Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0207138F / *F-22A Squadrons*

COST ($ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	0.000	542.659	725.889	768.561	0.000	768.561	647.983	474.352	582.879	594.387	0.000	4,336.710
674785: *F-22*	0.000	542.659	725.889	768.561	0.000	768.561	647.983	474.352	582.879	594.387	0.000	4,336.710
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The F-22 Raptor is a multi-mission fighter aircraft that combines low observability, supercruise, maneuverability and integrated avionics providing air superiority to the Joint Force, access in highly contested environments, as well as homeland and cruise missile defense into the 2040s. To maintain operational relevance, the program continues planned, incremental modernization efforts that enhance both F-22 air superiority and strike capabilities. The F-22 modernization enterprise develops, tests, and fields hardware/software of the air vehicle, engine, Operational Flight Program (OFP), and training systems to improve F-22 weapons, communications, navigation, pilot-vehicle interface, and electronic warfare suite.

Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill Federal Aviation Administration (FAA) or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY2023, $4.488M was expended for civilian pay expenses in this program element, and in FY2024, $6.300M 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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B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	559.709	725.889	682.082	0.000	682.082
Current President's Budget	542.659	725.889	768.561	0.000	768.561
Total Adjustments	-17.050	0.000	86.479	0.000	86.479
• 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	-17.050	0.000			
• Other Adjustments	0.000	0.000	86.479	0.000	86.479

Change Summary Explanation

FY23 decrease of $17.050M reflects Small Business Innovation Research (SBIR) reduction.

FY25 increase of $86.479M reflects the continued investment in Engineering, Manufacturing, and Development (EMD) activities for the Controlled Reception Pattern Antenna (CRPA), Embedded GPS/Inertial Navigation Systems (INS) Modernization (EGI-M), Link 16 (L16) and Open System Architecture (OSA) Improvements, and Viability programs.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Infrastructure	198.140	221.629	235.538
Description: This major thrust is comprised of, but not limited to: Combined Test Force (CTF), Laboratory Test and Operations (LTO), F-22 Small Projects, Operational Software Development and Reliability and Maintainability Program (RAMP) projects. Labs and CTF are continuous activities that plan and conduct development, integration, test, and verification of Operational Flight Programs (OFPs) and other software and hardware in support of the F-22 Raptor. Labs provide test and certification support, maintenance, staffing, with operation of 16 development labs including four unique major System Integration Laboratories (SILs): Agile Integration Lab (AIL) with the Flying Test Bed (FTB), Ogden Test Enterprise (OTE) Lab, Air Combat Simulation (ACS) Lab, and the Vehicle System Simulator (VSS) Lab. The F-22 CTF located at Edwards Air Force Base, CA, is the hub for developmental test efforts for the entire F-22 enterprise. It conducts full-up weapons system testing to assess the effect of the F-22 combined characteristics of stealth, speed, maneuverability, and integrated avionics upon mission accomplishment. The CTF uses operationally significant ground and flight test scenarios to identify system performance deficiencies early before they are more difficult and costly to resolve. Engines on CTF aircraft are supported under Infrastructure as well. F-22 Infrastructure efforts include the technological refresh of the entire F-22 developmental test enterprise.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
F-22 Small Projects provides technology studies, demonstrations and integration of capabilities to include, but not limited to, Low Observable (LO) signature management, threat modeling support, Developmental Test (DT) weapon assets, weapons, Pilot Training (PT), Pilot Vehicle Interface (PVI), countermeasures, helmet, future crypto upgrades, and Open System Architecture (OSA) / Open Systems Enclave (OSE) activities. Additionally, Small Projects include program requirements associated with dynamic Synthetic Aperture Radar (SAR), cyber security, flight test engine refurbishment, support equipment development, Government Furnished Equipment (GFE), Engine Enhancements (or similar), and Electronic Warfare (EW) system enhancements to counter evolving threats. Operational Software Development utilizes commercially available agile and lean best practices to transform and accelerate the F-22 OFP upgrade process. This includes, but is not limited to, the expansion of a cloud-based software development environment and partnering with commercial companies to adopt industry product development best practices. The Reliability, Availability, and Maintainability Program (RAMP) provides solutions to improve reliability, availability and maintainability (RAM) for the F-22 fleet. The associated RAMP implementation efforts (O&S funded) develop candidate initiatives, which are down-selected by Air Combat Command, based on development maturity and impact on the F-22 life cycle costs. RDT&E funding within Infrastructure may be used to improve RAM on F-22 test aircraft as part of the overarching F-22 RAMP effort. Program mission support costs are included in this major thrust. ***FY 2024 Plans:*** Provide support to the SILs for faster testing and assessment of F-22 enhancements. Continue to update critical systems required to support new aircraft configurations and capabilities. Further continue Lab test planning using agile methods for the following programs: Mode 5 Identification Friend or Foe Challenge (IFFC), Link 16 (L16), OFP releases, Sensor Systems and Advanced Technology Development (ATD) to hand off to the CTF for testing. Continue to update critical systems to include technology refresh and laboratory optimization improvements. Small projects continues technology planning studies and demonstrations for DT weapon assets, threat modeling support, test support, test aircraft modifications, Common Range Integrated Instrumentation System (CRIIS) integration, cyber security, engine enhancements, End Cryptographic Unit (ECU) Upgrade, dynamic SAR, GFE, PT, EW enhancements, Quick Reaction Instrumentation Package (QRIP) development, OSA/OSE activities, Data Management Solution (DMS) development, Technology Enabler-Raptor Environment Cloud Compute Services (TE-RECCS), and FoX Tablet integration.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Operational Software Development continues maturing and scaling cloud-based computing environment to leverage commercially-based agile software and hardware development best practices and tools to increase the speed and quality of product delivery to the warfighter. RAMP continues retrofit modifications on F-22 test aircraft in order to improve system/component reliability, maintainability and reduce F-22 weapon system life cycle costs. ***FY 2025 Plans:*** Provide support to the SILs for faster testing and assessment of F-22 enhancements. Continue to update critical systems required to support new aircraft configurations and capabilities. Further continue Lab test planning using agile methods for the following programs: Mode 5 IFFC, L 16, OFP releases, Sensor Systems and ATD to hand off to the CTF for testing. Continue to update critical systems to include technology refresh and laboratory optimization improvements. Small projects continue transformational projects through technology planning studies and demonstrations for DT weapon assets, threat modeling support, test support, DT aircraft modifications, cyber security, End Cryptographic Unit (ECU) Upgrade, engine enhancements, QRIP development, DMS development, TE-RECCS integration, FoX Tablet, OSA / OSE / Open Mission System (OMS) integration, and other advanced capability projects to improve the effectiveness of the F-22. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase of $13.909M from FY24 to FY25 supports design and delivery of multiple sets of special test equipment required for upgrades to the radar, weapons, sensors and the airworthiness certification of the OFP. New equipment reduces unscheduled maintenance, improves the throughput and performance of F-22 labs and CTF, improves the quality of overall product, reduces risk to flight test, and accelerates delivery of capabilities to Operational Test (OT) for eventual fielding.			
Title: Advanced Technology Development (ATD)	44.454	49.030	20.230
Description: Technology maturation, risk reduction, studies, demonstrations and prototypes of classified F-22 development efforts. The F-22 Advanced Technology Development (ATD) program is conducted using a rapid acquisition construct allowing the F-22 Raptor enterprise to develop, test, and field software/hardware from multiple programs (product lines) using a scheduled cadence for capabilities as they mature. ***FY 2024 Plans:*** Finalize technology maturation and risk reduction (TMRR) for the Low Drag Tanks and Pylons capabilities. Continued development and flight test demonstrations of advanced radar Electronic Protection (EP) capabilities for inclusion into future aircraft OFP. Project Keystone - Perform studies and prototyping for an advanced threat warning receiver technology development			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
to include vendor hardware and software assessments. Project Geyser - Continue to mature hardware and software designs through flight demonstrations and integration studies to assess fielding configuration options of this advanced capability. ***FY 2025 Plans:*** Continue technology maturation, development, and risk reduction projects in support of various F-22 development efforts. Examples include, but are not limited to, continued development of advanced radar Electronic Protection (EP) capabilities. Begin integration and lab testing with aircraft OFP to demonstrate EP maturity and for insertion consideration into a future software update such as EP Suite 2 (EPS2). Project Keystone - Finalize studies and complete development and perform vendor(s) down select for EMD. Project Geyser - continued flight demonstrations and begin test fleet modification into planned production configuration. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $28.800M from FY24 to FY25 reflects the planned completion of Keystone requirements.			
Title: Sensor Systems ***Description:*** Sensor Systems improves sensor capabilities to maintain air superiority and preserve first look, first shot, and first kill capability. This includes developing and maturing advanced Infrared Search & Track (IRST) sensor capabilities. ***FY 2024 Plans:*** Continue Sensor Enhancements software and hardware development for future fleet release. Continue lab, system, and airframe integration, as well as logistics standup. Continue Group A kit installations on DT/OT aircraft. ***FY 2025 Plans:*** Continue Sensor Enhancements software and hardware integration with the sensor test assets. Receive the first DT/OT asset, execute first DT flight test, and continue lab, system, and airframe integration. Continue technology maturation and manufacturing readiness. Complete Group A kit installations on DT/OT aircraft. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $98.190M from FY24 to FY25 reflects the ramp down of the hardware purchases for the development program as it transitions from design and prototyping to flight test and continued software development efforts.	154.822	207.890	109.700
Title: Navigation Systems ***Description:*** The Navigation Systems will include the integration of Embedded GPS/Inertial Navigation System (INS) Modernization (EGI-M) (in compliance with M-Code Mandate Public Law 111-383), replacement of the legacy GPS antenna with a robust Controlled Reception Pattern Antenna (CRPA), as well as other capabilities, working together to prevent exploitation of the weapon system by adversaries and to provide an anti-jam, anti-spoof PNT solution.	19.214	0.000	0.000

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2024 Plans: As of FY24, this major thrust is closed and has been replaced by CRPA and EGI-M. ***FY 2025 Plans:*** FY 2025 base plans are documented in the CRPA and EGI-M major thrusts. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** N/A			
Title: Controlled Reception Pattern Antenna (CRPA) ***Description:*** IAW CDGM 09-22-03 for Resilient Position, Navigation, and Timing (PNT), the Controlled Reception Pattern Antenna (CRPA) product line will replace the F-22's legacy Fixed Reception Pattern Array (FRPA) antenna. CRPA provides advanced antenna technologies which will dramatically reduce an adversary's ability to jam or otherwise interfere with GPS signals. ***FY 2024 Plans:*** Six of CRPAs SW capabilities will complete development and most scheduled integration activity in the F-22 Labs. CRPA also plans to complete development of its two remaining SW capabilities towards the end of the FY. CRPA's HW will demonstrate its anti-jam capabilities in NAVFEST 2024, leading to completion of Developmental and Operational Flight Test (DT/OT) by the end of the calendar year. Pending NAVFEST performance outcome, Milestone C planned NLT June 2024. ***FY 2025 Plans:*** CRPA HW will achieve Fleet Release. Six CRPA SW capabilities will finish DT/OT, and the remaining two SW capabilities should complete integration in the F-22 Labs. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $5.990M from FY24 to FY25 due to development and flight test of hardware decreasing in FY25.	0.000	31.340	25.350
Title: Embedded GPS/Inertial Navigation System (INS) Modernization (EGI-M) ***Description:*** In compliance with M-Code Mandate Public Law 111-383, EGI-M will provide an M-Code compliant, anti-spoofing PNT solution to prevent exploitation of the weapon system by adversaries, enable more accurate tracking of GPS satellites, and support a more secure and flexible cryptography architecture. This effort covers the M-Code Weapons product line, consisting of the integration, test, and fielding of software updates necessary to ensure the F-22's ability to employ M-Code configured weapons on F-22s without M-Code capability. The AF Weapons Program Office is scheduled to field M-Code-enabled weapons prior to the availability of an M-Code GPS solution for the F-22.	0.000	5.100	23.950

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2024 Plans: Perform integration activities with the Engineering Development Models (EDM). ***FY 2025 Plans:*** F-22 will begin development of M-Code Weapons software solution and continue integration and software development activities to support EGI-M and M-Code Weapons into FY26. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase of $18.850M from FY24 to FY25 is due to the ramp up in the integration software development effort.			
Title: Communication Systems ***Description:*** Communication Systems consists of software and hardware development, firmware updates, test, and certifications necessary to field Link 16 (L16) Transmit Receive and tactical Mode 5 Identify Friend or Foe Challenge (IFFC). L16 Receive & Transmit is implemented via an Open System Architecture (OSA) solution integrated with F-22 legacy avionics to enable tactical data sharing between the F-22 and 4th generation aircraft. The OSA implementation will provide a pathway to more competitive and open F-22 modernization. Mode 5 IFF is a Joint Requirements Oversight Council-mandated Blue Force identification capability that improves Raptor survivability and reduces fratricide risk DoD-wide. This capability brings significantly enhanced combat identification quality and security. ***FY 2024 Plans:*** As of FY24, this major thrust is closed and has been replaced by the Link 16 and OSA improvements and Mode 5 Challenge major thrusts. ***FY 2025 Plans:*** No change. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** N/A	78.368	0.000	0.000
Title: Link 16 (L16) and Open System Architecture (OSA) Improvements ***Description:*** Develop, enhance, and field L16, OSA, and Multifunction Information Distribution System Joint Tactical Radio System (MIDS JTRS) hardware/software/firmware capabilities to enable tactical data sharing between 5th generation and 4th generation aircraft. The OSA implementation provides a pathway to a more competitive and open F-22 modernization. ***FY 2024 Plans:***	0.000	35.090	49.430

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Continue firmware and software development, integration, test, and incremental upgrade activities for Link 16 messages. Continue development, integration, and flight test of J12.6 technical debt, Classified Capability Phase 2, and L 16 dual voice receive and transmit capability. Retrofit developmental and operational test aircraft common integrated processor (CIP) Low latency signal processor firmware. Incorporate open mission systems/communication suite requirements as well as enhancements of OSA interoperability with different Computer Software Configuration Items (CSCI) and improve system fault reporting. Complete BU3 feasibility and roadmap study. Begin post BU3 study development efforts. ***FY 2025 Plans:*** Continue software development, enhancements, firmware upgrades, integration, test, and incremental upgrade activities for L16 messages. Submit fielding decision for J12.6 technical debt, Classified Capability Phase 2, and L16 dual voice receive and transmit capability. Incorporate open mission systems/communication suite requirements as well as enhancements of OSA interoperability with different Computer Software Configuration Items (CSCI) and improve system fault reporting. Continue BU3 design and architecture developmental activities. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase of $14.340M from FY24 to FY25 is due to the increased MIDS JTRS BU3 software development and increased defect burndown of L 16 and OSA capabilities to meet warfighter interoperability requirements.			
Title: Mode 5 IFF Challenge (IFFC)	0.000	95.080	36.110
Description: Mode 5 IFFC is a Joint Requirements Oversight Council-mandated Blue Force identification capability that improves Raptor survivability and reduces fratricide risk DoD-wide. The Mode 5 IFFC capability incorporates new and updated hardware and software to add a new waveform, new cryptography, and additional data. ***FY 2024 Plans:*** Continue software development and lab testing of Mode 5 capabilities. Continue integration activities of Mode 5 Challenge circuit cards and crypto card hardware. Continue Air Traffic Control Radar Beacon System/IFF/Mark XII/Mark XIIA, System IFF (AIMS) platform certification activities for Selective Identification Feature (SIF) Modes and Mode 5. Continue spectrum certification activities to obtain a Stage 3 Radio Frequency Authorization (RFA). ***FY 2025 Plans:*** Finalize software development and lab testing of Mode 5 Level 1 capabilities. Continue software development and lab testing of Mode 5 classified capabilities. Continue integration and validation activities of Mode 5 Challenge circuit cards and crypto card hardware. Continue hardware modification and integration activities on test aircraft. Begin flight testing in conjunction with Release 5 flight testing. Obtain AIMS platform certification for initial Mode 5 software. Continue spectrum certification activities to obtain			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
a Stage 3 (developmental) RFA for Mode 5 classified capabilities. Continue spectrum certification activities to obtain a Stage 4 (operational) RFA for Mode 5 combat Air Forces operations. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $58.970M from FY24 to FY25 is attributable to the ramp down in peak software development, and completion of development activities for AEU Retrofit on test jets from FY24.			
Title: Low Drag Tanks and Pylons	47.661	34.240	23.200
Description: The F-22 Low Drag Tanks and Pylons (LDTP) are advanced technological designs providing increased persistence and range while maintaining lethality and survivability. The low drag tanks are intended to minimally increase drag for external tank carriage, facilitate supersonic flight with external tanks and extend the range of the F-22. The pylons are equipped with smart rack pneumatic technology to accurately control ejection performance and minimize drag without stores. LDTP risk reduction activities are captured under the ATD major thrust. Documentation of the development and integration components as part of the EMD program is captured under the LDTP major thrust. ***FY 2024 Plans:*** Finalize technology maturation and risk reduction while continuing EMD program. EMD objectives include the procurement of LDTP assets, to include support equipment, evaluation of designs for improvement, flight test execution for threshold envelope, and LDTP qualification and certification. Additionally, the development and formulization of software requirements to support Operational Flight Program (OFP) integration will be accomplished in FY24. The analysis, flight test and non-recurring engineering activities will ensure the program's transition to production to support required asset available (RAA) fielding with threshold capabilities. ***FY 2025 Plans:*** Continue with the EMD Program (Hardware and Threshold). Complete Flight Test for LDTP up to Threshold envelope. Verification and Validation of safety of flight certification testing of Low Drag Pylon design change enabling Low Drag Tank jettison flight testing. The software requirements to support Operational Flight Program (OFP) integration will be implemented in FY25. Transition to production to support first delivery of Lot 1 Assets. DT/OT efforts to continue. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Decrease of $11.040M from FY24 to FY25 reflects reduced hardware development costs due to program maturation.			
Title: Viability	0.000	18.130	147.023

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Description: Viability includes the Infrared Defensive System (IRDS), Keystone, and other programs to address future threats. IRDS is the Missile Launch Detector (MLD) modernization effort that improves missile launch detection capabilities. Keystone increases radar warning capabilities, pilot situational awareness, and effectiveness for certain countermeasures. Viability reflects the continuation of work that began as risk reduction and technology maturation activities in the ATD major thrust. Documentation of the development and integration components as part of the EMD program will be captured under the Viability major thrust. ***FY 2024 Plans:*** Continue efforts that began in the ATD project to develop IRDS software and hardware for future fleet release. Begin software integration activities and start initial purchasing of test assets. ***FY 2025 Plans:*** Increase IRDS group A and group B test asset purchases for developmental and operational test jets. Increasing engineering and design activities. Continuation of software integration development per the systems requirement document (SRD). Begin EMD for Keystone. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase of $128.893M from FY24 to FY25 reflects the increased development and integration activities for IRDS GEN III, which ramps up in FY25.			
Title: Cryptographic Modernization	0.000	28.360	98.030
Description: The Cryptographic Modernization program will update F-22 radios with revised interoperability and cryptographic security requirements as mandated by the Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), U.S. Procurement Specification SS103118. This major thrust also covers F-22 program activities required to update Tactical Secure Voice Cryptographic Interoperability Specification (TSVCIS) 2.1 to version 3.1.1, a key component of Cryptographic Modernization Planning as directed by CJCSI-6510.02D and IAW with guidance from the National Cryptographic Solution Management Office (NSCMO), dated August 2020. Cryptographic Modernization program activities in FY23 were previously documented within the Communication Systems major thrust. This program has been separated into its own major thrust beginning in FY24. ***FY 2024 Plans:***			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY24 efforts include the development of SATURN and TSVCIS solutions and the certification process with NSA. ***FY 2025 Plans:*** FY25 efforts include the ramp up in the EMD program activities for the SATURN and TSVCIS solutions. These efforts will include the development of new KOV-28 cryptographic module to enable it to handle the increased processing power required with the implementation of NSA Silver Linings mandate. Work will also be done on the redesign of the current Communication Navigation and Identification rack to provide growth space for current and future communication and cryptographic upgrades. Software requirements and hardware changes will continue to be formalized and developed. Lab testing should start for the SATURN software. Will continue working with NSA to ensure all certification requirements are met. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increase of $69.670M from FY24 to FY25 reflects the increased development and integration activities started in FY24.			
Accomplishments/Planned Programs Subtotals	542.659	725.889	768.561

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
• APAF 05 Line Item F02200: *F-22A Squadrons, PE 0207138F**	795.969	899.187	975.739	-	975.739	1,058.828	1,125.064	910.927	867.403	0.000	6,633.117

Remarks

NOTES:

*F-22A Squadrons, APAF/PE 0207138F, includes funding for F-22A Squadrons BPs 11 (Aircraft Modifications), 13 (Post-Production Support), 16 (Initial Spares), and 19 (Depot Activation).

E. Acquisition Strategy

The F-22 utilized Sec 804 Middle Tier of Acquisition (MTA) to rapidly develop and field advanced capability. Development efforts were conducted under a Rapid Prototyping MTA, which concluded at the end of FY23 with the exception of the Sensor Enhancements program, which received a 10-month extension to enable the completion of a technical demonstration on the F-22. The following programs transitioned to a Major Capability Acquisition (MCA): Mode 5 Identify Friend or Foe - Challenge (IFFC), Link 16 and Open System Architecture Improvements, Controlled Reception Pattern Antenna (CRPA), Embedded Global Positioning System (GPS)/ Inertial Navigation System (INS) - Modernized (EGI-M), Low Drag Tanks and Pylons. Sensor Enhancement Group B kit procurement, including an advanced Infrared Search and Track (IRST) sensor, is dependent on a successful Rapid Prototyping MTA demonstration. The programs will use the same Indefinite Delivery Indefinite Quantity (IDIQ) contract vehicles established under the MTA in order to maximize flexibility to start, stop, accelerate and decelerate projects as required and provide

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maximum flexibility to manage various modernization projects. In conjunction with the Raptor Enhancement Development & Integration II (REDI II) IDIQ ordering contract, the new Advanced Raptor Enhancement and Sustainment (ARES) IDIQ is a follow-on contract that began taking orders in FY22.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force		Date: March 2024
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Infrastructure	Various	Various : Various	0.000	193.652	Oct 2022	215.329	Oct 2023	229.102	Oct 2024	-		229.102	Continuing	Continuing	-
Advanced Technology Development	Various	Various : Various	0.000	44.454	Nov 2022	49.030	Nov 2023	20.230	Nov 2024	-		20.230	Continuing	Continuing	-
Sensor Systems	SS/CPFF	Lockheed Martin : Fort Worth, TX	0.000	154.822	Mar 2023	207.890	Feb 2024	109.700	Nov 2024	-		109.700	Continuing	Continuing	-
Navigation Systems	SS/CPFF	Lockheed Martin : Fort Worth, TX	0.000	19.214	Feb 2023	-		-		-		-	Continuing	Continuing	-
CRPA	SS/CPFF	Lockheed Martin : Fort Worth, TX	0.000	-		31.340	Oct 2023	25.350	Nov 2024	-		25.350	Continuing	Continuing	-
EGI-M	SS/TBD	Lockheed Martin : Fort Worth, TX	0.000	-		5.100	Oct 2023	23.950	Nov 2024	-		23.950	Continuing	Continuing	-
Communication Systems	SS/ Various	Lockheed Martin : Fort Worth, TX	0.000	78.368	Oct 2022	-		-		-		-	Continuing	Continuing	-
L 16 and OSA Improvements	SS/CPAF	Lockheed Martin : Fort Worth, TX	0.000	-		35.090	Oct 2023	49.430	Nov 2024	-		49.430	Continuing	Continuing	-
Mode 5 IFFC	SS/CPFF	Lockheed Martin : Fort Worth, TX	0.000	-		95.080	Nov 2023	36.110	Nov 2024	-		36.110	Continuing	Continuing	-
Low Drag Tanks and Pylons	SS/CPIF	Lockheed Martin : Fort Worth, TX	0.000	47.661	Mar 2023	34.240	Nov 2023	23.200	Nov 2024	-		23.200	Continuing	Continuing	-
Viability	SS/TBD	Lockheed Martin : Fort Worth, TX	0.000	-		18.130	Aug 2024	147.023	Nov 2024	-		147.023	Continuing	Continuing	-
Cryptographic Modernization	SS/TBD	Lockheed Martin : Fort Worth, TX	0.000	-		28.360	Aug 2024	98.030	Nov 2024	-		98.030	Continuing	Continuing	-
		Subtotal	0.000	538.171		719.589		762.125		-		762.125	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Direct Cite Civilian Pay	Various	Not specified. : TBD	0.000	4.488	Oct 2022	6.300	Oct 2023	6.436	Oct 2024	-		6.436	0.000	17.224	-
		Subtotal	0.000	4.488		6.300		6.436		-		6.436	0.000	17.224	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207138F / *F-22A Squadrons*	Project (Number/Name) 674785 / *F-22*	

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	542.659		725.889		768.561		-		768.561	Continuing	Continuing	N/A

Remarks

Target Value of Contract is not discrete due to the number of programs within the Indefinite Delivery, Indefinite Quantity (IDIQ) construct.

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207138F / *F-22A Squadrons*	**Project (Number/Name)** 674785 / *F-22*

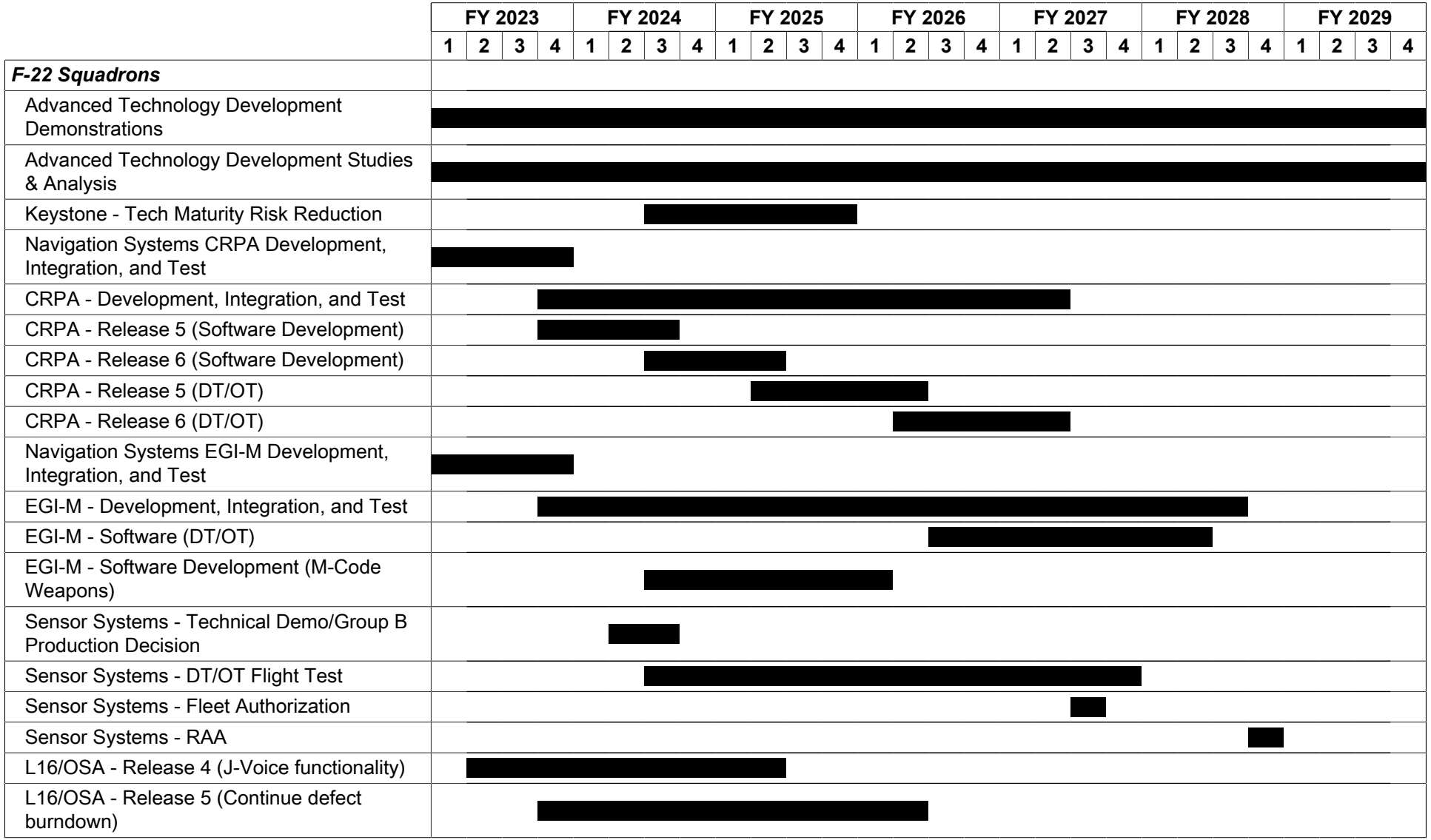

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207138F / *F-22A Squadrons*	**Project (Number/Name)** 674785 / *F-22*

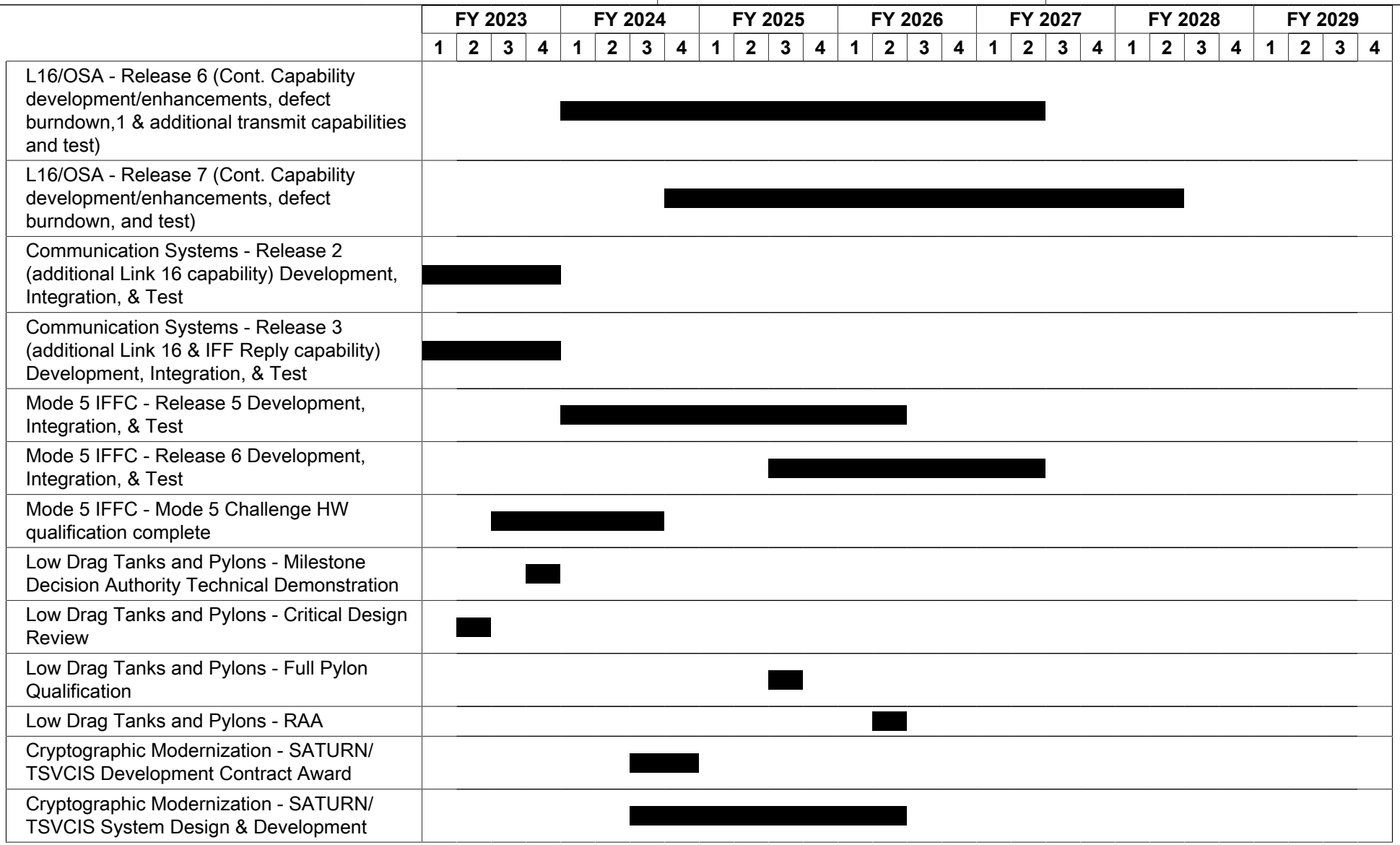

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207138F / *F-22A Squadrons*	**Project (Number/Name)** 674785 / *F-22*

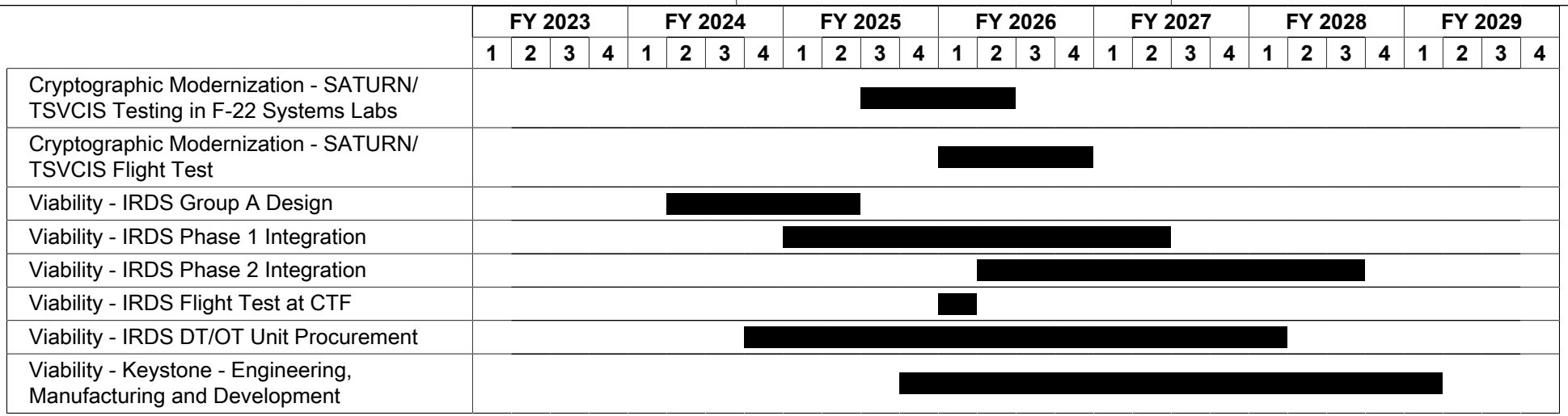

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207138F / *F-22A Squadrons*	**Project (Number/Name)** 674785 / *F-22*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-22 Squadrons				
Advanced Technology Development Demonstrations	1	2023	4	2029
Advanced Technology Development Studies & Analysis	1	2023	4	2029
Keystone - Tech Maturity Risk Reduction	3	2024	4	2025
Navigation Systems CRPA Development, Integration, and Test	1	2023	4	2023
CRPA - Development, Integration, and Test	4	2023	2	2027
CRPA - Release 5 (Software Development)	4	2023	3	2024
CRPA - Release 6 (Software Development)	3	2024	2	2025
CRPA - Release 5 (DT/OT)	2	2025	2	2026
CRPA - Release 6 (DT/OT)	2	2026	2	2027
Navigation Systems EGI-M Development, Integration, and Test	1	2023	4	2023
EGI-M - Development, Integration, and Test	4	2023	3	2028
EGI-M - Software (DT/OT)	3	2026	2	2028
EGI-M - Software Development (M-Code Weapons)	3	2024	1	2026
Sensor Systems - Technical Demo/Group B Production Decision	2	2024	3	2024
Sensor Systems - DT/OT Flight Test	3	2024	4	2027
Sensor Systems - Fleet Authorization	3	2027	3	2027
Sensor Systems - RAA	4	2028	4	2028
L16/OSA - Release 4 (J-Voice functionality)	2	2023	2	2025
L16/OSA - Release 5 (Continue defect burndown)	4	2023	2	2026
L16/OSA - Release 6 (Cont. Capability development/enhancements, defect burndown,1 & additional transmit capabilities and test)	1	2024	2	2027

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207138F / *F-22A Squadrons*	**Project (Number/Name)** 674785 / *F-22*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
L16/OSA - Release 7 (Cont. Capability development/enhancements, defect burndown, and test)	4	2024	2	2028
Communication Systems - Release 2 (additional Link 16 capability) Development, Integration, & Test	1	2023	4	2023
Communication Systems - Release 3 (additional Link 16 & IFF Reply capability) Development, Integration, & Test	1	2023	4	2023
Mode 5 IFFC - Release 5 Development, Integration, & Test	1	2024	2	2026
Mode 5 IFFC - Release 6 Development, Integration, & Test	3	2025	2	2027
Mode 5 IFFC - Mode 5 Challenge HW qualification complete	3	2023	3	2024
Low Drag Tanks and Pylons - Milestone Decision Authority Technical Demonstration	4	2023	4	2023
Low Drag Tanks and Pylons - Critical Design Review	2	2023	2	2023
Low Drag Tanks and Pylons - Full Pylon Qualification	3	2025	3	2025
Low Drag Tanks and Pylons - RAA	2	2026	2	2026
Cryptographic Modernization - SATURN/TSVCIS Development Contract Award	3	2024	4	2024
Cryptographic Modernization - SATURN/TSVCIS System Design & Development	3	2024	2	2026
Cryptographic Modernization - SATURN/TSVCIS Testing in F-22 Systems Labs	3	2025	2	2026
Cryptographic Modernization - SATURN/TSVCIS Flight Test	1	2026	4	2026
Viability - IRDS Group A Design	2	2024	2	2025
Viability - IRDS Phase 1 Integration	1	2025	2	2027
Viability - IRDS Phase 2 Integration	2	2026	3	2028
Viability - IRDS Flight Test at CTF	1	2026	1	2026
Viability - IRDS DT/OT Unit Procurement	4	2024	1	2028
Viability - Keystone - Engineering, Manufacturing and Development	4	2025	1	2029