

**UNCLASSIFIED**

PE NUMBER: 0305164F

PE TITLE: NAVSTAR Global Positioning System User Equipment Space

<b>Exhibit R-2, RDT&amp;E Budget Item Justification</b>	DATE <b>February 2007</b>
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<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0305164F NAVSTAR Global Positioning System User Equipment Space</b>
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Cost (\$ in Millions)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	111.710	133.574	93.267	67.001	68.680	68.454	90.967	90.116	Continuing	TBD
3028 Navstar GPS	111.710	133.574	93.267	67.001	68.680	68.454	90.967	90.116	Continuing	TBD

**(U) A. Mission Description and Budget Item Justification**

The Global Positioning System (GPS) is a space-based radio positioning, navigation, and time 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 and testing, studies and engineering to assist UE aircraft integration, software upgrades, product improvement studies, commercial GPS UE test and evaluation, and mission support. Due to increasing military GPS dependence and emerging Electronic Warfare (EW) threat, the Navigation Warfare (Navwar) program was established to address EW solutions for GPS. Key elements of GPS Modernization include protecting U.S. military and allies' use of GPS, preventing hostile exploitation of GPS, and preserving civil use of GPS outside the area of operations (AO). Modernized User Equipment (MUE) will develop the next generation of air, ground and space based GPS UE that will receive Y-code, Military (M)-code, and Coarse Acquisition code (YMCA).

This program element is in Budget Activity 7 - Operational System Development, because UE supports operational systems.

**(U) B. Program Change Summary (\$ in Millions)**

	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Previous President's Budget	123.794	131.083	92.394	66.187
(U) Current PBR/President's Budget	111.710	133.574	93.267	67.001
(U) Total Adjustments	-12.084	2.491		
(U) Congressional Program Reductions	-0.004	-0.302		
Congressional Rescissions		-0.507		
Congressional Increases		3.300		
Reprogrammings	-7.209			
SBIR/STTR Transfer	-4.871			

**(U) Significant Program Changes:**

FY06: -\$7.209M for higher Air Force priorities; FY07: \$3.300M for Joint Navwar Center (JNWC)

**Exhibit R-2a, RDT&E Project Justification**

DATE  
**February 2007**

BUDGET ACTIVITY <b>07 Operational System Development</b>					PE NUMBER AND TITLE <b>0305164F NAVSTAR Global Positioning System User Equipment Space</b>			PROJECT NUMBER AND TITLE <b>3028 Navstar GPS</b>		
Cost (\$ in Millions)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
3028 Navstar GPS	111.710	133.574	93.267	67.001	68.680	68.454	90.967	90.116	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

**(U) A. Mission Description and Budget Item Justification**

The Global Positioning System (GPS) is a space-based radio positioning, navigation, and time 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 and testing, studies and engineering to assist UE aircraft integration, software upgrades, product improvement studies, commercial GPS UE test and evaluation, and mission support. Due to increasing military GPS dependence and emerging Electronic Warfare (EW) threat, the Navigation Warfare (Navwar) program was established to address EW solutions for GPS. Key elements of GPS Modernization include protecting U.S. military and allies' use of GPS, preventing hostile exploitation of GPS, and preserving civil use of GPS outside the area of operations (AO). Modernized User Equipment (MUE) will develop the next generation of air, ground and space based GPS UE that will receive Y-code, Military (M)-code, and Coarse Acquisition code (YMCA).

This program element is in Budget Activity 7 - Operational System Development, because UE supports operational systems.

**(U) B. Accomplishments/Planned Program (\$ in Millions)**

	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) Continue Advanced UE Technology efforts	15.301	17.200	17.729	15.747
(U) Continue Selective Availability Anti-Spoofing Module (SAASM)/GPS Receiver Applications Module (GRAM-SAASM) development	3.405	2.200	3.687	0.692
(U) Continue Integration, Test and Evaluation	2.133	3.300	7.646	7.955
(U) Continue System Engineering	29.008	19.900	15.665	14.755
(U) Continue Program Support	4.363	6.400	4.682	4.849
(U) Continue Modernization efforts (Modernized UE Development)	57.500	84.574	43.858	23.003
(U) Total Cost	111.710	133.574	93.267	67.001

**(U) C. Other Program Funding Summary (\$ in Millions)**

	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Complete</u>							
(U) AF RDT&E										
(U) Other APPN										
(U) Operations and Maintenance (PE 0305164F, BA 1 -	2.810	3.413	5.305	6.142	6.885	4.312	4.409	4.504	Continuing	TBD

**Exhibit R-2a, RDT&E Project Justification**

DATE  
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BUDGET ACTIVITY <b>07 Operational System Development</b>	PE NUMBER AND TITLE <b>0305164F NAVSTAR Global Positioning System User Equipment Space</b>	PROJECT NUMBER AND TITLE <b>3028 Navstar GPS</b>
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**(U) C. Other Program Funding Summary (\$ in Millions)**

Operating Forces, SAG 13D)

(U) Aircraft Procurement (PE 0305164F, BA 7, Aircraft Support Equipment, BP19)	11.521	9.969	12.593	16.078	19.792	20.298	22.471	21.821	Continuing	TBD
(U) Other Procurement (PE 0305164F, BP 83 - Electronics & Telecommunications Equipment, WSC 836730, P-62)	8.974	5.974	8.102	6.089	5.883	5.374	2.125	2.120	Continuing	TBD

**(U) D. Acquisition Strategy**

The GPS Wing acquisition strategy is to continue the development of GPS user equipment (UE) to support current warfighter activities and execute concept definition and technology risk reduction programs that will define and mature technologies needed for GPS Modernization. The GPS UE program will continue Selective Availability Anti-Spoofing Module (SAASM) receiver development /production and work with platforms/users to identify requirements and upgrade paths for GPS enhancements. Additionally, several anti-jam technology risk reduction efforts will be pursued to mature technologies and prepare for technology insertion to combat the potential threat that U.S. forces may be denied the use of GPS signals. The Modernized User Equipment (MUE) program will develop aviation and ground receiver cards capable of position, navigation, and time (PNT) utilizing Y-Code/M-code/Coarse Acquisition (YMCA). The MUE program will also develop controlled, non-proprietary specifications and interface control documents (ICDs), to enable the Services to acquire affordable Modernized UE through their program offices and/or the GPS Wing.

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**Exhibit R-3, RDT&E Project Cost Analysis**

DATE  
**February 2007**

<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0305164F NAVSTAR Global Positioning System User Equipment Space</b>	<b>PROJECT NUMBER AND TITLE</b> <b>3028 Navstar GPS</b>
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<u>(U) Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior to FY 2006 Cost</u>	<u>FY 2006 Cost</u>	<u>FY 2006 Award Date</u>	<u>FY 2007 Cost</u>	<u>FY 2007 Award Date</u>	<u>FY 2008 Cost</u>	<u>FY 2008 Award Date</u>	<u>FY 2009 Cost</u>	<u>FY 2009 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>(U) Product Development</u>														
Rockwell (MAGR)	C/FPIFF/P/CPAF		19.293	0.000		0.000		0.000		0.000		0.000	19.293	
DOE Sandia (SAASM)	MIPR	Kirtland AFB, NM	43.288	2.793	Jan-06	1.700	Jan-07	0.575	Jan-08	0.580	Jan-09	Continuing	TBD	
NAWC (SAASM)	MIPR		0.599	0.000		0.000		0.000		0.000		0.000	0.599	
Various (SAASM/GB-GRAM)	Various	Various	29.932	0.612		0.500		3.112		0.112		Continuing	TBD	
Various (Modernized UE)	Various	Various	93.790	57.500	May-06	84.574	Jan-07	43.858	Jan-08	23.003	Jan-09	Continuing	TBD	
Alliant Techsys Inc (SAASM) & Multiple NAVWAR PRDAs	C/CPFF & C/CPAF		18.222	0.000		0.000		0.000		0.000		0.000	18.222	
Holloman AFB (Various Integration)	Project Order	46th TG, Holloman AFB, NM	6.304	0.400	Jan-06	0.420	Jan-07	0.441	Jan-08	0.463	Jan-09	Continuing	TBD	
SPAWAR (Various Integration)			0.122	0.164	Jan-06	0.000		0.000		0.000		0.000	0.286	
General Dynamics (Various)	Time and Materials		1.810	0.000		0.000		0.000		0.000		0.000	1.810	
Completed technology development efforts	Various		85.634	0.000		0.000		0.000		0.000		0.000	85.634	
Allan Osborne, Alliant Tech, Rockwell Collins, and Raytheon (DAGR)	PRDA	Various	28.108	0.000		0.000		0.000		0.000		0.000	28.108	
Raytheon (MAGR2K) (GRAM-SAASM)	PRDA		31.395	0.000		0.000		0.000		0.000		0.000	31.395	
Advanced UE Tech Invest	Various		4.646	0.000		0.000		0.000		0.000		0.000	4.646	
Receiver Technology	MIPR	AFRL - WPAFB, OH & KAFB, NM	16.048	1.710	Jan-06	0.534	Dec-06	0.800	Dec-07	1.150	Dec-08	Continuing	TBD	
Receiver Technology	Various	SPAWAR, CECOM	0.000	0.000		0.534	Dec-06	0.800	Dec-07	1.150	Dec-08	Continuing	TBD	
Anti-jam Filter Technology	Various	Various	7.847	0.000		0.000		0.000		0.000		0.000	7.847	
Advanced Antenna Technology	Various	Various	48.840	13.591	Jan-06	16.132	Dec-06	16.129	Dec-07	13.447	Dec-07	Continuing	TBD	
Subtotal Product Development			435.878	76.770		104.394		65.715		39.905		Continuing	TBD	0.000
Remarks:														
<u>(U) Support</u>														
Overlook Sys (OASD/C3I)	C/CPFF	OASD, Arlington, VA	27.897	0.000		0.000		0.000		0.000		Continuing	TBD	
Various	Various	Various	0.000	0.000		3.100	Jan-07	3.683	Jan-08	3.956	Jan-09		10.739	
Aerospace Corp (Technical Supt)	CPFF	Aerospace,	19.881	6.115	Jan-06	5.700	Dec-06	6.878	Dec-07	6.512	Dec-08	Continuing	TBD	

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Exhibit R-3 (PE 0305164F)

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis</b>	DATE <b>February 2007</b>
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<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0305164F NAVSTAR Global Positioning System User Equipment Space</b>	<b>PROJECT NUMBER AND TITLE</b> <b>3028 Navstar GPS</b>
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		Los Angeles, CA												
PRC (Technical Supt)	Time and Materials		0.714	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.714	
Miscellaneous (SE/Program Spt/Joint Navar Center (JNWC))	Various	Various	76.099	27.256	Jan-06	17.500	Jan-07	9.786	Jan-08	9.136	Jan-09	Continuing	TBD	
Various (Other Navwar Studies)	Various	Various	7.883	0.000		0.000		0.000		0.000		0.000	7.883	
Subtotal Support			132.474	33.371		26.300		20.347		19.604		Continuing	TBD	0.000
Remarks:														
(U) <u>Test &amp; Evaluation</u>														
46th TG (SAASM/Test)	Project Order		31.987	0.000		0.000		0.000		0.000		0.000	31.987	
46th TG/UE development & production Testing	Project Order / Various	Holloman AFB, NM / Various	20.234	1.569		2.880		7.205		7.492		Continuing	TBD	
Subtotal Test & Evaluation			52.221	1.569		2.880		7.205		7.492		Continuing	TBD	0.000
Remarks:														
(U) <u>Management</u>														0.000
Subtotal Management			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000
Remarks:														
(U)														0.000
Subtotal			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000
Remarks:														
(U) Total Cost			620.573	111.710		133.574		93.267		67.001		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile

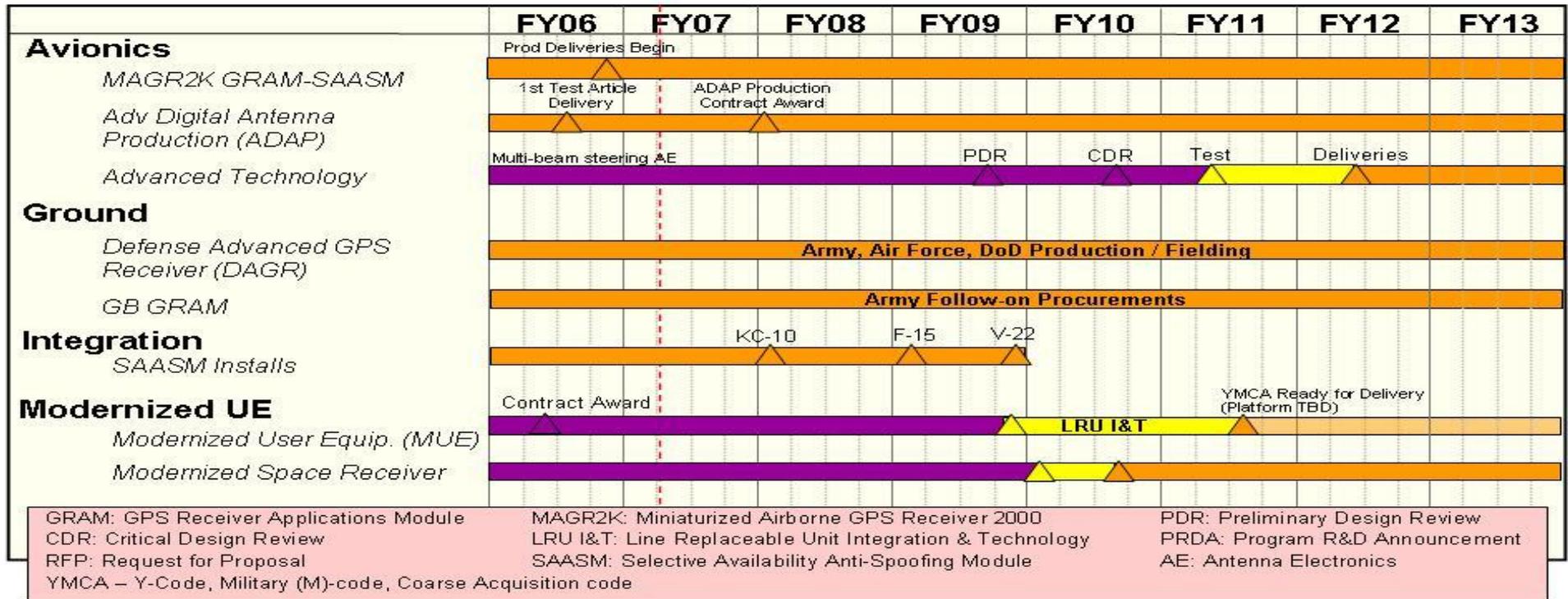
DATE

February 2007

BUDGET ACTIVITY  
07 Operational System Development

PE NUMBER AND TITLE  
0305164F NAVSTAR Global  
Positioning System User Equipment  
Space

PROJECT NUMBER AND TITLE  
3028 Navstar GPS



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<b>Exhibit R-4a, RDT&amp;E Schedule Detail</b>	DATE <b>February 2007</b>
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<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0305164F NAVSTAR Global Positioning System User Equipment Space</b>	<b>PROJECT NUMBER AND TITLE</b> <b>3028 Navstar GPS</b>
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<b>(U) <u>Schedule Profile</u></b>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
(U) MUE Development Contract Award	2Q			
(U) ADAP First Article Delivery	3Q			
(U) MUE System Requirements Review (SRR)		1Q		
(U) MUE System Design Review (SDR)		3Q		
(U) MUE Preliminary Design Review (PDR)			1Q	
(U) ADAP First Production Order			1Q	
(U) MUE Key Data Point-B (KDP) Decision			1Q	
(U) MUE Critical Design Review (CDR)			2Q	
(U) MSR CDR			3Q	
(U) MUE ASIC Complete				3Q