

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>
--	---

COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	-	128.708	171.314	31.143	0.000	31.143	74.096	208.545	480.460	497.846	Continuing	Continuing
664597: <i>AF Test Investments</i>	-	128.708	171.314	31.143	0.000	31.143	74.096	208.545	480.460	497.846	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This PE provides planning, improvements, and modernization for test capabilities within Air Force Test Center (AFTC) Major Range and Test Facility Base organizations: 96 Test Wing at Eglin AFB FL, the 412 Test Wing at Edwards AFB CA, and Arnold Engineering Development Complex (AEDC) at Arnold AFB TN. The 704th Test Group at Holloman AFB NM and the McKinley Climatic Lab at Eglin AFB are aligned under AEDC as part of the management consolidation of Ground test capabilities. Finally, in FY20 and FY21 this PE provided funds to Air Force Space Command (AFSPC) now United States Space Force (USSF) for space threat testing. In FY22, Space threat funding was transferred to USSF.

The improvement and modernization (I&M) requirements are defined through the AF Test Investment Planning & Programming (TIPP) Process. All projects have been reviewed through the Tri-Service Reliance Process (to communicate AF efforts to the other services and avoid unwarranted duplication of effort) and are documented in the Technology Development Acquisition Program (TDAP) database. Each project has its own planning, development, equipment acquisition, equipment installation, and checkout phases which often require significant differences in funding from one year to the next. As such, the changes in category funding from year to year does not necessarily indicate program growth, but rather a planned phasing of I&M efforts. The test capabilities at these locations enable testing through all phases of weapon system acquisition, from system concept exploration through component and full-scale integrated weapon system test to operational test.

The 96 TW, at Eglin AFB FL, conducts and supports Developmental Test and Evaluation (DT&E) of non-nuclear air armaments; Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) systems; target acquisition and weapon delivery systems; determines target/test item spectral signatures; and provides cyber testing capabilities as part of the Avionics Cyber Range (ACR).

The 412 Test Wing, at Edwards AFB CA, conducts and supports DT&E and Operational Test and Evaluation (OT&E) of aircraft and aircraft systems, aerospace research vehicles, unmanned aerial vehicles, cruise missiles, parachute delivery/recovery/systems, and cargo handling systems.

AEDC, at Arnold AFB TN, provides pre-flight reliability environmental test support for DoD aeropropulsion, flight systems, and space and missile programs. The center has 53 test facilities providing: aerodynamic testing of scale model aircraft, missiles, and space systems; testing of large and full-scale satellites, sensors, and space vehicles in a simulated space environment; altitude environmental testing for aircraft, missile, and spacecraft propulsion systems; testing of large-scale models such as space boosters together with their propulsion systems. This capability includes the world's largest climatic laboratory, the McKinley Climatic Laboratory at Eglin AFB, which provides controlled all-weather condition testing of full scale systems. The 704th TG at Holloman AFB, NM provides flight test and test support for joint, international and commercial customers in advanced avionics and weapons, inertial navigation systems, Global Positioning System (GPS) and other integrated aircraft and missile navigation systems. They test subsonic through hypersonic ground performance of aircraft and missiles in a flight-representative, highly instrumented

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>	
<p>environment while also coordinating and scheduling all US Air Force test operations at White Sands Missile Range. The 704 TG OL-AC at Wright-Patterson AFB, OH provides independent developmental T&E in support of aircraft survivability and evaluation of full-scale aircraft landing gear, tires and brakes. They also provide an independent capability for component qualification.</p> <p>In order to align the strategic capability goals set forth in the 2018 National Defense Strategy and the mission of the AFTC, program element funding has been assigned to these six mission area categories: T&E Range Asset Modernization, Hypersonics, Directed Energy, Cyberspace and Avionics Cyber, Autonomy, and Space Test Infrastructure.</p> <p>1) T&E Range and Test Asset Modernization refers to those capabilities required to acquire the ability to test long range, high-speed, highly-instrumented, high-data rate weapons in a crowded and restricted spectrum, while operating at multiple classification and cybersecurity levels. Also included in this mission area is the ability to collect, analyze and store big data and the ability to do multi-domain testing across the enterprise with realistic threat scenarios at multiple classification level up to Special Access Program (SAP).</p> <p>2) Hypersonics refers to the ability to test and evaluate flight-representative hypersonic engines, materials, warheads and fuzes in all portions of the employment envelope and conduct flight testing both in simulation and open-air ranges with sufficient space, telemetry, photo-optics and Time Space Position Information (TSPI) to appropriately inform decision-makers fielding such systems.</p> <p>3) Directed Energy/Electronic Combat acquires the ability to characterize irradiance and beam properties on aircraft, small UAVs and ground targets and create realistic environments to simulate adversary air defense capabilities in the year 2030. Enables 5th-6th generation weapon testing/tactics development in a threat-realistic Anti-Access Area Denial (A2AD) environment using a combination of indoor and open-air ranges.</p> <p>4) Cyberspace and Avionics Cyber is the advancement of cybersecurity/resiliency test capability for network, C4ISR, and airborne weapon platforms and includes development of tools, techniques and hardware-in-the-loop capabilities focused on cybersecurity and cyber-resiliency.</p> <p>5) Autonomy refers to the ability to test autonomous aerial and ground systems with hundreds of independent vehicles. Must be able to monitor system-under-test locations and states with the ability for soft and hard termination. Must develop techniques and processes to test systems with artificial intelligence.</p> <p>This program is in Budget Activity 6, RDT&E Management Support because this budget activity includes research, development, test and evaluation efforts and funds to sustain and/or modernize the installations or operations required for general research, development, test and evaluation.</p>		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force **Date:** March 2023

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>
--	---

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	130.766	44.714	76.815	0.000	76.815
Current President's Budget	128.708	171.314	31.143	0.000	31.143
Total Adjustments	-2.058	126.600	-45.672	0.000	-45.672
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	126.600			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-1.100	0.000			
• SBIR/STTR Transfer	-0.958	0.000			
• Other Adjustments	0.000	0.000	-45.672	0.000	-45.672

Change Summary Explanation

FY22: \$2.1 million decrease due to \$1.1 million below threshold reprogramming to PE 66398F and ~\$1 million reduction for SBIR.

FY23: Increase of \$126.6 million due to FY23 Congressional add for hypersonic test infrastructure at Eglin and AEDC.

FY24: Decrease of \$45.7 million due to \$13 million decrease for DAF rephasing of test modernization funds and a \$32.7 million reduction to account for account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
---	----------------	----------------	----------------

Title: T&E Range and Test Asset Modernization	51.215	26.283	17.313
--	--------	--------	--------

Description: Description: T&E Range and Test Asset Modernization refers to those capabilities required to acquire the ability to test long range, high-speed, highly-instrumented, high-data rate weapons in a crowded and restricted spectrum, while operating at multiple classification and cybersecurity levels. Ability to collect, analyze and store big data and ability to do multi-domain testing across the enterprise with realistic threat scenarios at multiple classification level up to Special Access Program (SAP).

FY 2023 Plans:

Close Out CRIIS Production, Voice Communication System Upgrade (VCSU), Next Generation Turbine Engine Test Capability (NGTETC), High Pressure Air Additional Capacity (HPAAC) and High-speed Small Engine Test Capability (HSETC) (previously ASMEC-II). Due to INV-001 and INV-011 reductions off-ramp (shut down) Network Telemetry Integration Program (NTIP) (formerly iSIS), Common Airborne Network Instrumentation System (CANIS), and Improved Data Link HITLS - Gen 4 & 5. Reduce funding for Modular Mission Control Room Upgrade (MMCRU) and finish out planning for Cooling Water Capacity (CWC) \$20M MILCON. Continue planning/execution for Gulf Range Enhancement (GRE), Next Generation Thrust Management

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force		Date: March 2023		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 6: <i>RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
<p>(NGTM), and Improve Plant Reliability and Efficiency/Transonic Aero Test Capability (IMTPC), Improve Large Model Supersonic Aerodynamic Ground T&E Capability (ILMSC) [formerly Tunnel 16S Reactivation]. Start Planning for a Low Observability (RCS) Engine Test Stand.</p> <p>FY 2024 Plans: Reduce funding for Modular Mission Control Room Upgrade (MMCRU). Continue planning/execution for Gulf Range Enhancement (GRE), Next Generation Thrust Management (NGTM), and the Low Observability (RCS) Engine Test Stand. Start planning/executing 6th Gen Datalink Test Capability. Close out Improve Plant Reliability and Efficiency/Transonic Aero Test Capability (IMTPC), Improve Large Model Supersonic Aerodynamic Ground T&E Capability (ILMSC) [formerly Tunnel 16S Reactivation].</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY23 to FY24 decrease of \$8.4 million due to Rephase Test Modernization and to account for account for the availability of prior year execution balances.</p>				
<p>Title: Hypersonics</p> <p>Description: Hypersonics refers to the ability to T&E flight-representative hypersonic engines, materials, warheads and fuzes in all portions of the employment envelope and conduct flight testing both in simulation and open-air ranges with sufficient space, telemetry, photo-optics and Time Space Position Information (TSPI) to appropriately inform decision-makers fielding such systems.</p> <p>The Department of Defense Test Resource Management Center (TRMC) oversees and manages all hypersonic test investment.</p> <p>FY 2023 Plans: Hypersonic related investments utilizing UPL funding: Security Upgrades for future Advanced Programs, M4/5/6 Large Scale/ High Dynamics Pressure Nozzle for Clear Air Facility, Improved Small Scale Hypersonics Impact T&E, Advanced Optical T&E for Super/Hypersonic Wind Tunnels, Tunnel 16S Restoration, M6/8 Nozzels for Tunnel B, VKF High Pressure Air Dryer Replacement, High Pressure Air Addition, VKF Compressor Cooler Replacement, M12 Nozzle for Tunnel C, Mach 12 Tunnel C Facility Modification.</p> <p>FY 2024 Plans: Start Planning and Executing the Non-Cooperative Tracking/Multi-Object Tracking phase I (NCT-1) project at the 412TW.</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		1.338	134.639	1.500

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force		Date: March 2023		
Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 6: <i>RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023	FY 2024
FY23 to FY24 decrease is due to multiple factors. The first is a \$126.6 million Congressional add to FY23 for hypersonic test infrastructure. In FY24, there are reductions to rephase Test Modernization and to account for the availability of prior year execution balances.				
<p>Title: Directed Energy/Electronic Combat</p> <p>Description: Directed Energy/Electronic Combat acquires the ability to characterize irradiance and beam properties on aircraft, small Unmanned Aerial Vehicles (UAV) and ground targets and create realistic environments to simulate adversary air defense capabilities in the year 2030. Enables 5th-6th generation weapon testing/tactics development in a threat-realistic Anti-Access Area Denial (A2AD) environment using a combination of indoor and open-air ranges.</p> <p>FY 2023 Plans: Continue Planning/Executing of the Advanced Multispectral Development - Phase I (AMD-I), JSE. Start new projects such as the Electronic Combat Range Early Warning Radar (ECR-EWR) at the 96TW. Continue the plan for Next Generation Engineering Targets (OPTICAMS).</p> <p>FY 2024 Plans: Continue Planning/Executing of the Advanced Multispectral Development - Phase I (AMD-I), JSE. Start new projects such as the Electronic Combat Range Early Warning Radar (ECR-EWR) at the 96TW. Continue the plan for Next Generation Engineering Targets (OPTICAMS).</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY23 to FY24 increase of \$3.3 million due to reprioritization of investment projects.</p>		63.450	0.700	4.000
<p>Title: Cyberspace and Avionics Cyber</p> <p>Description: Cyberspace and Avionics Cyber is the advancement of cybersecurity/resiliency test capability for network, C41SR and airborne weapon platforms and includes development of tools, techniques and hardware in the loop capabilities focused on cybersecurity and cyber-resiliency.</p> <p>FY 2023 Plans: Equip the cyberspace facility and continue the planning and execution of the Weapon System Cybersecurity (WSCS) Program tool development; Advanced Battle Management System Test Capability (ABMS)/Joint All Domain C2 (JADC2) Test Capability; Enterprise Cross Platform Data Center, Multi-Level Security - Joint Collaborative Environment (MLS-JCE). Close out Cyber Defense Test Capability (CDTC).</p> <p>FY 2024 Plans:</p>		12.505	9.492	6.830

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>
--	---

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023	FY 2024
Equip the cyberspace facility and continue the planning and execution of the Weapon System Cybersecurity (WSCS) Program tool development; Advanced Battle Management System Test Capability (ABMS)/Joint All Domain C2 (JADC2) Test Capability; Enterprise Cross Platform Data Center, Multi-Level Security - Joint Collaborative Environment (MLS-JCE).			
FY 2023 to FY 2024 Increase/Decrease Statement: FY23 to FY24 decrease of \$2.7 million due to Rephase Test Modernization and to account for account for the availability of prior year execution balances.			
Title: Autonomy	0.200	0.200	1.500
Description: Autonomy refers to the ability to test autonomous aerial and ground systems with hundreds of independent vehicles. Must be able to monitor system-under-test locations and states with the ability for soft and hard termination. Must develop techniques and processes to test systems with artificial intelligence.			
FY 2023 Plans: No planned projects but limited funding is available should an opportunity arise.			
FY 2024 Plans: Start Planning and Executing the Non-Cooperative Tracking/Multi-Object Tracking phase I (NCT-1) project at the 412TW.			
FY 2023 to FY 2024 Increase/Decrease Statement: FY23 to FY24 increase of \$1.3 million due to planning and executing of Non-Cooperative Tracking/Multi-Object Tracking Phase 1 (NCT-1) projects.			
Accomplishments/Planned Programs Subtotals	128.708	171.314	31.143

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2024</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• RDTE 06 0605807F: <i>Test and Evaluation Support</i>	811.032	841.854	913.213	-	913.213	892.125	1,005.821	1,063.898	1,116.911	Continuing	Continuing
• RDTE 06 0605976F: <i>Facilities Restoration and Modernization - Test and Evaluation Support</i>	70.788	133.420	87.889	-	87.889	94.662	217.566	202.455	209.540	Continuing	Continuing
• RDTE 06 0605978F: <i>Facilities Sustainment - Test and Evaluation Support</i>	30.057	31.561	35.065	-	35.065	41.225	54.342	53.420	55.290	Continuing	Continuing

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
--	-------------------------

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759F / <i>Major T&E Investment</i>
--	---

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

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	
			Base	OCO	Total					Complete	Total Cost
• RDTE 06 0604256F: <i>Threat Simulator Development</i>	46.393	21.067	16.626	-	16.626	20.391	42.980	49.100	50.876	Continuing	Continuing
• RDTE 06 0606398F: <i>Management HQ - T&E</i>	7.263	6.285	7.453	-	7.453	7.481	7.639	7.801	8.159	Continuing	Continuing

Remarks

E. Acquisition Strategy

N/A