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Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Air Force										Date: March 2014		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0305164F I NAVSTAR Global Positioning System (User Equipment) (SPACE)							
COST (\$ in Millions)	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO #	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost
Total Program Element	0.000	63.687	127.172	156.659	-	156.659	152.011	155.335	97.590	99.506	55.700	907.660
643833: MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP	0.000	63.687	127.172	156.659	-	156.659	152.011	155.335	97.590	99.506	55.700	907.660
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
MDAP/MAIS Code: 447												
# The FY 2015 OCO Request will be submitted at a later date.												
A. Mission Description and Budget Item Justification												
The 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, integration, test, and analysis for new PNT receiver capabilities in Navigation Warfare (Navwar) across all military platforms using GPS services.												
The MGUE Increment 1 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). This new family of modernized GPS receivers 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 Increment 1 received a Milestone A decision in April 2012 and is in the Technology Development acquisition phase. The program received approval in Dec 2013 from the Under Secretary of Defense for Acquisition, Technology, and Logistics to begin planning towards an alternate acquisition strategy to accelerate the program and provide units faster to military end users.												
This program 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.												

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3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0305164F I NAVSTAR Global Positioning System (User Equipment) (SPACE)				
B. Program Change Summary (\$ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	
Previous President's Budget	96.840	137.233	158.614	-	158.614	
Current President's Budget	63.687	127.172	156.659	-	156.659	
Total Adjustments	-33.153	-10.061	-1.955	-	-1.955	
• Congressional General Reductions	-0.095	-0.061				
• Congressional Directed Reductions	-25.000	-10.000				
• Congressional Rescissions	-	-				
• Congressional Adds	-	-				
• Congressional Directed Transfers	-	-				
• Reprogrammings	-	-				
• SBIR/STTR Transfer	-2.156	-				
• Other Adjustments	-5.902	-	-1.955	-	-1.955	
Change Summary Explanation						
FY13: -\$25.000M congressional directed reduction (-2.500M for directorate-unjustified growth, -\$2.500M for FFRDC unjustified growth, -\$20.000 for Reduction in growth); -\$5.902M in other adjustments for sequestration FY14: -\$10.000M congressional directed reduction for management services excess growth						
FY15: -\$1.955M inflation adjustment						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2013	FY 2014	FY 2015
Title: MGUE Increment 1 Technology Development				53.090	83.898	132.944
Description: The MGUE Increment 1 program will develop standard modernized receiver form factors for the service-nominated lead platforms identified in the draft MGUE CDD.						
FY 2013 Accomplishments:						
Executed MGUE Increment 1 Technology Development phase. Completed 3 System Requirements Reviews (SRR).						
FY 2014 Plans:						
Execute MGUE Increment 1 Technology Development phase. Review contractor submitted documents with Systems Engineering and Integration (SE&I) team for technical accuracy, completeness and compliance with contractual agreements. Complete 3 System Design Reviews (SDR) and 3 Preliminary Design Reviews. Develop Request for Proposal (RFP). Draft Acquisition Strategy. Commence source selection with tech sample evaluation.						
FY 2015 Plans:						

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2013	FY 2014	FY 2015
Complete MGUE Increment 1 Technology Development phase. Complete development of software to implement advanced cryptography and electronic warfare defense for three form factors (aviation, ground and common GPS module). Complete source selection, award, and execute GB-GRAM and GRAM S/M contracts.				
Title: Capability Demonstration Description: The MGUE program will demonstrate the ability to insert M-Code capability into various platforms. These platforms are in addition to the service lead platforms. FY 2013 Accomplishments: N/A FY 2014 Plans: One time effort to demonstrate M-Code capability in Increment 1 receivers on platforms. These platforms are in addition to the service lead platforms. FY 2015 Plans: N/A		-	15.000	-
Title: Advanced Technology Description: Advanced Technology efforts include studies to mature technology for future GPS receivers called out in the draft MGUE CDD. FY 2013 Accomplishments: Developed MGUE technology maturation utilizing Navwar concepts, Chip Scale Atomic Clock (CSAC), Software Define radio, and alternate security implementation. Executed trade studies to support development of a materiel concept. Researched interoperability of Electronic Attack (EA) capabilities through joint service projects. FY 2014 Plans: Develop critical applications to boost current fielded capabilities such as the Small Antenna System (SAS) that enables close air support of helicopters with greater protection against enemy jamming threats. Continue technology maturation to support development of a materiel concept for MGUE Increment 2. Coordinate interoperability of Electronic Attack (EA) capabilities with other Navwar disciplines. Continue MGUE Increment 2 Technology Maturation thru Navwar Trinity, CSAC, Software Defined Radio (SDR), and alternate security implementation. FY 2015 Plans: Execute trade studies to support materiel concept development for MGUE Increment 2. Implement targeted risk reductions by investing in key technologies for advanced receivers to include, but not limited to, Application Specific Integrated Circuit (ASIC)		1.588	13.113	8.000

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2013	FY 2014	FY 2015
and Field Programmable Gate Arrays (FPGA). Continue MGUE Increment 2 Technology Maturation thru Navwar Trinity, Chip Scale Atomic Clock (CSAC), Software Defined Radio (SDR), and alternate security implementation.				
Title: System/Platform Integration and Performance Certification Description: Technical and operational modernization impact analysis for MGUE Service lead platform integration. Development of DoD Policy, Strategy & Resource Requirements for MGUE Performance Certification. FY 2013 Accomplishments: Conducted external Navwar testing in support of Service lead platform integration. Updated Legacy and Modernized GPS interface control documents that affect GPS users worldwide. Support Army migration from handheld to embedded GPS. Develop policy and requirements related to performance certification. FY 2014 Plans: Establish interchange agreements with lead program offices for execution of new MGUE receivers and coordinate cost, schedule, and performance issues relevant to the integration process. Conduct external Navwar testing in support of Service lead platform integration. Support Army migration from handheld to embedded GPS in a variety of platforms. Continue to assist in current integration of GPS receivers for joint service platforms. FY 2015 Plans: Plan integration of airborne receiver card into embedded GPS Inertial Navigation System (INS) for the Service Lead Platforms. Prepare to integrate M-Code ground receiver card into Service Lead Platforms. Continue to assist in integration of current GPS receivers for joint service platforms.		6.400	10.008	9.389
Title: Information Assurance and Test/Evaluation Description: Develop, implement and maintain GPS Security Certification programs. FY 2013 Accomplishments: Conducted Modernized Security Evaluations/Tests for Selective Availability Anti-Spoofing Module (SAASM) receivers. Review, approve, and track integrated platforms using the military GPS signal for all military users. Continued pilot program with Modernized User Equipment (MUE) and developed requirements to security certify MUE and MGUE receivers. Continued to develop process to security certify MGUE receivers. FY 2014 Plans: Continue Modernized Security Evaluations/Tests for Selective Availability Anti-Spoofing Module (SAASM) receivers and other legacy GPS receiver equipment. Review, approve, and track integrated platforms using the military GPS signal for every military user. Continue pilot program with Modernized User Equipment (MUE) and develop requirements to security approve MUE and		2.609	5.153	6.326

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C. Accomplishments/Planned Programs (\$ in Millions) MGUE receivers. Develop process to security approve MGUE receivers. Achieve security handling for MUE delivered cards at a reduced classification level. FY 2015 Plans: Continue Modernized Security Evaluations/Tests for SAASM and other legacy GPS receiver equipment. Review, approve, and track SAASM/legacy receiver certified platforms and integrated applications for all of OSD. Continue MGUE security planning activities to include security approval for other than lead platforms, such as munitions and handhelds. Develop policy and requirements related to receiver compatibility accreditation with the GPS signal in space.										FY 2013	FY 2014	FY 2015
Accomplishments/Planned Programs Subtotals										63.687	127.172	156.659
D. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	FY 2016	FY 2017	FY 2018	FY 2019	Cost To Complete	Total Cost	
• RDTE: BA07: PE 0305164F: NAVSTAR Global Positioning System (User Equipment) (SPACE)	26.011	-	-	-	-	-	-	-	-	-	26.011	
• OPAF: BA03: PE 0305164F: 836730/ NAVSTAR GPS (SPACE)	2.028	2.053	2.075	-	2.075	2.119	2.158	2.196	2.235	-	14.864	
Remarks E. Acquisition Strategy The MGUE program has developed a comprehensive acquisition strategy to provide modernized GPS capabilities to US and Allied forces by: (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; (d) introducing the CGM to support long-term vision and modernized capabilities for non-lead platform and unique applications providing a secure, common-core GPS capability to a broader range of military applications; and (e) implementing a proactive, collaborative MGUE platform integration activity to mitigate risk and reduce cost for Enterprise modernization. The MGUE program awarded three sole source contracts for the Increment 1 Technology Development Phase effort in September 2012. This effort will span contract award to PDR, including MGUE Increment 1 requirements and preliminary design development. There will be a down-select of up to two contractors for the next phase of the program providing aviation, ground, and CGM form factors for integration into Service Lead Platforms. MGUE Increment 2 is in the Materiel Solutions Analysis 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 2015 Air Force												Date: March 2014			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0305164F / NAVSTAR Global Positioning System (User Equipment) (SPACE)				Project (Number/Name) 643833 / MILITARY GLOBAL POSITIONING SYSTEM USER EQUIP					
Product Development (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
MGUE Increment 1 Technology Development (Rockwell)	C/CPIF	Rockwell Collins : Cedar Rapids, IA	0.000	12.555	Jan 2013	18.660	Nov 2013	3.267	Nov 2014	-		3.267	9.900	44.382	-
MGUE Increment 1 Technology Development (Raytheon)	C/CPIF	Raytheon : El Segundo, CA	0.000	11.530	Jan 2013	22.074	Dec 2013	3.267	Nov 2014	-		3.267	9.900	46.771	-
MGUE Increment 1 Technology Development (L3)	C/CPIF	L3 : Anaheim, CA	0.000	15.545	Jan 2013	18.462	Dec 2013	3.267	Nov 2014	-		3.267	9.900	47.174	-
MGUE Increment 1 TD Downselect (TBD)	TBD	TBD : TBD,	0.000	-		-		98.058	Nov 2014	-		98.058	103.803	201.861	-
MGUE Increment 1 Advanced Antenna Technology	C/CPAF	Various : Various,	0.000	1.588	Apr 2013	13.113	Feb 2014	8.000	Jan 2015	-		8.000	6.278	28.979	-
MGUE Increment 1 Capability Demonstration	TBD	TBD : TBD,	0.000	-		15.000	Jun 2014	-		-		-	56.449	71.449	-
MGUE Increment 1 Integration	C/CPAF	Various : Various,	0.000	6.224	Mar 2013	8.123	Jan 2014	8.300	Jan 2015	-		8.300	220.699	243.346	-
MGUE Increment 1 Performance Certification	C/CPAF	Various : Various,	0.000	0.176	Feb 2013	1.885	Jan 2014	1.089	Jan 2015	-		1.089	-	3.150	-
MGUE Increment 1 Information Assurance	C/CPAF	Various : Various,	0.000	2.139	Feb 2013	3.181	Jan 2014	3.200	Jan 2015	-		3.200	46.582	55.102	-
MGUE Increment 1 Enterprise Studies	C/CPAF	Various : El Segundo, CA	0.000	4.036	Feb 2013	4.867	Nov 2013	5.479	Nov 2014	-		5.479	21.021	35.403	-
Subtotal			0.000	53.793		105.365		133.927		-		133.927	484.532	777.617	-
Support (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
Subtotal			-	-		-		-		-		-	-	-	-

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Test and Evaluation (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
MGUE Increment 1 Test and Evaluation (1)	C/CPAF	SPAWAR : San Diego, CA	0.000	0.350	Mar 2013	1.150	Jan 2014	1.526	Jan 2015	-		1.526	4.874	7.900	-
MGUE Increment 1 Test and Evaluation (2)	Various	Various : Various,	0.000	0.120	Jan 2013	0.822	Jan 2014	1.600	Jan 2015	-		1.600	5.300	7.842	-
Subtotal			0.000	0.470		1.972		3.126		-		3.126	10.174	15.742	-

Management Services (\$ in Millions)				FY 2013		FY 2014		FY 2015 Base		FY 2015 OCO		FY 2015 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
MGUE Increment 1 FFRDC 1	Various	Aerospace : El Segundo, CA	0.000	3.600	Jan 2013	10.839	Dec 2013	11.272	Dec 2014	-		11.272	39.976	65.687	-
MGUE Increment 1 FFRDC 2	Various	MITRE : El Segundo, CA	0.000	3.828	Feb 2013	1.622	Dec 2013	1.687	Dec 2014	-		1.687	5.894	13.031	-
MGUE Increment 1 Program Management Administration (PMA)	Various	Various : Various,	0.000	1.996	Jan 2013	7.374	Dec 2013	6.647	Dec 2014	-		6.647	19.566	35.583	-
Subtotal			0.000	9.424		19.835		19.606		-		19.606	65.436	114.301	-

	Prior Years	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	63.687	127.172	156.659	-	156.659	560.142	907.660	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2015 Air Force

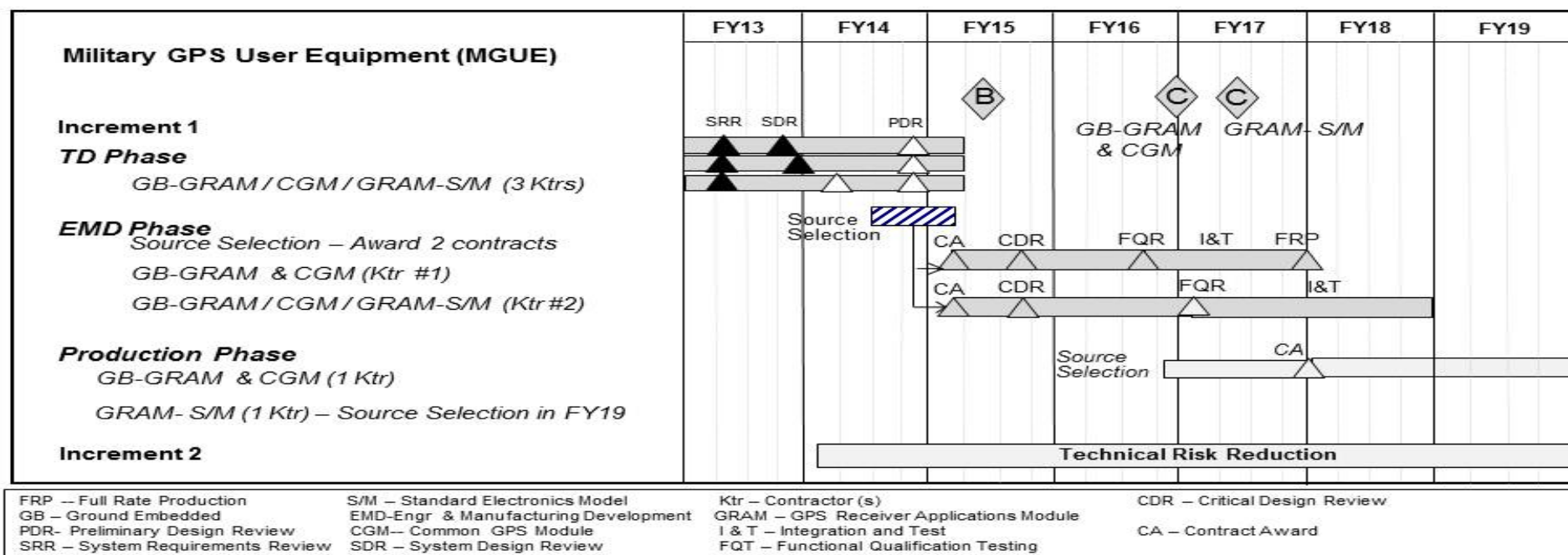
Date: March 2014

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R-1 Program Element (Number/Name)	Program Element Description	Program Element Type	Program Element Status	Program Element Location	Program Element Contact	Program Element Date	Program Element Comments

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

Project (Number/Name)	Start Date	End Date	Duration (Days)	Actual Cost	Budgeted Cost	Variance	Cost Index	Performance Index	Cost Variance	Cost Performance	Cost Variance	Cost Performance
101	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
102	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
103	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
104	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
105	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
106	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
107	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
108	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
109	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
110	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
111	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
112	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
113	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
114	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
115	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
116	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
117	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
118	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
119	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
120	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
121	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
122	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
123	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
124	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
125	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
126	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
127	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
128	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
129	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
130	10/1/2010	10/1/2010	1	1000	1000	0						

643833 / MILITARY GLOBAL
POSITIONING SYSTEM USER EQUIP

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Exhibit R-4A, RDT&E Schedule Details: PB 2015 Air Force			Date: March 2014
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
System Requirements Review (SRR)	3	2013	3	2013
System Design Review (SDR)	1	2014	1	2014
Preliminary Design Review (PDR)	3	2014	3	2014
Award Engineering and Manufacturing Development (EMD) contract(s)	1	2015	3	2015
EMD CDR	3	2015	3	2015