotals	0.000	46.263	20.184	-	20.184

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

N/A

Remarks

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 672001, (Next Generation Sensor) received \$18M in funds that were intended for PE 0305202F (Dragon U-2), Project 674820, (Sensor Development), per FY21 PBD. Funds will be executed against U-2 avionics and sensor efforts under PE 0305202F (Dragon U-2).

D. Acquisition Strategy

Next Generation Sensors (NGS) is currently executing under a Middle Tier Acquisition Section 804 authority and is currently in the Rapid Prototyping (Alpha) phase. NGS (formerly known as ASI) is utilizing Imaging and Targeting Support (I&TS) and other ISR programs to execute rapid technology maturation and risk reduction (TMRR) activities. Execution of the NGS Middle Tier Acquisition (MTA) Rapid Prototyping activities will leverage parallel development activities and integrate them with a risk-informed approach to develop and demonstrate NGS capabilities that meet military needs under operationally-relevant environments and conditions. NGS is leveraging Advanced Technology Demonstration authority to mature and demonstrate cutting-edge sensor technology. This program has established a forum of stakeholders, consisting of multiple Other Government Agencies (OGAs), end-users, and MAJCOMs to ensure that the program deliverables are answering identified warfighter needs, to ensure a clear and concise technology transition path.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672001 / Next-Generation Sensors
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Triple Raven ATD	Various	Various : TBD	-	-		6.000	Jun 2021	5.000	Feb 2022	-		5.000	-	-	-
NGS Sensors	Various	Various : TBD	-	-		30.186	Jun 2021	1.584	Feb 2022	-		1.584	-	-	-
NGS Algorithms (ATRI)	Various	Various : TBD	-	-		4.871	Jun 2021	2.214	Feb 2022	-		2.214	-	-	-
NGS Standards (OA)	Various	Various : TBD	-	-		2.525	Jun 2021	2.930	Dec 2021	-		2.930	-	-	-
Raging Parakeet JCTD	Various	Various : TBD	-	-		0.200	Feb 2021	5.900	Dec 2021	-		5.900	-	-	-
Subtotal			-	-		43.782		17.628		-		17.628	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA: Other Gov't costs	Various	Not specified. : TBD	-	-		2.481	Feb 2021	2.556	Oct 2021	-		2.556	-	-	-
Subtotal			-	-		2.481		2.556		-		2.556	-	-	N/A

Project Cost Totals	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
	-	-	46.263	20.184	-	20.184	-	-	N/A

Remarks
 In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to Next Generation Sensors were transferred to Project 672001, (Next Generation Sensor) in order to provide greater funding visibility and transparency into projects and to provide mission critical technology more quickly and cost effectively.

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 672001, (Next Generation Sensor) received \$17.946M in funds that were intended for PE 0305202F (Dragon U-2), Project 674820, (Sensor Development), per FY21 PBD. Funds will be executed against U-2 avionics and sensor efforts under PE 0305202F (Dragon U-2).

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) 672001 / <i>Next-Generation Sensors</i>

FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Next Generation Sensors																												
Sensors					████████████████████																							
- Sensor Maturation & Risk Reduction					████████████████████																							
- Multi-Mode LiDAR Dev					████████████████																							
- Algorithm/Code Dev, Camera Characterization					████████████████████																							
- Platform Integration					████████████████████																							
- Triple Raven ATD, EO/IR, LiDAR, Testing & Integration					████████████████████																							
Algorithms (ATRI)					████████████████████																							
- EO/IR Algorithm Development					████████████████████																							
- Radar Algorithm Development					████████████████████																							
- HSI Algorithm Development					████████████████████																							
- LiDAR Algorithm Development					████████████████████																							
Standards (Open Architecture)					████████████████████																							
- EMD					████████████████████																							
- SIL					████████████████████																							
- RedHawk					██████																							
- Government Reference OA Development					████████████████████																							
Raging Parakeet JCTD					████████████████████																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) 672001 / <i>Next-Generation Sensors</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Next Generation Sensors				
Sensors	2	2021	4	2022
- Sensor Maturation & Risk Reduction	2	2021	4	2022
- Multi-Mode LiDAR Dev	2	2021	2	2022
- Algorithm/Code Dev, Camera Characterization	2	2021	4	2022
- Platform Integration	2	2021	4	2022
- Triple Raven ATD, EO/IR, LiDAR, Testing & Integration	2	2021	4	2022
Algorithms (ATRI)	2	2021	4	2022
- EO/IR Algorithm Development	2	2021	4	2022
- Radar Algorithm Development	2	2021	4	2022
- HSI Algorithm Development	2	2021	4	2022
- LiDAR Algorithm Development	2	2021	4	2022
Standards (Open Architecture)	2	2021	4	2022
- EMD	2	2021	4	2022
- SIL	2	2021	4	2022
- RedHawk	2	2021	3	2021
- Government Reference OA Development	2	2021	4	2022
Raging Parakeet JCTD	2	2021	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672002 / Agile ISR
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
672002: Agile ISR	-	0.000	5.342	5.413	0.000	5.413	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to Agile ISR were transferred to Project 672002, (Agile ISR) in order to provide greater visibility and transparency. This project is not a new start.

A. Mission Description and Budget Item Justification

The Agile ISR BPAC matures, develops, and deploys projects started under the Imaging & Targeting Support (I&TS) program in support of current and future platform agnostic, non-proprietary, autonomous, multi-INT cross cueing ISR solutions based on Advanced Battle Management System (ABMS) and Joint All-domain Command and Control (JADC2) mission requirements. This includes, but is not limited to, Detection Removal and Characterization Operations (DRACO), support and development of AgilePod, and other projects. Portions of the developmental efforts under Agile ISR are classified.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to civilian pay expenses budgeted in program element 0605831F.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Title: DRACO</p> <p>Description: Detection Removal and Characterization Operations (DRACO) is a robust Image Quality improvement capability for Airborne Synthetic Aperture Radar (SAR) products. The software resides in multiple locations on the ground and future efforts will migrate algorithms to airborne platforms supporting the Air Force, Army, Navy and other customers. DRACO efforts include but are not limited to development, design, fabrication, integration, demonstration, test, and transition of image quality improvement capabilities. This project originated under the I&TS program. All other details are classified.</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Mature, develop and deploy DRACO capabilities in order to give the warfighter a more efficient and effective tool. - Complete DRACO 5.0 efforts and initiating DRACO 6.0. - Increase interoperability by developing common standards and interfaces. 	0.000	5.342	5.413	-	5.413

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Increase access and expand user base.					
<i>FY 2022 Base Plans:</i>					
- Will continue to mature, develop and deploy DRACO capabilities in order to give the warfighter a more efficient and effective tool.					
- Will continue to complete DRACO 6.0 efforts in FY23.					
- Will continue to increase interoperability by developing common standards and interfaces.					
- Will continue to increase access and expand user base.					
- Will integrate DRACO, assisted target recognition, and SAR compression algorithm into a software suite referenced as SAR Clean-up AI/ML Reduction (SCAR) Package					
<i>FY 2021 to FY 2022 Increase/Decrease Statement:</i>					
Increase due to continued expansion of user base and integration efforts.					
Accomplishments/Planned Programs Subtotals	0.000	5.342	5.413	-	5.413

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

N/A

Remarks

D. Acquisition Strategy

Capabilities will be developed and integrated onto various information systems and platforms using an agile acquisition approach. The projects will be executed and contracted with appropriate vendor(s) to deliver capability while driving competition where possible.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672002 / Agile ISR
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DRACO	SS/CPFF	Lockheed Martin : King of Prussia, PA	-	0.000		4.794	Dec 2020	5.116	Mar 2022	-		5.116	-	-	-
Subtotal			-	0.000		4.794		5.116		-		5.116	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMA: Other Govt Cost	Various	Not specified. : TBD	-	-		0.548	Oct 2020	0.297	Oct 2021	-		0.297	-	-	-
Subtotal			-	-		0.548		0.297		-		0.297	-	-	N/A

Project Cost Totals	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000	5.342	5.413	-	5.413	-	-	N/A

Remarks
 In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to Agile ISR were transferred to Project 672002, (Agile ISR) in order to provide greater visibility and transparency.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672002 / Agile ISR

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Agile ISR																												
DRACO 5.0																												
DRACO 6.0																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672002 / Agile ISR

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Agile ISR				
DRACO 5.0	1	2020	3	2021
DRACO 6.0	1	2021	1	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force										Date: May 2021		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems				Project (Number/Name) 672003 / Sensors Open System Architecture			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
672003: Sensors Open System Architecture	-	0.000	13.891	0.734	0.000	0.734	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to System Open System Architecture were transferred to Project 672003, (Sensor Open System Architecture) in order to provide greater visibility and transparency. This project is not a new start.

A. Mission Description and Budget Item Justification

The Sensors Open System Architecture (SOSA) project develops common hardware standards and associated software interfaces in support of the development for modalities of sensors, such as: RADAR, SIGINT, EW, Communications and EO/IR (development of standards and open architecture interfaces for Hardware and Electrical/Mechanical interfaces) in support of multiple airborne reconnaissance platforms, both manned and unmanned. Its objectives are to develop, demonstrate, and rapidly upgrade/iterate advanced, interoperable, multi-platform solutions to reduce the find, fix, target, and track kill chain timeline, and to provide safe separation and collision avoidance for remotely piloted aircraft through development of abstraction interfaces for sense (such as RADAR, ADS-B, TCAS, Next Generation Sensors, ASIP, and ASARS) and avoid logic.

This project is designed to support development of the Next Generation Sensors program, as well as other AFLCMC/WI emerging and program of record needs. As part of the development effort SOSA will be funding and supporting first article development of key common hardware solutions.

The SOSA SIL (System Integration Laboratory) will continue to support development of common hardware standards and associated software interfaces and provide a conformance/compliance program for industry partners and other DoD services.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Sensors Open System Architecture	0.000	13.891	0.734	-	0.734
Description: Description: The Sensors Open System Architecture (SOSA) project will execute activities to develop common hardware standards and associated software interfaces.					
FY 2021 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672003 / Sensors Open System Architecture

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<ul style="list-style-type: none"> - Continue to support of RPA Sense and Avoid Technology (C-ABSAA Technology Maturation & Risk Reduction Phase) - Continue to develop prototype of SOSA SAR/SIGINT capability - Continue to develop AgilePod internal electrical/mechanical interfaces - Continue to implement and execute hardware demonstrations - Continue to support EO/IR article prototyping - Continue to prepare and host interoperability demonstrations - SOSA/COARPSSIG/EW Demo Prototype 2 execution with congressional plus up (includes associated support) <p>FY 2022 Base Plans:</p> <ul style="list-style-type: none"> - Will continue to support of RPA Sense and Avoid Technology (C-ABSAA Technology Maturation & Risk Reduction Phase) - Will continue to develop prototype of SOSA SAR/SIGINT capability - Will continue to develop AgilePod internal electrical/mechanical interfaces - Will continue to implement and execute hardware demonstrations - Will continue to support EO/IR article prototyping - Will continue to prepare and host interoperability demonstrations <p>FY 2021 to FY 2022 Increase/Decrease Statement: Decrease in funding is due to realignment of funds to higher Air Force priorities</p>					
Accomplishments/Planned Programs Subtotals	0.000	13.891	0.734	-	0.734

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

N/A

Remarks

D. Acquisition Strategy

Coalition of Industry, DoD, and OGA partnerships to develop common hardware standards and associated software interfaces to support ACC and AFLCMC requirements for next generation sensors. Acquisition initiatives consist of prototype activities, risk reduction and demonstrations. Contracting strategy for FY22 and beyond is to be determined.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672003 / Sensors Open System Architecture
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SOSA Hardware Development	SS/FFP	Dynetics (JSIL) : Huntsville, AL	-	-		0.558	Dec 2020	-		-		-	-	-	-
SOSA Hardware Development (1)	SS/CPFF	Skayl : DC & Arizona, AZ	-	-		0.558	Dec 2020	-		-		-	-	-	-
SOSA Hardware Development (2)	SS/CPFF	DCS : Dayton, OH	-	-		0.500	Dec 2020	0.439	Dec 2021	-		0.439	-	-	-
SOSA Hardware Development (3)	SS/CPFF	MIT/LL : Boston, MA	-	-		0.130	May 2021	-		-		-	-	-	-
SOSA Hardware Development (4)	SS/CPFF	GTRI Conformance : Atlanta, GA	-	-		0.300	Dec 2020	-		-		-	-	-	-
SOSA Hardware Development (5)	SS/CPFF	GTRI H/W Dev : Atlanta, GA	-	-		0.550	May 2021	-		-		-	-	-	-
SOSA Hardware Development (6)	SS/CPFF	BAH : Baltimore, MD	-	-		0.300	Dec 2020	-		-		-	-	-	-
SOSA Hardware Development (7)	SS/CPFF	GTRI Hardware Upgrade : Atlanta, GA	-	-		0.300	Dec 2020	-		-		-	-	-	-
SOSA Hardware Development (8)	SS/CPFF	Leitos : Dayton, OH	-	-		0.600	Dec 2020	0.200	Dec 2021	-		0.200	-	-	-
SOSA Hardware Development (9)	SS/FFP	Spectranetix/Pacific Def : El Segundo, CA	-	-		10.000	Mar 2021	-		-		-	-	-	-
Subtotal			-	-		13.796		0.639		-		0.639	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration (PMA)	Various	Not specified. : TBD	-	-		0.095	Jul 2021	0.095	Dec 2021	-		0.095	-	-	-
Subtotal			-	-		0.095		0.095		-		0.095	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force								Date: May 2021			
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems				Project (Number/Name) 672003 / Sensors Open System Architecture			
	Prior Years	FY 2020	FY 2021		FY 2022 Base	FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	13.891		0.734	-		0.734	-	-	N/A

Remarks
 In FY2021, PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to System Open System Architecture were transferred to Project 672003, (Sensor Open System Architecture) in order to provide greater visibility and transparency.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672003 / Sensors Open System Architecture

FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Sensors Open System Architecture	
Technical Standard Publications (Semi-Annual Deliveries)	████████████████████
SOSA Demonstration	████████████████████
SIL Activites	████████████████████

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 672003 / Sensors Open System Architecture

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Sensors Open System Architecture				
Technical Standard Publications (Semi-Annual Deliveries)	1	2021	4	2022
SOSA Demonstration	1	2021	4	2022
SIL Activites	1	2021	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force										Date: May 2021		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems				Project (Number/Name) 674818 / Imaging and Targeting Support			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
674818: <i>Imaging and Targeting Support</i>	-	29.729	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2021, all funds in PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to NGS, Agile ISR, SOSA, and ASARS were transferred to Project 672001 (Next-Generation Sensors/ASI), Project 672002, (Agile ISR), Project 672003 (Sensors Open System Architecture), and Project 674820 (Sensor Development) in order to provide greater visibility and transparency.

A. Mission Description and Budget Item Justification

The I&TS purpose is to develop, mature, demonstrate, and rapidly transition next-generation, persistent, wide area surveillance and common imagery reconnaissance sensor capabilities (active and passive systems), including sensor data processing, for multiple airborne platforms, as well as sensor products to aid in rapid targeting (geolocation models, sensor-based exploitation tools, sensor networking capabilities).

Developmental efforts pursued include but are not limited to: Radar, Electro-Optical/Infrared, hyperspectral imagery (HSI), Lidar/Ladar, and other technologies to improve measurement and signature intelligence, polarimetric imaging, ground moving target indicator (GMTI), maritime search/track, foliage penetration, nuclear event detection, and other modalities; increased geolocation accuracy; increased dismount detection capability; advanced sensor data correlation; automated target detection; network centric warfare; and other ISR and associated planning and direction; collection; processing and exploitation; analysis and production; and dissemination capabilities. These efforts are intended to reduce both target search and kill chain timelines as well as supporting traditional intelligence activities. This project will also increase interoperability by developing common standards and interfaces.

The funds in this project are distributed in priority order, as supported by the Challenging Targets Initial Capabilities Document and set by the GCWG, for the goal of building a comprehensive GEOINT capability for the USAF. On an annual basis, developmental technologies are reviewed against warfighter capabilities and requirements based on strategic roadmaps and the results of the ASI AoA as prefaced in the Challenging Targets Initial Capabilities Document. Efforts advancing the technological maturity of promising sensors and processing capabilities are reviewed and prioritized into a recommended list for senior executive direction to implement in the coming year.

Activities also include studies and analysis to support both current program planning and execution and future program planning.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY19 \$0.458M and in FY20 \$0.857M was expended for civilian pay expenses in this program element.

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 674818 / Imaging and Targeting Support

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Title: Agile ISR</p> <p>Description: Mold current and future ISR into a platform agnostic, non-proprietary, autonomous Multi-INT fusion and cross cuing solution that is designed based on mission requirements. Sensors will have to penetrate up to highly contested domains and survive to operate. This project will also increase interoperability by developing common standards and interfaces for mission and sensor systems. Through the AoA execution, the solution set will improve requirements and the development path for High Altitude SAR (ASARS), Next Generation Sensors, DRACO, SOSA, as well as other GCWG approved projects.</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Agile ISR, Next Generation Sensors and Sensors Open System Architecture will be transferred to individual Projects within PE0305206F in order to provide greater visibility and transparency into these activities. These transferred efforts will not be new starts. The new Projects are: -- Next Generation Sensors, Project 672001 -- Agile ISR, Project 672002 -- Sensors Open System Architecture, Project 672003 <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p> <p>Decreased due to Agile ISR, Next Generation Sensors and Sensors Open System Architecture efforts being transferred to individual Projects within PE0305206F in order to provide greater visibility and transparency. These transferred efforts will not be new starts. The new Projects are:</p> <ul style="list-style-type: none"> -- Next Generation Sensors, Project 672001 -- Agile ISR, Project 672002 -- Sensors Open System Architecture, Project 672003 	20.279	0.000	-	-	-
<p>Title: ASARS-2B</p> <p>Description: Develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities.</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - ASARS efforts realigned to Project 674820 Sensor Development for consolidation and clarity of reporting. <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p>	9.450	0.000	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force	Date: May 2021
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 674818 / Imaging and Targeting Support
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Decrease due to ASARS efforts realigned to Project 674820 Sensor Development for consolidation and clarity of reporting.					
Accomplishments/Planned Programs Subtotals	29.729	0.000	-	-	-
	FY 2020	FY 2021			
Congressional Add: Sensor Open System Architecture (SOSA)	0.000	-			
FY 2020 Accomplishments: N/A					
Congressional Adds Subtotals	0.000	-			

C. Other Program Funding Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTE 07 0305202F: Dragon U-2	36.389	0.000	0.000	-	0.000	-	-	-	-	-	-

Remarks
A portion of the funding within the U-2 RDT&E line will be used to advance ASARS development/design/fabrication/integration/demonstration/testing and fielding deep look high altitude ISR radar capabilities.

D. Acquisition Strategy
Imaging and Targeting Support and Agile ISR efforts are prioritized on an annual basis by the GCWG, in accordance with the validated gaps in the Challenging Targets Initial Capabilities Document. Resulting funded efforts are then contracted for and/or executed by either various program offices, laboratories, industry, and/or other government agencies.

ASARS / High Altitude SAR technology maturation is conducted by Air Force Life Cycle Management Center/Intelligence, Surveillance, and Reconnaissance and Special Operations Forces (AFLCMC/WIN), in conjunction and cooperation with AFLCMC/HBG (Robins AFB) for test support.

Acquisition strategy is to maximize commercial and national development efforts and investment through multiple contracting methods, including the use of engineering change proposals to modify existing contracts and new contracts that were awarded both competitively or on a sole source basis.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force												Date: May 2021				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0305206F / Airborne Reconnaissance Systems				674818 / Imaging and Targeting Support								
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
SOSA	Various	Various : TBD	-	2.683	Feb 2020	-		-		-		-	-	-	-	
DRACO	SS/CPFF	Lockheed Martin : King of Prussia, PA	-	4.900	Mar 2020	-		-		-		-	-	-	-	
ASARS-2B EMD	SS/CPFF	Raytheon : El Segundo, CA	-	5.450	Feb 2020	-		-		-		-	-	-	170.430	
Triple Raven ATD	SS/CPFF	Collins : Westford, MS	-	10.402	Mar 2020	-		-		-		-	-	-	-	
Aether Spy	Various	Various : TBD	-	0.800	Apr 2020	-		-		-		-	-	-	-	
Subtotal			-	24.235		-		-		-		-	-	-	N/A	
Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Test and Evaluation	MIPR	Not specified. : TBD	-	0.130	Nov 2019	-		-		-		-	-	-	-	
Subtotal			-	0.130		-		-		-		-	-	-	N/A	
Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
PMA: Other Govt Cost	SS/T&M	Various : Dayton, OH	-	5.364	Jan 2020	-		-		-		-	-	-	-	
Subtotal			-	5.364		-		-		-		-	-	-	N/A	
Project Cost Totals			-	29.729		0.000		-		-		-	-	-	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force							Date: May 2021			
Appropriation/Budget Activity 3600 / 7			R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems			Project (Number/Name) 674818 / Imaging and Targeting Support				
	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 In FY2021, all funds in PE 0305206F, (Airborne Reconnaissance Systems), Project 674818, (Imaging and Targeting Support) efforts related to NGS, Agile ISR, SOSA, and ASARS were transferred to Project 672001 (Next-Generation Sensors/ASI), Project 672002, (Agile ISR), Project 672003 (Sensors Open System Architecture), and Project 674820 (Sensor Development) in order to provide greater visibility and transparency.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 674818 / Imaging and Targeting Support

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Imaging and Targeting Support																												
Advance Airborne PCPAD Development																												
- SOSA																												
- DRACO																												
ASARS-2B																												
ASARS-2B EMD																												
- NRE Contract Award (Feb 2019)																												
- PDR (Dec 2019)																												
- CDR (Jul 2020)																												
Next Generation Sensors																												
- Triple Raven ATD																												
- Aether Spy																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 674818 / Imaging and Targeting Support

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Imaging and Targeting Support				
Advance Airborne PCPAD Development	1	2020	4	2020
- SOSA	1	2020	4	2020
- DRACO	1	2020	4	2020
ASARS-2B				
ASARS-2B EMD	1	2020	4	2020
- NRE Contract Award (Feb 2019)	1	2020	1	2020
- PDR (Dec 2019)	1	2020	1	2020
- CDR (Jul 2020)	4	2020	4	2020
Next Generation Sensors				
- Triple Raven ATD	1	2020	4	2020
- Aether Spy	1	2020	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 674820 / Sensor Development
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
674820: <i>Sensor Development</i>	-	81.972	44.689	30.344	0.000	30.344	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Sensors Development project increases the range and collection capability, interoperability and processing of the Advanced Synthetic Aperture Radar Systems (ASARS) through design, development, testing, and fielding efforts. The Sensors Development efforts advance the capability of ASARS for U-2 employment, and is a critical component for the multi-INT Next Generation Sensors, project 672001, efforts. ASARS-2B (front-end) & ASARS-2C (back-end) efforts provide critical advancements and risk reduction in SAR/Moving Target Indication capability to be implemented in the future multi-INT, platform agnostic capability that Next Generation Sensors will provide.

The ASARS effort is a fifth generation, deep-look, high-altitude, ISR radar that is the foundation for the radar component of the Next Generation Sensors (NGS) family of systems as outlined in the AFROC approved ASARS-2C draft Capabilities Development Document (CDD). ASARS-2B (front-end) is the antenna and receiver exciter replacement. The ASARS-2C (back end) data processing efforts extend the ASARS-2B (front-end) radar capability using open architecture data processing and multi-platform integration. Open architecture improves performance and lowers cost by facilitating and enabling qualified third party software vendors to incorporate future multi-ISR capability to advance interoperability across joint operations. ASARS increases current capability and addresses National Defense Strategy Key Operational Problems and ISR Dominance flight plan.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Advanced Synthetic Aperture Radar System (ASARS)-2B (front-end)	81.972	44.689	30.344	-	30.344
Description: Develop, design, fabricate, integrate, test and field deep look high altitude ISR radar capabilities.					
FY 2021 Plans: - Continue to develop, design, fabricate, integrate, test and field deep look high altitude ISR radar capabilities.					
FY 2022 Base Plans: - Will Continue to develop, design, fabricate, integrate, test and field deep look high altitude ISR radar capabilities.					
FY 2021 to FY 2022 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 674820 / Sensor Development

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Funding decreased due to higher AF priorities,					
Title: Advanced Synthetic Aperture Radar System (ASARS)-2C (back-end)	0.000	0.000	0.000	-	0.000
Description: Integrate open radar processing architectures for enhanced RF capabilities and third party mode development.					
FY 2021 Plans: - Mature standards and technologies, and develop acquisition strategy for start in FY2021.					
FY 2022 Base Plans: - Will mature standards and technologies, and complete acquisition strategy for enhanced RF capabilities and third party mode development.					
FY 2021 to FY 2022 Increase/Decrease Statement: Decrease due to phasing of ASARS-2C (back-end) funding.					
Accomplishments/Planned Programs Subtotals	81.972	44.689	30.344	-	30.344

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDTE 07 0305202F: Dragon U-2 (JMIP)	36.389	18.660	18.319	-	18.319	-	-	-	-	-	-
• RDTE 07 0305206F: Airborne Reconnaissance Systems	0.000	48.138	70.855	-	70.855	-	-	-	-	-	-

Remarks
A portion of the funding within the U-2 RDT&E line will be used to advance ASARS development / design/fabrication/integration/demonstration/testing and fielding deep look high altitude ISR radar capabilities.
In FY20, a portion of funding within project 674818 (Imaging and Targeting Support) is being used to advance ASARS-2B (front-end) efforts.

D. Acquisition Strategy
ASARS / High Altitude SAR technology maturation is conducted by Air Force Life Cycle Management Center/Intelligence, Surveillance, and Reconnaissance and Special Operations Forces (AFLCMC/WIN), in conjunction and cooperation with AFLCMC/HBG (Robins AFB) for test support.
Acquisition strategy is to maximize commercial and national development efforts and investment through multiple contracting methods, including but not limited to the use of engineering change proposals to modify existing contracts and new contracts that were awarded both competitively or on a sole source basis.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 674820 / Sensor Development

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ASARS-2B																												
ASARS-2B EMD																												
-- NRE Contract Award (Feb 2019)																												
-- PDR (Dec 2019)																												
-- CDR (Jul 2020)																												
ASARS-2C																												
ASARS-2C																												
-- Tech Maturation																												
-- NRE Contract Award (Dec 2021)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) 674820 / <i>Sensor Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
ASARS-2B				
ASARS-2B EMD	1	2020	2	2022
-- NRE Contract Award (Feb 2019)	1	2020	1	2020
-- PDR (Dec 2019)	1	2020	1	2020
-- CDR (Jul 2020)	4	2020	4	2020
ASARS-2C				
ASARS-2C	3	2021	4	2022
-- Tech Maturation	3	2021	3	2022
-- NRE Contract Award (Dec 2021)	1	2022	1	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force										Date: May 2021		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems				Project (Number/Name) 675092 / JTC/SIL MUSE			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
675092: JTC/SIL MUSE	-	3.521	3.574	3.593	0.000	3.593	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Multiple Unified Simulation Environment (MUSE) is the DoD flight simulation/training system of choice for many Unmanned Aircraft Systems (UAS), RPA, and airborne platforms. MUSE is also known as the Air Force Synthetic Environment for Reconnaissance and Surveillance (AFSERS) in its Air Force training application. The MUSE/AFSERS is a software suite that simulates UAS/RPA (e.g., MQ-9) systems, tailored air vehicle & data links, and visualization systems used for payload product outputs-including Full Motion Video (FMV), Fixed Frame Imagery (FFI), Ground Moving Target Indicator (GMTI) data, and Link 16 (J2.2 and J3.5) tracking messages. Outputs are compliant with applicable DoD standards and are continually tested against actual ground data processors to ensure DoD systems interoperability.

The Services and Combatant Commanders have a requirement for training with a system that provides a real-time simulation environment containing multiple domain systems that can be integrated with larger force-on-force simulations. The MUSE creates a realistic operational environment supporting military utility assessment, architecture, and employment concept development. Training, Tactics, Techniques and Procedures (TTP) refinement, practice Processing, Exploitation and Dissemination (PED) of multi-domain information. Conduct emerging concepts experimentation, optimizing Command, Control, Communications, and Computing (C4) with warfighting exercises and experiments. MUSE is the preferred UAS/RPA simulation system used by US Combatant Commanders and Joint Services to support command and battle staff C4 training.

The MUSE also creates a realistic operational environment that supports: an embedded training capability for new UAS/RPA system Program Managers; tools to minimize acquisition and life cycle cost and schedule impacts. MUSE conducts emerging concepts experimentation, future systems exploration, systems integration, and technology insertion; applications for Joint and Service-specific warfighting exercises; and C4 training optimization.

MUSE is currently used by all Services and most unified commands simulating MQ-1, MQ-9, RQ-4, MQ-1C, M/RQ-5, RQ-7, national and commercial satellite systems, P-3, E-8 and the U-2 during warfighting exercises. The AFSERS provides National Imagery Transmission Format (NITF) information for simulated data collection systems, supporting PED training. The MUSE is also used as a mission rehearsal tool for current, on-going military combat operations. Most of the MUSE/AFSERS software suite components are also used in multiple airborne platform system training devices. Including the MQ-9 [Medium Altitude Long Endurance Tactical (MALET) JSIL Aircrew Trainer (MJAT)] and RQ-4 [Global Hawk Sensor Operator Part Task Trainer (GHSOPPTT), and Global Hawk Weapon System Trainer (WST)].

The Joint Technology Center/Systems Integration Laboratory (JTC/SIL) is the training center of excellence supporting UAS and RPA programs for the Services. JTC/SIL provides the system engineering, test and integration, interoperability, rapid technology insertion to address MUSE training requirements. The JTC/SIL combines the UAS/RPA knowledge of communications standards (such as STANAGs 4586, 4607, 4545 and 4609) with Hardware in the Loop (HIL) testing, MUSE, integrating with other DoD modeling and simulation (M&S) architectures. For those airborne assets normally not available for training, the JTC/SIL provides surrogate systems and interfaces. The JTC/SIL contributes to the distributed training environments, virtually linking participants from various locations worldwide, and are routinely supported

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force	Date: May 2021
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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 675092 / JTC/SIL MUSE
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within the MUSE architecture. The JTC/SIL continues to develop leading edge technologies supporting the rapidly evolving UAS/RPA training requirements required to support NDS future fighting force.

MUSE project funds may be utilized to cover the GCWG Secretariat, studies and analysis activities, supporting current program planning, execution, and future program planning.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Title: Air Force Synthetic Environment for Reconnaissance and Surveillance (AFSERS) Development</p> <p>Description: DoD's simulation/training system of choice for Intelligence Surveillance and Reconnaissance (ISR) systems, sensors, and platforms. Includes AFSERS, Common Ground Station Interface, and infrastructure support.</p> <p>FY 2021 Plans: JTC/SIL:</p> <ul style="list-style-type: none"> - Continue development and release of MUSE/AFSERS RPA and ISR simulation capability supporting theater level exercises such as Dong Maeng (formerly Ulchi Freedom Guardian and Key Resolve), Yama Sakura, Talisman Saber, Pacific Sentry, Austere Challenge, and associated events. - Continue incorporation of mandated Cyber Security updates. - Complete the re-architecture of Vignette Planning & Rehearsal Software (ViPRS) capability to include transitioning it to be web browser accessible, developing an after action report (AAR) capability, and more realistic attrition. - Continue architecture software optimization and modularization to facilitate extensibility and scalability. - Begin prototype development of an improved image generator based upon the results of the image generator trade study conducted during FY20. - Fully integrate the high fidelity SAR model into the MUSE/AFSERS baseline which provides realistic SAR imagery based upon material encoded terrain. - Fully integrate MTI/SAR sensor cross-cuing capability in MUSE/AFSERS. - Develop and integrate low-cost, fixed-wing support to RPA operations. - Integrate a Vehicle and Dismount Exploitation Radar (VADER) sensor model in MUSE/AFSERS. - Begin development of the Long Range Radar (LRR) sensor MUSE/AFSERS model. - Develop IFF Modes 4, 5, & S in MUSE/AFSERS. 	3.521	3.574	3.593	-	3.593

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 675092 / JTC/SIL MUSE

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
- Continue integration testing with designated federations (ASCCE, JLVC, JLCCTC) ensuring joint interoperability with services and JS/J7 capabilities. - Assess services and Joint Staff emerging environments and the impact to MUSE/AFSERS integration and interoperability FY 2022 Base Plans: JTC/SIL: - Will continue support and release of MUSE/AFSERS RPA and ISR simulation capability supporting theater level exercises such as Dong Maeng (formerly Ulchi Freedom Guardian and Key Resolve), Yama Sakura, Talisman Saber, Pacific Sentry/Fury, Austere Challenge, and associated events. - Continue incorporation of mandated Cyber Security updates. - Continue support of CAFDMO SPRs - Continue architecture software optimization and modularization to facilitate extensibility and scalability. - Continue integrate the high fidelity SAR model into the MUSE/AFSERS baseline which provides realistic imagery based upon material encoded terrain. - Continue integration testing with designated federations (ASCCE,) ensuring joint interoperability with services and JS/J7 capabilities. - Perform DMON Integration: Support CAFDMO SPRs for AFSERS; Integration/Testing at Distributed Training Centers - Develop and integrate Electronic Warfare (EW) modeling and simulation capabilities to include GPS Denied - Enhance and integrate UAS Swarming modeling and simulation FY 2021 to FY 2022 Increase/Decrease Statement: Small funding Increase from FY21 to FY22 was due to inflation.					
Accomplishments/Planned Programs Subtotals	3.521	3.574	3.593	-	3.593

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

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE 07 PE 0305204A: Tactical Unmanned Aerial Vehicles	4.954	3.905	0.000	-	0.000	-	-	-	-	-	-

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) 675092 / <i>JTC/SIL MUSE</i>

D. Acquisition Strategy

This is an enterprise services effort, jointly funded and centrally managed by the US Army. JTC/SIL falls under US Army Futures Command. US Army PE 0305204A funding ending after FY 2021. Additional continual Army funding expected from PEO STRI, JSJ7, exercise events, and other external Army users. AFLCMC/WIN MIPRs funds in support of Unmanned Aircraft Systems modeling and simulation efforts. The Air Force POC is Dr. Lillian-Campbell from AF Agency for Modeling & Simulation which falls under HAF/A3T.

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 675092 / JTC/SIL MUSE

FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

JTC/SIL MUSE	
AFSERS Development	

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / <i>Airborne Reconnaissance Systems</i>	Project (Number/Name) 675092 / <i>JTC/SIL MUSE</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
JTC/SIL MUSE				
AFSERS Development	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 675291 / Gorgon Stare
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
675291: <i>Gorgon Stare</i>	-	15.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Gorgon Stare system is a podded airborne sensor suite that provides city-sized wide area airborne surveillance and is integrated on specially-modified MQ-9 Reaper RPA. The Air Force Requirements Oversight Council (AFROC) approved Air Combat Command's recommendation to transition Gorgon Stare from a Quick Reaction Capability (QRC) to an Air Force Enduring Capability in November 2014. Gorgon Stare's requirements are documented in the Gorgon Stare Wide Area Airborne Sensor draft Capabilities Development Document (CDD). The acquisition strategy for this Air Force podded sensor suite solution is sustainment of the currently fielded capabilities with any upgrades implemented via validated -1067s, Urgent Operational Needs, or requirements as documented in the program CDD.

Development efforts conducted with FY 2017 Congressionally-added funds further progressed efforts associated with BLOS, to include first article testing for phase 1 and a limited BLOS capability delivered to the field in FY 2019. Development efforts conducted with FY 2018 Congressional added funds included further development of the next phase of BLOS to enable freedom of maneuverability and development of system imagery improvements. Development efforts conducted with FY 2019 Congressionally added funds included completion of BLOS Phase II system design and aircraft certification to enable full freedom on maneuverability (anticipate fielding in FY22), completing Phase I of imagery improvements and continuation of data automation through Area of Interest (AOI) tagging and tracking efforts. Development efforts conducted with FY2020 Congressionally added funds included the continuation of the following capabilities: Tagging and Tracking Full Field of View (FFoV), Electro-optical (EO)/Infrared (IR) Co-Collect, Airborne Tip and Cue, and Image Quality Enhancements Phase II.

Development efforts to be conducted with FY 2021 Congressionally added funds include the continuation of EO/IR Co-Collect, FFoV tagging and tracking, and Airborne Tip and Cue Phase II capabilities.

Activities also include studies and analysis to support both current program planning and execution as well as future program planning.

The acquisition program manager has the authority to redirect funding as necessary to meet Gorgon Stare current and emerging Combatant Commander requirements to better meet the war fighting objectives.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Gorgon Stare weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 \$0.000M was expended for civilian pay expenses in this program element, and in FY21 \$0.000M is forecasted for civilian pay expenses in this program element.

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

Congressional Add: Gorgon Stare

FY 2020	FY 2021
15.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 675291 / Gorgon Stare
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021
FY 2020 Accomplishments: Continued development efforts for the following capabilities: FFOV Tagging and Tracking, EO/IR Co-Collect, Airborne Tip and Cue Phase II, and Image Quality Enhancements Phase II.		
FY 2021 Plans: Development efforts to be conducted with the \$10M of FY 2021 Congressionally added funds include the continuation of EO/IR Co-Collect, FFOV tagging and tracking, and Airborne Tip and Cue Phase II capabilities.		
Congressional Adds Subtotals	15.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APAF 05 PRDTB3: MQ-9 UAS Payloads	19.800	63.500	0.000	40.800	40.800	-	-	-	-	-	-
• APAF 06 PRDTB3: Gorgon Stare	1.500	10.700	0.000	6.800	6.800	-	-	-	-	-	-

Remarks

D. Acquisition Strategy
 The wide area airborne surveillance requirement is being delivered via the Gorgon Stare podded wide area motion imagery sensor suite integrated on dedicated, specially-modified MQ-9 Reaper RPA. Gorgon Stare transitioned from a QRC to an Air Force Enduring Capability under AFROC authority in November 2014. The program is executed by the 645th Aeronautical Systems Group, Intelligence, Surveillance, and Reconnaissance and Special Operations Forces Directorate as a post-MS C program. The sensor suite will be sustained in its current configuration. Any future capability upgrades will be fielded as a result of validated -1067s or Urgent Operational Needs, or requirements as documented in the program CDD.

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 675291 / Gorgon Stare

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Gorgon Stare				
EO/IR Co-Collect	3	2020	4	2022
Tagging and Tracking Full Field of View (FFoV)	4	2020	3	2022
Airborne Tip and Cue Phase II	1	2021	4	2022
Image Quality Enhancements Phase II	4	2020	2	2022

Note

Gorgon Stare will continue operations as required using sustainment funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 676025 / Data Compression
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
676025: Data Compression	-	6.935	9.528	11.523	0.000	11.523	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

RDUCE provides efficient and integrated compression of airborne Intelligence, Surveillance, and Reconnaissance (ISR) sensor data, maximizing the use of limited bandwidth and delivering more data to the tactical user in the field. RDUCE develops, tests, and implements new sensor data compression algorithms for current and emerging airborne ISR sensors. The program develops compression capabilities for manned and unmanned airborne platforms, associated ground stations, and the Distributed Common Ground System (DCGS). Outputs will meet standard certification for use within the Department of Defense and Intelligence Community (IC) Geospatial Intelligence (GEOINT), Signals Intelligence (SIGINT), and Measurement and Signatures Intelligence (MASINT) compression applications.

Activities also include continuous studies, analysis and updates to support program planning and execution.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: Data Compression	6.935	9.528	11.523	-	11.523
<p>Description: The Data Compression effort provides the warfighter capabilities to efficiently compress ISR data and to enable dissemination in near real time to tactical users through bandwidth limited dissemination systems. The program focuses on current and emerging ISR sensors, including incorporation into open architectures like Common Open Architecture Radar Programs (COARPs), Future Airborne Capability Environment (FACE), and Sensor Open System Architecture (SOSA). The algorithms can be leveraged for any platform. For example, the HSI algorithm was selected by NASA to be included in an experimental system on the ISS. Outputs will meet standards certification for use within the DoD Geospatial Intelligence, Signals Intelligence and Measurement and Signatures Intelligence data compression applications.</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Provide continuous updates and integration support for the mature TRL modalities (SAR, HSI, SAR Phase History) - Finalize SAR Phase history standard for formal adoption - Continue development of LIDAR and SIGINT modalities 					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 676025 / Data Compression

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<ul style="list-style-type: none"> - Identify platform/sensor partners for initial test/integration - Begin feature updates to address any issues or previously uncaptured use cases to ensure the compression algorithms are operationally relevant - Begin studies and initial development of EO/IR compression algorithms - Support integration of SAR compression algorithm into DRACO using a software suite referenced as SAR Clean-up AI/ML Reduction (SCAR) Package - Begin SIGzip standards development for formal adoption <p>FY 2022 Base Plans:</p> <ul style="list-style-type: none"> - Will continue development of EO/IR compression algorithms. - Will complete initial development of LIDAR and SIGzip modalities. - Will identify platform/sensor partners for initial test/integration across all sensor modes - Will update to address any issues or previously uncaptured use cases to ensure the compression algorithms are operationally relevant - Will complete SIGzip standards development for formal adoption <p>FY 2021 to FY 2022 Increase/Decrease Statement: Increase, Project 676025-Data Compression due to additional sensor modes in FY21/22/23.</p>					
Accomplishments/Planned Programs Subtotals	6.935	9.528	11.523	-	11.523

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

N/A

Remarks

D. Acquisition Strategy

Data Compression program is conducted by Air Force Life Cycle Management Center/ Intelligence, Surveillance, and Reconnaissance and Special Operations Forces (AFLCMC/WIN). Acquisition strategy is to develop data compression hardware/software, and data compression standards for various ISR applications to include airborne, ground stations, data storage facilities, and exploitation tools. RDUCE will utilize existing contracts with full and open competition where appropriate. Integration will be accomplished by the requisite program offices.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 676025 / Data Compression
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LIDAR	Various	Various : Various	-	1.000	Feb 2020	1.000	Nov 2020	1.715	Mar 2022	-		1.715	-	-	-
SIGzip	Various	Various : Various	-	2.100	Jan 2020	1.000	Feb 2021	1.000	Mar 2022	-		1.000	-	-	-
EO/IR	Various	Various : Various	-	0.100	May 2020	0.500	Mar 2021	1.200	Apr 2022	-		1.200	-	-	-
Subtotal			-	3.200		2.500		3.915		-		3.915	-	-	N/A

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Standardization Development	C/CPAF	Various : Various	-	1.000	Dec 2019	-		-		-		-	-	-	-
Standardization Development (FLEX)	C/CPAF	Various : Various	-	-		0.600	Apr 2021	0.500	Feb 2022	-		0.500	-	-	-
Standardization Development (SARzip)	C/CPAF	Various : Various	-	-		0.600	Apr 2021	0.500	Feb 2022	-		0.500	-	-	-
Standardization Development (zPHD)	C/CPAF	Various : Various	-	-		0.500	Apr 2021	0.500	Feb 2022	-		0.500	-	-	-
New Mode Phase I	C/CPAF	Various : Various	-	-		0.100	Jan 2021	-		-		-	-	-	-
Subtotal			-	1.000		1.800		1.500		-		1.500	-	-	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ADDA Lab	C/CPAF	Various : Various	-	1.750	Jan 2020	0.795	Mar 2021	0.796	Feb 2022	-		0.796	-	-	-
COMPASE Lab	C/CPAF	Various : Various	-	0.100	Jan 2020	0.200	Feb 2021	0.250	Jan 2022	-		0.250	-	-	-
Integration Activities	C/CPAF	Various : Various	-	-		3.249	Nov 2020	4.050	Jan 2022	-		4.050	-	-	-
Subtotal			-	1.850		4.244		5.096		-		5.096	-	-	N/A

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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305206F / Airborne Reconnaissance Systems	Project (Number/Name) 676025 / Data Compression

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>RDUCE</i>				
LIDAR	1	2020	4	2022
EO/IR	3	2020	4	2022
SIGINT	2	2020	4	2022
COMPASE Lab	1	2020	4	2022
ADDA Lab	1	2020	4	2022
Standardization Development	1	2020	4	2020
Standardization Development (SARzip)	2	2021	4	2022
Standardization Development (FLEX)	2	2021	4	2022
Standardization Development (zPHD)	2	2021	4	2022