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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 I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0207131F I A-10 Squadrons							
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	-	17.459	27.738	36.816	0.000	36.816	24.581	24.248	24.193	23.670	Continuing	Continuing
674809: A-10 Squadrons	-	17.459	27.738	36.816	0.000	36.816	24.581	24.248	24.193	23.670	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

A-10 concept of operations requires a flexible, adaptable and survivable weapon system to conduct close air support (CAS), combat search and rescue (CSAR) and special operations missions. The A-10 must conduct around-the-clock air operations under various weather conditions against numerous and varied enemy threats.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, A-10 Thunderbolt Advanced-wing Continuation Kit (ATTACK), Central Interface Control Unit (CICU); accommodate technology insertion (Additional Gigabit Ethernet capability, High Resolution Display System (HRDS), 3-D Audio, On-Board Oxygen Generation System (OBOGS), and fulfill FAA and other mandates (IFF Mode-5, Automatic Dependent Surveillance Broadcast (ADS-B) Out, M-Code, NSA Crypto Modernization/ARC-210 radio/Mobile User Objective System (MUOS)) to ensure continued aircrew safety and mission effectiveness, Anti-Jam Embedded Global Positioning System within the provisions of 10 USC 2244A.

Operational Flight Program (OFP) development addresses evolving and continuing user requirements that must be incorporated in the aircraft software in order to employ advanced weapons (SMART Triple Ejector Rack (TER), increase situational awareness and enhance targeting capabilities as they become available. The funds budgeted continue regular OFP suite development efforts.

The RDT&E funds provide A-10 Developmental and Operational Testing ensuring all added capability meets safety and airworthiness criteria. FMT's DMS efforts to include removal of end-of-life software/hardware within simulators systems and move to a modular, common open system architecture that is sustainable and cyber-resilient. Implement requirements and standards defined under the Simulator Common Architecture Requirements and Standards (SCARS) initiative.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver A-10 weapon system 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, and 0605898F.

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.

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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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total		
Previous President's Budget		17.459	27.738	39.171	0.000	39.171		
Current President's Budget		17.459	27.738	36.816	0.000	36.816		
Total Adjustments		0.000	0.000	-2.355	0.000	-2.355		
• 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		0.000	0.000	-2.355	0.000	-2.355		
Change Summary Explanation								
No Significant Changes								
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: OFP Development				13.459	13.700	13.800	-	13.800
Description: Updates to the A-10C OFP Suite software to permit timely integration of new precision weapons, updated targeting pods, improved avionics and enhanced electronic warfare capabilities. These upgraded capabilities are in response to evolving operational requirements, including Urgent Operational Needs, generated by the ever-changing operational environment of air combat.								
This OFP effort also contains Program Management Administration (PMA) support activities to include travel, office supplies, training courses, Video Teleconferencing (VTC) and support contractors.								
FY 2019 Plans: Conclude Suite 9 development and continue Suite 10 development of the software design, development and integration.								
FY 2020 Base Plans:								

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue Suite 10 Software development and integration						
FY 2019 to FY 2020 Increase/Decrease Statement: Minimal Increase in budget						
Title: ARC-210 Gen 6  Description: The ARC-210 Gen 6 will provide the A-10 with numerous needed capabilities. The first of which is NSA crypto mandate compliant secure communications. The second is the Air Force mandate of all aircraft having Mobile User Objective System (MUOS) capability. The SATURN algorithm is also required for continued A-10 Combat Search and Rescue (CSAR) as well as Close Air Support with theater forces. The older Generation 4 radio does not currently have any of these capabilities.  FY 2019 Plans: Funding will be used for Non-recurring engineering (NRE) for System Integration Laboratory (SIL) Integration and Testing. This will ensure all required equipment and optimal configurations will be tested for fit and function within the A-10 aircraft. In addition, configurations will be flight tested to ensure capabilities are airworthy as well as functional.  FY 2020 Base Plans: Continue Non-recurring engineering (NRE) for System Integration Laboratory (SIL) Integration and Testing. This will ensure all required equipment and optimal configurations will be tested for fit and function within the A-10 aircraft. In addition, configurations will be flight tested to ensure capabilities are airworthy as well as functional.  FY 2019 to FY 2020 Increase/Decrease Statement: Increase in ARC-210 effort		0.000	4.200	11.174	-	11.174
Title: A-10 Small Projects  Description: RDT&E funds provide for updates and incorporation of capabilities for weapons integration, targeting pod updates, and communication/navigation/data link improvements (e.g., Central Interface Control Unit (CICU); M-Code, MUOS communication system, Embedded GPS/ INS, Gigabit Ethernet. HRDS,. 3-D Audio, Smart (TER), Small Diameter Bomb (SDB) capability and cyber security upgrades). These funds will ensure concurrency with systems impacted by OFP development, including but not limited to the Full Mission Trainer (FMT), mission planning and support equipment, as well as required upgrades to the Software Integration Laboratory (SIL).		4.000	8.838	11.842	-	11.842

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Begin efforts for integration of SDB onto the A-10 platform						
FY 2020 Base Plans: Funding will be used for integration of SDB onto A-10 platform; to include power study, test, labor, materials, etc.						
FY 2019 to FY 2020 Increase/Decrease Statement: Increase due increase in requirements						
Title: J-Hook  Description: Deployed A-10 units are reporting increased breakage/failure on weapons pylon retention snap hooks (J-Hooks) resulting in damage to the 1760 wiring harness at a rate of 4 to 6 times per week.  Breaking J Hooks/damaged 1760 cables were initially identified in 2009 during the PE program. A-10 SPO East contracted Lockheed Martin Owego to develop a solution. The design was successfully put through DT at Eglin AFB. OT was subsequently conducted for 30 days, dropping >100 munitions with no defects noted. A-10 SPO has no documentation from OT. J-Hook T-2 Modification was shut down and the design shelved. This J-Hook modification design is now government property.  FY 2019 Plans: This effort will provide material solution kits based on current drawings/specs to improve the pylon retention snap hook system.  FY 2020 Base Plans: N/A  FY 2020 OCO Plans: N/A  FY 2019 to FY 2020 Increase/Decrease Statement: RDT&E funding is only needed in FY19		-	1.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals		17.459	27.738	36.816	0.000	36.816

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<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 0207131F / A-10 Squadrons							
<b>D. Other Program Funding Summary (\$ in Millions)</b>												
	<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
	• APAF 05 Line Item A01000: <i>A-10 Squadrons, PE 0207131F</i>	109.010	168.060	132.069	-	132.069	135.980	128.947	135.002	86.231	0.000	895.299
<b>Remarks</b>												
<b>E. Acquisition Strategy</b>												
A-10 OFP development efforts will be conducted organically by the 309th Software Maintenance Group (309 SMXG) at Ogden Air Logistics Complex, Hill AFB UT. The ADS-B, ARC-210 radio Crypto Mandate, SMART Triple Ejector Rack (TER) development for the Small Diameter Bomb (SDB) missionization efforts will be conducted by contractor and organically by the 309 SMXG. The A-10 FMT simulator OFP is managed by the Simulator Division at Wright-Patterson Air Force Base and is currently contractor-developed and integrated.												
<b>F. Performance Metrics</b>												
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.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons				Project (Number/Name) 674809 / A-10 Squadrons					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
OFP Development 1st Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	1.180	Nov 2017	-		-		-		-	Continuing	Continuing	-
OFP Development 2nd Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	1.800	Jan 2018	-		-		-		-	Continuing	Continuing	-
OFP Development 3rd Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	4.800	Apr 2018	-		-		-		-	Continuing	Continuing	-
OFP Development 4th Qtr FY18 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	2.870	Jun 2018	-		-		-		-	Continuing	Continuing	-
OFP Development 1st Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		2.610	Nov 2018	-		-		-	Continuing	Continuing	-
OFP Development 2nd Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		2.610	Jan 2019	-		-		-	Continuing	Continuing	-
OFP Development 3rd Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		2.610	Apr 2019	-		-		-	Continuing	Continuing	-
OFP Development 4th Qtr FY19 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		2.616	Jun 2019	-		-		-	Continuing	Continuing	-
OFP Development 1st Qtr FY20 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		-		2.610	Nov 2019	-		2.610	Continuing	Continuing	-
OFP Development 2nd Qtr FY20 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		-		2.610	Jan 2020	-		2.610	Continuing	Continuing	-
OFP Development 3rd Qtr FY20 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		-		2.610	Apr 2020	-		2.610	Continuing	Continuing	-
OFP Development 4th Qtr FY20 (309 SMXG)	PO	309 SMXG : Hill AFB, UT	-	-		-		2.610	Jun 2020	-		2.610	Continuing	Continuing	-
Subtotal			-	10.650		10.446		10.440		-		10.440	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
USAF (Multiple)	Various	Various : Various	-	4.799	Jan 2018	9.242	Jan 2019	18.326		-		18.326	Continuing	Continuing	-
Subtotal			-	4.799		9.242		18.326		-		18.326	Continuing	Continuing	N/A

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Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Remarks															
FY18 \$4.00M - A-10 Small Projects FY18 \$0.750M - SIM SPO Full Mission Trainers (FMT) FY18 \$0.049M - SPO TDY FY19 \$6.288M - ARC-210 Crypto Mandate FY19 \$6.750M - A-10 Small Projects FY19 \$0.750M - SIM SPO Full Mission Trainers (FMT) FY19 \$0.049M - SPO TDY FY20 \$0.400M - SIM SPO Full Mission Trainers (FMT) FY20 \$0.75M - SPO TDY FY20 \$9.086 - ARC-210 FY20 \$10.835 - A-10 Small Projects FY20 \$0.500M - PMA Tax															
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
USAF (OFP)	Various	Various : Various	-	1.850	Sep 2018	3.250	Sep 2019	3.250	Sep 2019	-		3.250	Continuing	Continuing	-
Subtotal			-	1.850		3.250		3.250		-		3.250	Continuing	Continuing	N/A
Remarks															
RDT&E Test and Evaluation will not begin until 1st Quarter FY18 due to FY17 cut/mark of \$10M.															
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	Various	Various : Various	-	0.160	Aug 2018	4.800	Aug 2019	4.800		-		4.800	Continuing	Continuing	-
Subtotal			-	0.160		4.800		4.800		-		4.800	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			-	17.459		27.738		36.816		-		36.816	Continuing	Continuing	N/A

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Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons			Project (Number/Name) 674809 / A-10 Squadrons			
	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2020 Air Force	<b>Date:</b> February 2019
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<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0207131F / A-10 Squadrons	<b>Project (Number/Name)</b> 674809 / A-10 Squadrons
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	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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>OFP</b>																												
Suite 10 - OFP System Design, Development and Flight Test																												
Suite 10 - OFP Fields																												
ARC - 210 Crypto Mandate																												
Suite 11 - OFP System Design, Development and Flight Test																												
Suite 11 - OFP Fields																												
Suite 12 - OFP System Design, Development and Flight Test																												
Suite 12 - OFP Fields																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207131F / A-10 Squadrons	Project (Number/Name) 674809 / A-10 Squadrons	

## Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>OFP</b>				
Suite 10 - OFP System Design, Development and Flight Test	2	2018	4	2020
Suite 10 - OFP Fields	4	2020	4	2021
ARC - 210 Crypto Mandate	2	2019	4	2020
Suite 11 - OFP System Design, Development and Flight Test	2	2018	2	2022
Suite 11 - OFP Fields	2	2022	2	2023
Suite 12 - OFP System Design, Development and Flight Test	2	2019	3	2023
Suite 12 - OFP Fields	3	2023	3	2024

### Note

Suite 10 was subjected to a FY17 mark for \$10M. The program was reinstated upon receiving supplemental funding. As a result of the mark and late-to-need funding, 13 candidates were also lost from Suite 9.