Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	2.492	11.556	5.509	0.000	5.509	-	-	-	-	-	-
674101: *Undergraduate Remotely Piloted Aircraft Training*	-	0.768	0.809	0.814	0.000	0.814	-	-	-	-	-	-
676035: *T-6 Operational System Development*	-	1.141	1.832	0.223	0.000	0.223	-	-	-	-	-	-
676037: *T-38 Operational System Development*	-	0.583	8.915	4.472	0.000	4.472	-	-	-	-	-	-

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 the T-6 including but not limited to studies & development efforts, instructional courseware, and logistics support to include Diminishing Manufacturing Sources & Materiel Shortages (DMSMS) and development activities related to DMSMS. Included is development for the Next Generation On-Board Oxygen Generation System, 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 system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 $0.000M was expended for civilian pay expenses in this program element, and in FY21 $0.000M is forecasted for civilian pay expenses in this program element.

This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, Sec 240-D.

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

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

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	2.584	8.777	5.592	0.000	5.592
Current President's Budget	2.492	11.556	5.509	0.000	5.509
Total Adjustments	-0.092	2.779	-0.083	0.000	-0.083
• Congressional General Reductions	0.000	-0.021			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	2.800			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.092	0.000			
• Other Adjustments	0.000	0.000	-0.083	0.000	-0.083

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 676037: *T-38 Operational System Development*		
Congressional Add: *Predator Reaper Integrated Mission Environment (PRIME) Desktop Training System (DTS) Support*	0.000	2.800
Congressional Add Subtotals for Project: 676037	0.000	2.800
Congressional Add Totals for all Projects	0.000	2.800

Change Summary Explanation

FY 2022 Funding request was increased by $2.800 million due to Congressional Add for PRIME DTS.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / *Specialized Undergraduate Flight Training*	Project (Number/Name) 674101 / *Undergraduate Remotely Piloted Aircraft Training*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
674101: *Undergraduate Remotely Piloted Aircraft Training*	-	0.768	0.809	0.814	0.000	0.814	-	-	-	-	-	-
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 the Specialized Undergraduate Flight Training system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 $0.000M was expended for civilian pay expenses in this program element, and in FY21 $0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Predator Reaper Integrated Mission Environment (PRIME) support	0.768	0.809	0.814
Description: Add Phase 8 operational capabilities.			
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.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 674101 / *Undergraduate Remotely Piloted Aircraft Training*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 2022 Plans:*** Transition support of PRIME from contractor support to organic sustainment at Oklahoma City Air Logistics Complex, Tinker AFB, OK. Develop and implement live air traffic control integration Study into the URT GBTS. Flight Planning Software: Further development of flight planning software. Continue development of new training simulation software to replace the current software on URTIS and PRIME to train RPA pilots. Continue effort to develop organic software capabilities and replace proprietary software. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increased due to economic adjustments.			
Accomplishments/Planned Programs Subtotals	0.768	0.809	0.814

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Transition support of PRIME from contractor support to organic sustainment at Oklahoma City Air Logistics Complex, Tinker AFB, OK.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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 : Tinker AFB, OK	-	0.698	Mar 2020	0.733	Mar 2021	0.719	Mar 2022	-		0.719	-	-	-
		Subtotal	-	0.698		0.733		0.719		-		0.719	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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	-	0.070	Oct 2019	0.076	Oct 2020	0.095	Oct 2021	-		0.095	-	-	-
		Subtotal	-	0.070		0.076		0.095		-		0.095	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.768		0.809		0.814		-		0.814	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 674101 / *Undergraduate Remotely Piloted Aircraft Training*

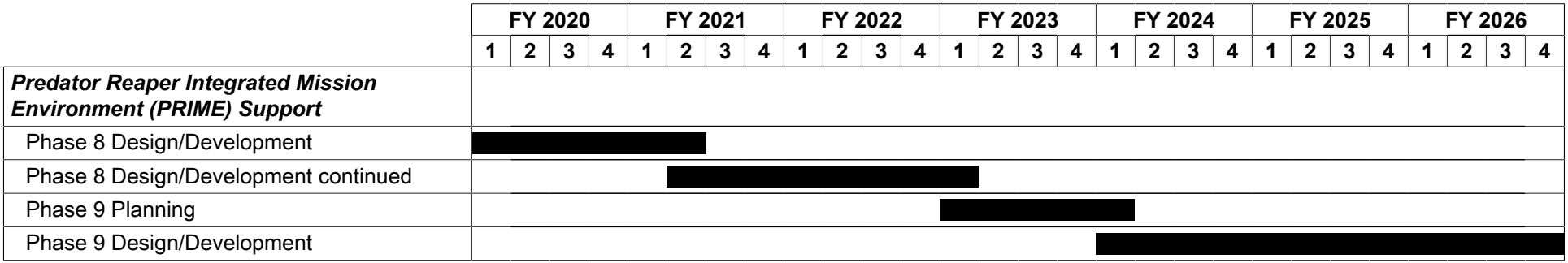

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 674101 / *Undergraduate Remotely Piloted Aircraft Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Predator Reaper Integrated Mission Environment (PRIME) Support				
Phase 8 Design/Development	1	2020	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	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604233F / *Specialized Undergraduate Flight Training*	Project (Number/Name) 676035 / *T-6 Operational System Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
676035: *T-6 Operational System Development*	-	1.141	1.832	0.223	0.000	0.223	-	-	-	-	-	-
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 the Specialized Undergraduate Flight Training system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 $0.000M was expended for civilian pay expenses in this program element, and in FY21 $0.000M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: T-6A (JPATS) Studies and Analysis	0.100	1.732	0.223
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 2021 Plans: Continue 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 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue 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 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased due to reduced studies and analysis and realignment of funds.			
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 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 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased due to completion of RDT&E activities for Next Generation On-Board Oxygen Generation System in FY 2022.	0.661	0.100	0.000
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 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased due to completion of the Crash Survivable Recorder R&D efforts.	0.380	0.000	0.000
Accomplishments/Planned Programs Subtotals	1.141	1.832	0.223

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts*	-	-	-	-	-	-	-	-	-		
• APAF 05 Line Item JPAT00: *T-6*	11.826	23.929	8.735	-	8.735	-	-	-	-	-	-

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 2022 Air Force			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T-6 Operational System Development Crash Survivable Recorder	C/FFP	Scientific Research Corp : Atlanta, GA	-	0.338	Mar 2020	1.616	Jan 2021	-		-		-	-	-	-
T-6 Operational System Development Alternative On-Board Oxygen Generation System	C/CPAF	Textron Aviation Defense : Wichita, KS	-	0.703	Feb 2020	-		-		-		-	-	-	-
		Subtotal	-	1.041		1.616		-		-		-	-	-	N/A

Remarks

The second phase of the Crash Survivable Recorder RDT&E effort awarded 2Q FY21.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	-	-		0.216	May 2021	0.223	May 2022	-		0.223	-	-	-
Physiological Event's: Edwards Test Center	PO	Edwards Test Center : Edwards, CA	-	0.100	Oct 2019	-		-		-		-	-	-	-
		Subtotal	-	0.100		0.216		0.223		-		0.223	-	-	N/A

Remarks

Continue Unknown Physiological Event's studies at Edwards AFB. Phase II of this effort began 3Q in FY21. Phase III will begin in 3Q FY22.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.141		1.832		0.223		-		0.223	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

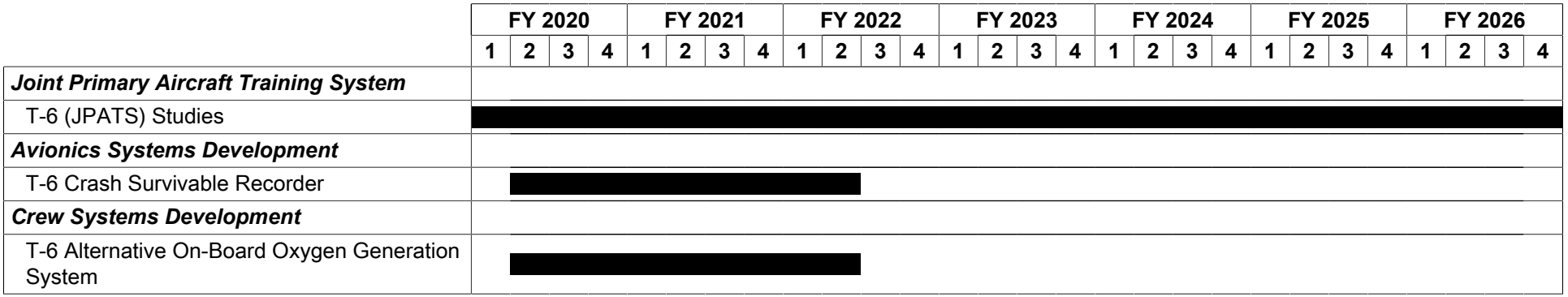

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676035 / *T-6 Operational System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Joint Primary Aircraft Training System				
T-6 (JPATS) Studies	1	2020	4	2026
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 2022 Air Force			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
676037: *T-38 Operational System Development*	-	0.583	8.915	4.472	0.000	4.472	-	-	-	-	-	-
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 497 active T-38's in the Air Force inventory (53 T-38A, six (6) AT-38B and 438 T-38C). T-38s first entered service in 1960 and average over 50 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.

Block 11 - Updates the T-38C avionics software to include updates for the Operational Flight Program (OFP), Aircrew Training Device (ATD), Joint Mission Planning System (JMPS), and applicable Ground Station Software (GSS).

Multi-Functional Display (MFD) and the Electronic Engine Display (EED) - L3 Display Systems is unable to continue support of the T-38C MFD and EED beyond March 2026. Development of replacement displays must begin in FY21 to ensure continued AETC pilot production. There are 2 MFDs and 2 EEDs per aircraft (1,768 displays). A new Digital Fuel Mass Flow Transmitter will need to be incorporated into the EED redesign which will reduce Unscheduled Engine Removals (UER). This is a top driver of engine removals across the T-38C fleet; replacement will increase MTBF and save the USAF repair and maintenance costs.

Video Data Transfer Unit (VDTU) - The current T-38C VDTU is obsolete and the Compact Flash Cards (CFC) that record flight data are no longer procurable and are unsustainable in terms of repair cost, maintenance actions, aircraft downtime, and availability of replacement parts. A redesigned VDTU is required to interface at the higher data speeds inherent with new technology such as the recently installed Mission Display Processor. An increased data recorder sample rate will need to be incorporated as well as the Power Level Angle recording to monitor engine performance. Increase recording capability is required to handle the increased data flow.

Flight Director/Attitude Heading and Reference System (AHARS) - Requirement to develop , integrate, and replace the Attitude Director Indicator (ADI), Horizontal Situation Indicator (HSI), Attitude Gyro Control Assembly, Rate Switching Gyro, Rate Gyro Transmitter, Servo-Amplifier, and Flight Director Computer for the T-38A/ AT-38B. The intent of this effort is to significantly improve sub-system reliability, suitability, and pilot safety during flight operations.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

Traffic Collision Avoidance System (TCAS) - to update firmware on approximately 448 T-38C TCAS units. The need for which derives from increased TCAS II processor failures resulting from increased squitter traffic associated with Automatic Dependent Surveillance - Broadcast (ADS-B) transmissions.

T-38A & AT-38B Speed Brake Open Warning Light - Is a new requirement that will require market research and an estimate. This modification has been accomplished on the T-38C however the avionics system architecture prevent to T-38C design incorporation in to the T-38A and AT-38B.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: T-38 Avionics Component Integration (AvCI)	0.583	3.759	2.760
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 2021 Plans:*** Begin T-38C Operational Flight Plan and Aircrew Training Device software efforts for the planned Block 11 Upgrade, including requirements development, integration, and fielding. Begin implementation of Product Improvement Change Requests which fix software bugs, provide security enhancements, and new capabilities. Begin 64 Bit development of the Joint Mission Planning Unique Product Component. Develop and implement Cyber Security requirements for the T-38C Block 11 software. ***FY 2022 Plans:*** Continue Block 11 JMPS and T-38C Operational Flight Program development. Begin development of the new EED and MFD displays. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased due to anticipated completion of Block 11 development and testing.			
Title: T-38 Studies and Development Efforts	0.000	2.356	1.712
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 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Cyber Security software requirements that impact the T-38C Operational Flight Program will be resolved as part Block 11 development, which will begin in FY21. ***FY 2022 Plans:*** Continue and complete Block 11 Cyber Security development and testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding decreased due to anticipated completion of Block 11 development and testing.			
Accomplishments/Planned Programs Subtotals	0.583	6.115	4.472

	FY 2020	FY 2021
Congressional Add: Predator Reaper Integrated Mission Environment (PRIME) Desktop Training System (DTS) Support ***FY 2020 Accomplishments:*** N/A ***FY 2021 Plans:*** Transition support of PRIME from contractor support to organic sustainment at Oklahoma City Air Logistics Complex, Tinker AFB, OK. Upgrade current computer systems to Windows 10 to comply with DoD cybersecurity mandates.	0.000	2.800
Congressional Adds Subtotals	0.000	2.800

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• APAF 05 Line Item T03800: *T-38*	37.341	36.806	52.121	-	52.121	-	-	-	-	-	-

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.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

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 and VDTU 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 2022 Air Force		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T-38 Avionics System DMSMS mitigation efforts	C/CPFF	The Boeing Company : St. Louis, MO	-	0.583	Feb 2020	3.745	Jun 2021	2.706	Nov 2021	-		2.706	-	-	-
T-38C Block 11 Hardware and Software Upgrade Development	C/FFP	The Boeing Company : TBD	-	-		2.356	Jul 2021	1.668	Nov 2021	-		1.668	-	-	-
Undergraduate Remotely Piloted Aircraft Training Organic Development	MIPR	76 SWEG : Tinker AFB, OK	-	-		2.800		-		-		-	-	-	-
		Subtotal	-	0.583		8.901		4.374		-		4.374	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA Contract Services	C/FFP	Not specified. : NV	-	-		0.014	Dec 2020	0.038	Dec 2021	-		0.038	-	-	-
PMA Other Government Costs	Various	Not specified. : NV	-	0.000	Dec 2019	-		0.060	Dec 2021	-		0.060	-	-	-
		Subtotal	-	0.000		0.014		0.098		-		0.098	-	-	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.583		8.915		4.472		-		4.472	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

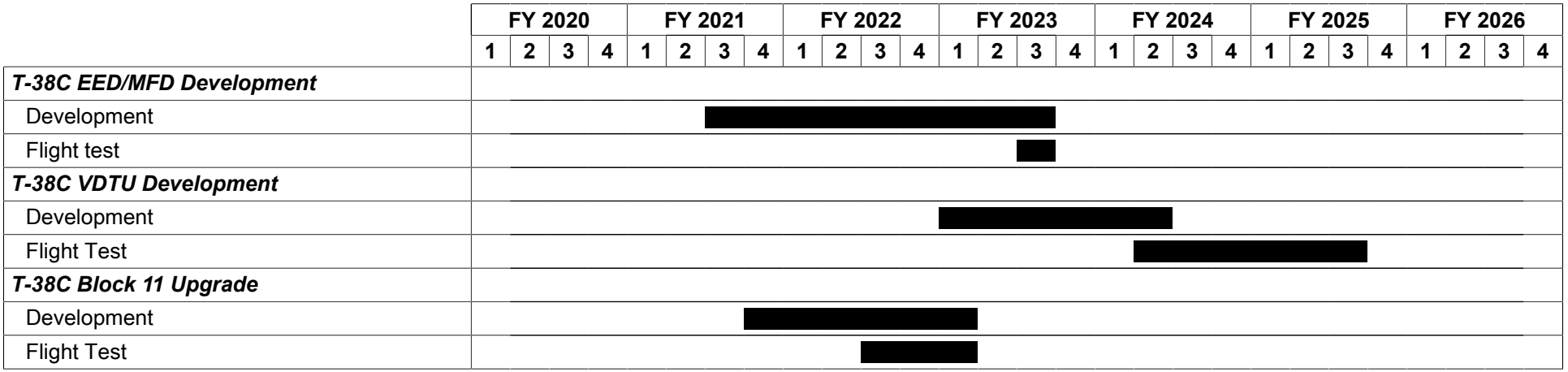

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604233F / *Specialized Undergraduate Flight Training*	**Project (Number/Name)** 676037 / *T-38 Operational System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
T-38C EED/MFD Development				
Development	3	2021	3	2023
Flight test	3	2023	3	2023
T-38C VDTU Development				
Development	1	2023	2	2024
Flight Test	2	2024	3	2025
T-38C Block 11 Upgrade				
Development	4	2021	1	2023
Flight Test	3	2022	1	2023