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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

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	787.541	370.354	353.807	300.025	0.000	300.025	134.068	0.000	0.000	0.000	0.000	1,945.795
643833: *MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP*	787.541	370.354	353.807	300.025	0.000	300.025	134.068	0.000	0.000	0.000	0.000	1,945.795
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 447

A. Mission Description and Budget Item Justification

The Global Positioning System (GPS) is a space-based radio Positioning, Navigation, and Timing (PNT) distribution system. GPS User Equipment (UE) consists of standardized receivers, antennas, antenna electronics, and other related equipment, grouped together in sets to derive navigation and time information transmitted from GPS satellites. These receiver sets are used by the Department of Defense (DoD). Research, Development, Test and Evaluation (RDT&E) funds UE development, integration, test, and analysis for new PNT receiver capabilities in Navigation Warfare (NAVWAR) across all military platforms using GPS services.

The Military Global Positioning System User Equipment (MGUE) Increment (Inc) 1 program is responsible for the development of standard modernized receiver form factors for the Service-nominated lead platforms. The MGUE Inc 1 Capability Development Document (CDD) was approved by the Joint Requirements Oversight Council (JROC) on 24 July 2014. MGUE Inc 1 is initiating a new family of modernized GPS receivers that will deliver significantly improved capability to counter current and emerging PNT threats and enable military operations in a NAVWAR environment where current legacy receiver performance would be compromised. MGUE Inc 1 received a Milestone A decision in April 2012. The program received direction in February 2014, from the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) to execute a new acquisition strategy, accelerating the program to provide test units faster to facilitate military end users. The MGUE program received a Milestone B decision in January 2017.

The MGUE Inc 2 effort will continue to expand Military-Code (M-Code) receiver technology into additional applications (space receivers and precision guided munitions), and develop a modernized Handheld (HH) device to meet Service requirements. This effort leverages the MGUE Inc 1 technology to the maximum extent while addressing the production of M-Code integrated circuits far into the future. The MGUE Inc 2 program is being executed in three parts: 1) Risk Reduction Activities, 2) Miniature Serial Interface (MSI) Receiver Card Middle Tier Acquisition (MTA) rapid prototyping, and 3) Joint Modernized GPS HH Receiver Middle Tier Acquisition rapid prototyping effort. The JROC approved the MGUE Inc 2 CDD on 6 April 2018. The Air Force Service Acquisition Executive approved the MGUE Inc 2 Acquisition Strategy to include designation of two MTA Rapid Prototype efforts: 1) MSI Receiver Cards to include Next-Generation (Next Gen) Application Specific Integrated Circuit (ASIC) and 2) Joint, Modernized HH Receiver.

The total cost of the Military GPS User Equipment Increment 2 Miniature Serial Interface Middle Tier of Acquisition effort is 1,532.5 million, including RDT&E and procurement of prototype units. The MGUE Inc 2 MSI program 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 and performance trades based on technical maturity.

The total cost of the Military GPS User Equipment Increment 2 Joint Modernized Hand Held Middle Tier of Acquisition effort is 71.6 million, including RDT&E and procurement of prototype units. The MGUE Inc 2 JMHH RP program is fully funded across the Future Years Defense Program.

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

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	381.394	353.807	299.499	0.000	299.499
Current President's Budget	370.354	353.807	300.025	0.000	300.025
Total Adjustments	-11.040	0.000	0.526	0.000	0.526
• 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	-8.881	0.000			
• Other Adjustments	-2.159	0.000	0.526	0.000	0.526

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Military Global Positioning System (GPS) User Equipment (MGUE) Increment (Inc) 1 Product Development	65.232	24.581	11.627
Description: The MGUE Inc 1 program develops standard modernized receiver form factors for the Service-nominated lead platforms in accordance with the MGUE Inc 1 CDD.			
FY 2024 Plans: Complete GPS Enterprise Engineering updates to GPS Receiver Application Module - Standard Electronic Module (GRAM-S/M). Conduct deficiency resolution for test problems resulting from lead platform testing. Complete Program Executive Officer (PEO) Certification of Readiness for B-2 and Navy Guided Missile Destroyer (DDG) Platform Operational Test and Evaluation (OT&E).			

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, prototyping, etc. ***FY 2025 Plans:*** Complete contractor engineering support of B-2 combined Development Testing/Operational Testing (DT/OT) and DDG Platform OT&E. Complete Program Executive Officer (PEO) Certification of Readiness for B-2 Platform combined Developmental Test and Operational Test and Evaluation (OT&E). Continue deficiency resolution activities of lead platform test results. 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 the completion of contractor GRAM-S/M and card level Development Testing (DT).			
Title: Advanced Technology ***Description:*** Advanced Technology/Pre-Tech includes efforts to mature technology for future GPS receivers identified in the MGUE CDDs. These efforts aim to find innovative solutions to increase resiliency in GPS performance and improve on size, weight, power, and cost (SWAP/C) of military receivers. ***FY 2024 Plans:*** Mature and test technologies and prototype demonstration systems that increase the robustness and resilience of Modernized GPS receivers and PNT system solutions. Implement required Request for Change modifications, including Regional Military Protection (RMP) and from a engineering perspective, extended Pseudorandom Noise (PRN) codes into the Modernized Protection Device (MoPD). Support the integration and security certification activities associated with implementing MoPD into a multi-GNSS software defined radio platform and continue to demonstrate the functional performance and flexibility of this security architecture. Continue multi-GNSS prototyping exploring the trustworthiness of "covered signals" to increase the resilience and capability of military PNT equipment and to meet applicable National Defense Authorization Act objectives. Continue working with US Special Forces and Foreign Military System (FMS) customers on supporting test, evaluation, and transition opportunities for the Military Underwater Navigation System with M-Code (MUNS-M). Complete the qualification testing and prototype fabrication of the Integrated M-Code/Antenna System (IMAS). ***FY 2025 Plans:*** Continue with the integration of MoPD into a multi-GNSS software defined radio platform. Support MGNSS receiver security certification activities, specifically related to RMP and extended PRN codes added capabilities. Build on FY 2024 multi-GNSS advancements in resilience and assurance algorithms by developing standard metrics and test methodologies that enable unique implementations to be compared / measured. Utilize algorithms implemented on Global Navigation Satellite System	5.717	7.816	12.492

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Test Architecture (GNSSTA) as well as Open Service receivers for international partners to validate standard metrics and test methodologies. In coordination with international partners, perform platform integration and Anti-Jam (AJ) performance demonstration of IMAS on a Unmanned Aerial Vehicles (UAV) and/or Unmanned ground vehicles (UGV). ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 increased due to an increase in algorithm validation/implementation activity with international partners to demonstrate IMAS on a UAV or UGV.			
Title: MGUE Inc 1 System/Platform Integration and Performance Certification ***Description:*** Integration of MGUE Inc 1 receiver form factors into the Service-nominated lead platforms in support of developmental and operational (or field) test events. Conduct technical and operational modernization impact analysis for MGUE Service lead platform integration. ***FY 2024 Plans:*** Continue platform-level verification testing of the GRAM-S/M. Continue platform-level requirements verification and reliability test activities as required to include approved engineering changes. Complete B-2 and DDG integration and qualification efforts in support of developmental and operational or field test events. Complete B-2 combined developmental and operational test. Assist DoD integration of M-Code GPS receivers for joint Service non-lead platforms. 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, etc. ***FY 2025 Plans:*** Complete B-2 & DDG platform integration and equipment installation to support DT/OT. Complete B-2 and DDG Platforms DT/OT efforts. Complete test data analysis and final reports. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 decreased due to completing integration and qualification efforts on both the B-2 and DDG platforms.	23.988	49.934	15.750
Title: Information Assurance, Security/Compatibility Certification, and Test/Evaluation ***Description:*** Develop, implement, and maintain GPS security certification programs. Develop policy, strategy and resource requirements for MGUE security certification and compatibility certification. Security certification, compatibility certification, and security approval ensures future military GPS receivers protect critical program information and continue working in all environments and concepts of operations called for by U.S. Strategic Command. ***FY 2024 Plans:***	12.988	18.609	20.092

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Continue to conduct initial and delta security certification activities for all M-Code receivers, as required. Continue modernized security evaluations/tests for SAASM and other legacy GPS receiver equipment. Review, approve, and track Selective Availability Anti-Spoofing Module (SAASM), M-Code receivers, and legacy receiver certified platforms and integrated applications for all of DoD. Continue technical support to develop, validate and process engineering changes. Continue SAASM and modernize Key-Data Loading Installation Facility (KLIF) effort. The KLIF facilitates the programming of black key (cryptographic) algorithms into the SAASM to provide accurate positioning solutions for GPS users using secure equipment. Conduct GPS Enterprise Integrated System Test (IST) activities for MGUE lead platforms. ***FY 2025 Plans:*** Continue to conduct initial and delta security certification activities for all M-Code receivers, as required. Continue modernized security evaluations/tests for SAASM and other legacy GPS receiver equipment. Review, approve, and track SAASM, M-Code receivers, and certified legacy receiver certified platforms and integrated applications for all of DoD. Continue technical support to develop, validate and process engineering changes. Continue SAASM and modernize KLIF effort. The KLIF facilitates the programming of black key (cryptographic) algorithms into the SAASM to provide accurate positioning solutions for GPS users using secure equipment. Continue providing mobile Crypto Initialization Capability for SAASM receivers and develop mobile initialization capability for M-code receivers. Continue Military Standard Order certification for GPS Precise Positioning Service receivers for integration into aviation platforms. Military Standard Order program provides equivalent Federal Aviation Administration certification for GPS Precise Positioning Service receivers. Continue GPS Enterprise IST activities for MGUE program. Continue integration and testing of MGUE Inc 2 MSI ASIC. Conduct MGUE Inc 2 HH ASIC early Integration and Testing. Continue to provide Military Standard Order support to portfolio of airborne GPS receiving programs. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** FY 2025 increased due to MGUE Inc 2 transition to Integration and Testing.			
Title: MGUE Inc 2 Risk Reduction	2.671	0.000	0.000
Description: The MGUE Inc 2 program will develop M-Code receiver technology to meet Service requirements. MGUE Inc 2 Risk Reduction activities include, but are not limited to, acquisition strategy development, early design efforts through Preliminary Design Review (PDR) for the next generation Application Specific Integrated Circuit (ASIC) using 14nm (nanometer) ASIC technology node, handheld design activities and early user demonstrations, advanced concept studies, receiver component prototyping to include MGUE Inc 2 requirements. ***FY 2024 Plans:*** N/A ***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 I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
N/A ***FY 2024 to FY 2025 Increase/Decrease Statement:*** N/A			
Title: MGUE Inc 2 Miniature Serial Interface (MSI) Receiver Card Rapid Prototyping	254.440	235.541	218.469
Description: The MGUE Inc 2 program will develop M-Code receiver technology for additional applications (space receivers, precision guided munitions, and handheld receivers) to meet Service requirements. MGUE Inc 2 MSI Receiver Card Rapid prototyping builds on the ASIC post-Preliminary Design Review (PDR) progress and will develop, integrate, produce, and test M-Code capable, low size and power GPS MSI form factor to include a Next Gen ASIC. The MSI receiver card is to meet the needs of low size, weight and power (SWaP) ground-embedded users. However, the Next Gen ASIC must meet the needs of the MSI form factor and be backwards compatible with Inc 1 performance requirements as a potential functional replacement due to Inc 1 ASIC obsolescence. MGUE Inc 2 MSI Receiver Card Rapid Prototyping has been broken out into a separate effort for additional visibility. ***FY 2024 Plans:*** Continue two development contracts for new low size/power MSI receiver card to include Next Gen ASIC, hardware, and software. Continue efforts related to the prototypes including, but not limited to, ordering of components for early integrated testing, long-lead parts planning and purchase, procurement of test equipment and articles, manufacturing prototypes, and manpower. Complete First Test Article (FTA) and Proof of Design (POD) for all vendors. Assess ASIC viability and determine whether a respin is required. Contractors will continue to verify performance requirements are met through demonstrations and testing. Continue security certification and design validation activities. Continue investments in core ASIC technology, early ASIC fabrication, manufacturing and Intellectual Property procurement. Continue MSI rapid prototyping through intellectual property maturation. 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 2025 Plans:*** Continue two development contracts for new low size/power MSI receiver card to include Next Gen ASIC, hardware, and software. Continue efforts related to the prototypes including, but not limited to, ordering of components for early integrated testing, long-lead parts planning and purchase, procurement of test equipment and articles, manufacturing prototypes, and manpower. If necessary, complete ASIC respin. Complete First Test Article (FTA) and Proof of Design (POD) for all vendors. Continue efforts to complete security certification, formal MSI Functional Qualification Test, and Functional Configuration Audit/ Physical Configuration Audit activities. Complete development of the receiver form factor with next gen ASIC. Continue MSI rapid prototyping through intellectual property maturation. Rapidly respond to implement system resiliency and situational awareness			

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
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 funding decreased due to transition from FY 2024 vendor completion of FTA, to test activities in FY 2025.			
Title: MGUE Inc 2 Handheld ***Description:*** The MGUE Inc 2 HH effort will develop a joint common modernized HH receiver that will provide M-code, anti-spoof, and anti-jam capabilities, with significant improvements in size, weight, and power. The goal of the MGUE Inc 2 HH risk reduction activities is to reduce development risk for the MGUE Inc 2 HH receiver through feedback from the rapid prototyping process and multiple joint service demonstration events. Transition HH risk reduction activities to a MTA Rapid Prototyping effort in line with the Service Acquisition Executive (SAE)-approved MGUE Inc 2 Acquisition Strategy. ***FY 2024 Plans:*** Continue the HH MTA Rapid Prototyping effort in line with the 2018 SAE-approved MGUE Inc 2 Acquisition Strategy. Continue to develop the Ground Application Technical Requirement Document (TRD)-compliant prototype that will be M-Code capable and ready for security approval. Continue to conduct Joint service demonstration events to inform HH development, burning down user acceptance risk. Continue to integrate MSI technology into the HH advanced prototype; continue to perform limited operational testing, security testing and power model analysis. Analyze prototype manufacturing, hardware, software, and critical component completeness in support of the initial product baseline. 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, etc. ***FY 2025 Plans:*** Continue the HH MTA Rapid Prototyping effort in line with the 2018 SAE-approved MGUE Inc 2 Acquisition Strategy. Continue to develop the Ground Application TRD-compliant prototype that will be M-Code capable and ready for security approval. Continue to conduct Joint service demonstration events to inform HH development, burning down user acceptance risk. Continue to integrate MSI technology into the HH advanced prototype via testing hardware/software, proprietary message sets, key loading, zeroization, etc.; continue to perform limited operational testing, security testing and power model analysis. Continue to support Technology Advancement Group (TAG) as they conduct Functional Qualification Testing (FQT) activities. Complete HH Objective C and award HH Objective C Option contract. Analyze prototype manufacturing, hardware, software, and critical component completeness in support of the initial product baseline. 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:***	5.318	17.326	21.595

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
FY 2025 increased due to MSI first test article and HH prototype integration activities.			
Accomplishments/Planned Programs Subtotals	370.354	353.807	300.025

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
• SPSF 01 GPSSPC: *Global Postioning (Space)*	0.947	0.893	0.835	-	0.835	0.883	0.834	0.852	0.870	0.000	6.114

Remarks

Procurement, Space Force (PSF) funding in this PE supports legacy SAASM efforts. Similar work for the MGUE is in the planning phase.

E. Acquisition Strategy

The MGUE program has developed a comprehensive acquisition strategy to provide modernized GPS capabilities to U.S. and Allied Forces by developing a competitive market driven approach. This strategy establishes the signal compatibility and security criteria along with a process for evaluating components to enable rapid movement from development to fielding. The pillars of this effort are: (a) establishing time certain and low risk development; (b) bounding requirements to leverage mature technology to the maximum extent possible; (c) focusing on the development of form factors based on well-defined standards to support lead platform integration; and (d) implementing a proactive, collaborative MGUE platform integration activity to mitigate risk and reduce cost for DoD force structure modernization.

The MGUE program awarded three sole source contracts for the Inc 1 Technology Development Phase effort in September 2012, as follow-on efforts to the competitively awarded Modernized User Equipment (MUE) contracts awarded in June 2006. The effort spans the Technology Maturation and Risk Reduction Phase through design and includes integration and test of M-Code receivers into Service-nominated lead platforms. In 1QFY2021, the program office converted the remaining Raytheon GRAM-S/M development effort to a Firm Fixed Price contract type at the direction of the Air Force Service Acquisition Executive. The contracts of the other two vendors remain primarily a Cost Plus Incentive Fee type contract. This effort also includes the security and compatibility certification of GPS receiver cards as a part of the integration effort. The Service lead platforms will select from the available vendors to integrate and perform operational testing with funding from the MGUE program. This supports compliance with PL 111-383, section 913.

The MGUE Inc 2 program developed an Acquisition Strategy to continue MGUE development by: addressing long term producibility of MGUE ASICs, identifying a U.S. owned trusted foundry for ASIC development, delivering GPS receiver cards to meet stringent Inc 2 requirements, and developing a modernized GPS handheld receiver to meet the needs of the Services. The MGUE Inc 2 program is being executed in three parts: 1) Risk Reduction Activities, 2) MSI MTA rapid prototyping, and 3) Joint Modernized GPS Handheld Receiver MTA rapid prototyping effort. The Air Force SAE approved the MGUE Inc 2 Acquisition Strategy to include designation of two MTA Rapid Prototype efforts: 1) MSI Receiver Card (includes Next-Gen ASIC) and 2) Joint, Modernized Handheld Receiver. MGUE Inc 2 awarded three full and open competitive contracts in Nov 2020 for MSI. Due to a bilaterally negotiated contract modification, one vendor's Period of Performance completed in November 2023. The

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 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1203164SF *I NAVSTAR Global Positioning System (User Equipment) (SPACE)*

program office awarded the Handheld contract in fourth quarter FY 2023. The government is currently planning the transition of the MSI development out of MTA Rapid Prototype acquisition pathway with an MDA decision expected in 2024.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1203164SF / *NAVSTAR Global Positioning System (User Equipment) (SPACE)*	**Project (Number/Name)** 643833 / *MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP*	

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
MGUE Inc 1 Technology Development (1)	C/CPIF	Collins Aerospace : Cedar Rapids, IA	8.111	0.496	Nov 2022	-		-		-		-	0.000	8.607	-
MGUE Inc 1 Technology Development (2)	C/CPIF	Raytheon : El Segundo, CA	92.326	45.022	Nov 2022	10.788	Nov 2023	-		-		-	0.000	148.136	-
MGUE Inc 1 Technology Development (3)	C/CPIF	L3 Harris : Anaheim, CA	1.000	0.354	Nov 2022	-		-		-		-	0.000	1.354	-
MGUE Inc 1 Platform Integration	Various	Various : Various	35.319	31.770	Nov 2022	49.960	Nov 2023	18.959	Nov 2024	-		18.959	0.000	136.008	-
MGUE Inc 1 Information Assurance	Various	Various : Various	2.707	-		-		-		-		-	0.000	2.707	-
MGUE Inc 1 Technical Mission Analysis	Various	Aerospace/MITRE : Various	9.168	1.142	Nov 2022	0.861	Nov 2023	0.885	Nov 2024	-		0.885	0.000	12.056	-
MGUE Inc 1 Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	4.998	1.261	Dec 2022	3.180	Dec 2023	0.342	Dec 2024	-		0.342	0.000	9.781	-
MGUE Advanced Technology/Pre-Tech	Various	Various : Various	12.696	5.717	Jan 2023	7.816	Jan 2024	12.492	Jan 2025	-		12.492	Continuing	Continuing	-
MGUE Inc 2 MSI Receiver Card Rapid Prototyping	Various	Various : Various	106.852	8.362	Dec 2022	19.468	Dec 2023	9.523	Dec 2024	-		9.523	Continuing	Continuing	-
MGUE Security Certification	Various	Various : Various	15.275	7.166	Nov 2022	8.611	Nov 2023	6.672	Nov 2024	-		6.672	Continuing	Continuing	-
MGUE Inc 2 Technology Development (1)	C/CPIF	BAE Systems : Cedar Rapids, IA	106.261	77.224	Nov 2022	109.774	Nov 2023	84.856	Nov 2024	-		84.856	Continuing	Continuing	-
MGUE Inc 2 Technology Development (2)	C/CPIF	L3 Harris : Anaheim, CA	86.997	50.565	Nov 2022	48.486	Nov 2023	65.279	Nov 2024	-		65.279	Continuing	Continuing	-
MGUE Inc 2 Technology Development (3)	C/CPIF	Raytheon : El Segundo, CA	123.724	67.636	Nov 2022	0.000	Nov 2023	-		-		-	Continuing	Continuing	-
MGUE Inc 2 Risk Reduction	Various	Various : Various	75.714	2.671		-		-		-		-	0.000	78.385	-
MGUE Inc 2 Information Assurance	Various	Various : Various	2.963	3.029	Nov 2022	4.660	Nov 2023	4.180	Nov 2024	-		4.180	Continuing	Continuing	-
MGUE Inc 2 Handheld	C/FFP	Technology Adv. Group : Ashburn, VA	0.000	5.318	Nov 2022	15.175	Nov 2023	15.383	Nov 2024	-		15.383	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1203164SF / *NAVSTAR Global Positioning System (User Equipment) (SPACE)*	**Project (Number/Name)** 643833 / *MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP*	

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
MGUE Inc 2 Technical Mission Analysis	Various	Aerospace/MITRE : El Segundo, CA	19.112	13.879	Nov 2022	8.924	Nov 2023	10.397	Nov 2024	-		10.397	Continuing	Continuing	-
MGUE Inc 2 Enterprise SE&I	C/CPAF	SAIC : El Segundo, CA	7.698	2.277	Jan 2023	5.279	Jan 2024	5.119	Jan 2025	-		5.119	Continuing	Continuing	-
MGUE Inc 1 and Inc 2 SBIR/STTR	Allot	TBD : TBD	0.000	-		12.651		10.799		-		10.799	Continuing	Continuing	-
		Subtotal	710.921	323.889		305.633		244.886		-		244.886	Continuing	Continuing	N/A

Test and Evaluation ($ 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
MGUE Inc 1 Test and Evaluation	Various	Various : Various	1.312	-		0.356	Jan 2024	-		-		-	0.000	1.668	-
MGUE Inc 2 Test and Evaluation	Various	Various : Various	7.200	2.792	Jan 2023	6.147	Jan 2024	14.592	Jan 2025	-		14.592	Continuing	Continuing	-
		Subtotal	8.512	2.792		6.503		14.592		-		14.592	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
MGUE Inc 1 FFRDC	RO	Aerospace/MITRE : El Segundo, CA	11.007	2.131	Dec 2022	1.593	Dec 2023	1.637	Dec 2024	-		1.637	1.367	17.735	-
MGUE Inc 2 FFRDC	RO	Aerospace/MITRE : El Segundo, CA	12.469	7.046	Dec 2022	12.599	Dec 2023	12.162	Dec 2024	-		12.162	Continuing	Continuing	-
MGUE Inc 1 A&AS	Various	Various : Various	24.740	6.844	Dec 2022	4.896	Dec 2023	4.420	Dec 2024	-		4.420	3.434	44.334	-
MGUE Inc 2 A&AS	Various	Various : Various	19.350	27.106	Dec 2022	22.052	Dec 2023	21.940	Dec 2024	-		21.940	Continuing	Continuing	-
MGUE Inc 1 and Inc 2 Other Support	Various	Various : El Segundo, CA	0.542	0.546	Oct 2022	0.531	Oct 2023	0.388	Oct 2024	-		0.388	0.150	2.157	-
		Subtotal	68.108	43.673		41.671		40.547		-		40.547	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1203164SF / *NAVSTAR Global Positioning System (User Equipment) (SPACE)*	**Project (Number/Name)** 643833 / *MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP*	

	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	787.541	370.354		353.807		300.025		-		300.025	Continuing	Continuing	N/A

Remarks

FINANCIAL PERFORMANCE: MGUE Inc 1 and Inc 2 is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the MGUE Inc 1 and Inc 2 contracts are FPIF contracts with progress payments. 10 percent of incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations and progress payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program execution health.

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1203164SF / *NAVSTAR Global Positioning System (User Equipment) (SPACE)*	**Project (Number/Name)** 643833 / *MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP*

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1203164SF / *NAVSTAR Global Positioning System (User Equipment) (SPACE)*	**Project (Number/Name)** 643833 / *MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP*

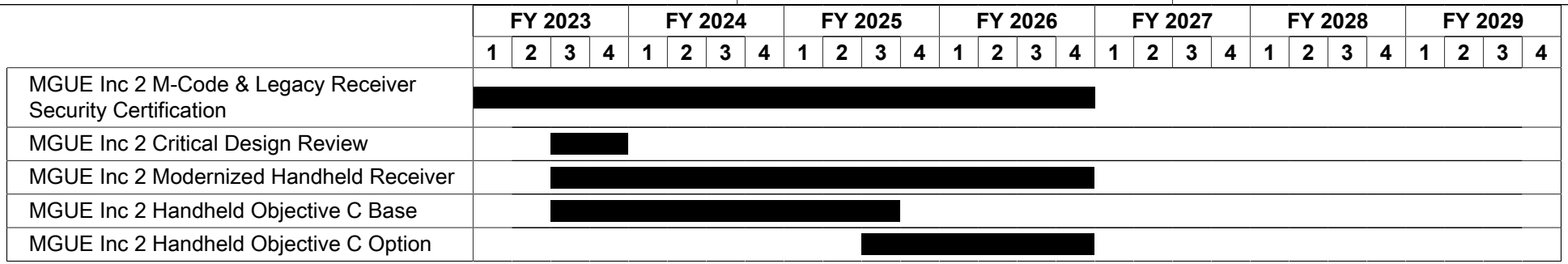

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3620F / 4	**R-1 Program Element (Number/Name)** PE 1203164SF / *NAVSTAR Global Positioning System (User Equipment) (SPACE)*	**Project (Number/Name)** 643833 / *MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MGUE Increment 1				
MGUE Inc 1 Developmental & Modernization	1	2023	3	2023
MGUE Inc 1 Development Test	1	2023	4	2023
MGUE Inc 1 DDG Card level PEO Certification	1	2023	4	2024
MGUE Inc 1 B-2 Card level PEO Certification	1	2023	2	2025
MGUE Inc 1 Lead Platform Integration and Test	1	2023	2	2025
Advanced Technology/Pre-Tech				
ADV/Pre-Tech MoPD Security Certification Testing, Implement RFCs, and Integration into M-GNSS SDR Platforms	4	2023	3	2025
ADV/Pre-Tech IMAS TRD System fabrication and conduct design validation testing	2	2023	2	2025
ADV/Pre-Tech MUNS-M software and displays maturation	2	2023	3	2025
ADV/Pre-Tech IMAS Transition opportunities / Evaluation	4	2023	2	2026
ADV/Pre-Tech IMAS Platform Transition / Evaluation	3	2024	1	2027
MoPD follow on RFC implementation & vendor integration support	4	2025	3	2027
MGUE Increment 2				
MGUE Inc 2 Risk Reduction Transfer to Handheld Activities	1	2023	4	2023
MGUE Inc 2 MSI Receiver Card w/Next Gen ASIC Rapid Prototyping	1	2023	1	2026
MGUE Inc 2 M-Code & Legacy Receiver Security Certification	1	2023	4	2026
MGUE Inc 2 Critical Design Review	3	2023	4	2023
MGUE Inc 2 Modernized Handheld Receiver	3	2023	4	2026
MGUE Inc 2 Handheld Objective C Base	3	2023	3	2025
MGUE Inc 2 Handheld Objective C Option	3	2025	4	2026