Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	78.122	34.585	23.145	0.000	23.145	54.802	60.821	61.527	34.886	Continuing	Continuing
644818: *Imaging and Targeting Support*	-	54.991	16.942	16.987	0.000	16.987	15.943	16.154	16.138	9.960	Continuing	Continuing
645148: *Common-Airborne Sense and Avoid (C-ABSAA)*	-	21.647	17.643	6.158	0.000	6.158	38.859	44.667	45.389	24.926	Continuing	Continuing
646025: *Data Compression*	-	1.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.484

A. Mission Description and Budget Item Justification

The Advanced Technology and Sensors (ATS) program coordinates the development of advanced technologies (sensors, data links, targeting networks and products, and quick reaction capabilities) in support of multiple airborne reconnaissance platforms, both manned and unmanned. Its objectives are to develop, demonstrate, and rapidly transition 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. This program also coordinates the development of common collection, processing, and dissemination solutions for near-real time intelligence, surveillance, and reconnaissance. The ATS program also increases interoperability by developing common standards and interfaces.

The funds in this project are distributed in priority order for the goal of building a comprehensive Geospatial Intelligence (GEOINT) capability for the USAF. On an annual basis, developmental technologies are reviewed against warfighter capabilities and requirements based on strategic roadmaps and on the results of the Airborne Sensors for ISR Analysis of Alternatives, 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. The program office has the ability to initiate an I&TS project, within the GEOINT Capabilities Working Group (GCWG) construct but outside the normal annual GCWG vetting process, to expedite development and acquisition of urgently needed capabilities for the warfighter.

Funds in any project can also cover activities to 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 capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	68.719	34.585	33.145	0.000	33.145
Current President's Budget	78.122	34.585	23.145	0.000	23.145
Total Adjustments	9.403	0.000	-10.000	0.000	-10.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	-10.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	19.630	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-0.227	0.000	-10.000	0.000	-10.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 644818: *Imaging and Targeting Support*		
Congressional Add: *Advanced Synthetic Aperture Radar System (ASARS) 2B Congressional Add*	11.500	0.000
Congressional Add Subtotals for Project: 644818	11.500	0.000
Congressional Add Totals for all Projects	11.500	0.000

Change Summary Explanation

In FY 2018, 0604257F PE received $11.5M Congressional add for ASARS-2B, $8.13M Congressional add for H-Chip development, and -$10M Congressional reductions for I&TS unjustified growth.In FY20, -$10M realigned for higher Air Force priorities

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 644818 / *Imaging and Targeting Support*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
644818: *Imaging and Targeting Support*	-	54.991	16.942	16.987	0.000	16.987	15.943	16.154	16.138	9.960	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The purpose of the Imaging and Targeting Support (I&TS) project 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 (e.g., eolocation models, sensor-based exploitation tools, sensor networking capabilities).

Developmental efforts pursued include: improved sensor capabilities such as Hyperspectral Imagery (HSI), Measurement and Signature Intelligence (MASINT), Polarimetric Imaging (PI), Ground and Dismount Moving target indicator (GMTI/ DMTI), maritime search/track, Inverse Synthetic Aperture Radar, Foliage Penetration (FOPEN) and additional radar, Electro-Optical (EO), nuclear event detection, and other modalities; increased geolocation accuracy; increased dismount detection capability; advanced sensor data correlation; automated target detection/recognition; Artificial Intelligence (AI): Machine Learning (ML): 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 (e.g. Open Mission Systems (OMS), Sensor Open System Architecture (SOSA), Common Open Architecture Reconnaissance Processor Standard (COARPS), AgilePod and data reduction) and interfaces.

The funds in this project are distributed in priority order for the goal of building a comprehensive GEOINT/Multi-INT capability for the USAF. On an annual basis, developmental technologies are reviewed against warfighter capabilities and requirements based on strategic roadmaps and on the results of the Airborne Sensors for ISR Analysis of Alternatives, 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. The program office has the ability to initiate an I&TS project outside of the normal GCWG process to support rapid development, demonstration and/or acquisition of urgently needed capabilities.

Traditional focus areas include, but are not limited to: development, demonstration, and rapid transition of common radar and EO sensors (Synthetic Aperture Radar (SAR), Low Frequency SAR, antenna, Infrared (IR), Hyperspectral Imagery (HSI), Light Detection And Ranging (LIDAR) and their operational modes (high resolution imagery, Ground and Dismount Moving Target Indicator (GMTI/DMTI), persistent surveillance, wide area motion imagery, Spectral Identification) for multiple airborne platforms at all altitudes; development and demonstration of advanced tactical sensor and associated tasking, processing, exploitation, and dissemination processing algorithms and tools (automatic registration, automatic and assisted target detection, network centric warfare, etc); development of integrated multi-sensor capabilities to detect and identify obscured targets; development and implementation of standards (Common GMTI/DMTI, National Imagery Transmission Format; and monitoring and enhancement of Imagery Intelligence product quality (radar and EO/IR imagery, GMTI data, and spectral information) and timeliness throughout the image chain (from sensor to user); and development and integration of airborne sensors to support an open stems architecture pod capability. These efforts focus on reducing the find, fix and track elements of the time critical targeting kill-chain timeline while improving operator and decision-maker efficiency and effectiveness.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

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 capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Imaging & Targeting Support (I&TS) ***Description:*** Corporately prioritized Air Force Multi-INT Portfolio of projects to develop and demonstrate next generation airborne sensors and processing technologies to further the art of the possible and/or transition ISR capabilities (ex: radar improvement, next-generation HSI, LIDAR, ISR Standards, EO/IR, and data mitigation technologies). ***FY 2019 Plans:*** Continue development, modernization, and demonstration of advanced sensors and detection and processing algorithms, hyperspectral imaging technologies, multiband EO/IR and SAR sensor systems, enhanced LIDAR capabilities, polarimetric imaging (PI), and other GEOINT sensing modalities for Anti-Access Area Denial, permissive and non-permissive environments, foliage penetration, and littoral environments as well as other prioritized GCWG technology efforts. Other efforts include but are not limited to MTS-B, DRACO 4.0, Advanced Large Optical Freeform Telescope (ALOFT), CERBERUS (Full Spectrum HSI in AgilePod). Standoff High-altitude Enhanced Reconnaissance Long-range Operational Concept (SHERLOC), Predator/Reaper Off-board Sensing and Improved Targeting (PROSIT), SUAS Tactical Agile Gimbal (STAG), H-Chip, and other projects supporting rapid acquisition and Advanced Technology Demonstration (ATDs). ***FY 2020 Plans:*** - Will continue development, modernization, and demonstration of advanced sensors and detection and processing algorithms, HSI technologies, multiband EO/IR and SAR sensor systems, enhanced LIDAR capabilities, PI technologies, and other GEOINT sensing modalities for Anti-Access Area Denial, permissive and non-permissive environments, foliage penetration, and littoral environments as well as other Multi-INT technology efforts. Other efforts include but are not limited to CERBERUS (Full Spectrum HSI in AgilePod), SHERLOC, ALOFT, COARPS, AgilePod, AI/ML, PROSIT, STAG, H-Chip (Hyperspectral on a Chip), LIDAR, and other projects supporting Advanced Technology Demonstration (ATDs) and rapid acquisition. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 increased funding to support GCWG approved projects.	31.270	15.492	16.987
Title: Advanced Synthetic Aperture Radar System (ASARS) 2B ***Description:*** Develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2019 Plans:***	12.221	1.450	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue to develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities. ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease from FY19 to FY20 due to efforts transferred to PE 0305206F, BPAC 674818.			
Accomplishments/Planned Programs Subtotals	43.491	16.942	16.987

	FY 2018	FY 2019
Congressional Add: Advanced Synthetic Aperture Radar System (ASARS) 2B Congressional Add	11.500	0.000
FY 2018 Accomplishments: None		
FY 2019 Plans: - Continue to develop/design/fabricate/integrate/demonstrate/test and field deep look high altitude ISR radar capabilities.		
Congressional Adds Subtotals	11.500	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Imaging and Targeting Support 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.

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.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MTS-B Track Through Launch Transient	SS/CPFF	Raytheon : McKinney, TX	-	0.172	Nov 2017	-		-		-		-	Continuing	Continuing	-
DRACO 4.0	SS/CPFF	Lockheed Martin : King of Prussia, PA	-	1.588	Nov 2017	-		-		-		-	Continuing	Continuing	-
MQ-9 Systima Speedloader	C/CPAF	TBD : TBD	-	1.800	Sep 2018	-		-		-		-	Continuing	Continuing	-
ALOFT	SS/CPFF	UTC Aerospace Systems : Westford, MA	-	0.500	Dec 2017	1.235	Mar 2019	-		-		-	Continuing	Continuing	-
SHERLOC	SS/CPFF	UTAS : Westford, MA	-	0.750	Oct 2018	4.745	Nov 2018	4.700	Dec 2019	-		4.700	Continuing	Continuing	-
H-Chip	SS/CPFF	EO Vista : Acton, MA	-	11.100	Jan 2018	4.030	Dec 2018	-		-		-	Continuing	Continuing	-
SUAS Tactical Agile Gimbal (STAG)	SS/CPFF	Not specified. : TBD	-	3.928	Feb 2018	0.597	Nov 2018	-		-		-	Continuing	Continuing	-
Predator/Reaper Off-board Sensing and Improved Targeting (PROSIT)	SS/CPFF	Various : Various, OH	-	3.700	Feb 2018	1.963	Nov 2018	-		-		-	Continuing	Continuing	4.750
Other Technology Efforts (Prioritized by GCWG)	Various	Various : Various	-	6.860	Dec 2017	-		10.287	Dec 2019	-		10.287	Continuing	Continuing	-
ASARS 2B Technical Demonstration	SS/CPIF	Raytheon : El Segundo, CA	-	12.766	Dec 2017	-		-		-		-	0.000	12.766	-
ASARS-2B operationalization	SS/CPIF	Raytheon : El Segundo, CA	-	4.421	Feb 2019	1.450	Feb 2019	-		-		-	0.000	5.871	-
		Subtotal	-	47.585		14.020		14.987		-		14.987	Continuing	Continuing	N/A

Remarks

On an annual basis, the GEOINT Capabilities Working Group reviews developmental technologies against warfighter capabilities and requirements based on strategic roadmaps and on the Airborne Sensors for ISR Analysis of Alternatives. Projects advancing the technological maturity of promising sensors and processing capabilities are reviewed and prioritized into a recommended list for senior executive direction to implement for the coming fiscal year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 644818 / *Imaging and Targeting Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test Range Support	Various	Various : Various, CA	-	1.994	Jun 2018	-		-		-		-	0.000	1.994	-
		Subtotal	-	1.994		-		-		-		-	0.000	1.994	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA: Other Govt Cost	Various	Various : Dayton, OH	-	5.412	Nov 2017	2.922	Nov 2018	2.000	Nov 2019	-		2.000	Continuing	Continuing	-
		Subtotal	-	5.412		2.922		2.000		-		2.000	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	54.991		16.942		16.987		-		16.987	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

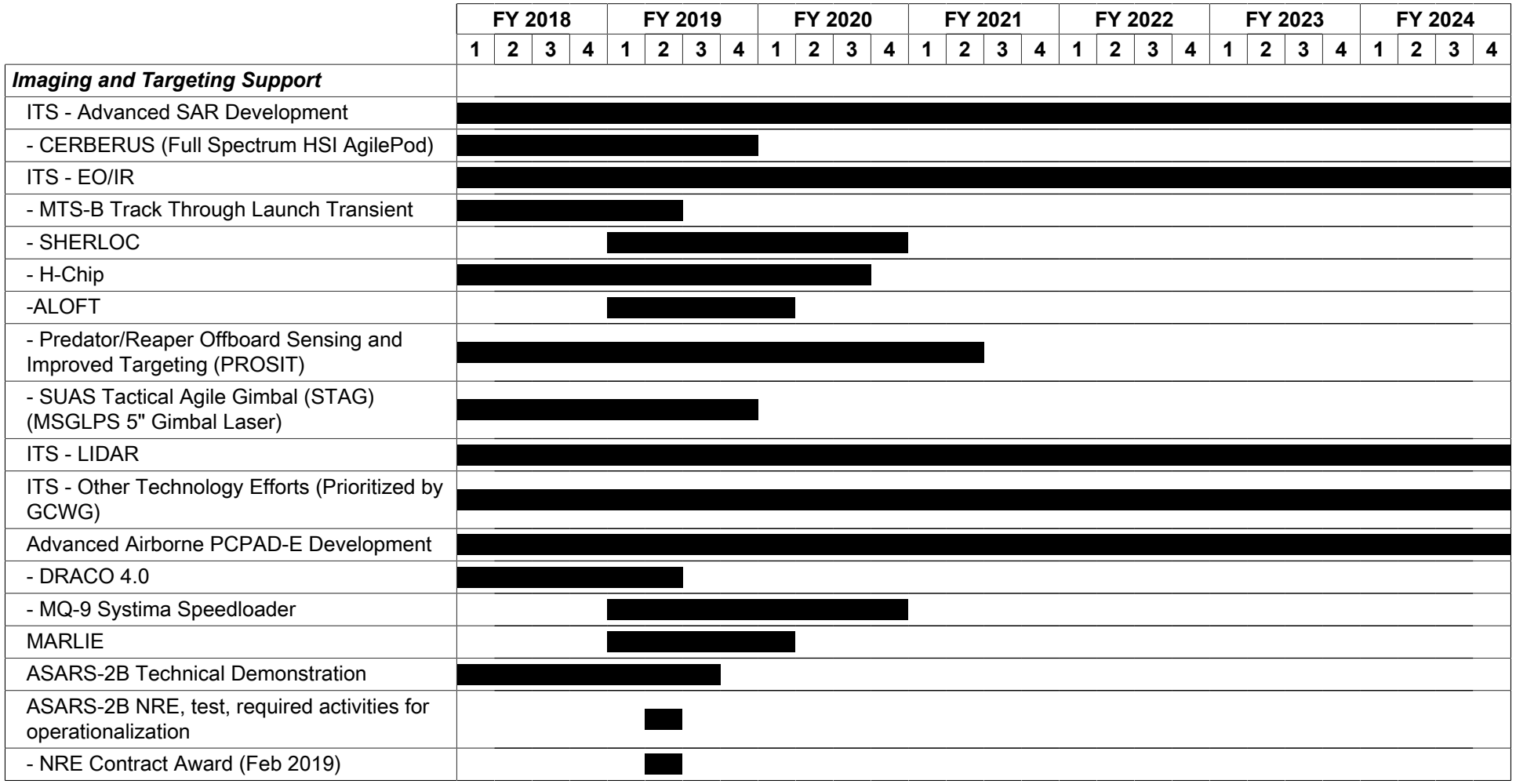

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 644818 / *Imaging and Targeting Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Imaging and Targeting Support				
ITS - Advanced SAR Development	1	2018	4	2024
- CERBERUS (Full Spectrum HSI AgilePod)	1	2018	4	2019
ITS - EO/IR	1	2018	4	2024
- MTS-B Track Through Launch Transient	1	2018	2	2019
- SHERLOC	1	2019	4	2020
- H-Chip	1	2018	3	2020
-ALOFT	1	2019	1	2020
- Predator/Reaper Offboard Sensing and Improved Targeting (PROSIT)	1	2018	2	2021
- SUAS Tactical Agile Gimbal (STAG) (MSGLPS 5" Gimbal Laser)	1	2018	4	2019
ITS - LIDAR	1	2018	4	2024
ITS - Other Technology Efforts (Prioritized by GCWG)	1	2018	4	2024
Advanced Airborne PCPAD-E Development	1	2018	4	2024
- DRACO 4.0	1	2018	2	2019
- MQ-9 Systima Speedloader	1	2019	4	2020
MARLIE	1	2019	1	2020
ASARS-2B Technical Demonstration	1	2018	3	2019
ASARS-2B NRE, test, required activities for operationalization	2	2019	2	2019
- NRE Contract Award (Feb 2019)	2	2019	2	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 645148 / *Common-Airborne Sense and Avoid (C-ABSAA)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
645148: *Common-Airborne Sense and Avoid (C-ABSAA)*	-	21.647	17.643	6.158	0.000	6.158	38.859	44.667	45.389	24.926	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common-Airborne Sense and Avoid (C-ABSAA) program provides Group 4 and 5 Remotely Piloted Aircraft (RPA) with the ability to safely and effectively operate in all classes of airspace worldwide. The program acts as a replacement for the sense and avoid capability of the pilot on board a manned aircraft.

The Air Force is pursuing a software intensive approach to maintain safe separation, avoid collisions, and provide the ability to safely integrate with other airspace users. The software solutions identified in this Information System Capability Development Document (IS-CDD) are open and modular and accept inputs from any type of sensor or data link and will operate any legacy and future Group 4 and 5 RPA. The effort includes technology maturation, risk reduction, EMD and life-cycle costs, such as: 1) prototyping activities, 2) agile development, test and implementation of the software, 3) development of open system architecture using modular design, standards-based interfaces, and widely-supported consensus-based standards, and 4) collaboration with the Federal Aviation Agency (FAA), National Aeronautics and Space Administration (NASA), and other services to develop national policy and standards.

The program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F,0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Sense and Avoid (SAA)-Related Activities	21.647	17.643	6.158
Description: Conduct risk reduction and prototyping activities to improve affordability, reduce cost, schedule and technical risk entering next milestone. ***FY 2019 Plans:*** - Continue C-ABSAA Technology Maturation & Risk Reduction Phase - Support validation of IS CDD and System Requirements Document/Technical Requirements Document - Prepare/present all documentation/results as part of C-ABSAA Milestone decision review - Continue collaborating with FAA, NASA, and other Services and agencies on national policy and standards - Continue development/test/certification of open modular architecture processes, standards and design ***FY 2020 Plans:*** - Will continue C-ABSAA Technology Maturation & Risk Reduction Phase			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 645148 / *Common-Airborne Sense and Avoid (C-ABSAA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will prepare all documentation/results in anticipation of C-ABSAA Milestone decision review - Will continue to collaborate with FAA, NASA, and other Services and agencies on national policy and standards - Will continue development/test/certification of open modular architecture processes, standards and design ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased from FY19 to FY20 due to higher Air Force priorities			
Accomplishments/Planned Programs Subtotals	21.647	17.643	6.158

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The IS CDD requirements uses an iterative and incremental approach to develop, test and implement high quality software in a cost effective and timely manner. The software utilizes Open System Architecture (OSA) principles, COTS, Application Programming Interfaces (APIs), and maximum software and interface module independence. C-ABSAA will integrate applicable Better Buying Power 3.0 initiatives throughout its acquisition lifecycle.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 645148 / *Common-Airborne Sense and Avoid (C-ABSAA)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C-ABSAA Technology Development	C/Various	Various : Various, NV	-	20.071	Dec 2017	16.020	Feb 2019	4.543	Oct 2019	-		4.543	Continuing	Continuing	-
		Subtotal	-	20.071		16.020		4.543		-		4.543	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	Various	Various : Various, NV	-	1.576	Dec 2017	1.623	Feb 2019	1.615	Oct 2019	-		1.615	Continuing	Continuing	-
		Subtotal	-	1.576		1.623		1.615		-		1.615	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	21.647		17.643		6.158		-		6.158	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 645148 / *Common-Airborne Sense and Avoid (C-ABSAA)*

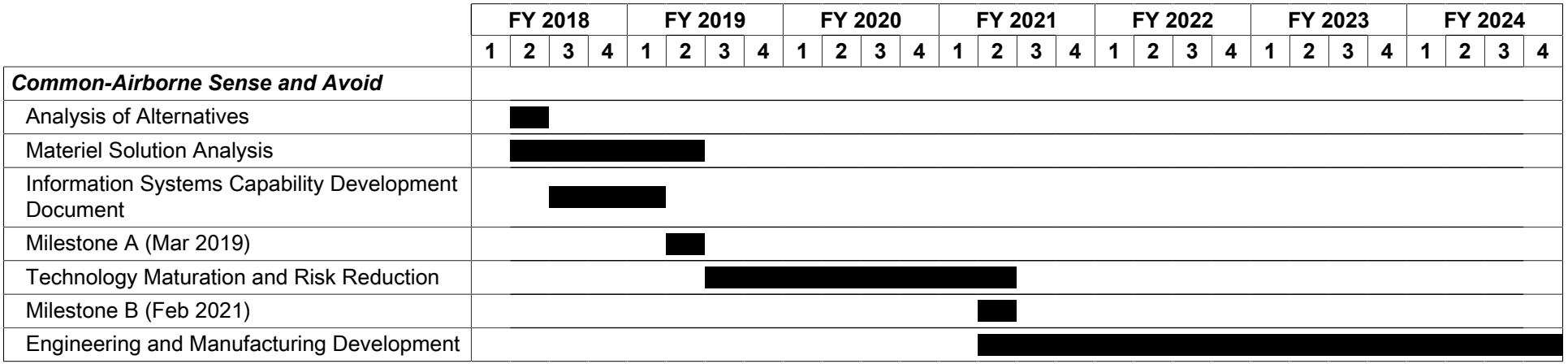

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 645148 / *Common-Airborne Sense and Avoid (C-ABSAA)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Common-Airborne Sense and Avoid				
Analysis of Alternatives	2	2018	2	2018
Materiel Solution Analysis	2	2018	2	2019
Information Systems Capability Development Document	3	2018	1	2019
Milestone A (Mar 2019)	2	2019	2	2019
Technology Maturation and Risk Reduction	3	2019	2	2021
Milestone B (Feb 2021)	2	2021	2	2021
Engineering and Manufacturing Development	2	2021	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 646025 / *Data Compression*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
646025: *Data Compression*	-	1.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.484
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019, PE 0604257, Advanced Technology and Sensors, Data Compression effort was transferred to PE 0305206F, Airborne Reconnaissance Systems (ARS), Project 676025, Data Compression.

A. Mission Description and Budget Item Justification

The Data Compression effort provides the warfighter with capability to efficiently compress and decompress airborne ISR sensor data and transmit near real time to tactical users through current and future bandwidth limited commercial satellite communications (SATCOM) or military SATCOM. The effort develops, tests, and will implement new sensor data compression and decompression algorithms for current and emerging airborne ISR sensors. Additionally, the program develops compression and decompression capabilities for manned and unmanned airborne platforms, associated ground stations, and Distributed Common Ground System (DCGS). Outputs will meet standard certification for use within the Department of Defense GEOINT and Measurement and Signatures Intelligence(MASINT) architectures. This program element may include necessary civilian pay expenses required to manage, execute, and deliver technology and sensor capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Reduction of Data Using Compression Enhancements (RDUCE)	1.484	0.000	0.000
Description: The Data Compression effort provides the warfighter a capability to efficiently compress and decompress airborne Intelligence, Surveillance, and Reconnaissance (ISR) sensor data and transmit near real time to tactical users through current and future bandwidth limited commercial satellite communications (SATCOM) or military SATCOM. The effort will develop, test and implement new sensor data compression and decompression algorithms for current and emerging airborne ISR sensors. Additionally, the program develops compression and decompression capabilities for manned and unmanned airborne platforms, associated ground stations, and the DCGS. Outputs will meet standard certification for use within the Department of Defense GEOINT and MASINT architectures.			
FY 2019 Plans: N/A - In FY 2019, PE 0604257, Advanced Technology and Sensors, Data Compression effort was transferred to PE 0305206F, Airborne Reconnaissance Systems (ARS), Project 676025, Data Compression.			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 646025 / *Data Compression*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** In FY 2019, PE 0604257, Advanced Technology and Sensors, Data Compression effort was transferred to PE 0305206F, Airborne Reconnaissance Systems (ARS), Project 676025, Data Compression.			
Accomplishments/Planned Programs Subtotals	1.484	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Data Compression acquisition approach is to design and develop compression and decompression technology hardware and software components, interfaces and standards for various airborne intelligence, surveillance, and reconnaissance platforms, ground stations, data storage facilities, and exploitation tools utilizing existing contracts with full and open competition where appropriate. Integration will be accomplished by the requisite program offices.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604257F / *Advanced Technology and Sensors*	Project (Number/Name) 646025 / *Data Compression*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Development	C/CPFF	General Atomics : San Diego, CA	-	1.312		-		-		-		-	0.000	1.312	-
		Subtotal	-	1.312		-		-		-		-	0.000	1.312	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Support	Various	Govt/Contractors : Dayton, NV	-	0.172	Oct 2017	-		-		-		-	0.000	0.172	-
		Subtotal	-	0.172		-		-		-		-	0.000	0.172	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.484		0.000		-		-		-	0.000	1.484	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 646025 / *Data Compression*

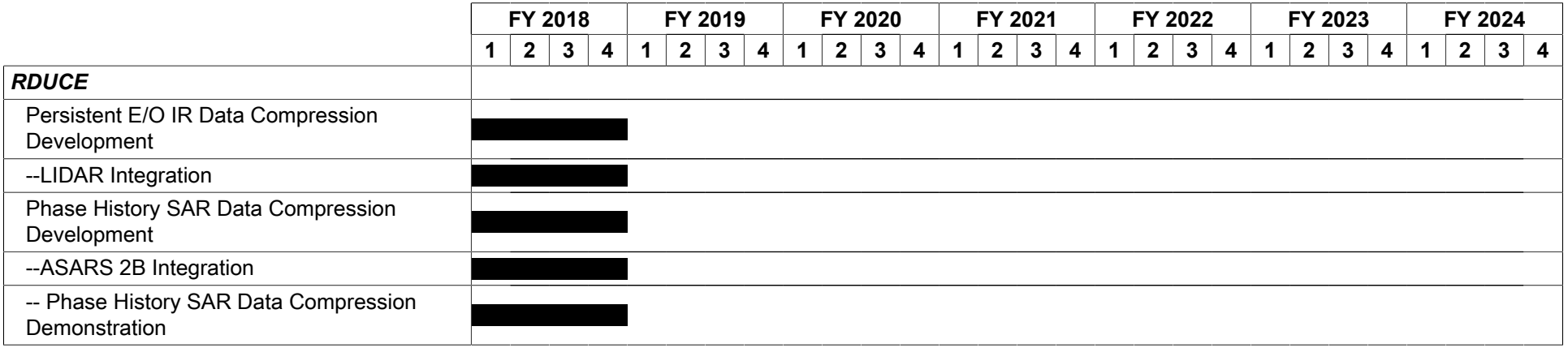

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604257F / *Advanced Technology and Sensors*	**Project (Number/Name)** 646025 / *Data Compression*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RDUCE				
Persistent E/O IR Data Compression Development	1	2018	4	2018
--LIDAR Integration	1	2018	4	2018
Phase History SAR Data Compression Development	1	2018	4	2018
--ASARS 2B Integration	1	2018	4	2018
-- Phase History SAR Data Compression Demonstration	1	2018	4	2018

Note

In FY 2015, efforts were reported under PE 0305208F, Distributed Common Ground/Surface Systems, Project 676025, Data Compression.
In FY 2016, efforts were reported in PE 0305206F, Airborne Reconnaissance Systems, Project 676025, Data Compression.
In FY 2017, PE 0305206F, Airborne Reconnaissance Systems, Project 676025, Data Compression, efforts transferred to PE 0604257F, Advanced Technology and Sensors, Project 646025, Data Compression.
In FY 2019, PE 0604257, Advanced Technology and Sensors, Data Compression effort was transferred to PE 0305206F, Airborne Reconnaissance Systems (ARS), Project 676025, Data Compression.