Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force											Date: February 2020	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0604233F / *Specialized Undergraduate Flight Training*							
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	-	10.974	2.584	8.777	0.000	8.777	5.592	1.243	1.204	4.053	Continuing	Continuing
674101: *Undergraduate Remotely Piloted Aircraft Training*	-	0.735	0.796	0.809	0.000	0.809	0.826	0.841	0.856	0.871	Continuing	Continuing
676035: *T-6 Operational System Development*	-	1.718	1.183	1.832	0.000	1.832	0.226	0.232	0.238	3.182	Continuing	Continuing
676037: *T-38 Operational System Development*	-	8.521	0.605	6.136	0.000	6.136	4.540	0.170	0.110	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Supports Air Education and Training Command's implementation of Specialized Undergraduate Pilot Training and the Department of Defense initiative for joint pilot training.

Undergraduate Remotely Piloted Aircraft Training supports Air Education and Training Command's implementation of Undergraduate Remotely Piloted Aircraft Training. This program provides and maintains the currency of Predator Reaper Integrated Mission Environment Desktop Training System.

T-6 Operational System Development continues follow on development activities to JPATS including but not limited to studies & development efforts, instructional courseware, and logistics support to include Diminishing Manufacturing Sources(DMS) and development activities related to DMS. Included is development for the Next Generation On-Board Oxygen Generation System, Automatic Dependent Surveillance Broadcast Out (ADS-B Out), Crash Survivable Recorder (CSR),Controlled Flight Into Terrain - Prevention (CFIT-Prevention), Pilot Training Next (PTN) and associated upgrades. There are currently 443 aircraft in the Air Force inventory. Remaining service life is up to 39 years from the final delivery in May 2010.

The T-38 program continues studies & development efforts supporting future ACAT III Engineering Change Proposals to address DMSMS issues for the T-38 Platform and regular block upgrades for the T-38C as required to keep the system current. Block upgrades incorporate software and/or hardware improvements for the aircraft and aircrew training devices to address flight safety issues and to comply with new capabilities mandated by Department of Defense, Federal Aviation Administration, or National Airspace System.

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

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	11.344	2.584	5.368	0.000	5.368
Current President's Budget	10.974	2.584	8.777	0.000	8.777
Total Adjustments	-0.370	0.000	3.409	0.000	3.409
• 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	-0.370	0.000			
• Other Adjustments	0.000	0.000	3.409	0.000	3.409

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / *Specialized Undergraduate Flight Training*	Project (Number/Name) 674101 / *Undergraduate Remotely Piloted Aircraft Training*	

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
674101: *Undergraduate Remotely Piloted Aircraft Training*	-	0.735	0.796	0.809	0.000	0.809	0.826	0.841	0.856	0.871	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This effort supports Air Education and Training Command's (AETC) implementation of Undergraduate Remotely Piloted Aircraft (RPA) Training (URT). URT produces RPA pilots and Sensor Operators from accession sources to man RPA squadrons.

Success of the program is heavily dependent on Predator Reaper Integrated Mission Environment (PRIME) Desktop Training System to prepare undergraduate students for entry in RPA Formal Training Units (FTU). PRIME has completed seven Phases of development and is now at baseline functionality. PRIME is a desktop trainer similar to the Reaper training system now in use to train undergraduate RPA pilots and sensor operators. PRIME currently emulates the MQ-9 Reaper and needs to keep pace with that baseline system and expand to other RPAs in order to maintain concurrency and relevancy. Funds will also be used to develop enhancements that increase fidelity and functionality.

Funds may be used to address emerging and short-notice Diminishing Manufacturing Sources and Material Shortage (DMSMS) issues. Diminishing Manufacturing Sources efforts 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.

Implementation requirements and standards are 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 URT weapon system capability. 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 2019	FY 2020	FY 2021
Title: Predator Reaper Integrated Mission Environment (PRIME) support	0.735	0.796	0.809
Description: Add Phase 8 operational capabilities.			
FY 2020 Plans: -Continue development and implementation of Phase 8 enhancements. -Continue to extend and enhance interoperability between PRIME and Modern Air Combat Environment (MACE) software for instructor operations and entity generation.			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 674101 / *Undergraduate Remotely Piloted Aircraft Training*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
-Add metadata crosshair coordinates option in MGRS format (10 digit precision). -Add multisegment line drawing tool to tracker screen. -Add aircraft response to icing. -Add load/save capability. -Implement altimeter display, status messages, and engine feedback on HUD. -Increase functionality/variety/fidelity of MACE PRIME entities. ***FY 2021 Plans:*** Stand up a SIL: URT GBTS requires the development of an independent software / hardware testing capability on a stand-alone device. Effort includes researching, designing, developing, and building a SIL. Air Traffic Control Integration Study: Feasibility study of Live ATC integration into the URT GBTS. Flight Planning Software: Replace tactical situation display software with new software solutions that have to be developed and integrated with PRIME. Development of new training simulation software to replace the current software on URTIS and PRIME to train RPA pilots. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase due to inflation.			
Accomplishments/Planned Programs Subtotals	0.735	0.796	0.809

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Contract via Training Systems Acquisition III (TSA III) Task Order to Cubic Corporation, parent company of PRIME software data rights owner (Intific).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 674101 / *Undergraduate Remotely Piloted Aircraft Training*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Undergraduate Remotely Piloted Aircraft Training Phased planning, design, and development of software updates	SS/FFP	Cubic Corporation : NV	-	0.707	Mar 2019	0.726	Mar 2020	0.733	Mar 2021	-		0.733	Continuing	Continuing	-
		Subtotal	-	0.707		0.726		0.733		-		0.733	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Undergraduate Remotely Piloted Aircraft Training PMA Other Government Cost and Contract Services	SS/CPFF	Program Office : WPAFB, OH	-	0.028	Oct 2018	0.070	Oct 2019	0.076	Oct 2020	-		0.076	Continuing	Continuing	-
		Subtotal	-	0.028		0.070		0.076		-		0.076	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.735		0.796		0.809		-		0.809	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 674101 / *Undergraduate Remotely Piloted Aircraft Training*

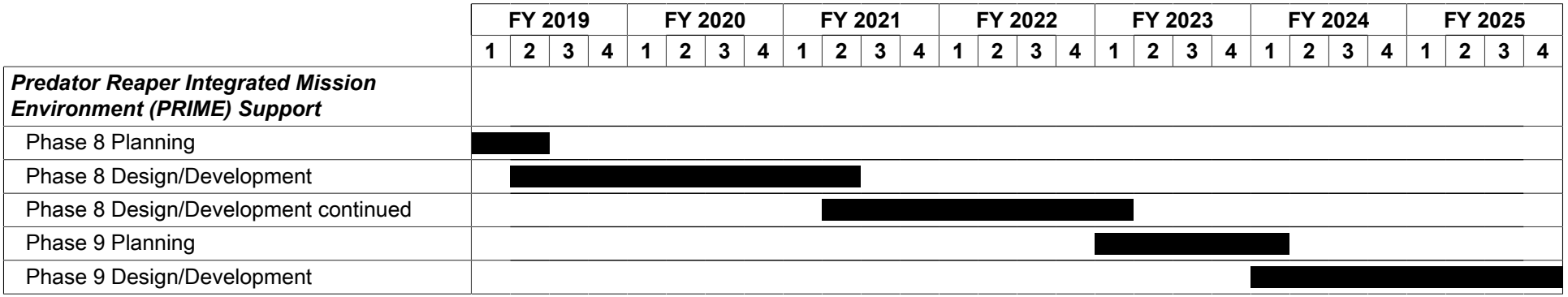

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 674101 / *Undergraduate Remotely Piloted Aircraft Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Predator Reaper Integrated Mission Environment (PRIME) Support				
Phase 8 Planning	1	2019	2	2019
Phase 8 Design/Development	2	2019	2	2021
Phase 8 Design/Development continued	2	2021	1	2023
Phase 9 Planning	1	2023	1	2024
Phase 9 Design/Development	1	2024	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / *Specialized Undergraduate Flight Training*	Project (Number/Name) 676035 / *T-6 Operational System Development*	

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
676035: *T-6 Operational System Development*	-	1.718	1.183	1.832	0.000	1.832	0.226	0.232	0.238	3.182	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

T-6 Operational System Development continues follow on development activities to JPATS including but not limited to studies and development efforts, instructional courseware, and logistics support to include Diminishing Manufacturing Sources (DMS) and development activities related to DMS. Included is development for the Next Generation On-Board Oxygen Generation System, Automatic Dependent Surveillance Broadcast Out (ADS-B Out), Crash Survivable Recorder (CSR), Controlled Flight Into Terrain - Prevention (CFIT-Prevention), Pilot Training Next (PTN) and associated upgrades. There are currently 443 aircraft in the Air Force inventory. Remaining service life is up to 39 years from the final delivery in May 2010.

Funding contained in this platform's documentation directly aids Air Education Training Command flying training enterprise to continue its overall pilot production increase starting in FY2020 thus reducing the USAF Pilot Shortage.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver T-6 Operational System Development capabilities. The use of such program funds would be in addition to the civilian pay expense budgeted in program elements 0605831F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: T-6A (JPATS) Studies and Analysis	1.518	0.100	1.732
Description: T-6A (JPATS) studies and development activities including but not limited to: Engine Preservation/Upgrade Development, On-Board Oxygen Generation System (OBOGS) Characterization Study, Next Generation On-Board Oxygen Generation System Study, Supplemental Oxygen System Study, Cockpit Environmental Monitoring/Analysis, and Physiological Events (PE) Analysis. Includes engineering and contractor support/services and Program Management Administration (PMA) costs.			
FY 2020 Plans: T-6A Aircraft studies and development activities including but not limited to: Engine Preservation development, On-Board Oxygen Generation System Characterization Study, Next Generation On-Board Oxygen Generation System Study, and Cockpit Environmental Monitoring/Analysis.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
T-6A Aircraft studies and development activities including but not limited to: engine preservation development, cockpit environmental monitoring/analysis, diminishing manufacturing source issues, and upgrades to on-aircraft software packages. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increased due to studying upgrades to the T-6A on-aircraft software.			
Title: Next Generation On-Board Oxygen Generation System ***Description:*** The Next Generation On-Board Oxygen Generation System will provide the aircraft with a system that will meet and/or exceed the Military Standard 3050 specifications. The development and fielding of this capability will directly improve the safety of pilot training. This acquisition is a direct response to Air Education and Training Command requirements and on-going Physiological Events (PE) in the T-6A aircraft. ***FY 2020 Plans:*** Begin RDT&E activities to include but not limited to: development, integration, test and certification of the Next Generation On-Board Oxygen Generation System that meets or exceeds Mil Standard 3050 specifications. ***FY 2021 Plans:*** Continue RDT&E activities to include but not limited to: development, integration, test and certification of the Next Generation On-Board Oxygen Generation System that meets or exceeds Mil Standard 3050 specifications. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreased due to this effort transitioning to procurement.	-	0.703	0.100
Title: Crash Survivable Recorder (CSR) ***Description:*** Crash Survivable Recorder (CSR) will provide the aircraft with a system that will meet the minimum crash survivable data collection capability as outlined in Air Force Instruction 63-133 Aircraft Information Program (Change 1, 4 November 2010) and SECDEF Memo of 22 June 06, Reducing Preventable Accidents. Includes engineering and contractor support/services and PMA costs. ***FY 2020 Plans:*** Continue RDT&E activities to include but not limited to: development, integration, test and certification of the Crash Survivable Recorder (CSR) to comply with the minimum crash survivable data collection capability as outlined in AFI 63-133 Aircraft Information Program 6 February 2001 Incorporating Change 1, 4 November 2010, and the Secretary of Defense Memo of 22 June 06, Reducing Preventable Accidents. ***FY 2021 Plans:***	0.200	0.380	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreased due to this effort transitioning to procurement.			
Accomplishments/Planned Programs Subtotals	1.718	1.183	1.832

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts*	0.590	-	0.001	-	0.001	-	1.485	-	-	Continuing	Continuing
• APAF 05 Line Item JPAT00: *T-6*	53.150	11.826	26.829	-	26.829	14.147	6.148	3.210	30.298	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Air Force is lead service for the T-6 Operational Systems Development program and currently manages upgrades to the entire family of systems for both the Air Force and Navy. T-6 Operational Systems Development acquisition strategy for satisfying emerging software and hardware requirements is designed to enable competition and control cost. Development resulting from Diminishing Manufacturing Sources and Material Shortages requirement will be evaluated and implemented incrementally to efficiently deliver required capabilities to AETC.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T-6 Operational System Development Crash Survivable Recorder	C/FFP	TBD : TBD	-	0.200	Mar 2020	0.380	Mar 2020	1.616	Dec 2020	-		1.616	Continuing	Continuing	-
T-6 Operational System Development Alternative On-Board Oxygen Generation System	C/CPAF	TBD : TBD	-	-		0.703	Feb 2020	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.200		1.083		1.616		-		1.616	Continuing	Continuing	N/A

Remarks

The first piece of the Crash Survivable Recorder RDT&E effort is planned to 2Q FY20.

The first piece of the Controlled Flight Into Terrain - Prevention RDT&E effort will be awarded in 4Q FY20.

The first piece of the Next Generation On-Board Oxygen System RDT&E effort is planned to begin in 2Q FY20.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		-		0.216	May 2021	-		0.216	Continuing	Continuing	-
Physiological Event's: Edwards Test Center	PO	Edwards Test Center : Edwards, CA	-	1.458	Oct 2018	0.100	Oct 2019	-		-		-	Continuing	Continuing	-
		Subtotal	-	1.458		0.100		0.216		-		0.216	Continuing	Continuing	N/A

Remarks

Continue Unknown Physiological Event's studies at Edwards AFB. Phase II of this effort began 1Q in FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA Contract Services	C/FFP	Not specified. : TBD	-	0.010	Sep 2019	-		-		-		-	Continuing	Continuing	-
PMA Other Government Costs	Various	Not specified. : TBD	-	0.050	Sep 2019	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.060		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.718		1.183		1.832		-		1.832	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

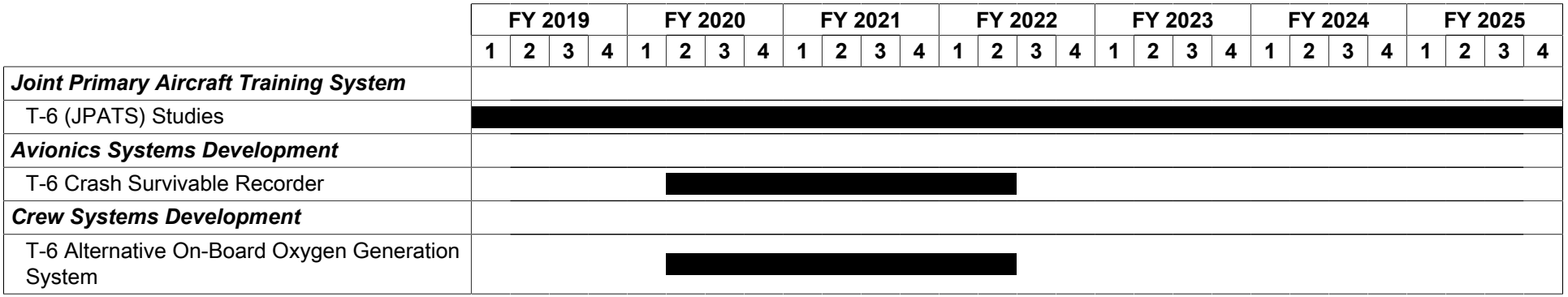

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Joint Primary Aircraft Training System				
T-6 (JPATS) Studies	1	2019	4	2025
Avionics Systems Development				
T-6 Crash Survivable Recorder	2	2020	2	2022
Crew Systems Development				
T-6 Alternative On-Board Oxygen Generation System	2	2020	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / *Specialized Undergraduate Flight Training*	Project (Number/Name) 676037 / *T-38 Operational System Development*	

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
676037: *T-38 Operational System Development*	-	8.521	0.605	6.136	0.000	6.136	4.540	0.170	0.110	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The T-38 is a twin engine, two seat (tandem), supersonic jet trainer used by Air Education and Training Command (AETC) as an advanced trainer in Specialized Undergraduate Pilot Training. Modifications are budgeted to enhance operational capability while improving flight safety, reliability and maintainability. There are currently 503 T-38's in the Air Force inventory (53 T-38A, six AT-38B and 444 T-38C) with five T-38Cs pending removal. T-38s first entered service in 1960 and average over 51 years old.

Studies & development efforts supporting future ACAT III Engineering Change Proposals to address obsolescence issues for the T-38 platform and accomplish the regular block upgrades on the T-38C as required to keep the system current. Block upgrades will be accomplished with Operations & Maintenance funding unless the block upgrade provides additional capabilities. Block upgrades incorporate software and/or hardware improvements to comply with new capabilities mandated by Department of Defense, Federal Aviation Administration, or National Airspace System, and to address flight safety issues. The block upgrades support the T-38C aircraft and Aircrew Training Devices.

L3 Display Systems is unable to continue support of the T-38C Multi-Functional Display (MFD) and the Electronic Engine Display (EED) beyond March 2026. Development of replacement displays must begin in FY20 to ensure continued AETC pilot production. There are 2 MFDs and 2 EEDs per aircraft (1,768 displays).

This program element may include necessary civilian pay expenses required to manage, execute, and deliver T-38 Operational systems Development weapon system capability. 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 2019	FY 2020	FY 2021
Title: T-38 Avionics Component Integration (AvCI)	8.464	0.605	3.780
Description: T-38C Avionics System obsolescence remediation effort is developing and qualifying replacement components/Line Replaceable Units (LRU) that are becoming non-supportable. Systems include the Mission Display Processor (MDP), Heads-Up Display (HUD) and Very High Frequency (VHF) Communication and Navigation radios. Furthermore, L3 Display Systems is unable to continue support of the T-38C Multi-Functional Display (MFD) and the Electronic Engine Display (EED) beyond March 2026. Development of replacement displays must begin in FY20 to ensure continued AETC pilot production beyond March of 2026.			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
EED and MFD development will start in the 2nd quarter of FY20. ***FY 2021 Plans:*** Begin T-38C Operational Flight Plan and Aircrew Training Device software efforts for planned Block Upgrade to include requirements development, integration, and fielding. Begin implementation of Product Improvement Change Requests which fix software bugs, provide security enhancements, and new capabilities. Begin development and sustainment requirements development for the Joint Mission Planning framework, Unique Product Component, and Ground Station Software. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase due to T-38C Block 11 software/hardware upgrade development. The primary issue to resolve is meeting mandated cybersecurity requirements in order to maintain the T-38C Authority to Operate.			
Title: T-38 Studies and Development Efforts ***Description:*** Studies and efforts to support future ACAT III Engineering Change Proposals to address obsolescence issues and the regular block upgrades that are required to keep the system current. ***FY 2020 Plans:*** N/A ***FY 2021 Plans:*** Cybersecurity software requirements that impact the T-38C Operational Flight Program will be resolved as part Block 11 development, which will begin in FY21. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase due to development of T-38C Operational Flight Program updates to meet cybersecurity requirements.	0.042	0.000	2.356
Title: T-38A/B ADS-B ***Description:*** Develop and integrate an Automatic Dependent Surveillance Broadcast (Out) solution the T-38A/B model fleet. The solution must maintain the military transponder modes. ***FY 2020 Plans:*** N/A ***FY 2021 Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***	0.015	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
N/A			
Accomplishments/Planned Programs Subtotals	8.521	0.605	6.136

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• APAF 05 Line Item T03800: *T-38*	70.623	37.341	36.806	-	36.806	52.146	65.334	73.261	59.608	Continuing	Continuing

Remarks

D. Acquisition Strategy

The T-38 Platform Operations System Development acquisition strategy for satisfying emerging software and hardware requirements is designed to enable competition and cost control. Developmental requirements resulting from Diminishing Manufacturing Sources and Material Shortages research and reporting will be evaluated and implemented incrementally to efficiently deliver required capabilities to Air Education & Training Command in support of the pilot training program. System block upgrades will be required to maintain aircraft airworthiness and will be implemented based on Air Education & Training Command requirements. An appropriate level of technical data rights is required by all current support contracts.

Contract FA8211-16-D-0001 is a Type D Indefinite Delivery, Indefinite Quantity contract competitively awarded to address T-38C avionics system obsolescence issues and provide Contractor Logistics Support follow-on support. The Avionics Component Integration contract was awarded 8 January 2016. Obsolescence remediation efforts began immediately and the follow-on Contractor Logistics Support effort began 1 April 2017. The period of performance ends 31 March 2026.

The T-38C display obsolescence issues are within scope on the current contract with Boeing. The contract FA8211-16-D-0001 will be utilized for development and procurement.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / *Specialized Undergraduate Flight Training*	Project (Number/Name) 676037 / *T-38 Operational System Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T-38 Avionics System DMSMS mitigation efforts	C/FFP	The Boeing Company : St. Louis, MO	-	8.372	Oct 2018	0.605	Feb 2020	3.683		-		3.683	Continuing	Continuing	-
T-38 A/B Automatic Dependent Surveillance-Broadcast	SS/FFP	The Raytheon Company : Aberdeen, MD	-	0.015	Oct 2018	-		-		-		-	0.000	0.015	-
T-38 Studies and Development Efforts	Various	TBD : NV	-	0.042	Oct 2018	-		-		-		-	Continuing	Continuing	-
T-38C Block 11 Hardware and Software Upgrade Development	C/FFP	The Boeing Company : TBD	-	-		-		2.356	Dec 2020	-		2.356	Continuing	Continuing	-
		Subtotal	-	8.429		0.605		6.039		-		6.039	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA Contract Services	C/FFP	Not specified. : NV	-	0.033	Dec 2018	-		0.038	Dec 2020	-		0.038	Continuing	Continuing	-
PMA Other Government Costs	Various	Not specified. : NV	-	0.059	Oct 2017	0.000	Dec 2019	0.059	Dec 2020	-		0.059	Continuing	Continuing	-
		Subtotal	-	0.092		0.000		0.097		-		0.097	Continuing	Continuing	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.521		0.605		6.136		-		6.136	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

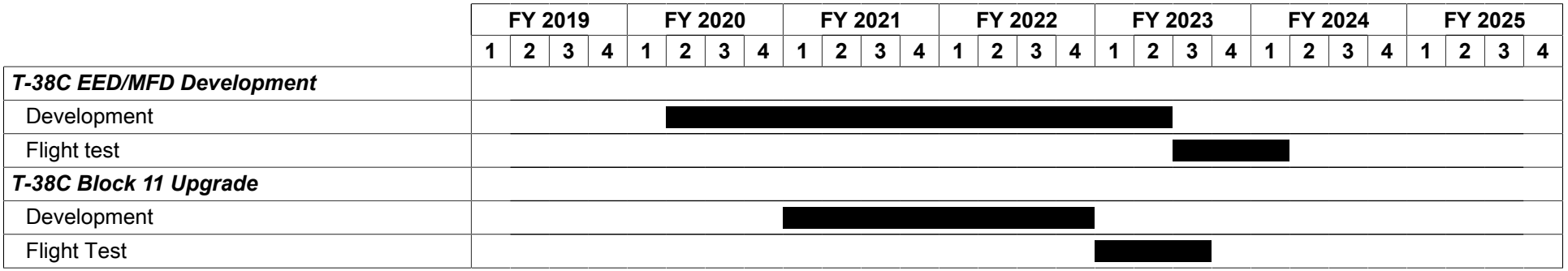

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
T-38C EED/MFD Development				
Development	2	2020	2	2023
Flight test	3	2023	1	2024
T-38C Block 11 Upgrade				
Development	1	2021	4	2022
Flight Test	1	2023	3	2023