Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173SF / *Space and Missile Test and Evaluation Center*

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	-	4.028	22.039	20.844	0.000	20.844	22.932	23.131	23.685	24.152	Continuing	Continuing
67A014: *R&D Space & Missile Operations*	-	4.028	22.039	20.844	0.000	20.844	22.932	23.131	23.685	24.152	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Research and Development Space and Missile Operations (RDSMO) program, executed by the Acquisition Delta - Innovation and Prototyping, Space Systems Command at Kirtland Air Force Base (KAFB), NM, conducts Space Vehicle and Ground technology transition, prototype development, Developmental Test and Evaluation (DT&E) and Initial Operational Test and Evaluation (IOT&E). RDSMO develops and evaluates ground systems for prototype experimental, demonstration, and operational satellites within the RDT&E Support Complex (RSC) at KAFB, NM and at Schriever Space Force Base (SSFB), CO. Additionally, this program augments the Space Force Satellite Control Network (SCN) with the Mobile Range Flight (MRF) while prototyping new antenna systems and networking technologies worldwide. The RDSMO program develops, acquires, delivers, integrates, tests, operates and sustains the Multi-Mission Satellite Operations Center (MMSOC) satellite command and control (C2) Ground System Enterprise (GSE) for existing experimental and prototype missions. RDSMO develops, acquires, delivers integrates, tests and operates new tactical space C2 architectures from ground stations (including government, commercial, and a local Kirtland station) through their networks to the RSC. RDSMO then ensures users receive the highest quality data at the required latency in support of USSF, Department of Defense (DoD), and other government mission partners. This program also leads the transfer of approved on-orbit missions to operational command organizations such as Space Operations Command. It performs prototype and technology evaluation for multiple USSF missions to include the Enterprise Ground Services, Space Domain Awareness missions, and other mission areas as required.

The objective of the RDSMO Program is to innovate, prototype, and evaluate USSF ground systems to support USSF, DoD, and other government mission partners while speeding transition of war-winning capabilities. The program is centered at the RSC in KAFB, but is developing, testing and evaluating architectures with distributed cloud based operations, integration in existing and future USSF data distribution networks as well as evaluating resiliency and availability to meet future warfighter needs. RDSMO develops and integrates new space technologies to maximize operator usability, such as refining software operator interfaces and developing and evaluating novel Tactics, Techniques and Procedures (TTP). The RDSMO program provides beneficial ground and space vehicle technology directly to the warfighting organizations, for continued experimentation or operations. RDSMO uses a combination of standard hardware and software to:

(1) perform satellite C2 in support of launch and on-orbit requirements;
(2) develop TTP to conduct satellite operations;
(3) provide a satellite C2 incremental or revolutionary (as required) ground resource for RDT&E of new satellite and C2 systems and concepts;
(4) deliver operational flexibility for new and legacy satellite missions designed to out-pace adversary on-orbit systems;.
(5) maximize flexible satellite operations to support multi-mission prototype operations to move to cloud-based systems;
(6) explore and implement innovative ground automation, C2, and data dissemination in concert with experimental, demonstration and prototype space missions;

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(7) ensure a stable and reliable C2 and ground baseline as necessary for experiment and prototype space missions;
(8) provide an environment to mature technology for developmental satellites and payloads;
(9) transition and provide best practices for satellites and ground systems to operational squadrons if necessary.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver RDSMO weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

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

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	4.157	22.039	22.408	0.000	22.408
Current President's Budget	4.028	22.039	20.844	0.000	20.844
Total Adjustments	-0.129	0.000	-1.564	0.000	-1.564
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.129	0.000			
• Other Adjustments	0.000	0.000	-1.564	0.000	-1.564

Change Summary Explanation

FY 2025 funding decreased compared to the previous President's Budget due to higher Space Force priorities.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: MMSOC Development	4.028	4.640	3.297
Description: Evolution of the Ground Services Architecture (GSA) through the on-premises hardware-based Multi-Mission Satellite Operations Center (MMSOC). Development, integration, and test of common services for space vehicle prototype and operational capabilities, including shared orbital analysis and mission planning tools, data distribution and dissemination, cyber defense, on-premises cloud computing, multi-security level operations, and enhanced ground entry points for prototype-operations. This primarily includes development and evaluation of local hardware solutions as required for space experiment and prototype requirements including both security, resiliency and availability where other cloud-based solutions will not work.			

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173SF *I Space and Missile Test and Evaluation Center*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2024 Plans: Continue to investigate then develop a separate enclave that provides data separation, encryption and logical segregation, with minimal hardware separation as required by the experiment and prototype space mission needs. Continue to improve the operation of existing and planned prototype missions that will inform new acquisitions and improve USSF's ground systems transition for the most cyber-secure posture possible. Begin to develop cyber resiliency strategies and evaluate effects and trades between on-premises vs cloud-based architectures. Partner with AFRL and others to speed technology transition of ground system capabilities from experimental to prototype phases. Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to the Long Duration Propulsive Evolved Expendable Launch Vehicle Secondary Payload Adapter (LDPE)-1 and LDPE-2 missions. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities include, but are not limited to, program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities. ***FY 2025 Plans:*** Continue to evolve hardware, on-premises based MMSOC XPro architectures for full cybersecurity compliance (PKI, 2 Factor Authentication, out of band management) and ensure reliable and resilient development and evaluation to meet "on-premises" requirements. Continue to investigate then develop a separate enclave that provides data separation, encryption and logical segregation, with minimal hardware separation as required by the experiment and prototype space mission needs. Continue to improve the operation of existing and planned prototype missions that will inform new acquisitions and improve USSF's ground systems transition for the most cyber-secure posture possible. Continue to develop cyber resiliency strategies and evaluate effects and trades between on-premises vs cloud-based architectures. Partner with AFRL and others to speed technology transition of ground system capabilities from experimental to prototype phases. Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions.			

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Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173SF *I Space and Missile Test and Evaluation Center*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, experimentation, prototyping, and activities that may leverage commercial and international opportunities. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 decreased due to transition of missions from legacy hardware-based enclave to a cloud-enabled ground system.			
Title: Cloud-Enabled Ground System Development	0.000	9.099	9.552
Description: Evaluate, develop, integrate, test and operate cloud-based space C2 capability that will transform the RSC into a more modular solution for space prototype missions, by enabling the handling and distributing mission data at multiple security levels, resolving a current capability gap on payload mission data. Primary goals of this effort will be to measure cost-effectiveness, reliability, cyber resiliency, and mission-effectiveness for upcoming technology transitions. Coordinating with mission partners and AFRL to ensure technology transition evaluation is performed as efficiently as possible. Fully transition existing and future space experiment and prototype missions to an off-premises architecture while ensuring minimal risk to space mission support. ***FY 2024 Plans:*** Begin to develop, field, and evaluate cloud-based space mission operations using commercially available architectures to increase system reliability, data distribution, and decrease system life cycle costs for future missions consistent with the GSA. Begin to prototype and demonstrate a modernized cloud-based off-premises GSA solution and follow-on EGS capabilities, to include critical technology maturation of new mission on-boarding solutions, the stand-up of integration and test environments, enabling of data distribution at multiple security levels, transition to a cloud service provider, and stand-up of shared EGS services into a combined GSA and EGS architecture. Develop, integrate and evaluate trades and implementations between hybrid (on-premises and cloud-based solutions) to determine the most cost and mission-effective optimization. Continue integrating the prototype operations center with EGS development, including developing the EGS Risk Reduction & Integration Plan for each prototype mission. Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to the LDPE-3A mission and subsequent Rapid On-Orbit Space Technology Evaluation Ring (ROOSTER) and Tetra 3, 4, & 5 missions. ***FY 2025 Plans:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173SF / *Space and Missile Test and Evaluation Center*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Continue to develop, field, and evaluate cloud-based space mission operations using commercially available architectures (Nebula) to increase system reliability, data distribution, and decrease system life cycle costs for future missions consistent with the GSA. Continue to prototype and demonstrate a modernized cloud-based off-premises GSA solution and Rapid Resilient Command and Control (R2C2) capabilities, to include critical technology maturation of new mission on-boarding solutions, the stand-up of integration and test environments, enabling of data distribution at multiple security levels, transition to a cloud service provider, and stand-up of shared R2C2 architecture. Evaluate trades and implementations between hybrid (on-premises and cloud-based solutions) to determine the most cost- and mission-effective optimization. Continue integrating the prototype operations center with R2C2 development, including developing a Risk-Reduction & Integration Plan for each prototype mission. Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to the ROOSTER and Tetra 3, 4, & 5 missions. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 increased due to transitioning away from legacy hardware-based ground systems and expansion of cloud-based solutions and integration with experimental/prototype mission operations.			
Title: Prototype Baseline Support ***Description:*** Develops expanded use of automated mission planning tools, data distribution and dissemination and cyber-defense. Purchase hardware and software as needed to maintain and advance experiment and prototype operations including: mission planning, ground equipment configuration, real-time satellite commanding, telemetry processing, mission data & cyber-defense. ***FY 2024 Plans:*** Continue to develop automated mission planning tools to decrease the requirement for additional manpower to fly the satellites, thereby decreasing the total cost to operate the anticipated 20+ experimental and prototype satellite missions. Use Federally-Funded Research and Development Contractor (FFRDC), Systems Engineering and Technical Assistance (SETA), and/or University Affiliated Research Center (UARC) support to develop and evaluate TTP across on- and off-premises systems.	0.000	8.300	7.995

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173SF *I Space and Missile Test and Evaluation Center*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Monitor, develop, and mitigate cyber risks. Ensure cyber accreditations to receive approval to operate (ATO), and coordinate cyber-defense capabilities. Develop and integrate ground antenna system capabilities for USSF mission needs. Update and include full networked integration of KAFB antenna assets, enhance needs for energy sustainability and portability of ground system support, and develop, integrate and evaluate cost-effective sustainment methodologies for hardware-based systems. Continue to develop and deliver ground solutions and support for prototype, demonstration, and experimental missions, including but not limited to: the Air Force Vanguard Navigation Technology Satellite-3 (NTS-3), and the two QZSS payloads hosted on Japanese satellites. As part of this, develop TTPs for next-generation USSF satellites. Provide for necessary infrastructure needs to perform system operations and continue evolution of system capabilities both for off- and on-premise architectures. ***FY 2025 Plans:*** Continue to develop automated mission planning tools to decrease the requirement for additional manpower to fly the satellites, thereby decreasing the total cost to operate the anticipated 20+ experimental and prototype satellite missions. Use FFRDC, SETA, and/or UARC support to develop and evaluate TTP procedures across on- and off-premises systems. Monitor, develop, and mitigate cyber risks. Ensure cyber accreditations to receive approval to operate (ATO), and coordinate cyber-defense capabilities. Develop and integrate ground antenna system capabilities for USSF mission needs. Integrate a cloud-based antenna as a service (AaaS) capability. Update and include full networked integration of KAFB antenna assets, enhance energy sustainability and portability of ground system support, and develop, integrate and evaluate cost-effective sustainment methodologies for hardware-based systems. Develop and integrate ground antenna system capabilities at the Mobile Range Flight (MRF). Continue to develop and deliver TTPs for next-generation USSF satellites. Provide for necessary infrastructure needs to perform system operations and continue evolution of system capabilities both for off- and on-premises architectures. ***FY 2024 to FY 2025 Increase/Decrease Statement:***			

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173SF *I Space and Missile Test and Evaluation Center*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 decreased due to the planned completion of ground solutions and support for NTS-3 and QZSS.			
Accomplishments/Planned Programs Subtotals	4.028	22.039	20.844

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
• SPAF 01 GNRLIT: *General Information Tech - Space*	2.046	0.000	0.000	-	0.000	0.000	0.000	0.000	-	0.000	2.046

Remarks

E. Acquisition Strategy

RDSMO will continue to use the competitively awarded Engineering, Development, Integration, and Sustainment (EDIS) contract (awarded Feb 2020) to support the development and evaluation of ground systems for prototype, experimental, demonstration, and operational satellites. RDSMO will continue to use the competitively awarded Prototype Operations (POPS)-I contract (awarded May 2022) for prototype operations support and concept development activities. RDSMO will use existing mission partner contracts to leverage cost savings or technological efficiencies, including R2C2 contracts, partnerships with AFRL (including UARC support through the Space & Nuclear Advanced Prototypes/Experiments/Tech (SNAPET) contract), and other mission partners. Acquisition strategies will be developed to determine the need for additional contracts to meet the full system requirements, and new contracts may be required as development plans evolve. Additionally, RDSMO uses an SSC Advisory & Assistance Support (A&AS) contract (SSC Acquisition and Finance Support (SAFS)-II and its follow-on SAFS-III), and an SSC SETA contract SSC Technical Support-III (STS-III), as well as FFRDC support through Aerospace.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203173SF / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*	

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
Ground Services R&D Engineering, Development, Integration, and Test	C/CPAF	SAIC : Albuquerque, NM	-	2.012	Nov 2022	9.316	Nov 2023	6.359	Nov 2024	-		6.359	Continuing	Continuing	-
EGS and Mission Partner Integration Support	Various	TBD : TBD	-	-		1.425	Feb 2024	2.734	Feb 2025	-		2.734	Continuing	Continuing	-
UARC - Space & Nuclear Advanced Prototypes/ Experiments/Tech (SNAPET) Contract (through AFRL)	SS/CPFF	Space Dynamics Laboratory : Logan, UT	-	-		3.380	Feb 2024	3.989	Feb 2025	-		3.989	Continuing	Continuing	-
SBIR/STTR	Allot	TBD : TBD	-	-		0.681	Oct 2023	0.691	Oct 2024	-		0.691	Continuing	Continuing	-
		Subtotal	-	2.012		14.802		13.773		-		13.773	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
Prototype Operations-I (POPS-I)	C/CPAF	a.i. solutions, Inc. : Kirtland AFB, NM	-	1.324	Oct 2022	1.007	May 2024	0.820	May 2025	-		0.820	Continuing	Continuing	-
		Subtotal	-	1.324		1.007		0.820		-		0.820	Continuing	Continuing	N/A

Management Services ($ 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
A&AS - STS-III	C/FFP	MEI : Los Angeles, CA	-	0.692	Nov 2022	0.400	Nov 2023	0.400	Nov 2024	-		0.400	Continuing	Continuing	-
A&AS - SAFS-II/SAFS-III	C/FFP	Tecolote : Kirtland AFB, NM	-	-		1.327	Nov 2023	1.364	Nov 2024	-		1.364	Continuing	Continuing	-
FFRDC - Aerospace	RO	Aerospace : Los Angeles, CA	-	-		3.347	Oct 2023	3.330	Oct 2024	-		3.330	Continuing	Continuing	-
Other Support	TBD	TBD : TBD	-	-		1.156	Oct 2023	1.157	Nov 2024	-		1.157	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203173SF / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

Management Services ($ 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
		Subtotal	-	0.692		6.230		6.251		-		6.251	Continuing	Continuing	N/A

	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	-	4.028		22.039		20.844		-		20.844	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203173SF / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

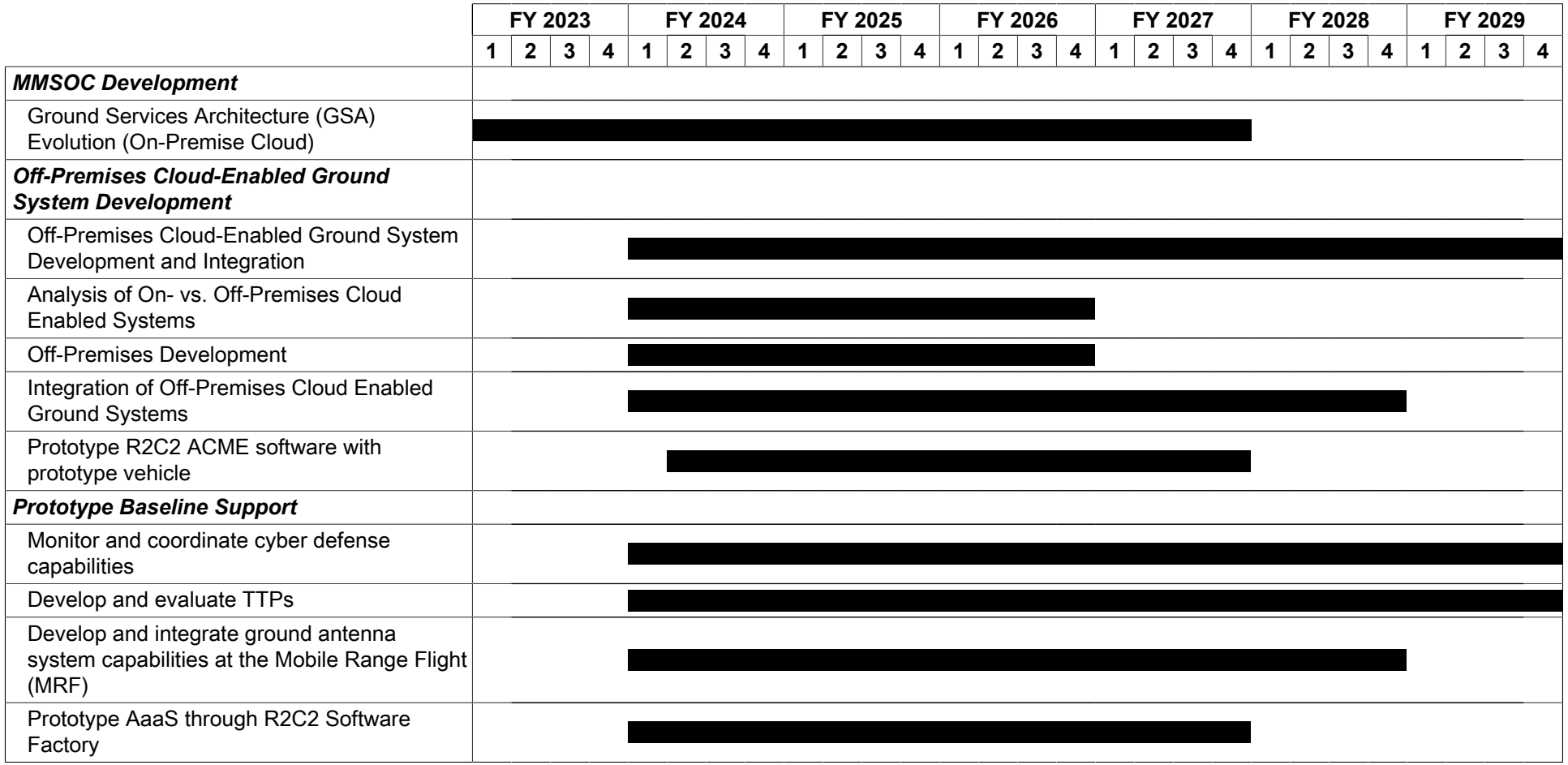

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 7	**R-1 Program Element (Number/Name)** PE 1203173SF / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space & Missile Operations*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MMSOC Development				
Ground Services Architecture (GSA) Evolution (On-Premise Cloud)	1	2023	4	2027
Off-Premises Cloud-Enabled Ground System Development				
Off-Premises Cloud-Enabled Ground System Development and Integration	1	2024	4	2029
Analysis of On- vs. Off-Premises Cloud Enabled Systems	1	2024	4	2026
Off-Premises Development	1	2024	4	2026
Integration of Off-Premises Cloud Enabled Ground Systems	1	2024	4	2028
Prototype R2C2 ACME software with prototype vehicle	2	2024	4	2027
Prototype Baseline Support				
Monitor and coordinate cyber defense capabilities	1	2024	4	2029
Develop and evaluate TTPs	1	2024	4	2029
Develop and integrate ground antenna system capabilities at the Mobile Range Flight (MRF)	1	2024	4	2028
Prototype AaaS through R2C2 Software Factory	1	2024	4	2027