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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Air Force **Date:** February 2020

<b>Appropriation/Budget Activity</b> 3620F: <i>Research, Development, Test &amp; Evaluation, Space Force I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	4.397	0.000	4.397	4.013	4.085	4.158	4.234	Continuing	Continuing
67A014: <i>R&amp;D Space &amp; Missile Operations</i>	-	0.000	0.000	4.397	0.000	4.397	4.013	4.085	4.158	4.234	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

In FY 2021, PE 1203173F, Space and Missile Test and Evaluation Center efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1203173SF, Space and Missile Test and Evaluation Center from Appropriation 3600, Budget Activity 07 due to the creation of a new Appropriation for Space Force.

The Research and Development Space and Missile Operations (RDSMO) program, executed by the Innovation and Prototyping Directorate at Kirtland AFB, NM, conducts space and missile Research and Developmental Test and Evaluation (RDT&E) and Initial Operational Test and Evaluation (IOT&E) in support of prototype experimental, demonstration, and operational satellites at the RDT&E Support Complex (RSC) and the Mobile Range Flight (MRF) at Kirtland, NM and at Schriever AFB, CO. 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) and fixed/deployable telemetry, tracking, and commanding (TT&C) antenna systems in support of AF and DoD missions and transitions designated satellite missions to the operational command upon user needs. Funds in the General Information Technology (Space) line in appropriation 3022, Procurement, Space Force, procures Information Technology products to support RDSMO.

The objective of the MMSOC C2/GSE environment is to develop the capability to rapidly support R&D, prototype and operational systems and to transition R&D space vehicle technology with residual military utility to operational status for immediate warfighter support. MMSOC is a multiple mission operation system that uses standard hardware and software infrastructure to (1) perform satellite C2 in support of launch requirements; (2) develop and test tactics, techniques, procedures and concepts to conduct satellite operations; (3) provide a satellite C2 incremental block evolution resource for RDT&E of new satellite and C2 systems and concepts; and (4) deliver operational flexibility for new and legacy satellite missions.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	4.397	0.000	4.397
Total Adjustments	0.000	0.000	4.397	0.000	4.397
• 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	0.000	0.000			
• Other Adjustments	0.000	0.000	4.397	0.000	4.397

**Change Summary Explanation**

FY 2021: +\$4.397M; funds starting in FY 2021 were transferred from RDT&E, Air Force to RDT&E, Space Force.

<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
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<b>Title:</b> MMSOC Development	0.000	0.000	4.397
<b>Description:</b> Evolution of the Ground Services Architecture (GSA) through the 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, cloud computing, multi-security level operations, and enhanced ground entry points for geosynchronous proto-ops.			
<b>FY 2020 Plans:</b> N/A			
<b>FY 2021 Plans:</b> Continue providing capability to USSF HQ for reduced cost of operations and maintenance through evolution of the ground services architecture and automated processes. Integrate EGS backwards functionality into MMSOC C2. Continue LDPE-1 & 2 while providing initial support to Tetra-1 & 2 and LDPE-3A & 4 mission C2. Provide backup to Enterprise Ground Services (EGS) program mission schedule. Continue support to the AFSPC-12 payload, Navigation Technology Satellite-3 (NTS-3) and Tetra prototyping projects. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>			

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
N/A			
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	0.000	4.397

<b>D. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• SPAF 01 BP23 GNRLIT / 1203173F: <i>General Information Technology</i>	1.361	1.894	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• SPSF 01 BP23 GNRLIT / 1203173SF: <i>General Information Technology</i>	0.000	0.000	1.926	0.000	1.926	1.962	1.999	2.035	2.073	Continuing	Continuing

**Remarks**  
 In FY2021, P-1 Line Item GNRLIT / General Information Technology efforts were transferred to Appropriation 3022, Procurement, Space Force, from Appropriation 3021 due to the creation of a new Appropriation for Space Force.

**E. Acquisition Strategy**  
 Modernize ground system capabilities and leverage MMSOC sustainment as a test bed for new ground service development, integration testing and operationalization. This includes integration and testing of early EGS prototypes for the Space Based Infra-Red System (SBIRS) Highly Elliptical Orbit (HEO) Migration to EGS (HOME), Operationally Responsive Space (ORS)-5, ROOSTER (formerly Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA)) Augmented Geostationary Laboratory Experiment (EAGLE), Mycroft, Long Duration Propulsive ESPA (LDPE), AFSPC-12 payload, NTS-3 and Tetra prototyping projects. The US Space Force competitively awarded the new Engineering, Development, Integration, and Sustainment (EDIS) Contract to support MMSOC, MRF and EGS activities. Additionally, MMSOC is using a competitively awarded Space Test and Engineering Contract (STEC) and uses Advisory & Assistance Support (A&AS) contracts. These contracts are all managed by Space and Missile Systems Center (SMC).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 7				PE 1203173SF / Space and Missile Test and Evaluation Center				67A014 / R&D Space & Missile Operations							
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Services R&D Engineering, Development, Integration, and Test	C/Various	Various : TBD	-	-		-		2.554	Oct 2020	-		2.554	Continuing	Continuing	-
Core Services Development and Configuration	MIPR	Various : TBD	-	-		-		0.200	Jan 2021	-		0.200	Continuing	Continuing	-
Service Bus Architecture Standards	MIPR	NASA Goddard : Greenbelt, MD	-	-		-		0.050	May 2021	-		0.050	Continuing	Continuing	-
Information Assurance Engineering	MIPR	SAF/FMBIB : Albuquerque, NM	-	-		-		0.127	Jan 2021	-		0.127	Continuing	Continuing	-
<b>Subtotal</b>			-	-		-		2.931		-		2.931	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Space Test and Engineering Contract (STEC) (MMSOC)	C/CPAF	LINQUEST : Kirtland, AFB, NM	-	-		-		0.382	Nov 2020	-		0.382	Continuing	Continuing	-
<b>Subtotal</b>			-	-		-		0.382		-		0.382	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS- METIS	Various	Various : Kirtland, AFB, NM	-	-		-		1.084	Mar 2021	-		1.084	Continuing	Continuing	-
<b>Subtotal</b>			-	-		-		1.084		-		1.084	Continuing	Continuing	N/A





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**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 3620F / 7	<b>R-1 Program Element (Number/Name)</b> PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>	<b>Project (Number/Name)</b> 67A014 / <i>R&amp;D Space &amp; Missile Operations</i>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Long Duration Propulsive ESPA (LDPE)- Tetra	[REDACTED]
AFSPC-12 Payload Support	[REDACTED]

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Air Force		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 3620F / 7	<b>R-1 Program Element (Number/Name)</b> PE 1203173SF / <i>Space and Missile Test and Evaluation Center</i>	<b>Project (Number/Name)</b> 67A014 / <i>R&amp;D Space &amp; Missile Operations</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>MMSOC Development</i></b>				
MMSOC Ground Services Architecture (GSA) Evolution	1	2021	4	2025
GSA Backwards Compatibility, Test, and Mission Schedule Relief	1	2021	3	2023
Core Services Development and Configuration	1	2021	4	2025
MMSOC Space Test Program Satellite-2 (STPSat-2)	1	2021	4	2025
MMSOC Space Test Program Satellite-3 (STPSat-3) (Customer Funded)	1	2021	4	2025
MMSOC CloudSat Supt (Customer Funded)	1	2021	4	2023
MMSOC Green Propellant Infusion Mission (GPIM) Support (Customer Funded)	1	2021	2	2021
MMSOC Demonstration and Science Experiment (DSX) Support (Customer Funded)	1	2021	2	2022
MMSOC ORS-5 Support (Customer Funded)	1	2021	4	2025
Navigation Technology Satellite NTS-3	1	2021	1	2025
MMSOC Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) Augmented Geostationary Laboratory Experiment (EAGLE) Support (Customer Funded)	1	2021	4	2021
MMSOC Mycroft Support (Customer Funded)	1	2021	4	2022
MMSOC Long Duration Propulsive ESPA-1 (Customer Funded)	1	2021	3	2022
Long Duration Propulsive ESPA (LDPE)- Tetra	1	2021	3	2025
AFSPC-12 Payload Support	1	2021	4	2025