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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

June 2001

BUDGET ACTIVITY

07 - Operational System Development

PE NUMBER AND TITLE

0305164F NAVSTAR Global Positioning System (User 3028 EQ) Space)

PROJECT

COST (\$ in Thousands)	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
3028 Navstar GPS	39,004	66,360	53,093	57,035	50,629	50,814	54,982	59,552	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

NOTE: This administration has not addressed FY 2003-2007 requirements. All FY 2003-2007 budget estimates included in this book are notional only and subject to change.

(U) A. Mission Description

The Global Positioning System (GPS) is a space-based radio positioning, navigation, and time distribution system. GPS User Equipment (UE) consists of standardized receivers, antennae, antenna electronics, etc., grouped together in sets to derive navigation and time information transmitted from GPS satellites. These receiver sets are used by all Services and 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, 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 (AOO).

(U) FY 2000 (\$ in Thousands)

(U) \$6,090	Continued advanced UE technology effort
(U) \$17,627	Continued Selective Availability Anti-Spoofing Module (SAASM) /GPS Receiver Applications Module (GRAM)-SAASM development
(U) \$2,741	Continued integration, test and evaluation
(U) \$404	Continued ACTD (Protection) objectives under Joint GPS Combat Evaluation (JGPSCE) Demo
(U) \$5,659	System Engineering and Support
(U) \$6,483	Continued classified requirement
(U) \$39,004	Total

(U) FY 2001 (\$ in Thousands)

(U) \$16,360	Continue advanced UE technology effort
(U) \$24,114	Continue SAASM/GRAM-SAASM development
(U) \$2,338	Continue Integration, Test and Evaluation
(U) \$375	Complete ACTD (Protection) objectives under Joint GPS Combat Evaluation (JGPSCE)
(U) \$7,320	Continue System Engineering and Support

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(U) **A. Mission Description Continued**(U) **FY 2001 (\$ in Thousands) Continued**

(U) \$7,553 Continue Modernization efforts (SAASM M-Code Development)

(U) \$8,300 Continue classified requirement

(U) \$66,360 Total

The following net transactions are not reflected in the FY01 program total: SBIR = -\$4,377K; BTR = -\$400K These transactions are not reflected in other sections of the R-Docs where an FY01 total is shown.

(U) **FY 2002 (\$ in Thousands)**

(U) \$12,452 Continue Advanced UE Technology efforts

(U) \$15,039 Continue SAASM/GRAM-SAASM development

(U) \$3,492 Continue Integration, Test and Evaluation

(U) \$5,799 Continue System Engineering and Support

(U) \$14,311 Continue Modernization efforts (SAASM M-Code Development)

(U) \$2,000 Continue classified requirement

(U) \$53,093 Total

(U) **B. Budget Activity Justification**

This program element is in Budget Activity 7 - Operational System Development, because UE passed Milestone IIB in January 1992.

(U) **C. Program Change Summary (\$ in Thousands)**

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2001 PBR)	49,244	66,975	50,425	TBD
(U) Appropriated Value	49,913	66,975		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-399	-469		
b. Small Business Innovative Research	-1,814			
c. Omnibus or Other Above Threshold Reprogram	-3,200			
d. Below Threshold Reprogram	-5,301			
e. Rescissions	-195	-146		

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 3028 EQ) Space)			PROJECT				
(U) C. Program Change Summary (\$ in Thousands) Continued											
		<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Total Cost</u>						
(U)	Adjustments to Budget Years Since FY 2001 PBR			2,668							
(U)	Current Budget Submit/FY 2002 PBR	39,004	66,360	53,093	TBD						
(U) Significant Program Changes: The following net transactions are not reflected in the FY01 program total: SBIR = -\$4,377K; BTR = -\$400K. -\$6,289K FY02 adjustment to fund higher priority Air Force efforts; +\$9,000K added in FY02 for M-code development and SAASM. These transactions are not reflected in other sections of the R-Docs where an FY01 total is shown.											
(U) D. Other Program Funding Summary (\$ in Thousands)											
		<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>Cost to</u>	<u>Total Cost</u>
		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U)	AF RDT&E										
(U)	Other APPN										
(U)	Operations and Maintenance (PE 0305164F, BA 1 - Operating Forces, SAG 13D)	1,444	1,951	2,078	1,940	6,344	6,311	6,567	6,615		33,250
(U)	Aircraft Procurement (PE 0305164F, BA 7, Aircraft Support Equipment, BP19, P-74)	35,320	38,931	29,659	27,894	50,963	68,255	79,208	71,000		401,230
(U)	Other Procurement (PE 0305164F, BP 63 - Electronics & Telecommunications Equipment, WSC 6730, P-62)	2,335	1,637	4,384	4,393	4,758	4,380	4,771	1,061		27,719
(U)	Related RDT&E:										
(U)	PE 0305165F, NAVSTAR										
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(U) **D. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
GPS (Space/Ground Segments)										
(U) PE 0603421, NAVSTAR GPS (GPS III)										
(U) PE 0305176F, Combat Survivor/Evader Locator										

(U) **E. Acquisition Strategy**

Several ongoing and planned concept definition and technology risk reduction programs will define and mature required GPS technologies needed for GPS Modernization. Our strategy will develop an open system architecture for a GPS receiver based on the GPS Receiver Application Module (GRAM) concept. The GRAM-SAASM program is a further risk reduction effort to integrate the GPS receiver operations internally between GRAM and SAASM. Also, several anti-jam technology risk reduction efforts will be pursued to mature technologies and prepare for technology insertion. Continue to work with platforms/users to identify requirements and upgrade paths to insert GPS enhancements. Additionally, conduct a study to develop a low end and high end handheld receivers as the first part of a two step acquisition approach (a PRDA followed by a production contract).

(U) **F. Schedule Profile**

	<u>FY 2000</u>				<u>FY 2001</u>				<u>FY 2002</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Defense Science Board	*											
(U) GRAM-SAASM ICD complete							*					
(U) GRAM-SAASM preproduction prototypes deliveries											X	
(U) Begin M-Code receiver development							*					
(U) DAE review for M-Code receiver								X				
(U) Adv UE Technology - GAS AE upgrade CDR												X
(U) Adv UE Tech - Small antenna prototype development completion											X	
(U) Adv UE Tech - Filter (AE-1 FF Applique Development Completion)								X				
(U) Adv UE Tech - Receiver (Draft ultralight Algorithm Evaluation at												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE June 2001				
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305164F NAVSTAR Global Positioning System (User 3028 EQ) Space)				PROJECT				
(U) A. Project Cost Breakdown (\$ in Thousands)												
						<u>FY 2000</u>		<u>FY 2001</u>		<u>FY 2002</u>		
(U)	Advanced UE Technology effort					6,090		16,360		12,452		
(U)	SAASM/GRAM-SAASM development					17,627		24,114		15,039		
(U)	Integration,Test and Evaluation					2,741		2,338		3,492		
(U)	ACTD (Protection) objectives under JGPSCE demo					404		375		0		
(U)	System engineering and support					5,659		7,320		5,799		
(U)	Modernization (SAASM M-Code Development)							7,553		14,311		
(U)	Classified Requirement					6,483		8,300		2,000		
(U)	Total					39,004		66,360		53,093		
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)												
(U) Performing Organizations:												
<u>Contractor or</u>		<u>Contract</u>										
<u>Government</u>		<u>Method/Type</u>		<u>Award or</u>	<u>Performing</u>	<u>Project</u>						
<u>Performing</u>		<u>or Funding</u>		<u>Obligation</u>	<u>Activity</u>	<u>Office</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>		
<u>Activity</u>		<u>Vehicle</u>		<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>to FY 2000</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>		
<u>Product Development Organizations</u>									<u>Budget to</u>	<u>Total</u>		
									<u>Complete</u>	<u>Program</u>		
Rockwell (MAGR)		C/FPIF/FFP/ CPAF		Various	19,293	19,293	19,293	0	0	0	19,293	
DOE Sandia (SAASM)		MIPR		Feb 94	N/A	N/A	10,584	6,338	6,700	2,500	Continuing	TBD
NAWC (SAASM)		MIPR		Oct 95	599	599	599	0	0	0	0	599
Various (SAASM)		Various		Various	N/A	N/A	5,728	5,471	2,655	2,043	Continuing	TBD
Various (SAASM M-Code)		Various		Dec 00	N/A	N/A	0	0	7,553	18,268	Continuing	TBD
Alliant Techsys Inc (SAASM)		C/CPFF		Oct 95	4,782	4,782	4,782	0	0	0	0	4,782
Multiple (NAVWAR PRDAs)		C/CPAF		Aug 96	13,440	13,440	13,440	0	0	0	0	13,440
Holloman AFB (Integration)		Project Order		N/A	N/A	N/A	3,280	580	659	626	Continuing	TBD
General Dynamics (Various)		Time and		Jan 96	1,810	1,810	1,810	0	0	0	0	1,810
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BUDGET ACTIVITY				PE NUMBER AND TITLE					PROJECT	
07 - Operational System Development				0305164F NAVSTAR Global Positioning System (User 3028 EQ) Space)						
(U) <u>Performing Organizations Continued:</u>										
<u>Product Development Organizations</u>										
	Materials									
ACTD (Prevention/Protection)	Various	Various	7,428	7,428	7,428	0	0	0	0	7,428
ACTD (Protection)	Various	Various	20,186	20,186	19,407	404	375	0	0	20,186
Adv UE Protection Dev	Various	Various	16,075	16,075	0	1,810	7,683	6,582		16,075
Various (NET)	Various	Various	10,334	10,334	10,334	0	0	0	0	10,334
Various (Classified Requirement)	Various	Various	N/A	24,535	7,752	6,483	8,300	2,000	Continuing	TBD
Various (GPS Modernization)	Various	Various	TBD	TBD	5,785	0	0	0	0	5,785
Various (Navwar M&S)	Various	Various	3,575	3,575	3,575	0	0	0	0	3,575
CeCom (DAGR study)	MIPR	Dec 97	273	273	273	0	0	0	0	273
Allan Osborne, Alliant Tech, Rockwell Collins, and Raytheon (Handheld PRDA)	PRDA	Jan 01	13,645	13,645	0	0	10,645	3,000	0	13,645
Various (GRAM-SAASM)	PRDA	Jul 98	27,469	27,469	21,159	4,010	2,300	0	0	27,469
Advanced UE Tech Invest	Various	Various	4,646	4,646	4,646	0	0	0	0	4,646
Receiver Technology	Various	Various	N/A	N/A	0	3,218	1,850	2,650	Continuing	TBD
Anti-jam Filter Technology	Various	Various	N/A	N/A	0	150	450	1,700	Continuing	TBD
Advanced Antenna Technology	Various	Various	N/A	N/A	0	2,722	3,415	5,102	Continuing	TBD
<u>Support and Management Organizations</u>										
Overlook Sys (OASD/C3I)	C/CPFF	Dec 95	N/A	N/A	17,028	1,934	2,780	2,309	Continuing	TBD
Aerospace Corp (Technical Supt)	CPFF	Various	N/A	N/A	928	2,112	2,112	2,112	Continuing	TBD
SMC/FMB (Shared Prg Cost)	Various	Various	N/A	N/A	5,158	674	667	628	Continuing	TBD
PRC (Technical Supt)	Time and	Dec 95	714	714	714	0	0	0	0	714
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BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT		
07 - Operational System Development				0305164F NAVSTAR Global Positioning System (User 3028 EQ) Space)						
(U) <u>Performing Organizations Continued:</u>										
<u>Support and Management Organizations</u>										
Materials										
Miscellaneous (In-house support)	Various	Various	N/A	N/A	3,903	937	6,537	707	Continuing	TBD
Various (Other Navwar Studies)	Various	Various	2,375	2,375	2,375	0	0	0	0	2,375
<u>Test and Evaluation Organizations</u>										
46th TG (SAASM/Test)	Project Order	Various	31,987	31,987	31,987	0	0	0	0	31,987
46th TG (UE develop & product testing)	Project Order	Various	N/A	N/A	4,793	2,161	1,679	2,866	Continuing	TBD
(U) <u>Government Furnished Property:</u>										
<u>Contract</u>										
<u>Method/Type</u>										
<u>Award or</u>										
<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 2000</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
N/A										
<u>Support and Management Property</u>										
N/A										
<u>Test and Evaluation Property</u>										
N/A										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>					<u>to FY 2000</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development					139,875	31,186	52,585	44,471	TBD	TBD
Subtotal Support and Management					30,106	5,657	12,096	5,756	TBD	TBD
Subtotal Test and Evaluation					36,780	2,161	1,679	2,866	TBD	TBD
Total Project					206,761	39,004	66,360	53,093	TBD	TBD
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