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Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Air Force										DATE: April 2013		
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 7: Operational Systems Development					R-1 ITEM NOMENCLATURE PE 0305164F: NAVSTAR Global Positioning System (User Equipment) (SPACE)							
COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 <sup>#</sup>	FY 2014 Base	FY 2014 OCO <sup>##</sup>	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
Total Program Element	1,272.800	125.935	29.621	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
673028: Navstar GPS	1,272.800	125.935	29.621	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles		0	0	0		0	0	0	0	0		
MDAP/MAIS Code(s): 166												
<sup>#</sup> FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012												
<sup>##</sup> The FY 2014 OCO Request will be submitted at a later date												
Note												
No FY2014 funding requested for project 673028 in this Program Element (PE). In FY2013, Navstar GPS Project 673028 is complete. Beginning in FY13, funds for Military GPS User Equipment (MGUE) are transferred to Project 643833 in this PE.												
A. Mission Description and Budget Item Justification												
The Navstar Global Positioning System (GPS) is a space-based radio Positioning, Navigation, and Time (PNT) distribution system. GPS User Equipment (UE) consists of standardized receivers, antennas, antenna electronics, etc., grouped together in sets to derive navigation and time information transmitted from GPS satellites. These receiver sets are used by DoD. RDT&E funds UE development, test, and analysis for new PNT receiver capabilities in Navigation Warfare (Navwar) across all military platforms using GPS services.												
The Modernized User Equipment (MUE) program serves as a technology demonstration and risk reduction effort to provide the technical foundation for the Military GPS User Equipment (MGUE) program which is the next generation of GPS UE. The objectives of the MUE program are to demonstrate that enhanced modernized capabilities are achievable in ground embedded and aviation form factor solutions, successfully mature the Critical Technologies Elements (CTE), establish a modernized Information Assurance architecture, implement the USD(AT&L) Trusted Foundry process, and subject the receiver prototypes to the Government's pilot Security Certification and Performance Evaluation process.												
This program element is in Budget Activity 7 - Operational System Development, because UE supports operational systems.												

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3600: Research, Development, Test & Evaluation, Air Force		PE 0305164F: NAVSTAR Global Positioning System (User Equipment) (SPACE)				
BA 7: Operational Systems Development						
B. Program Change Summary (\$ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	
Previous President's Budget	131.832	29.621	0.000	-	0.000	
Current President's Budget	125.935	29.621	0.000	-	0.000	
Total Adjustments	-5.897	0.000	0.000	-	0.000	
• Congressional General Reductions	-	0.000				
• Congressional Directed Reductions	-	0.000				
• Congressional Rescissions	0.000	0.000				
• Congressional Adds	-	0.000				
• Congressional Directed Transfers	-	0.000				
• Reprogrammings	0.000	0.000				
• SBIR/STTR Transfer	-1.487	0.000				
• Other Adjustments	-4.410	0.000	0.000	-	0.000	
Change Summary Explanation						
Starting in FY13, MGUE funding is transferred in this PE to Project 643833 in BA-04. Current User Equipment (CUE) including MUE remains in Project 673028 in this PE.						
FY12: -\$4.410M decrease due to higher Department priorities; -\$1.487M for SBIR.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2012	FY 2013	FY 2014
Title: GPS User Equipment				117.535	29.621	0.000
Description: The MUE program serves as a technology demonstration and risk reduction effort to provide the technical foundation for the MGUE program.						
FY 2012 Accomplishments:						
Executed the MUE completion effort. Initiated the design and fabrication of new Application Specific Integrated Circuits (ASICs) to resolve performance and security deficiencies identified in contractor and government testing of the ground embedded prototype receiver cards. Designed additional processing and memory capacity to support updated system requirements. Updated GPS system Interface Control Documents (ICDs). Completed development and functional qualification testing (FQT) of the aviation form factor, GPS Receiver Application Module-Standard Electronics Module (GRAM-S/M); evaluated performance/security with government independent testing. Provided program and technical support, receiver testing, integration and security/performance certification efforts.						
FY 2013 Plans:						

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C. Accomplishments/Planned Programs (\$ in Millions)									FY 2012	FY 2013	FY 2014
Conclude the MUE effort; complete ASIC redesign and deliver to government as tech samples. This effort will conclude shortly before MGUE Increment 1 Preliminary Design Review (PDR) ensuring discovery and risk reduction activities for the MGUE Increment 1 Technology Development phase.											
Title: MGUE									8.400	0.000	0.000
Description: MGUE program is responsible for the development of standard modernized receiver form factors for the service nominated lead platforms identified in the draft MGUE Capability Development Document (CDD).											
FY 2012 Accomplishments: Awarded and executed the Technology Development phase contracts for MGUE Increment 1. Three sole source contracts were awarded to the current MUE contractors for the completion of MGUE Increment 1 Preliminary Design Review (PDR). Provided program and technical support as well as receiver testing, integration and security/performance certification efforts.											
Accomplishments/Planned Programs Subtotals									125.935	29.621	0.000
D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
• APAF: BA07: Line Item # 000075:	10.201	1.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	11.201
Other Production Charges											
• OPAF: BA03: Line Item # 836730: Navstar GPS Space	2.008	2.031	2.061		2.061	2.093	3.661	13.907	16.193	2.245	44.199
• RDTE: BA04: PE 0305164F: NAVSTAR Global Positioning System (User Equipment) (SPACE)	0.000	96.840	137.233		137.233	158.614	153.769	157.390	98.840	30.360	833.046
Remarks											
E. Acquisition Strategy											
The MUE program awarded three competitive MUE technology demonstration contracts to develop and produce Ground-Based GPS Receiver Application Module (GB-GRAM-M) (ground) and GRAM-S/M (aviation) receiver form factors to mature the five critical technology elements (CTEs), test and demonstrate these CTEs in a relevant environment to achieve Technology Readiness Level (TRL) 6, and subject the prototypes to the Government's pilot security certification and performance evaluation processes. To further reduce technology and manufacturing risk in MGUE Increment 1, the three contractors will continue risk reduction activities under the MUE completion effort. This activity is a two part effort: (1) Refining software to resolve any deficiencies revealed during FQT and independent government test & evaluation, and (2) Initiating ASIC modifications to accommodate new updates to GPS system ICDs. This effort will conclude shortly before MGUE Increment 1 PDR, ensuring each contractor has completed discovery and technology maturation in preparation for entry into the Engineering, Manufacturing, and Development phase.											

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**F. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Air Force												DATE: April 2013			
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 7: Operational Systems Development						R-1 ITEM NOMENCLATURE PE 0305164F: NAVSTAR Global Positioning System (User Equipment) (SPACE)				PROJECT 673028: Navstar GPS					
Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Receiver Technology	Various	Various:Various,	49.425	3.000	Jan 2012	1.800	Dec 2012	0.000		-		0.000	0.000	54.225	
Advanced Antenna Technology	C/CPAF	Various:Various,	136.285	4.061	Jan 2012	0.000		0.000		-		0.000	0.000	140.346	
Selective Availability Anti-Spoofing Module (SAASM)	MIPR	Sandia National Labs:Kirtland AFB, NM	53.040	0.000		0.000		0.000		-		0.000	0.000	53.040	
SAASM/GB-GRAM	Various	Various:Various,	35.589	1.000	Jan 2012	1.861	Dec 2012	0.000		-		0.000	0.000	38.450	
Modernized User Equipment (MUE)	C/CPAF	Rockwell Collins:Cedar Rapids, IA	189.457	15.286	Jan 2012	6.853	Nov 2012	0.000		-		0.000	0.000	211.596	
MUE (Raytheon)	C/CPAF	Raytheon:Garland, TX	197.574	26.197	Jan 2012	1.882	Nov 2012	0.000		-		0.000	0.000	225.653	
MUE (L-3)	C/CPAF	L-3:Anaheim, CA	188.924	19.697	Jan 2012	9.804	Nov 2012	0.000		-		0.000	0.000	218.425	
Integration	PO	46th Test Group:Holloman AFB, NM	10.258	1.200	Jan 2012	0.000		0.000		-		0.000	0.000	11.458	
MGUE (Rockwell)	C/CPIF	Rockwell Collins:Cedar Rapids, IA	0.000	2.800	Jan 2012	0.000		0.000		-		0.000	0.000	2.800	
MGUE (Raytheon)	C/CPIF	Raytheon:El Segundo, CA	0.000	2.800	Jan 2012	0.000		0.000		-		0.000	0.000	2.800	
MGUE (L3)	C/CPIF	L3:Anaheim, CA	0.000	2.800	Jan 2012	0.000		0.000		-		0.000	0.000	2.800	
Performance Certification	Various	Various:Various,	0.000	0.290	Jan 2012	0.000		0.000		-		0.000	0.000	0.290	
Information Assurance and Testing	Various	Various:Various,	0.000	3.904	Jan 2012	0.000		0.000		-		0.000	0.000	3.904	
SE&I	C/CPAF	SAIC:Various, CA	0.000	5.328	Jan 2012	0.000		0.000		-		0.000	0.000	5.328	
Subtotal			860.552	88.363		22.200		0.000		0.000		0.000	0.000	971.115	

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2014 Air Force</b>												<b>DATE:</b> April 2013			
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>						<b>R-1 ITEM NOMENCLATURE</b> PE 0305164F: <i>NAVSTAR Global Positioning System (User Equipment) (SPACE)</i>						<b>PROJECT</b> 673028: <i>Navstar GPS</i>			
<b>Support (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013</b>		<b>FY 2014 Base</b>		<b>FY 2014 OCO</b>		<b>FY 2014 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>All Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
FFRDC	Various	Various:Various,	29.670	14.155	Jan 2012	0.000		0.000		-		0.000	0.000	43.825	
SE/Program Spt/Joint Navwar Center (JNWC)	Various	Various:Various,	135.969	6.268	Jan 2012	0.000		0.000		-		0.000	0.000	142.237	
Completed Support Efforts	Various	Various:Various	62.490	0.000		0.000		0.000		-		0.000	0.000	62.490	
<b>Subtotal</b>			228.129	20.423		0.000		0.000		0.000		0.000	0.000	248.552	
<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013</b>		<b>FY 2014 Base</b>		<b>FY 2014 OCO</b>		<b>FY 2014 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>All Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
User Equipment Development Testing	PO	46th Test Group:Holloman AFB, NM	68.268	2.607	Jan 2012	2.800	Nov 2012	0.000		-		0.000	0.000	73.675	
<b>Subtotal</b>			68.268	2.607		2.800		0.000		0.000		0.000	0.000	73.675	
<b>Management Services (\$ in Millions)</b>				<b>FY 2012</b>		<b>FY 2013</b>		<b>FY 2014 Base</b>		<b>FY 2014 OCO</b>		<b>FY 2014 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>All Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Office Support (PMA)	Various	Various:Various,	0.000	1.336	Jan 2012	1.291	Nov 2012	0.000		-		0.000	0.000	2.627	
Directorate Support	Various	Various:Various,	115.851	13.206	Jan 2012	3.330	Nov 2012	0.000		-		0.000	0.000	132.387	
<b>Subtotal</b>			115.851	14.542		4.621		0.000		0.000		0.000	0.000	135.014	
<b>Project Cost Totals</b>			1,272.800	125.935		29.621		0.000		0.000		0.000	0.000	1,428.356	
<b>Remarks</b>															

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2014 Air Force

**DATE:** April 2013

**APPROPRIATION/BUDGET ACTIVITY**

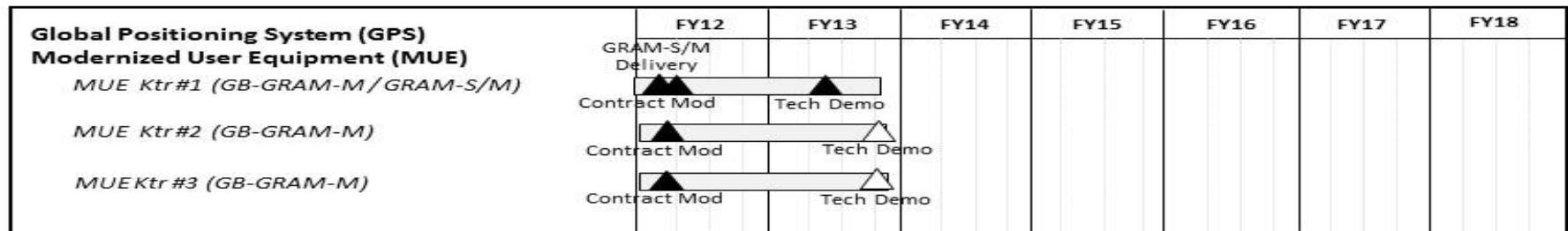
3600: Research, Development, Test & Evaluation, Air Force  
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**R-1 ITEM NOMENCLATURE**

PE 0305164F: NAVSTAR Global Positioning System (User Equipment) (SPACE)

**PROJECT**

673028: Navstar GPS



S/M – Standard  
GRAM – GPS Receiver Applications Module

Ktr – Contractor (s)

GB – Ground Embedded

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2014 Air Force			<b>DATE:</b> April 2013
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Delivery of GRAM S/M Aviation Receivers	1	2012	1	2012
MUE Contract Mod	1	2012	1	2012
MUE Tech Demo	3	2013	3	2013