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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Air Force **Date:** February 2020

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0305202F / <i>Dragon U-2</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	87.618	36.389	18.660	0.000	18.660	18.319	19.813	20.167	0.000	Continuing	Continuing
674820: <i>Sensor Development</i>	-	87.618	36.389	18.660	0.000	18.660	18.319	19.813	20.167	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The U-2S Dragon Lady platform is a high-demand/low-density aircraft equipped with state-of-the-art sensor and data link systems providing mission essential Intelligence, Surveillance, and Reconnaissance (ISR) to the Combatant Commands, Joint and Combined forces, and the IC community in peacetime and wartime. The program supports core missions such as Sensitive Reconnaissance Operations (outlined in CJCSI 3250.01) in addition to other missions that include execution of CCMD OPLANs and CONPLANs, Humanitarian Assistance/Disaster Response (HADR), Counter-Insurgency (COIN) operations and third-party treaty verification/monitoring via the OLIVE HARVEST mission.

Currently, the Air Force plans to divest the U-2 in FY25. Until that time, in order to meet NDAA mandated capability and capacity, the Air Force continues to invest and modernize the U-2 program in the 2021 President's Budget. These investments will address reliability, maintainability, supportability, diminishing manufacturing sources/material shortages (DMS/MS), flight test, safety issues, and integration of capability development activities in support of the broader ISR portfolio. This continued investment in the platform ends in FY25, where the U-2 will be divested. Until that time, RDT&E efforts will address sustainment, modification, and modernization of sensors and associated mission equipment, and focus on integrating/expanding platform capabilities within the larger ISR portfolio; these efforts include (but are not limited to) ASARS 2B/C, avionics and navigation tech refresh, mission planning software and infrastructure upgrades, modernization of aircraft data links, next generation SIGINT, and developing a quick reaction capability (QRC), enabling improved collection against emerging threats and capabilities.

Additionally, the U-2 program will continue to prioritize emergent and/or experimental RDT&E efforts designed to mitigate the rapidly evolving combat environment (e.g. electromagnetic requirements) in order to maintain safety and operational relevance through current and future U-2 operating locations.

Currently, the U-2 Program provides funding for an Advanced Synthetic Aperture Radar System (ASARS) acquisition effort. This effort will design, fabricate, integrate, and demonstrate system capability enhancements for a high altitude deep look SAR system. This mitigates a Diminishing Manufacturing Supply and Material Shortages (DMSMS) issue with the current U-2 SAR sensor and processor.

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.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	87.618	38.939	18.694	0.000	18.694
Current President's Budget	87.618	36.389	18.660	0.000	18.660
Total Adjustments	0.000	-2.550	-0.034	0.000	-0.034
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	-2.550			
• 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	0.000	0.000	-0.034	0.000	-0.034

**Change Summary Explanation**

FY19, FY20, FY21 numbers reflect retention of the U-2. Addresses prudent acquisition efforts to address safety-of-flight and DMSMS issues for airframe and sensors; FY19 previous/current PB reflects +17M Congressional add for EO/IR upgrade in FY19.

FY21 3600 budget reflects database error, and incorrect total. In FY21, 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 & PDM. Upon initial distribution of funds, OSD and SAF/FM will coordinate for internal transfer of funds to the U-2 program to continue future and ongoing work for avionics and sensor efforts under PE 0305202F (Dragon U-2)."

<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> U-2 Aircraft Update Block 20.1	40.498	35.839	18.110
<b>Description:</b> Aircraft sustainment and/or enhancement development includes activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, avionics system upgrades, emergency egress system sustainability and suitability effort, airframe Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation, mission planning system migration, navigation system and stellar tracker initiatives, Open Mission Systems and Unmanned Aerospace Systems Command and Control Standard Initiative (OMS/UCI) standards compliance, GPS technical refresh, helmet and Full Pressure Suit technical refresh, and tactical data-link (L-16, IBS, IFDL, MADL, etc.) design and integration.			
<b>FY 2020 Plans:</b> Aircraft sustainment and/or enhancement development includes activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, avionics			

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>system upgrades, emergency egress system sustainability and suitability effort, airframe Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation, mission planning system software and infrastructure migration, navigation system and stellar tracker initiatives, advanced and agile systems, Open Mission Systems and Unmanned Aerospace Systems Command and Control Standard Initiative (OMS/UCI) standards compliance, GPS technical refresh, helmet and Full Pressure Suit technical refresh, quick reaction capability (QRC) development, enhanced communications/SIGINT system demo and development, and tactical data-link (L-16, IBS, IFDL, MADL, etc.) design and integration.</p> <p><b>FY 2021 Plans:</b> Aircraft sustainment and/or enhancement development includes activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, avionics system upgrades, emergency egress system sustainability and suitability effort, airframe Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation, mission planning system software and infrastructure migration, navigation system and stellar tracker initiatives, advanced and agile systems, Open Mission Systems and Unmanned Aerospace Systems Command and Control Standard Initiative (OMS/UCI) standards compliance, GPS technical refresh, helmet and Full Pressure Suit technical refresh, quick reaction capability (QRC) development, enhanced communications/SIGINT system demo and development, and tactical data-link (L-16, IBS, IFDL, MADL, etc.) design and integration.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Reduced sustainment and/or enhancement development.</p>				
<p><b>Title:</b> U-2 Payload Update Block 20.1</p> <p><b>Description:</b> Aircraft payload development supports sustainment and/or enhancement development includes activities such as, but not limited to, trade studies, analysis, preliminary system engineering, system and subsystem testing or demonstrations, sensor specification development, Advanced Synthetic Aperture Radar System (ASARS) development and test, SIGINT and multi-spectral sensor technical refresh integration and test, defensive systems, sensor range improvements, strategic and tactical data link (L-16, IBS, IFDL, MADL, etc.) design and integration.</p> <p><b>FY 2020 Plans:</b> In FY20, the majority of planned RDT&amp;E base funding will fall under that aircraft mod category. ACQ manager and HAF U-2 PEM have the authority to adjust funding between categories as mission and threat environment evolves.</p> <p>Payload mod funding will be used to integrate ASARS-2B radar onto the platform.</p> <p><b>FY 2021 Plans:</b> In FY21, the majority of planned RDT&amp;E base funding will fall under that aircraft mod category. ACQ manager and HAF U-2 PEM have the authority to adjust funding between categories as mission and threat environment evolves.</p>		47.120	0.550	0.550

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Payload mod funding will be used to integrate ASARS-2B radar onto the platform.			
<b>Accomplishments/Planned Programs Subtotals</b>	87.618	36.389	18.660

**D. Other Program Funding Summary (\$ in Millions)**  
N/A

**Remarks**

**E. Acquisition Strategy**  
N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0305202F / <i>Dragon U-2</i>	<b>Project (Number/Name)</b> 674820 / <i>Sensor Development</i>
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
ASARS Phase 1 Enhancements Design	SS/CPFF	Raytheon/Lockheed Martin : El Segundo, CA	-	-		1.700	Feb 2020	-		-		-	Continuing	Continuing	-
ASARS Phase 2 Integration & Demonstration	SS/CPFF	Raytheon/Lockheed Martin Aeronautics : El Segundo, CA	-	0.520	Mar 2019	0.550	Feb 2020	1.840	Dec 2020	-		1.840	Continuing	Continuing	-
Flight Test Support	SS/CPFF	Lockheed Martin Aeronautics : Palmdale, CA	-	-		-		-		-		-	Continuing	Continuing	-
Data Links Modernization	SS/CPFF	L3 Communications : Salt Lake City, UT	-	-		14.331	Mar 2020	2.843	Dec 2020	-		2.843	Continuing	Continuing	-
Navigation System	SS/CPFF	Lockheed Martin Aeronautics : Palmdale, CA	-	6.000	Mar 2019	-		-		-		-	Continuing	Continuing	-
Emergency Egress System Sustainability and Suitability Effort	SS/CPFF	Lockheed Martin Aeronautics : Palmdale, CA	-	16.665	Apr 2019	1.000	Feb 2020	1.010	Feb 2021	-		1.010	Continuing	Continuing	-
Avionics Technical Refresh	SS/CPFF	LMA : Palmdale, CA	-	11.234	Apr 2019	6.257	Jan 2020	5.567	Dec 2020	-		5.567	Continuing	Continuing	-
Loads and Environment Spectra Survey (L/ESS) Compliance and Flight Data Recorder Installation	SS/CPFF	LMA : Palmdale, CA	-	7.500	Jun 2019	-		-		-		-	Continuing	Continuing	-
Electro-Optical/Infrared Sensor Technical Refresh	SS/CPFF	Lockheed Martin Aeronautics : Palmdale, CA	-	24.500	Apr 2019	-		-		-		-	Continuing	Continuing	-
Mission Planning Software Technical Refresh	TBD	TBD : TBD	-	7.099	Apr 2019	6.096	Mar 2020	-		-		-	Continuing	Continuing	-
Electronic Warfare Suite (EWS) Advanced Threat	SS/CPFF	BAE : Nashua, NY	-	14.100		5.055	Apr 2020	6.000	Dec 2020	-		6.000	0.000	25.155	22.100
<b>Subtotal</b>			-	87.618		34.989		17.260		-		17.260	Continuing	Continuing	N/A



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**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0305202F / <i>Dragon U-2</i>	<b>Project (Number/Name)</b> 674820 / <i>Sensor Development</i>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
<b><i>U-2 Dragon Lady</i></b>																												
Advanced Synthetic Aperture Radars System (ASARS)																												
Data Links Modernization																												
Navigation System																												
Emergency Egress System Sustainability and Suitability Effort																												
Avionics Tech Refresh																												

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Air Force **Date:** February 2020

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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>U-2 Dragon Lady</i></b>				
Advanced Synthetic Aperture Radars System (ASARS)	1	2019	4	2025
Data Links Modernization	1	2019	4	2025
Navigation System	1	2019	1	2021
Emergency Egress System Sustainability and Suitability Effort	3	2019	4	2023
Avionics Tech Refresh	2	2020	4	2023