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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206440SF / <i>Next-Gen OPIR -- Ground</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	542.477	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
657106: <i>Next-Gen OPIR-Ground</i>	-	0.000	542.477	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In accordance with Congressional direction in the FY22 enacted budget, funds in Program Element 1206442SF, Project 657106, Next-Gen OPIR Ground, have been transferred to 1206440SF.

A. Mission Description and Budget Item Justification

Next-Gen OPIR Ground (Project 657106): Next-Gen OPIR Ground, also known as Future Operationally Resilient Ground Evolution (FORGE), consists of Command and Control (C2) migration to US Space Force (USSF) Enterprise Ground Services (EGS), modernization of Mission Data Processing (MDP) to implement an open framework and develop mission applications, and required development and/or upgrades to Relay Ground Stations (RGS) to meet USSF current and future space domain demands. FORGE and EGS efforts combined will provide the flexibility and scalability to integrate new satellites, sensors and capabilities more rapidly and efficiently in order to meet evolving threats and warfighter needs. Identify shared/common platform, infrastructure, and data layer solutions to support open frameworks and architectures across the enterprise ground portfolio. The Next-Gen OPIR ground efforts enable cyber enhancements for both space and ground systems. EGS will introduce common ground services such as Telemetry, Tracking, and Commanding (TT&C); mission management; and automation. To support initial Next-Gen OPIR Space satellite launches without driving risk into the FORGE development schedule, the program has established a risk reduction ground Next-Gen OPIR Interim Operations (NIO) capability based on a limited Space Based Infrared System (SBIRS) Block 20 solution.

The total cost of the FORGE Rapid Prototyping Middle Tier of Acquisition effort is 2,849.44 million, including RDT&E and procurement of prototype units. The FORGE Rapid Prototyping is not fully funded across the Future Years Defense Program. The Department of the Air Force is assessing all options to address the funding shortfalls for MTA programs including additional funding in a future budget request, performance trades based on technical maturity, or transition to alternative pathways

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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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	542.477	0.000	0.000	0.000
Total Adjustments	0.000	542.477	0.000	0.000	0.000
• 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	542.477			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

In accordance with Congressional direction in the FY22 enacted budget, funds in Program Element 1206442SF, Project 657106, Next-Gen OPIR Ground, have been transferred to 1206440SF.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
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Title: FORGE - C2	-	64.253	0.000
Description: The Space Force is transitioning to Enterprise Ground Services, a Government-owned ground architecture that focuses on Mission Management (MM), TT&C, and Ground Control (GC) utilizing common services. FORGE C2 creates Mission Unique Software (MUS) and provides sensor/spacecraft specific C2 capabilities to plug into the EGS suite of services. C2 of the legacy SBIRS constellation assets will be transitioned using the FORGE C2 portion of EGS.			
FY 2022 Plans: GEO Non-Integrated Threat Warning/Attack Assessment (ITW/AA) Ops Migration to EGS (GNOME): Continue development and integration of C2 MUS and core applications for a GEO space vehicle onto EGS. Conduct live testing of developed MUS and integrated system at all applicable test locations. Work with Naval Research Laboratory (NRL) to refine software required to operate MUS with core applications on the EGS framework (e.g., Neptune & Virtual Mission Operations Center (VMOC)) and support deficiency burn-down from test events. SBIRS Constellation Cutover (C2X): Continue development of MUS and integration activities to support migration of all HEOs and GEO assets to EGS/FORGE framework. Continue to develop or refine NRL software required to operate core applications, and conduct preliminary testing.			
FY 2023 Plans:			

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
FY23 Budget Year Plans are captured in Program Element 1206442SF. They will be captured in Program Element 1206440SF per direction in the FY22 Appropriations Bill in the next budget cycle.				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 funding amount in PE 1206442SF increased compared to the FY 2022 funding amount in this PE by 8.05M as SBIRS C2 constellation cutover activities ramp-up.				
Title: FORGE - Mission Data Processing (MDP)		-	296.157	0.000
Description: The FORGE MDP effort creates a replacement for the existing legacy SBIRS Ground mission processing applications which have cyber security and scalability limitations. MDP is creating a cyber-resilient, flexible, and scalable open framework capable of meeting current and future threats. MDP will plan OPIR and other mission data resource utilization to meet warfighter requirements. MDP provides the ability to ingest and publish varying levels of processed data for enhanced processing, perform efficient and systematic upgrades, and orchestrate real-time wide-band processing for ITW/AA and non-ITW/AA mission areas. The MDP system provides modular mission applications to meet the future challenges of Missile Warning (MW), Missile Defense (MD), Battlespace Awareness (BA), Technical Intelligence (TI). MDP is critical to making cyber-secure, effective use of the increased amounts of data that will be collected by Next-Gen OPIR.				
FY 2022 Plans: Continue development of follow-on Mission Data Processing Framework Provider (MDPAF) effort. Award follow-on Mission Data Processing Applications Provider (MDPAP) effort. Establish MDP capability in the OPIR Battlespace Awareness Center (OBAC) and Mission Control Station (MCS) enclaves. Begin creating and processing approved plans for ITW/AA, Theater Event System, and Missile Defense certification. Start SBIRS Legacy and Next Gen Polar sensor specific processing software. Additionally, FY 2022 funding will allow the program 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, etc.				
FY 2023 Plans: FY23 Budget Year Plans are captured in Program Element 1206442SF. They will be captured in Program Element 1206440SF per direction in the FY22 Appropriations Bill in the next budget cycle.				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 funding amount in PE 1206442SF decreased compared to the FY 2022 funding amount in this PE by \$6.658M as GNOME activities begin to ramp down.				
Title: FORGE - Next Gen Transition		-	159.067	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: The title of this major thrust has changed from "Next Gen Interim Operations (NIO)" to "FORGE-Next Gen Transition" to better encompass and describe all of the associated activities. Next Gen is the development to transition future OPIR space systems to using FORGE and EGS for mission processing and C2.</p> <p>Included in this effort is the development of an interim system (NIO) to ensure the most critical ground processing is ready in time for the first Next-Gen OPIR satellite launch. NIO will create mono tracks and publish those mono tracks to the existing SBIRS Block 20 ground system for fusion and dissemination to the warfighter.</p> <p>FY 2022 Plans: Continue development of the risk reduction system, and conduct early integration and testing events. Continue development of FORGE C2 and start integration with EGS. Start install of hardware at the Consolidated and Continental United States (CONUS) Relay ground sites. Start integration of mission data processing applications into the framework to support NGG. Continue to execute NGG contract.</p> <p>FY 2023 Plans: FY23 Budget Year Plans are captured in Program Element 1206442SF. They will be captured in Program Element 1206440SF per direction in the FY22 Appropriations Bill in the next budget cycle.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 funding amount in PE 1206442SF increased compared to the FY 2022 funding amount in this PE by \$10.107M as initial integration and testing events begin.</p>				
<p>Title: FORGE - Relay Ground Stations (RGSs)</p> <p>Description: OPIR data collected in space must be relayed to ground entry points and routed to provide warfighters with timely information. The legacy SBIRS ground architecture requires RGS upgrades and new RGSs to receive OPIR data from legacy and future Next-Gen OPIR assets. This effort expands the set of RGSs with up to three additional RGSs that will use common hardware capable of supporting all Next Gen OPIR space assets. This effort will provide data to the MCS for processing and dissemination to warfighters and National Command Authorities. The RGS modernization effort will include the ability to operate antennas, process data, and support older Defense Support Program (DSP) assets.</p> <p>FY 2022 Plans: Relay Ground Station (RGS): Start build-out of RGS-A site facility which is an integral part of RGS development. Start antenna/infrastructure design. Perform site surveys and planning for the next RGS site.</p> <p>FY 2023 Plans:</p>		-	23.000	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY23 Budget Year Plans are captured in Program Element 1206442SF. They will be captured in Program Element 1206440SF per direction in the FY22 Appropriations Bill in the next budget cycle.			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The FY 2023 funding amount in PE 1206442SF increased compared to the FY 2022 funding amount in this PE by \$54.000M due to hardware/antenna purchases and continuing effort to install, integrate and test first site while initiating planning and design efforts on the second site.			
Accomplishments/Planned Programs Subtotals	-	542.477	0.000

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

N/A

Remarks

E. Acquisition Strategy

The Next Gen OPIR Ground program is executing an acquisition strategy using Middle Tier of Acquisition (MTA) authority for Rapid Prototyping approved via Acquisition Decision Memorandum on 5 Dec 19.

To support this acquisition strategy, the program will follow an agile approach to develop capabilities and a robust DevSecOps (Development/Security/Operations) solution to deliver the capabilities. The FORGE program is pursuing a rapid prototyping approach founded primarily on software and infrastructure reuse, partnerships with other programs, limited scope, use of existing contracts where necessary, and maximizing competition where possible. For the MDP thrust, the FORGE program will competitively use Other Transaction (OT) authorities to develop the framework and the applications. For the C2 thrust, the program team will use existing Space Systems Command (SSC) contracts with an emphasis to on-ramp to Enterprise Ground Services as soon as practical. For the Next Gen Transition effort, the program is using the Next Gen GEO contract with the prime contractor. The program is executing the MDP, C2, and NIO thrusts within the scope of its Middle Tier of Acquisition authorities. The program is executing the RGS thrust using traditional acquisition authorities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206440SF / Next-Gen OPIR -- Ground	Project (Number/Name) 657106 / Next-Gen OPIR-Ground
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FORGE - C2	Various	Various : TBD	-	-		64.253	Jan 2022	-		-		-	Continuing	Continuing	-
FORGE - MDP	Various	Various : TBD	-	-		245.025	Nov 2021	-		-		-	Continuing	Continuing	-
FORGE - Next Gen Transition	Various	Various : TBD	-	-		159.067	Nov 2021	-		-		-	Continuing	Continuing	-
FORGE - RGS-A	Various	Various : TBD	-	-		23.000	Nov 2021	-		-		-	Continuing	Continuing	-
FORGE - RGS Second Site	TBD	Various : TBD	-	-		0.000		-		-		-	Continuing	Continuing	-
SE&I	TBD	TBD : TBD	-	-		13.118	Dec 2021	-		-		-	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corporation : El Segundo, CA	-	-		2.125	Jan 2022	-		-		-	Continuing	Continuing	-
Subtotal			-	-		506.588		-		-		-	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
FFRDC	RO	Aerospace Corporation : El Segundo, CA	-	-		4.688		-		-		-	Continuing	Continuing	-
A&AS	Various	Various : TBD	-	-		30.851		-		-		-	Continuing	Continuing	-
Other Support	Various	Various : TBD	-	-		0.350		-		-		-	Continuing	Continuing	-
Subtotal			-	-		35.889		-		-		-	Continuing	Continuing	N/A

			Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-	542.477	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force **Date:** April 2022

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	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
FORGE - C2																												
GNOME																												
SBIRS Constellation C2 Transition																												
FORGE - MDP																												
Competitive Prototype Applications Provider																												
Follow-On Prototype Framework Development																												
Follow-On Prototype Applications Provider Development																												
Sensor Specific Processing																												
FORGE - Next Gen Transition																												
Next Gen GEO Development																												
Next Gen Polar Development																												
FORGE - RGS																												
RGS-A Development																												
Second Site Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force **Date:** April 2022

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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>FORGE - C2</i>				
GNOME	1	2021	1	2024
SBIRS Constellation C2 Transition	3	2021	4	2024
<i>FORGE - MDP</i>				
Competitive Prototype Applications Provider	1	2021	4	2021
Follow-On Prototype Framework Development	1	2021	4	2025
Follow-On Prototype Applications Provider Development	2	2022	4	2027
Sensor Specific Processing	1	2021	4	2025
<i>FORGE - Next Gen Transition</i>				
Next Gen GEO Development	1	2021	4	2027
Next Gen Polar Development	1	2021	4	2027
<i>FORGE - RGS</i>				
RGS-A Development	1	2021	4	2025
Second Site Development	2	2023	4	2027