Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Air Force	Date: March 2023
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*

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	-	122.940	129.941	74.023	0.000	74.023	74.432	76.528	128.499	80.926	Continuing	Continuing
655050: *TDL System Integration*	-	122.940	129.941	74.023	0.000	74.023	74.432	76.528	128.497	80.924	Continuing	Continuing
655262: *Family of Gateways**	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	Continuing	Continuing

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2024

Note

This program, BA 5, PE 0604281F, project 655050, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), is a new start.

N/A

A. Mission Description and Budget Item Justification

The Tactical Data Networks Enterprise (TDNE) develops, enhances and fields Tactical Data Links (TDL) including internet protocol (IP) networks, advanced waveforms, radios, network management tools, and associated hardware and software that comprise the Joint Aerial Layer Network (JALN). This will be accomplished by upgrading currently fielded communications and TDL systems and IP networks. The upgrades align with the development and fielding of more advanced systems in support of the Advanced Battle Management System (ABMS). ABMS is a family of systems which provides capabilities consisting of air, land, and maritime surveillance, tactical communications and networking, integrated with battle management command and control in support of Joint forces. ABMS is an integral component to transition to the Joint All Domain Command and Control (JADC2) concept at the tactical level of warfare. TDNE supports the development, fielding and training of aerial layer networking capabilities across multiple force projection missions including air superiority, ground precision attack, command and control, intelligence, surveillance and reconnaissance (ISR), and personal recovery while integrating capabilities with space operations. This program ensures the continued enhanced interoperability of Air Force and joint/ coalition/NATO assets through efforts such as early systems engineering for program requirements analysis and architectural design development/ coordination of all TDN standards and management capabilities, configuration management, platform/system interoperability assessments, development of government reference architectures, interoperability certification testing, and flight testing. The aerial layer extends to interfacing with space communication assets (both military and commercial). An example of this interface work includes the use of the Protected Tactical Waveform (PTW) designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments. PTW development activities may include technical and acquisition-related studies, analysis, early systems engineering and risk reduction activities, addressing all subsystems to support both current program planning/execution and future AF program planning. This effort also funds PTW modem development and aperture development on suitable platforms.

TDL System Integration will provide for the study (acquisitions current and proposed), analysis, enhancement, development, integration, demonstration, test, and evaluation of TDLs as a subset of the broader aerial layer networks. TDLs are used in both peace time and combat environments to exchange information such as character-oriented and fixed-formatted messages, data, radar tracks, target information, platform status, imagery, free-text messaging and command assignments. TDLs provide interoperability, local and global connectivity, and situational awareness to the user when training or fighting under rapidly changing operational conditions. TDLs increase mission effectiveness by providing enhanced air domain situational awareness, positive combat identification of aircraft in the network, fusion/correlation of on-

and off-board sensor data, digital sharing of machine-to-machine target and threat information, thereby, enabling time critical targeting and other mission assignment tasking.

TDLs are used by all service theater command and control (C2) elements, weapons platforms, and sensors. TDLs include, but are not limited to: Link 16, Link 22, and other Advanced TDL Link technologies, such as Tactical Targeting Network Technology (TTNT), Common Data Link (CDL), Intra-Flight Data Link (IFDL) and Multifunction Advanced Data Link (MADL) . SATURN (Second-Generation Anti-Jam Tactical UHF Radio for NATO) is the next generation UHF line-of-sight link and is required to supporting a DoD CIO Mandate a resilient voice and data capability for operations in a contested environment. Agile Communications includes the capability to share tactically significant information within/to/from highly contested environments in support of the Air Superiority 2030 Flight Plan. Agile Communication efforts provide processes and coordination for enterprise communication development activities. Connect The QUAD supports new capabilities based on government ownership and modular communications architecture for the next generation of fighter, bomber, and ISR platforms to operate within a Highly Contested Environment (HCE). High Capacity Backbone (HCB), a subset of the overall ABMS plan, will provide the warfighter with a robust communication infrastructure enhancing C2 capabilities. HCB connects users operating within disadvantaged conditions to space and terrestrial communications utilizing Deployed Ground Entry Points (DGEP) and aerial nodes. To address future Advanced Tactical Datalinks, development of a Software Programmable OMS compliant (SPOC) radio terminal prototype is being built and tested. SPOC will provide a next generation radio set capable of hosting a variety of advanced tactical datalinks which aligns with the ABMS plan, and allows for more than one waveform operating simultaneously resulting in improved connectivity and situational awareness for the warfighter. Another development and demonstration effort known as Small Form Factor (SFF) supports Digitally Assisted Close Air Support (DACAS) and other missions across the full spectrum of operating environments.

Communication gateways are necessary to support systems of systems integration and the delivery of information exchanges across disparate physical and logical network pathways. Gateway functions include enabling interoperability between data formats, protocols, and communication mediums. Additionally, gateway functions extend the connectivity range, consolidate data from multiple networks into high capacity links for transmission to key C2ISR nodes, route information between disadvantaged users, and fuse/correlate data from multiple sources to improve accuracy. Gateway functions also provide application hosting, shared data storage, on-demand information access, smart data forwarding, and system monitoring and network management. Family of Gateways provides for the study (acquisitions current and proposed), analysis, enhancements, development, integration, costing, demonstration, test, and evaluation efforts related to future TDL communications development that will allow joint combat forces to exchange information quickly and accurately by bridging discrete airborne, terrestrial, maritime, and space-based C4ISR networks producing operational effects not possible within individual networks. Efforts in this project include waveform, ground, and rapid acquisition activities supporting Air Force requirements for communication bridging across multiple platforms, sources and communication domains.

This program element may include necessary civilian pay expenses required to support, manage, execute, and deliver weapon system capabilities across the BACN platforms, aerial network, and tactical data network enterprise. 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 FY2021 0.900M was expended for civilian pay expenses in this program element, and in FY2022 0.900M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	159.836	133.117	92.813	0.000	92.813
Current President's Budget	122.940	129.941	74.023	0.000	74.023
Total Adjustments	-36.896	-3.176	-18.790	0.000	-18.790
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-11.400			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	12.500			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-32.039	0.000			
• SBIR/STTR Transfer	-4.857	0.000			
• Other Adjustments	0.000	-4.276	-18.790	0.000	-18.790

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2022	FY 2023
Project: 655050: *TDL System Integration*		
Congressional Add: *Next Generation (Software Programmable Open Mission System Compliant (SPOC) radio)*	0.000	6.500
Congressional Add: *KC-135 advanced intelligent gateway "Congressional funding will allow KC-135s to be outfitted with an Advanced Intelligent Gateway capability by funding all up-front non-recurring engineering, RTI...*	0.000	6.000
Congressional Add Subtotals for Project: 655050	0.000	12.500
Congressional Add Totals for all Projects	0.000	12.500

Change Summary Explanation

FY22:
-10.505 AF FY22-51 PA DoD FY22-11 PA - OMNIBUS Part I - Implementation 4 (3400 and 3080)
-11.888 AF FY22-79 PA DoD FY22-15 PA - SEPTEMBER E7 New Start (AWACS)
-3.658 C3IN AFDCO BTR
-0.670399 FY22 M-Code BTR
-5.671600 Rapid Sustainment Modernization
+0.354 FY22 3600 Realignment from 67 to LC - Distribution to MAJCOM
-4.857 SBIR

FY23:
+6.5 Congressional Add-SPOC

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+6.0 Congressional Add-KC135 Advanced Intel Gateway
-11.4 Congressional Mark PTW
-4.276 for FFRDC reduction
-3.931 SBIR *not reflected in doc program change summary due to data load issues but will be reflected in staffer brief

FY24:
-18.790 for realignment for higher Department of the Air Force priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604281F / *Tactical Data Networks Enterprise*	Project (Number/Name) 655050 / *TDL System Integration*	

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
655050: *TDL System Integration*	-	122.940	129.941	74.023	0.000	74.023	74.432	76.528	128.497	80.924	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 5, PE 0604281F, project 655050, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), is a new start.

A. Mission Description and Budget Item Justification

Tactical Data Links (TDL) System Integration provides for the study, analysis, enhancement, development, integration, demonstration, joint/coalition/NATO interoperability exercises, costing, test, trials, and evaluation of TDL as a subset of the broader aerial layer network. TDLs are used in both peacetime and combat environments to exchange information such as character-oriented and fixed-formatted messages, data, radar tracks, target information, platform status, imagery, free- text messaging and command assignments. TDLs provide interoperability, local and global connectivity, and situational awareness to the user when training or fighting under rapidly changing operational conditions. TDLs increase mission effectiveness by providing enhanced air domain situational awareness, positive combat identification of aircraft in the network, fusion/correlation of on- and off-board sensor data, digital sharing of machine to machine target and threat information and, thereby, enabling time critical targeting and other mission assignment tasking. TDLs are used by all service, NATO, and coalition theater C2 elements, weapons platforms, and sensors.

The number of Air Force platforms hosting TDLs has expanded from C2 aircraft (E-7, E-8, E-11A, EQ-4B, etc.) to the fighter, bomber, intelligence, surveillance and reconnaissance (ISR), tanker, airlift and other tactical fleets (F-15, F-16, F-22A, Rivet Joint, B-1, B-2, B-52, KC-46, etc.), as well as precision guided munitions. Utilization of TDLs in joint and international environments requires the integration of terminals into host platforms and interoperability of TDL networks across all deployed joint/Coalition/NATO platforms. USAF mandates require additional studies and analysis in order to meet frequency reprogramming and cryptographic requirements.

High Capacity Backbone (HCB) effort implements an incremental approach for deploying resilient reach back connectivity to DISN services and in-theater rear echelon organizations through dedicated aerial gateways and opportunistic airborne nodes. The HCB Transport supports a robust deployable ground infrastructure required, through reach back, range extension and payload control. It will use an open system approach composed of non-proprietary government and commercial interface standards. Link 16 Enhancement will develop and field advanced signal processing capabilities on 4th and 5th generation platforms to address threats in the contested and highly contested environments.

Efforts in this project include waveform and integration activities.

Waveform:
Waveform activities include, but are not limited to, enabling and supporting Joint Interoperability of Tactical Command and Control Systems (JINTACCS), joint/Coalition/NATO Interoperability, Link 16 enhancements, and development of a next generation waveform and/or advanced tactical data link. Funding will provide training, logistics,

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
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development, testing and certification of individual TDL implementations to joint/allied standards, establishment of service-wide network management procedures/ operations, and system-wide enhancements/testing, demonstration and experimentation.

Integration:
Integration activities include but are not limited to, Data Link Test Facility (DTF), MIDS JTRS, Air Force Participating Test Unit (AFPTU), Interoperable System Management and Requirements Transformation (iSMART), Network Centric Capability Assessment (NCCA), NATO interoperability, Coalition interoperability, , integration analysis of C2 of JALN, Combat Cloud, Protected Tactical Waveform (PTW), second generation Anti Jam(AJ) Tactical Ultra High Frequency(UHF) Radio for North Atlantic Treaty Organization(NATO) (SATURN) and analysis of integration on platforms of existing TDN systems, system-of-systems analysis. Funding will ensure continued enhanced interoperability of Air Force/joint/Coalition/NATO assets through efforts such as early systems engineering for program requirements analysis and architectural design development/coordination of all TDN standards and management capabilities, configuration management, platform/system interoperability assessments, development of government reference architectures, integration of cyber technologies, interoperability certification testing, and flight testing, demonstration and experimentation. Another development and demonstration effort known as Small Form Factor (SFF) supports Digitally Assisted Close Air Support (DACAS) and other missions across the full spectrum of operating environments.

Activities also include studies, prototypes, analysis (engineering and cost), demonstrations and experiments to support both current program planning and execution and future program planning efforts for Tactical Data Networks (TDN), to include but not limited to development of joint concepts for C2, Analysis of Alternatives (AoA) follow-on analysis, advanced gateway planning, development/integration of Advanced Battle Management systems (ABMS) capabilities, across all aerial network and tactical data networks enterprise platforms including (but not limited to) E-11 Battlefield Airborne Communications Node (BACN).

Activities will also include joint/Coalition/NATO Interoperability that provides program office system engineering to support Foreign Military Sales (FMS).

Agile Communications include the capability to share tactically significant information within/to/from highly contested environments in support of the Air Superiority 2030 Flight Plan. Agile Communication efforts provide for pre-Analysis of Alternatives (AoA) and development activities. Agile Communications supports the application of open standards & advanced apertures over an Enterprise-wide Aerial Network, enabling all platforms to share combat-relevant data/info to, from & within the Highly Contested Environment (HCE).

This program element may include necessary civilian pay expenses required to support, manage, execute, and deliver weapon system capabilities across the BACN platforms, aerial network, and tactical data network enterprise. 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 PY 0.9M was expended for civilian pay expenses in this program element, and in CY 0.9M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Tactical Data Networks (TDN) Integration	25.823	24.716	21.945	0.000	21.945

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Description: TDN Integration activities include but are not limited to, Data Link Test Facility (DTF), Air Force Participating Test Unit (AFPTU), Network Centric Capability Assessment (NCCA), Joint/Coalition/NATO Interoperability, Analysis of Alternatives (AoA) follow-on, gateway planning as well as Joint Interoperability of Tactical Command and Control Systems (JINTACCS) ensures interoperability of TDL systems with associated joint, allied, and Coalition systems. It includes configuration management of TDL Military Standards (MIL-STDs), TDL message development, interoperability test/certification, and TDL message standard implementation using interoperable System Management and Requirements Transformation (iSMART) for Link 16, Link 22, Intra-flight Data Link (IFDL), Multifunction Advanced Data Link (MADL), and others. Full Motion Video (FMV) Extended Unified Relay (FEURY) system development. Efforts also include AFPTU will purchase hardware and software in support for testing Link16 updates made by contractors and MAJCOMs to ensure they are in compliance with the MIL STD 6016 the Link 16 specification. The JINTACCS review and comment on changes being requested to the MIL STD Link16 specification, they support the various MAJCOM and coalition engagements that present new changes to the specification or changes to the message formats along with other documentation that could also impact the specification. Requirement analysis includes engagements with contractors and FFRDC regarding future capabilities/initiatives by conducting studies and analysis that will then feed into future requirements and capabilities. ***FY 2023 Plans:*** -Continue to manage the development, certification, training and logistics plans for individual TDL implementations to Joint/ allied standards. -Continue to provide the necessary engineering, technical, and administrative support required to add and/or update Air Force platform and system information exchange requirements -Continue to ensure compatibility and interoperability of TDLs by funding required Air Force/joint MIL-STD compliance and interoperability tests -Continue to ensure compatibility and interoperability of TDLs by developing TDL messaging capability to address new or updated operational requirements ***FY 2024 Base Plans:*** -Will continue to manage the development, certification, training and logistics plans for individual TDL implementations to Joint/ allied standards.					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
-Will continue to provide the necessary engineering, technical, and administrative support required to add and/or update Air Force platform and system information exchange requirements -Will continue to ensure compatibility and interoperability of TDLs by funding required Air Force/joint MIL-STD compliance and interoperability tests -Will continue to ensure compatibility and interoperability of TDLs by developing TDL messaging capability to address new or updated operational requirements ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** TDN integration requirements fluctuate based on scope of analysis development and certification efforts for AFPTU (AF Participating Unit), JINTACC (Joint Interoperability of Tac Command & Control Sys), NATO interoperability, and Coalition implementation. A slight reduction in scope of efforts has resulted in reduced funding required.					
Title: High Capacity Backbone (HCB) ***Description:*** High Capacity Backbone (HCB) is an expeditionary dynamic network made up of aerial and ground nodes that augment existing communication networks to greatly increase connectivity, network capacity, and information sharing at all security levels in order to effectively employ military capability across the range of military operations. HCB reduces joint forces reliance on limited, relatively fixed/static satellite and surface line-of-sight communication components. HCB rapid prototyping is a demonstration of HCB network transport installed in existing USAF aircraft and deployable ground entry points that meets this Rapid Prototyping Requirements Document's threshold technical and functional requirements while operating as an integral part of an aerial layer network in a realistic operational environment. HCB capabilities are required to close four specific capability gaps: network connectivity, network capacity, share information and data, and network management. ***FY 2023 Plans:*** -Will complete development and demonstrate the HCB capability ***FY 2024 Base Plans:***	17.161	15.154	16.448	0.000	16.448

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
-Complete core development and conduct the flight operational demonstration of the HCB prototype as directed in ACC's RPRD. The successful demonstration will lead to the development and production of initial test article systems that will be integrated on various platforms identified in the approved 1067 documentation. -Will develop and award a follow on contract of the HCB that will be fielded in ground units and will be integrated on the E-11 as well as other various platforms ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Funding slightly increases as developments prototypes are refined to closer production ready hardware/software and project shifts toward testing (both ground/flight) and modifications necessary to ready HCB for production/ fielding.					
Title: Protected Tactical Waveform (PTW) ***Description:*** Protected Tactical Waveform (PTW) is a waveform designed to mitigate the effects of advanced jamming in Anti- Access/Area Denial environments. PTW provides worldwide, beyond line of sight, Anti-Jam (AJ), Low Probability of Intercept communications, via military and commercial satellite systems for tactical users in all Services. This effort funds PTW modem development and aperture development on suitable platforms to include but not limited to; F-35, RQ-4 Global Hawk and EQ-4B/E-11A Battlefield Airborne Communications Node (BACN). PTW provides communications path diversity by increasing SATCOM resilience through satellite, spectral, and waveform diversity. This effort continues work started in Protected Tactical Service Field Demonstration (PTSFD) to complete PTW maturity and modem development, leveraging TALON Tacet Avis aperture work to develop PTW antenna and radome. It includes terminal certification efforts (Information Assurance (IA), NSA and MIL-STD). This effort funds continued development of PTW components, protected tactical terminal modems that will be capable of being fully integrated into existing wideband terminals and will ensure delivery of protected tactical SATCOM to the joint and coalition warfighters in contested, degraded environments. PTW development activities may also include technical and acquisition related studies, analysis, and early systems engineering and risk reduction activities addressing all subsystems to support both current program planning/execution and future AF program planning. ***FY 2023 Plans:*** -Continue the development, integration and testing of an airborne modem that will be utilized by fighter and wide-body aircraft.	27.553	26.364	0.000	0.000	0.000

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
-Develop a standards-based PTW modem with Anti-Jam (AJ) capability to augment existing Aerial SATCOM terminals across vendors and platforms. -Continue addition of COMSEC capability to allow use of classified data and fully certify the crypto to be able to encrypt data for multiple waveforms. -Complete the development and conduct the test of two (BIFROST and HAAM-R) prototype modem kits in CY23. ***FY 2024 Base Plans:*** There is no funding in FY2024. However, the E-11A SPO has funding in FY24 to begin the integration of HAAM-R on the platform and the MAJCOM is working a draft 1067 for integrating PTW HAAM-R on other platforms. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** An 11.4M cut in the FY23 PTW funding hampered the development and slowed test planning but BIFROST will be demonstrated in April/May timeframe and HAAM-R is planned to be tested at Northern Edge Exercise in May 23. HAAM-R version is on contract to deliver 14-16 operational test kits that would be available in CY23. These unintended delays in project development and testing for PTW as well as reductions in funding prioritization have altered the scope and deferred requirements to later Fiscal Years which delays fielding of necessary Protected SATCOM terminals to the warfighters.					
Title: Agile Comms ***Description:*** Agile Comms supports the application of open standards, multi-function processors, and advanced apertures over an Enterprise-wide Aerial Network, enabling all platforms to share combat-relevant data/info to, from and within the Highly Contested Environment (HCE) regardless of the data link and messages format that they are operating on. It supports the application of open standards, multi-function processors, and advanced apertures over the Enterprise-wide Aerial Network, enables all platforms to share combat relevant data/info to, from and within the Highly Contested Environment. This includes supporting the development of airborne gateways. Agile Comms further includes initial integration of advanced communications and networking capabilities onto tactically-relevant aircraft. Finally, this effort supports planning, data collection, development and analysis for initial technology maturation experimentation campaign.	27.157	40.114	33.060	0.000	33.060

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Combat Tactical Edge Network (CTEN) effort within Agile Comms addresses unique challenges of DoD networks by using content routing to establish connections between heterogeneous networks across different media and domains. It is a software (SW) overlay network that routes data within and between permissive, contested, and highly contested environments. To meet the needs of the DoD Networks and in the future CTEN will be integrated on various platforms allowing the flexibility to support various missions. The effort will also continue to support message translation allowing the flexibility to Message transforms and extensible markup languages (XMLs) development. Additional work will continue to support advanced non proprietary antenna apertures supporting various missions. Work will continue in the study/analysis of a ATDL waveform to meet the needs of the modern warfighter. ***FY 2023 Plans:*** -Continue to develop and demonstrate the Common Tactical Edge Network (CTEN) Minimum Viable Product (MVP) and mature the Enterprise Approach to the Joint Aerial Network ***FY 2024 Base Plans:*** -Continue to develop and demonstrate the Common Tactical Edge Network (CTEN) Minimum Viable Product (MVP) and continue the development of the software architecture and support advanced non proprietary antenna apertures necessary to mature the Enterprise Approach to the Joint Aerial Network. -Begin development of an enterprise Advanced Tactical Data Link (ATDL) and Weapons Data Links (WDL) capabilities in direct support of Connect the QUAD initiative to include the study/analysis of a ATDL waveform to meet the needs of the modern/future warfighters. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Requirements and funding align with scope of demonstration efforts to support maturing Enterprise approaches and future comm needs. As CTEN continues to mature, DAF has realigned some focus within Agile Comms toward Advanced Tactical Data Link (ATDL) and Weapons Data Links (WDL) capabilities.					
Title: Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN) ***Description:*** SATURN is a fast frequency hopping waveform that was developed as a replacement for the Have Quick waveform." The upgrade to SATURN will provide an improved radio resistant to jamming through fast-frequency hopping and digital modulation techniques.	0.000	0.000	1.790	0.000	1.790

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: N/A ***FY 2024 Base Plans:*** Will continue to update the waveform specification complying with NATO STANAG and testing utilizing the Reference Implementation Lab (RIL). ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Increase of funds due to new phase of waveform development/certification/testing					
Title: SFF/DACAS Modernization and System-of-Systems (SoS) Enterprise Integration ***Description:*** This effort will support the development and demonstration of Small Form Factor (SFF) technologies that can support Digitally Assisted Close Air Support (DACAS) and other missions across the full spectrum of operating environments. This effort will consider System-of-Systems (SoS) engineering, technical analysis/performance, platform integration, and Tactics, Techniques, and Procedures (TTPs) to best utilize technologies and acquisition approaches for enterprise modernization. SFF Phase II (TURTLE) will be a rapid prototyping and demonstration effort. ***FY 2023 Plans:*** Will conduct testing of solutions with JTACS and TACP fielders. ***FY 2024 Base Plans:*** Will continue testing of solutions with JTACS and TACP fielders will complete the development and demonstration in late CY23. ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** Decrease of funds due to effort shifting to final phase of development and completion of demonstrations.	4.437	5.333	0.780	0.000	0.780
Title: Link 16 Enhancements	20.809	5.760	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Description: Link 16 Enhancements will develop and field Link 16 Anti Jam (AJ) capabilities on 4th and 5th generation platforms to address Link 16 jamming threats in the contested and highly contested environments. This effort will implement Link 16 technologies into TDL terminals and investigate integration of additional baseline(s) to efficiently execute development and enhancements. Emerging technologies will be developed and evaluated for efficacy; recommendations will be identified for appropriate terminal fielding/upgrades to platforms and will be considered when evaluating enterprise TDL capabilities/gaps. Early Development of Next Generation radio (SPOC) were within Link 16 Enhancements and completed until an FY23 Congressional Add, in which the effort was broken out separately beginning in FY23. ***FY 2023 Plans:*** Continued work on Link 16 development/fielding/upgrades. ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** FY25 will be the next iterations of development/fielding/upgrades.					
Accomplishments/Planned Programs Subtotals	122.940	117.441	74.023	0.000	74.023

	FY 2022	FY 2023
Congressional Add: Next Generation (Software Programmable Open Mission System Compliant (SPOC) radio)	0.000	6.500
FY 2022 Accomplishments: This effort will support the development and demonstration of Software Programmable Open Mission System Compliant (SPOC) radio. SPOC is a software defined radio prototype that will allow three waveforms to operate simultaneously and will have the capability to reprogram said waveforms to allow for greater mission flexibility. The Radio will be designed for use in airborne and ground platforms. ***FY 2023 Plans:*** Will complete the development and demonstration of the two prototypes. Begin Phase 2 to update the SPOC radio to meet cryptological, environmental and airworthiness compliance		
Congressional Add: KC-135 advanced intelligent gateway	0.000	6.000

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	FY 2022	FY 2023
"Congressional funding will allow KC-135s to be outfitted with an Advanced Intelligent Gateway capability by funding all up-front non-recurring engineering, RTI... ***FY 2022 Accomplishments:*** No FY22 Actions ***FY 2023 Plans:*** These funds were incorrectly aligned, DAF will realign these funds appropriately to ensure proper execution and successful development effort initiated to meet Congressional intent.		
Congressional Adds Subtotals	0.000	12.500

C. Other Program Funding Summary ($ in Millions)

Line Item	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
• RDTE 07 PE 0207448F: *C2ISR TDL*	1.587	1.616	-	-	-	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item F01500: *F-15*	20.933	21.310	-	-	-	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item F01600: *F-16*	8.695	8.851	-	-	-	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item B00200: *B-2A*	0.210	0.213	-	-	-	-	-	-	-	Continuing	Continuing
• APAF 05 Line Item B01B00: *B-1B*	0.000	0.000	-	-	-	-	-	-	-	Continuing	Continuing
• OPAF 03 Line Item 834010: *General Information Technology*	1.701	1.731	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Airborne Networking Directorate provides for common development, integration, and interoperability across the entire airborne network and ensures that data links are procured and maintained as a joint, end-to-end command and control system. Platform acquisition strategies vary by program, but the majority of development and integration is normally accomplished by the weapon system prime contractor.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TDN Integration	Various	Various : Various	-	10.226	Jan 2022	12.966	May 2023	7.156		-		7.156	Continuing	Continuing	-
High Capacity Backbone (HCB)	C/TBD	Various : Various	-	17.220	Mar 2022	15.154	Feb 2023	16.448		-		16.448	Continuing	Continuing	-
Agile Comms	Various	Various : Various	-	28.081	Jan 2022	40.114	May 2023	33.060		-		33.060	Continuing	Continuing	-
SFF/DACAS Modernization and SoS Enterprise	Various	Various : Various	-	4.436	Jan 2022	5.333	Feb 2023	0.780		-		0.780	Continuing	Continuing	-
Protected Tactical Waveform (PTW)	C/TBD	Not specified. : TBD	-	25.517	Jan 2022	26.364	Mar 2023	-		-		-	Continuing	Continuing	-
Link 16 Enhancements	Various	Not specified. : TBD	-	11.900	Jan 2022	5.760	Mar 2023	-		-		-	Continuing	Continuing	-
Next generation Radio (SPOC)	C/CPAF	Not specified. : TBD	-	10.904	Apr 2022	6.500	Aug 2023	-		-		-	Continuing	Continuing	-
KC-135 advanced intelligent gateway	C/CPAF	Not specified. : TBD	-	-		6.000		-		-		-	Continuing	Continuing	-
		Subtotal	-	108.284		118.191		57.444		-		57.444	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TDN Integration - DTF	PO	46th Test Squadron : Eglin AFB, FL	-	1.500	Dec 2021	1.500	Nov 2022	2.000		-		2.000	Continuing	Continuing	-
JINTACCS	C/FFP	Spectrum Comm Inc : Newport News, VA	-	3.815	Mar 2022	3.900	Mar 2023	8.495		-		8.495	Continuing	Continuing	-
TDN Integration - AFPTU	Various	Various : Various	-	2.336	Jan 2022	2.500	Sep 2023	2.500		-		2.500	Continuing	Continuing	-
		Subtotal	-	7.651		7.900		12.995		-		12.995	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Air Force			Date: March 2023
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TDN Integration PMA - A&AS support - NCCA, Coalition Interoperability, JALN AoA	C/CPAF	Various : Various	-	6.000	Apr 2022	3.000	Apr 2023	3.100		-		3.100	Continuing	Continuing	-
TDN Integration PMA - FFRDC support - Coalition Interoperability, JALN AoA	C/T&M	MITRE : Bedford, MA	-	0.510	Jan 2022	0.450	Dec 2022	0.059		-		0.059	Continuing	Continuing	-
TDN Integration PMA - Travel, Government Purchase Cards, etc...DTF, NCCA, Coalition Interoperability, AFPTU, JALN AoA	Various	Various : Various	-	0.450	Sep 2022	0.300	Sep 2023	0.350		-		0.350	Continuing	Continuing	-
JINTACCS PMA - Travel, Government Purchase Cards, etc...	Various	Various : Various	-	0.045	Sep 2022	0.100	Sep 2023	0.075		-		0.075	Continuing	Continuing	-
		Subtotal	-	7.005		3.850		3.584		-		3.584	Continuing	Continuing	N/A

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	122.940		129.941		74.023		-		74.023	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

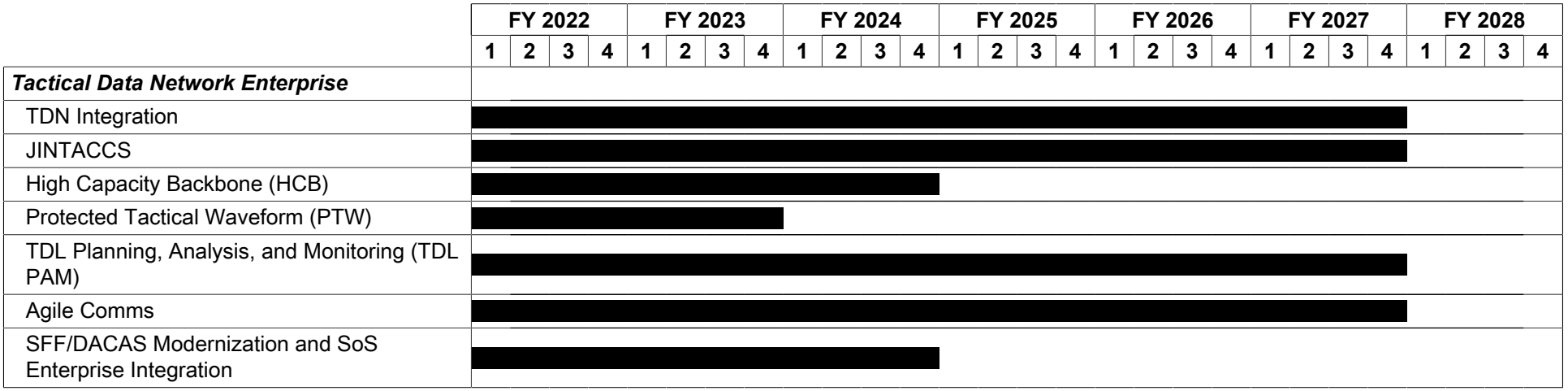

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Air Force		Date: March 2023
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0604281F / *Tactical Data Networks Enterprise*	**Project (Number/Name)** 655050 / *TDL System Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Tactical Data Network Enterprise				
TDN Integration	1	2022	4	2027
JINTACCS	1	2022	4	2027
High Capacity Backbone (HCB)	1	2022	4	2024
Protected Tactical Waveform (PTW)	1	2022	4	2023
TDL Planning, Analysis, and Monitoring (TDL PAM)	1	2022	4	2027
Agile Comms	1	2022	4	2027
SFF/DACAS Modernization and SoS Enterprise Integration	1	2022	4	2024