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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305116F / <i>Aerial Targets</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.438	1.528	1.365	0.000	1.365	1.646	1.676	1.711	1.750	Continuing	Continuing
675136: <i>Target Systems Development</i>	-	0.438	1.528	1.365	0.000	1.365	1.646	1.676	1.711	1.750	Continuing	Continuing

A. Mission Description and Budget Item Justification

Full-scale Aerial Targets (FSAT), Subscale Aerial Targets (SSAT), Next Generation Aerial Targets (NGAT) and companion Target Control Systems (TCS) assure the effectiveness and currency of warfighter weapon systems to combat real-world enemy fighters and cruise missiles. Aerial targets support adherence to Public Law Title 10, Section 2366, which requires major systems and munitions programs to conduct live fire survivability and lethality testing before full rate production. Targets are used to validate operational missile/weapon system effectiveness and fighter Operational Flight Program (OFP) updates. Targets are required for developmental/operational testing for all air-to-air and surface-to-air missiles, and for the F-22A, F-35, F-18, F-16, F-15, among other aircraft. Funding supports simulator development and improvements on the QF-16 FSAT, BQM-167A SSAT, NGAT, and updates of Target Control Systems and specialized target payload subsystems for requirements such as: missile scoring, electronic attack (EA), infrared (IR) countermeasures, radar/IR signature augmentation, and chaff and flare dispensing systems. Enables analysis, development and prototyping of threat emulations/simulations, and presentation of evolving threat scenarios and target area environments to prepare for emerging weapons development activities. Development is required to evolve aerial targets and target control capabilities to meet current and future threats. Air Force is the executive agent for full-scale aerial targets.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 \$0.0M was expended for civilian pay expenses in this program element, and in FY22 \$0.0M is forecasted for civilian pay expenses in this program element.

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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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305116F / <i>Aerial Targets</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.448	1.528	0.000	0.000	0.000
Current President's Budget	0.438	1.528	1.365	0.000	1.365
Total Adjustments	-0.010	0.000	1.365	0.000	1.365
• 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	-0.010	0.000			
• Other Adjustments	0.000	0.000	1.365	0.000	1.365

Change Summary Explanation

The FY2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force										Date: April 2022		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0305116F / <i>Aerial Targets</i>				Project (Number/Name) 675136 / <i>Target Systems Development</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
675136: <i>Target Systems Development</i>	-	0.438	1.528	1.365	0.000	1.365	1.646	1.676	1.711	1.750	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Full-scale Aerial Targets (FSAT), Subscale Aerial Targets (SSAT), Next Generation Aerial Targets (NGAT) and companion Target Control Systems (TCS) assure the effectiveness and currency of warfighter weapon systems to combat real-world enemy fighters and cruise missiles.

The BQM-167A Air Force Subscale Aerial Target (AFSAT) is a reusable jet-powered target aircraft measuring approximately 20 feet long with a mission to simulate threat aircraft for testing and evaluation of surface-to-air, ship-to-air, or air-to-air missiles. The target accomplishes this mission through the use of optional payloads including chaff and flare, electronic attack (EA), and infrared (IR) devices. Funding supports continued improvement of overall performance enhancement efforts to meet evolving threats. Funding supports development, improvements, and updates of target control systems and specialized target payload subsystems for requirements to include, but not limited to: missile scoring, EA and IR countermeasures, radar and IR signature augmentation, chaff and flare dispensing systems, and overall target threat emulation.

EA payload upgrades provide new techniques and capabilities critical to subscale, mid-scale, and full-scale targets to realistically emulate current and emerging foreign threat systems in support of weapons testing.

TCS provides a myriad of sub-systems that, together, deliver the capability to control and track mission aerial targets and to track a mix of other critical mission participants (to include relay platforms, shooters, and the missile system under test). In this role, TCS ensures an optimum integrated aerial target environment that enhances both weapon system assessments and companion aircrew skills, and the full safety of mission participants throughout the conduct and fulfillment of Test and Evaluation (T&E) objectives. Funding supports continued improvement of TCS capabilities to effectively meet the multi-service T&E demands of current and future warfighter weapon systems.

NGAT seeks to conduct early systems engineering and risk reduction activities to identify and mitigate the major risks associated with developing a new aerial target equipped with modern, threat representative, EA and associated subsystems needed for live fire air-to-air missile tests. This effort is aligned with the Rapid Prototyping Requirements Document (RPRD) process underway at Air Combat Command (ACC) and an element of the Rapid Prototyping/Rapid Fielding strategies within Section 804/Middle Tier Acquisition.

NGAT seeks to represent as well as keep pace with adversary aircraft developments to present an up to date, realistic target as required in Title 10 for live-fire testing. These activities include design concept studies, engineering analysis, Radar Cross Section (RCS) measurements, RCS modeling Verification and Validation (V&V), and early prototyping/demonstration events as a proof of concept. These prototypes will be evaluated to determine suitability in meeting the requirements in the RPRD. Efforts will include engineering and design activities needed to modify prototype airframes with representative EA payloads as well as other subsystems unique to live-fire target missions, including, but not limited to, the design and integration of systems needed for missile scoring, telemetry, and target and payload control. Results

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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305116F / <i>Aerial Targets</i>	Project (Number/Name) 675136 / <i>Target Systems Development</i>
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will lead to informed requirements development as well as indicate viable mid and far term solutions. Successful prototype demonstrations could lead to continued development and acquisition of a limited number of prototypes within the scope of the Rapid Prototyping/Rapid Fielding architectures and will generate cost/schedule/performance/technical risk data needed to continue refining the design and determine viability in follow on efforts.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 0.0M was expended for civilian pay expenses in this program element, and in FY22 0.0M is forecasted for civilian pay expenses in this program element.

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. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
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Title: AF Subscale Aerial Target (AFSAT) Development	0.000	0.976	0.871
Description: Provide enhancements to AFSAT ability to emulate emerging threats in support of weapon testing.			
FY 2022 Plans: Continue system upgrades to support expanded AFSAT capabilities to support achieving emulation of emerging threat targets as our adversaries develop and expand their arsenals.			
FY 2023 Plans: Continue system upgrades to support expanded AFSAT capabilities to support achieving emulation of emerging threat targets as our adversaries develop and expand their arsenals.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased due to reduced system upgrade requirements supporting expanded AFSAT capabilities.			

Title: Target Control System (TCS)	0.438	0.453	0.479
Description: Provide system enhancements to Advance Airborne Threat Target Control System (AATTCS), formerly known as Gulf Range Drone Control System (GRDCS), for command and control and tracking of aerial targets. Funding may be utilized for development/augmentation/modification of control systems to fulfill gaps in functional capabilities identified in 2018 ACC Capabilities Analysis of target control systems. Gaps relate to creating the emulation of next generation enemy aircraft threats.			
FY 2022 Plans: Continue system upgrades to include, but not limited to, AATTCS software/hardware updates to support implementing QF-16, AFSAT, TCS enhancements and future TCS capability enhancements in order to close capability gaps identified by users.			
FY 2023 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Continue system upgrades to include, but not limited to, AATTCS software/hardware updates to support implementing QF-16, AFSAT, TCS enhancements and future TCS capability enhancements in order to close capability gaps identified by users. FY 2022 to FY 2023 Increase/Decrease Statement: Funding increased due to supporting system upgrade requirements addressing TCS capability gaps.			
Title: Next Generation Aerial Target (NGAT) Description: NGAT seeks to conduct early systems engineering and risk reduction activities to identify and mitigate the major risks associated with developing a new aerial target for live fire surface-to-air, ship-to-air, and air-to-air missile tests. FY 2022 Plans: Conduct limited initial design efforts to identify risks in future fabrication, installation, and ground/flight test of prototype electronic attack and other associated equipment needed to complete analysis of potential aerial target alternatives. FY 2023 Plans: Continue to conduct engineering analysis to identify candidate configurations and concepts that lead to early identification of technical risks in integrating advanced electronic attack systems in prototype airframes. Results of these studies will be used to select the most promising concepts for further evaluation and follow on detailed design, integration, ground and flight test of the candidate configurations. FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased due to continuing only limited concept planning activities.	0.000	0.099	0.015
Accomplishments/Planned Programs Subtotals	0.438	1.528	1.365

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APAF 04 Line Item 10TRGT: <i>Target Drones</i>	133.273	112.443	128.906	-	128.906	134.351	137.010	139.343	142.362	Continuing	Continuing
• APAF 06 000999: <i>Initials Spares</i>	0.600	0.600	0.401	-	0.401	0.641	0.653	0.663	0.677	Continuing	Continuing
• APAF 07 000074: <i>War Consumables</i>	4.757	4.759	4.994	-	4.994	5.083	5.178	5.261	5.375	Continuing	Continuing
• APAF 07 Line Item 000075: <i>Other Production Charges</i>	16.495	16.450	17.188	-	17.188	17.493	17.812	18.105	18.497	Continuing	Continuing

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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

APAF, BA 04: Target Drones 10TRGT - Full Scale and Subscale Aerial Targets assure warfighters' weapon systems will perform effectively against real-world enemy fighters and cruise missiles. Adheres to Public Law title 10, Section 2366 "Live fire/Lethality" developmental/operational test requirements.

APAF, BA 06: Initial Spares/Repair Parts - Aircraft Initial Spares are required to fill the initial pipeline or inventory for all new aircraft systems, including modifications, support equipment, and other production categories. Initial spares include peculiar repairable and consumable components, assemblies, and sub-assemblies that must be available for issues at all levels of supply in time to support newly fielded end items.

APAF, BA 07: War Consumables - AFSAT Rocket-Assisted Take-Off (RATO) requirements executed at Hill AFB. A RATO is used in the initial launch phase to obtain appropriate speed and altitude.

APAF, BA 07: Other Production Charges - ALQ-167 and/or DLQ-9 Electronic Attack (EA) payloads for target drones including support equipment. Payloads emulate threat aircraft electronic countermeasures and jamming capabilities.

D. Acquisition Strategy

The AFSAT acquisition strategy is a sole source follow-on contract. The Target Control System acquisition strategy includes several small projects to provide enhancements to TCS (to include AATTCS) and will be accomplished with other government agencies and contracts as needed. EA Payloads acquisition strategy includes several small projects managed by the US Navy program office to provide enhancements to the target payloads for aerial targets. Similarly, the acquisition strategy for NGAT includes multiple contract awards to various contractors as well as support from other government agencies.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force **Date:** April 2022

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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

<i>Target System Development</i>	
AFSAT Gas & Aero Development	
AFSAT Flt Controller System Upgrade	
TCS Software Enhancement	
NGAT Analysis & Studies	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Target System Development</i>				
AFSAT Gas & Aero Development	1	2021	3	2023
AFSAT Flt Controller System Upgrade	4	2022	2	2024
TCS Software Enhancement	1	2021	4	2026
NGAT Analysis & Studies	1	2022	1	2023