

# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: <b>February 2002</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY /BA-5</b>				R-1 ITEM NOMENCLATURE 0604777N NAVIGATION/ID SYSTEMS					
COST (\$ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Program
Total PE Cost	17.300	23.673	46.618	47.854	30.371	50.723	48.721	Continuing	Continuing
F0253      Navigation and Electro-Optical Support	1.536	2.271	14.584	12.186	6.868	10.038	8.092	Continuing	Continuing
W0676      Improved ID Development	0.000	1.755	1.956	2.038	2.223	3.387	3.864	Continuing	Continuing
W1253      Combat ID System	2.957	6.023	10.934	10.889	5.900	14.810	13.796	Continuing	Continuing
X0921      NAVSTAR GPS Equipment	12.807	13.624	19.144	22.741	15.380	22.488	22.969	Continuing	Continuing
<p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Reliable and secure Navigation and positive identification (ID) systems are essential elements of battle management in the naval environment. The Photonics Mast (F0253) is a non-hull penetrating replacement for existing optical periscopes. The Photonics Mast exploits a wide portion of the electro-magnetic spectrum utilizing advanced Electro-Optic/thermal imaging; and communications intercept/Electronic Warfare Support (ES). The Combat Identification System (CIS) project (W1253) and Improved Identification Development (W0676) covers the Navy lead of a MK XII Mode5 upgrade to the existing Mark XII family of systems that is Joint and NATO interoperable. Per OSD direction, NATO participation is encouraged and performance data is exchanged to ensure the opportunity for interoperability with allied identification systems is maximized. NAVSTAR Global Positioning System (GPS), project (X0921) is a space-based radio positioning and navigation system that provides users with worldwide, all weather, three dimensional position, velocity and precise time data based on a constellation of 24 satellites. Navy Sensor System Interface (NAVSSI) is a system that provides an integrated navigation message structure for network distribution to support combat, information and other mission critical capabilities. Navy Navigation Warfare (NAVWAR) is a key element and subset of this program and will provide Air and Sea units with jam resistant GPS antennas and GPS receivers to ensure the continued use of GPS information in a hostile environment. In addition to distinguishing friend from foe for weapons employment, the Navy requires secure, jam resistant Identification Friend or Foe (IFF) systems for battle group air defense management and air traffic control. Identification is multifaceted and includes information received from several sensors (both cooperative and non-cooperative systems).</p>									

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Exhibit R-2, RDT&E Budget Item Justification

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EXHIBIT R-2a, RDT&E Budget Item Justification							DATE: <b>February 2002</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E,N/BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS				PROJECT NUMBER AND NAME F0253 Navigation and Electro-Optical Support					
COST (\$ in Millions)		Prior Year Cost	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Program
F0253	Navigation and Electro-Optical Support		1.536	2.271	14.584	12.186	6.868	10.038	8.092	Continuing	Continuing

A. (U) Mission Description and Budget Item Justification: The Photonics Mast mounted on the Universal Modular Mast will provide imaging capability for the VIRGINIA class submarine. The Photonics Mast design exploits a wide portion of the electro-magnetic spectrum through advanced E-O and thermal imaging and Electronic Warfare Support (ES)/Communications intercept. It will provide significant improvements in submarine stealth and infrared imaging capability. The non-hull penetrating design provides freedom in ship design and space savings for VIRGINIA CLASS and future submarines designs. The system was designed to satisfy Operational Requirement #365-87-94.

(U) Program Accomplishments and Plan:

1. (U) FY 2001 Accomplishments:

- (U) (\$0.611) Continued Photonics Mast At-Sea Test and Evaluation.
- (U) (\$0.755) Continued On-Board Team Trainer Development.
- (U) (\$0.170) Completed EDM Shore Based Testing.

2. (U) FY 2002 Plan:

- (U) (\$0.929) Complete On-Board Team Trainer Development.
- (U) (\$0.183) EDM removal/Deinstallation Planning.
- (U) (\$1.159) Continue Photonics At Sea Test And Evaluation.

3. (U) FY2003 Plan:

- (U) (\$1.494) Complete Photonics At Sea Test And Evaluation.
- (U) (\$0.736) EDM Removal/Deinstallation.
- (U) (\$2.942) Initiate Imaging Console development.
- (U) (\$1.148) Initiate Realtime Rangefinder for Type 8 Periscope development.
- (U) (\$8.264) Initiate Low Level TV, improved image processing, and Photonics Mast all digital signal path development.

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E,N/BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS			PROJECT NUMBER AND NAME F0253 Navigation and Electro-Optical Support					
B. (U) Program Change Summary										
				FY2001	FY2002	FY2003				
(U) FY2002 President's Budget:				1.561	2.291					
(U) Appropriated Value				1.575	2.291					
(U) Adjustment To FY2001/2002 Appropriated Value/FY2002 President's Budget:				(0.039)	(0.020)					
(U) FY2003 Pres Budget Submit:				1.536	2.271	14.584				
(U) Change Summary Explanation:										
(U) Funding:										
FY2001: Minor adjustments (-\$39K). FY2002: Minor adjustments (\$-20K).										
(U) Schedule: Not applicable.										
(U) Technical: Not applicable.										
C. (U) Other Program Funding Summary										
		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Program
(U) SCN Line 201300 (Photonics Mast only)		20.850	22.904	23.727	23.802	23.814	24.535	49.328	CONT.	CONT.
OPN Line 083100		0	0	7,980	3,290	12,048	14,777	26,196	CONT.	CONT.
OPN Line 083105		0	0	0	170	540	1,752	1,989	CONT.	CONT.
(U) Related RDT&E										
(U) PE 0603226E (Experimental Evaluation of Inovative Technology)										
(U) PE 0604558N (The VIRGINIA Class Design Development)										
D. (U) Acquisition Strategy: Not Applicable.										
E. (U) Schedule Profile: See Attached.										

APPROPRIATION/BUDGET ACTIVITY

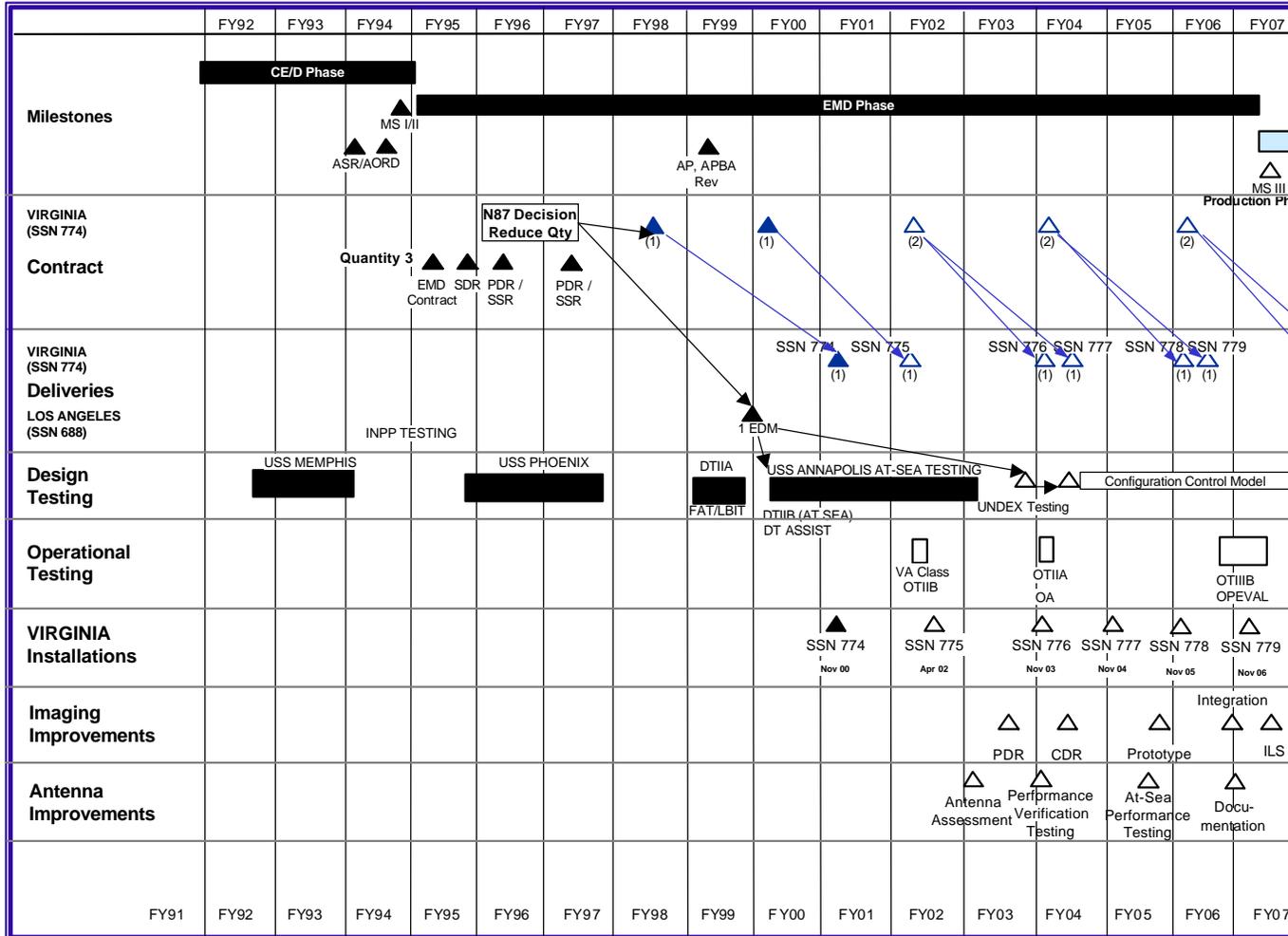
RDT&E,N/BA-5

PROGRAM ELEMENT NUMBER AND NAME

0604777N NAVIGATION/ID SYSTEMS

PROJECT NUMBER AND NAME

F0253 Navigation and Electro-Optical Support



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Exhibit R-3 Cost Analysis								DATE: <b>February 2002</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME					
<b>RDT&amp;E, N/BA-5</b>			0604777N NAVIGATION/ID SYSTEMS				F0253 Navigation and Electro-Optical Support					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPIF	Kollmorgen, Northampton, MA	34.173	0.506	10/00	0.283	10/01	5.630	10/02	0.000	40.592	
Software Development											0.000	
Ancillary Hardware Development											0.000	
Systems Engineering	WR/RC	NUWC Newport	3.898	0.812	10/00	1.283	10/01	4.050	10/02	CONT.	CONT.	
Site Platform Integration											0.000	
Licenses											0.000	
Tooling											0.000	
Miscellaneous	Various	Various	0.271	0.030	12/00	0.357	05/02	4.413	01/03	CONT.	CONT.	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			38.342	1.348		1.923		14.093		CONT.	CONT.	
Remarks:												
Development Support Equipment											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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**Exhibit R-3, Project Cost Analysis**

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Exhibit R-3 Cost Analysis										DATE: <b>February 2002</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA-5</b>			PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS			PROJECT NAME AND NUMBER F0253 Navigation and Electro-Optical Support						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Developmental/Operational T&E											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Management Support Services ETS	Various	Various	3.302	0.140	11/00	0.348	11/01	0.491	11/02	CONT.	CONT.	
Miscellaneous												
Travel			0.397	0.048		0.000		0.000				
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			3.699	0.188		0.348		0.491		CONT.	CONT.	
Remarks:												
Total Cost			42.041	1.536		2.271		14.584		CONT.	CONT.	
Remarks:												

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**Exhibit R-3, Project Cost Analysis**

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EXHIBIT R-2a, RDT&E Project Justification									DATE: <b>February 2002</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS				PROJECT NUMBER AND NAME W0676 IMPROVED ID DEVELOPMENT					
COST (\$ in Millions)	Prior Year Cost		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost				1.755	1.956	2.038	2.223	3.387	3.864	<b>Continuing</b>	<b>Continuing</b>
RDT&E Articles Qty											
<p>A. (U) MISSION AND BUDGET ITEM JUSTIFICATION: Reliable and secure navigation and positive identification (ID) systems are essential elements of battle management in the naval environment. In addition to distinguishing friend from foe for weapons employment, the Navy requires secure, jam resistant Identification Friend or Foe (IFF) systems for battle group air defense management and air traffic control. Identification is multifaceted and includes information received from several sensors (both cooperative and non-cooperative systems). The Improved Identification Development project (W0676) covers the navy lead of a MK XIIA Mode 5 Upgrade to the existing Mark XII family of systems that is Joint and NATO interoperable. These funds provide for Mode 5 integration into the AN/UPX-29(V) IFF system which interfaces with the AEGIS baseline weapon system and for other AN/UPX-29(V) improvements.</p> <p>1. FY02 PLANS:</p> <ul style="list-style-type: none"> <li>- (U) (\$.913) Initiate development of MARK XIIA Mode 5 modifications to the AN/UPX-29(V) for integration with the AEGIS weapons system baseline 5.3.8.</li> <li>- (U) (\$.789) Initiate modification of the AN/UPX-29(V) IFF system software for interface with the AEGEIS weapons system.</li> <li>- (U) (\$.053) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15USC 68.</li> </ul> <p>2. FY03 PLANS:</p> <ul style="list-style-type: none"> <li>- (U) (\$1.111) Complete development and baseline testing of MARK XIIA Mode 5 modifications to the AN/UPX-29(V) to include integration and land based testing.</li> <li>- (U) (\$.560) Complete development of AN/UPX-29(V) system software for interface with AEGIS weapons system.</li> <li>- (U) (\$.285) Develop core ILS documents.</li> </ul>											

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS	PROJECT NUMBER AND NAME W0676 IMPROVED ID DEVELOPMENT

B. (U) PROGRAM CHANGE SUMMARY: (Show total funding, schedule, and technical changes for the program element that have occurred since the last President's submission.

	FY2001	FY2002	FY 2003
(U) FY 2002 President's Budget:		1.771	
(U) Adjustments from the FY2002 President's Budget:		-0.016	
(U) FY 2003 President's Budget Submit:		1.755	1.956

CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY2002 decrease of \$0.016 for congressional reduction: Section 8123 Management Reform Initiative.
- (U) Schedule: Not Applicable.
- (U) Technical: Not Applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. &amp; Name</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>To Complete</u>	<u>Total Cost</u>
Identification Systems - 42MT	13.246	18.053	32.633	39.707	22.475	28.138	28.618	Continuing	Continuing

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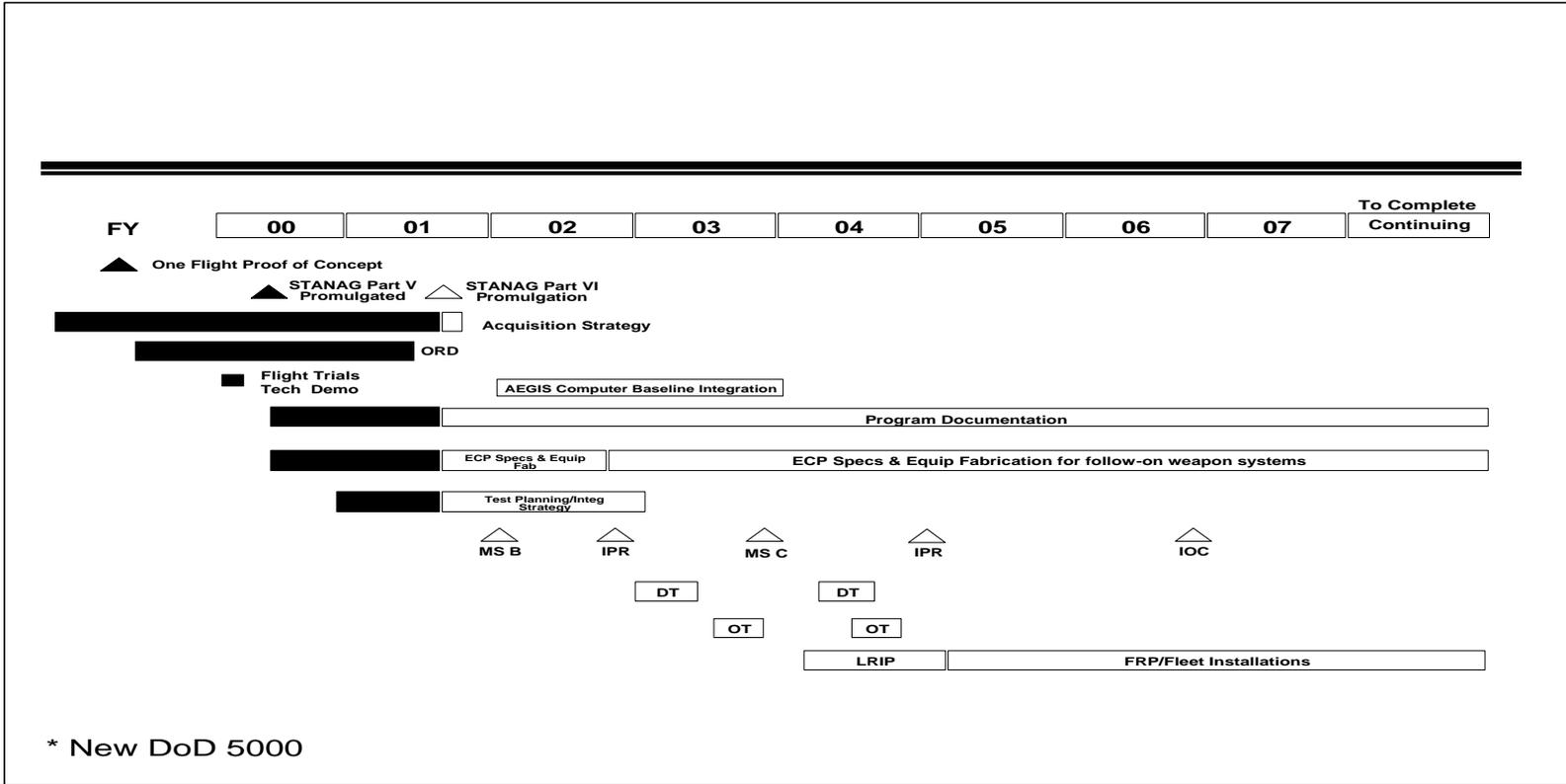
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS	PROJECT NUMBER AND NAME W0676 Improved ID Development

D. (U) ACQUISITION STRATEGY: The acquisition strategy is to develop Mode 5 ECPs (Engineering Change Proposals) for modern Mark XII IFF (Identification Friend or Foe) equipment and integrate into all Navy Combat Weapons Systems platforms and transition the Navy's Cooperative Identification Capability to Mode 5.



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Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2002</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
<b>RDT&amp;E, N / BA-5</b>			0604777N NAVIGATION/ID SYSTEMS			W0676 IMPROV ID DEVELOPMENT						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWCAD				0.913	01/02	1.111	11/02	Continuing	Continuing	
Ancillary Hardware Development												
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development						0.913		1.111		Continuing	Continuing	
Remarks:												
Development Support Equipment												
Software Development	WR	NAWCAD				0.789	01/02	0.560	11/02	Continuing	Continuing	
Training Development												
Integrated Logistics Support	WR	NAWCAD						0.285	11/02	Continuing	Continuing	
Configuration Management												
Technical Data												
GFE												
Subtotal Support						0.789		0.845		Continuing	Continuing	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2002</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604777N NAVIGATION/ID SYSTEMS			PROJECT NUMBER AND NAME W0676 IMPROV ID DEVELOPMENT						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E												
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel												
Labor (Research Personnel)												
SBIR Assessment						0.053					0.053	
Subtotal Management						0.053				Continuing	Continuing	
Remarks:												
Total Cost						1.755		1.956		Continuing	Continuing	
Remarks:												

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APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME					
<b>RDT&amp;E, N / BA-5</b>		0604777N NAVIGATION/ID SYSTEMS				W1253 Combat ID System					
COST (\$ in Millions)		Prior Year Cost	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost			2.957	6.023	10.934	10.889	5.900	14.810	13.796	Continuing	Continuing
RDT&E Articles Qty											
<p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: In 1995, the Under Secretary of Defense (Acquisition and Technology)/Vice Chairman, Joint Chiefs of Staff [USD(A&amp;T)/VCJCS] tasked the Services to develop a high-level plan and long-range strategy for migrating to new digital Mark XII (MK XII) equipment. The services were also tasked to work with participating NATO Allies to develop a new MK XII waveform and document it in a NATO Standard Agreement (STANAG). The Navy took the lead in a waveform development effort conducted in coordination with a Five-Nation Technical Working Group (TWG), supported by Joint Services and Industry. The Navy, in conjunction with the TWG, designed, developed, modeled, and tested a new waveform – MK XIIA Mode 5. A separate Five-Nation Communication Security (COMSEC) group, led by the National Security Administration (NSA), developed a new cryptographic algorithm and associated Cryptographic Equipment Interoperability Requirements Specification. STANAG 4193, Part V has been ratified and promulgated to all NATO nations, and Part VI was approved for promulgation in May 2001.</p> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. FY 2001 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> <li>- (U) (\$ .190 ) Developed Test and Evaluation and platform integration strategy for MK XIIA Mode 5.</li> <li>- (U) (\$1.759) Began development of Mode 5 hardware in preparation for the Developmental Test in FY03.</li> <li>- (U) (\$ .400 ) Began development of cryptographic hardware.</li> <li>- (U) (\$ .073 ) Initiated Stage 3 Frequency Allocation Request and conducted waveform analysis and simulation.</li> <li>- (U) (\$ .535 ) Continued to develop and coordinate program documentation.</li> </ul> <p>2. FY 2002 PLANS:</p> <ul style="list-style-type: none"> <li>- (U) (\$2.523) Continue development of Mode 5 hardware ECP, Stage 3 Frequency assignment and cryptographic hardware in preparation for the Developmental Test in FY03.</li> <li>- (U) (\$ .385 ) Conduct Mode 5 Test Planning and preparation.</li> <li>- (U) (\$2.933) Initiate software development for integration into F/A-18E/F.</li> <li>- (U) (\$0.182) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15USC 68.</li> </ul> <p>3. FY 2003 PLANS:</p> <ul style="list-style-type: none"> <li>- (U) (\$4.883) Continue software development for integration into F/A-18E/F.</li> <li>- (U) (\$3.548) Conduct DT &amp; OT of the Mode 5 upgrade for AN/UPX-37 Interrogator, Common Digital Transponder, and AN/APX-111 Combined Interrogator/Transponder</li> <li>- (U) ( \$ .089) Complete Stage 3 Frequency assignment, and initiate Stage 4 Frequency assignment request</li> <li>- (U) (\$1.109) Initiate Mode 5 ECP development for OL-483 E-2C Interrogator System</li> <li>- (U) ( \$ .449) Conduct platform integration studies for follow-on Mode 5 integrations</li> <li>- (U) ( \$ .856) Integrated Logistics Support and Training</li> </ul>											

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<p>B. (U) PROGRAM CHANGE SUMMARY: (Show total funding, schedule, and technical changes for the program element that have occurred since the last President's submission.</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:60%;"></th> <th style="width:10%;">FY2001</th> <th style="width:10%;">FY2002</th> <th style="width:10%;">FY2003</th> <th style="width:10%;"></th> </tr> </thead> <tbody> <tr> <td>(U) FY 2002 President's Budget:</td> <td align="right">3.147</td> <td align="right">6.077</td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments from FY2002 President's Budget:</td> <td align="right">-0.190</td> <td align="right">-0.054</td> <td></td> <td></td> </tr> <tr> <td>(U) FY 2003 President's Budget Submit:</td> <td align="right">2.957</td> <td align="right">6.023</td> <td align="right">10.934</td> <td></td> </tr> </tbody> </table> <p>CHANGE SUMMARY EXPLANATION:</p> <p>(U) Funding: FY2001 decrease of \$.190 includes a reduction of \$.089 for reprioritization of requirements within the Navy, a decrease of \$ .094 for a Small Business Innovative Research Assessment, and a decrease of \$.007 for the FY2001 rescission. FY2002 decrease of \$.054 for Congressional reduction: Section 8123 Management Reform Initiative.</p> <p>(U) Schedule: Not Applicable.</p> <p>(U) Technical: Not Applicable.</p> <p>C. (U) OTHER PROGRAM FUNDING SUMMARY:</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"><u>Line Item No. &amp; Name</u></th> <th style="width:5%;"><u>FY 2001</u></th> <th style="width:5%;"><u>FY 2002</u></th> <th style="width:5%;"><u>FY 2003</u></th> <th style="width:5%;"><u>FY 2004</u></th> <th style="width:5%;"><u>FY 2005</u></th> <th style="width:5%;"><u>FY 2006</u></th> <th style="width:5%;"><u>FY 2007</u></th> <th style="width:5%;"><u>To Complete</u></th> <th style="width:5%;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>Identification Systems - 42MT</td> <td align="right">13.246</td> <td align="right">18.053</td> <td align="right">32.633</td> <td align="right">39.707</td> <td align="right">22.475</td> <td align="right">28.138</td> <td align="right">28.618</td> <td align="center">Continuing</td> <td align="center">Continuing</td> </tr> </tbody> </table>						FY2001	FY2002	FY2003		(U) FY 2002 President's Budget:	3.147	6.077			(U) Adjustments from FY2002 President's Budget:	-0.190	-0.054			(U) FY 2003 President's Budget Submit:	2.957	6.023	10.934		<u>Line Item No. &amp; Name</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>To Complete</u>	<u>Total Cost</u>	Identification Systems - 42MT	13.246	18.053	32.633	39.707	22.475	28.138	28.618	Continuing	Continuing
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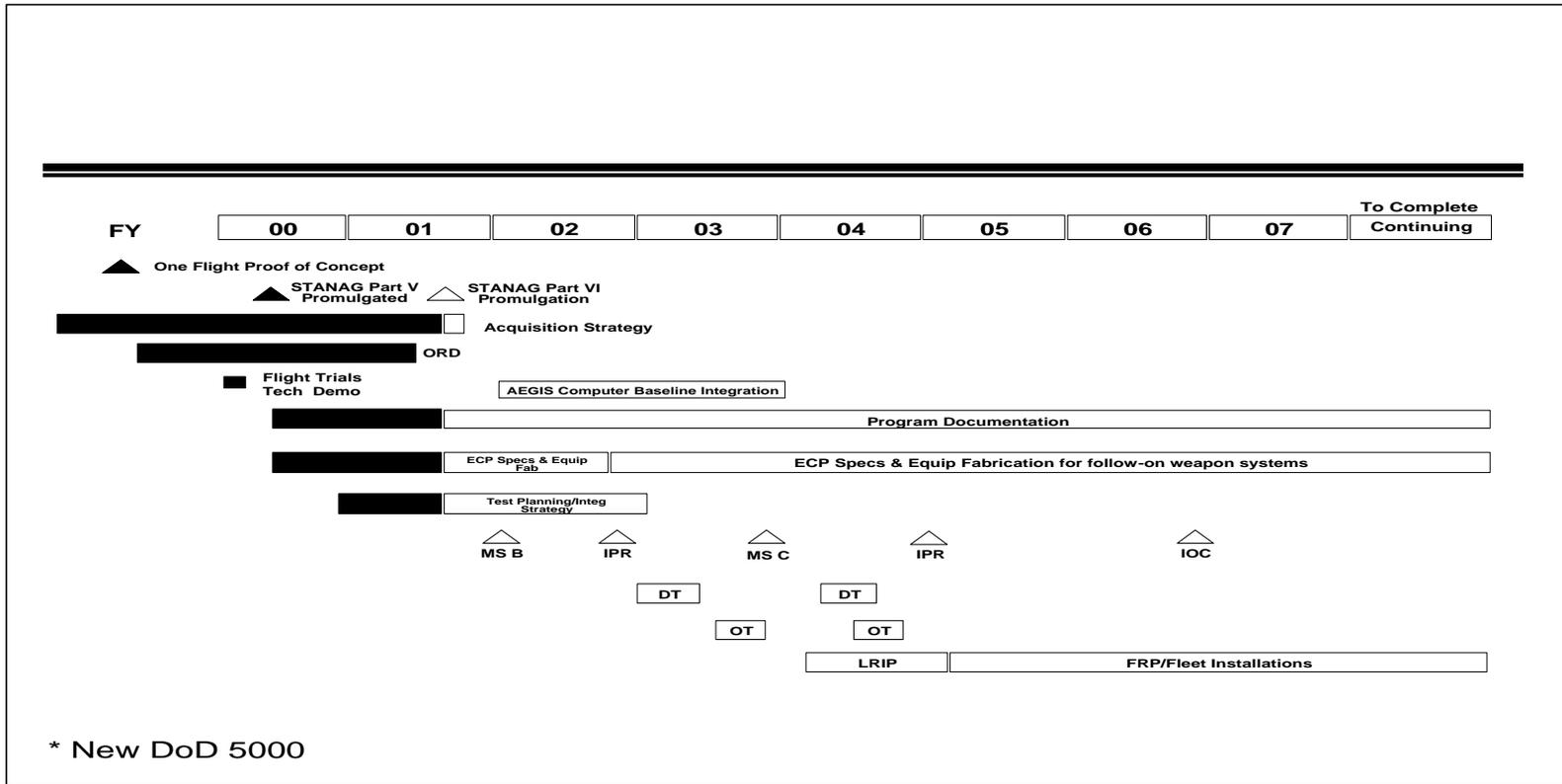
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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2002</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS	PROJECT NUMBER AND NAME W1253 Combat ID System

D. (U) ACQUISITION STRATEGY: The acquisition strategy is to develop Mode 5 ECPs (Engineering Change Proposals) for modern Mark XII IFF (Identification Friend or Foe) equipment and integrate into all Navy Combat Weapons Systems platforms and transition the Navy's Cooperative Identification Capability to Mode 5.



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Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2002</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
<b>RDT&amp;E, N / BA-5</b>			0604777N NAVIGATION/ID SYSTEMS			W1253 Combat ID System						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	VAR	VAR	0.185	1.754	VAR	0.798	VAR	0.746	VAR	Continuing	Continuing	
Ancillary Hardware Development												
Systems Engineering	WR	NAWCAD	0.602	0.400	VAR	0.341	01/02	0.187	11/02	Continuing	Continuing	
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development			0.787	2.154		1.139		0.933		Continuing	Continuing	
Remarks:												
Development Support Equipment												
Software Development	WR	NAWCAD				2.933	01/02	4.515	11/02	Continuing	Continuing	
Training Development	WR	NAWCAD						0.144	11/02	Continuing	Continuing	
Integrated Logistics Support	WR	NAWCAD				0.145	01/02	0.466	11/02	Continuing	Continuing	
Configuration Management												
Technical Data	WR	NAWCAD				0.053	01/02			Continuing	Continuing	
GFE												
Subtotal Support						3.131		5.125		Continuing	Continuing	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2002</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604777N NAVIGATION/ID SYSTEMS				PROJECT NUMBER AND NAME W1253 Combat ID System					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD	0.275	0.190	11/00	0.385	11/01	2.862	11/02	Continuing	Continuing	
Operational Test & Evaluation	WR	NAWCAD/COMOPTEVFOR, Norfolk						0.353	VAR	Continuing	Continuing	
Tooling												
GFE												
Subtotal T&E			0.275	0.190		0.385		3.215		Continuing	Continuing	
Remarks:												
Contractor Engineering Support	VAR	VAR				0.450	VAR	1.008	VAR	Continuing	Continuing	
Government Engineering Support	WR	NAWCAD		0.442	11/00	0.476	11/01	0.482	11/02	Continuing	Continuing	
Program Management Support	WR	NAWCAD	0.234	0.146	11/00	0.225	11/01	0.134	11/02	Continuing	Continuing	
Travel	WR	NAWCAD		0.025	02/01	0.035	11/01	0.037	11/02	Continuing	Continuing	
Labor (Research Personnel)												
SBIR Assessment						0.182						0.182
Subtotal Management			0.234	0.613		1.368		1.661		Continuing	Continuing	
Remarks:												
Total Cost			1.296	2.957		6.023		10.934		Continuing	Continuing	
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification						DATE: <b>February 2002</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E,N/BA-5</b>			PROJECT NUMBER AND NAME X0921 NAVSTARS GPS Equipment						
COST (\$ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Program
X0921 NAVTAR Global Positioning System (GPS) Equipment	<b>12.807</b>	<b>13.624</b>	<b>19.144</b>	<b>22.741</b>	<b>15.380</b>	<b>22.488</b>	<b>22.969</b>	<b>Continuing</b>	<b>Continuing</b>

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The mission is to provide supported, affordable, integrated, and interoperable navigation solutions to the warfighters. RDT&E funds are used to perform all the non-recurring Global Positioning System (GPS) Surface Ship, Submarine and Aircraft Integration efforts. The Aircraft integration efforts are required for 102 different configurations of Navy, Marine Corps and Coast Guard aircraft in response to the CNO GPS Integration Guidance (GIG), the Public Law 103-160 and the Secretary of Defense As Soon As Possible direction of April 1996 (ASAP program). The GIG directs GPS design functional characteristics for the aircraft and Public Law 103-160 directs the schedule for completion of all installations by 30 September 2005. The GPS is a space-based radio positioning and navigation system that provides users with worldwide, all-weather, three-dimensional position, velocity and precise time data based on a constellation of 24 satellites. PMW/PMA-156 is the central office responsible for funding all GPS aircraft integration RDT&E efforts performed by over 20 NAVAIR program offices, dozens of DoD/Navy field activities and laboratories, and dozens of contractors. The aircraft installation recurring efforts are funded separately by PMW/PMA-156 and the platform program offices with APN dollars. The primary tasks to be accomplished for each of the 102 aircraft configurations include: GPS integration design studies; acquisition of aircraft and lab RDT&E assets; development of test aircraft hardware and/or software designs; development of Integrated Logistics Support (ILS) elements to support test (operator and maintenance training, technical manuals); and Formal Navy Test and Evaluation (Development and Operational Test). Other tasks include the development of: new hardware and software systems for over 3300 Naval Aircraft to meet GIG, GPS Flight In Controlled Airspace (FICA), CNS/ATM and JPALS requirements when existing systems are unsuitable; the Digital Data Set (DDS); the Control Display Navigation Unit (CDNU) and associated software for many different aircraft and modifications to the GPS Mission Planning Module for the Naval Mission Planning System (NAVMPS)/Joint Mission Planning System (JMPS). The Surface Ship and Submarine integration efforts include two vitally important navigation integration initiatives. The first program is the Navigation Sensor System Interface (NAVSSI) development. The NAVSSI is the surface ship system with a requirement of integrating with over 54 systems/interfaces on 131 surface ship platforms. This operational requirement for the NAVSSI has two distinct functions. The first is the integration and distribution of real time navigation and time sources, primarily GPS, to combat systems, combat support systems, air alignment systems and support systems. The second is as the primary surface ship navigators' electronic workstation required to perform fully integrated Electronic Chart Display Information System for the Navy (ECDIS-N) navigation. NAVSSI is an evolutionary acquisition development. A low cost ECDIS-N system will also be developed to support non-NAVSSI ships. The second surface ship development program is the replacement of the AN/WRN-6, which is out of production and approaching obsolescence, with low cost Versa Module Europa (VME) GPS Receiver Card (GVRC) technology combined with fiber optic antenna capability and a new security chip. For NAVSSI ships, this integration will be done in conjunction with NAVSSI integrations. (For non-NAVSSI surface ships, PMW/PMA 156 is developing a low cost system to replace the AN/WRN-6.) For submarine systems, PMW/PMA 156 is supporting ongoing NAVSEA initiatives for the replacement of the AN/WRN-6 systems with the GVRC card technology. The National Defense Authorization Act for Fiscal Year 1999 included GPS language directing DoD to start "The development of an enhanced Global Positioning System [as] an urgent national security priority."

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E,N/BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS	PROJECT NUMBER AND NAME X0921 NAVSTARS GPS Equipment
<p>OSD directed the start of Navy GPS NAVWAR procurements starting in 2001 in order to equip Naval platforms with GPS Anti-Jam upgrades to enable them to operate in an environment with GPS interference. The Naval Research Advisory Committee (NRAC) GPS Vulnerability Study Panel tasked by OPNAV N6 and ASN(RD&amp;A), assessed the Navy's GPS Vulnerabilities and recommended specific actions to resolve serious vulnerability issues. As a result, OPNAV N633 and N880 (now N78) drafted the Navy Enhanced GPS User Equipment ORD to address operational requirements that were validated and approved on June 7, 2000. This signed ORD will result in the formation of two ACAT III GPS NAVWAR programs for Air (already designated ACAT III) and Sea (pending designation). This has become the basis for the Navy's GPS NAVWAR program. Given the current threat to GPS navigation from jamming, and the increasing use of GPS by potential adversaries, RDT&amp;E funds are required to design, develop, and test anti-jam antenna and receiver equipment for use on naval platforms. Funds are also required to integrate identified JPO GPS modernization requirements (new signals in space, enhanced receiver security, and operation in controlled airspace) into naval platforms and other GPS UE. All of the above efforts are directed by, tasked by and funded through PMW/PMA-156.</p>		

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E,N/BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS	PROJECT NUMBER AND NAME X0921 NAVSTARS GPS Equipment
<p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>(U) 1. FY 2001 ACCOMPLISHMENTS:</p> <p>(U) (\$4.508) Continued NAVSSI upgrade, integration engineering and testing with shipboard combat, weapons, navigation, and command and control systems. Evolutionary upgrades include all integrations required for the support of Aircraft Carrier, Destroyer and Amphibious Platform Integrations. Testing of evolutionary upgrades include collection/distribution of precise navigation and time data from/to Aircraft Carrier, Destroyer and Amphibious Systems. Continued the coordination of Electronic Charting (ECDIS) integration with the US Coast Guard developed programs. Developed interface support for LHD-8, LPD-18 and DDG-51 Navigation integration efforts. Began integrations with Hostile Force Integrated Targeting System (HITS), AEGIS LAN Interconnection System Local Area Network (ALIS LAN), Tactical Control System (TCS), Position Location Reporting Systems (PLRS) and weather tracking. Began development for integration into emerging combat, combat support and support systems including Joint Precision Approach Landing System (JPALS). Continue support of NSSN integration of GVRC. Continued development of Interactive Electronic Technical Manual (IETM) to meet the standards of the current NAVSSI Block. Transition NAVSSI hardware/software into updated environment. Initiated precise time and time interval effort to support hot-starting GPS-guided munitions such as ERGM, Tomahawk, Standard Missile-3 (SM-3) and Land Attack Standard Missile (LASM). Restarted development of NAVSSI Computer Based Trainer (CBT) to meet the standards of the current NAVSSI Block. Developed a NAVSSI Lite system to support the acceleration of electronic charting systems for surface platforms.</p> <p>(U) (\$1.229) Continued aircraft integration efforts.</p> <p>(U) (\$7.070) Continued NAVWAR integration efforts on initial platforms and begin selected DT and OT testing on the C-130 and P-3C. Began equipment specification development and integration efforts for the F/A-18 C/D/E/F conformal antenna design and the GAS-1N integration on the AV-8B and other priority platforms in each category area. Completed data analysis and contracting efforts for the GAS-1N preproduction units. Continued RDT&amp;E efforts on F/A-18 C/D/E/F, (modeling/simulation and integration analysis). Completed LCAC feasibility assessment test data reduction, validate modeling techniques, formalize ground plane design, and prepare for M-class DT/OT. Began initial GAS-1 Antenna Electronics (AE) Fiber Optic Antenna Link (FOAL) design and analysis for the NAVSSI integration. Began RDT&amp;E modeling/simulation and integration/analysis for M-class ships. Continued to evaluate anti-jam technology for application to selected Naval air, surface, and subsurface platforms. This includes continued evaluation of ongoing RDT&amp;E special projects/SBIRs associated with anti-jam GPS user equipment and prevention programs. Continued support as the Navy's representative to the GPS Joint Program Office for all GPS Modernization Initiatives.</p>		

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E,N/BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS	PROJECT NUMBER AND NAME X0921 NAVSTARS GPS Equipment
<p>(U) 2. FY 2002 PLAN:</p> <p>(U) (\$8,924) Air NAVWAR: Complete Development Test/Operational Test (DT/OT) on the C-130, and P-3C. Continue DT/OT on the HH-60 and AV-8B. Validate aircraft modeling/simulation data. Start NAVWAR anti-jam conformal antenna and MAGR 2000 receiver design integrations on F/A 18C/D/E/F. Continue GAS-1N and MAGR 2000 design integrations on the AV-8B. Begins RDT&amp;E efforts on the EA-6B.</p> <p>(U) (\$1.000) Sea NAVWAR: Finalize groundplane design and baseline GAS-1 system interface requirements. Complete DT/OT on an M-Class ship and LCAC.</p> <p>(U) (\$3.700) Continue NAVSSI integration engineering for shipboard combat, weapons, navigation, command and control systems and NAVSSI Lite development.</p> <p>(U) 3. FY 2003 PLAN:</p> <p>(U) (\$12.877) Air NAVWAR: Continue NAVWAR RDT&amp;E on the F/A-18C/D/E/F, AV-8B, and EA-6B. Begin DT/OT on the F/A-18C/D/E/F and EA-6B. Complete DT/OT on the AV-8B and F/A-18 C/D.</p> <p>(U) (\$4,196) Sea NAVWAR: Begin RDT&amp;E modeling/simulation and integration analysis for MCS-12 and LHA-1 class of ships. Conduct a friendly emitter analysis on the CG-47. Begin Modeling and Simulation and integration analysis for CG-47/DDG-51 to include development and contracting for the Fiber Optic Antenna Link and GAS-1 AE integration with NAVSSI.</p> <p>(U) (\$2.071) Continue NAVSSI integration engineering for shipboard combat, weapons, navigation, command and control systems and NAVSSI training development.</p> <p>B. (U) PROGRAM CHANGE SUMMARY</p> <p>(U) Funding: FY 2001: Section 8086: 0.7% Pro-Rata Reduction (-\$96K), Government-Wide Rescission (-\$30K), SBIR Assessment (-\$110K), BTR Paperless Acquisition (-\$271K), Navy Miscellaneous Adjustments (-\$418K).</p> <p>(U) Funding: FY2002: Section 8123 Management Reform Initiative (-\$121K)</p> <p>(U) Schedule: None.</p> <p>(U) Technical: None.</p>		

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B. (U) Other Program Funding Summary												
		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	To Complete	Total Program		
(U) O&MN PE # 0305164N		0.672	2.473	2.417	2.660	2.595	2.614	2.679	Continuing	Continuing		
(U) OPN Line #26570		11.975	13.896	11.402	16.787	12.958	14.284	13.602	Continuing	Continuing		
(U) APN - Common Avionics		12.921	7.018	4.548	24.260	18.204	18.652	23.043	Continuing	Continuing		
(U) Related RDT&D: None												
D. (U) ACQUISITION STRATEGY: (NAVWAR) Participate in GPS Joint Program Office FY 01-FY 06 procurements for GAS-1 and GAS-1M anti-jam antennas. Initiate Navy contracting options for smaller array anti-jam antenna solutions for selected aircraft. Participate in GPS JPO procurements where practicable for GPS Modernization Enhancements. See attached Milestone chart.												
E. (U) NAVWAR Schedule Profile:												
	FY 2001				FY 2002				FY 2003			
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Air and Sea Phase 1												
Major Milestones:					^ Sea M/S B		^ Sea M/S C					
					^ Air LRIP (C-130/P-3C)		^ Air M/S C					
Contracts/Procurements					^ GAS 1 Option 5 (Air)		^ GAS 1 Option 6 (Air and Sea)		^ GAS 1 F/O opt (Air and Sea)			
C 130 (Lead Platform)	C 130 DT/OT				C-130 Installs				P-3 Installs			
HH 60					HH 60 DT/OT		HH 60 Install					
MCM	M-class & LCAC DT/OT								M-Class & LCAC Installs			
LHA/CG-47									LHA, /CG-47, DDG-51 RDT&E			
Air Phase 2												
Major Milestones:					^ M/S B				^ GAS-1N M/S C			
Contracts							^ GAS-1N Contract Awd		^ GAS-1N Full Production Contract			
AV-8					AV 8 DT/OT							
Note: Similar classes of aircraft and ships will use the "Extension of Application" philosophy for OT to avoid unnecessary testing. (Schedule does not show all platforms integrations)												

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Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	Various	Other Contracts	260.415	2.464	Various	1.100	Various	2.819	Various	Cont	Cont	
Product Dev. (SSC -SD)	WX	SSC-SD	58.510	5.918	10/00	0.250	10/01	0.750	10/02	Cont	Cont	
Product Dev. (Other Inhouse)	WX	Various Field Activities	437.966	1.282	10/00	1.500	10/01	1.250	10/02	Cont	Cont	
Subtotal Product Development			756.891	9.664		2.850		4.819		0.000	0.000	
Remarks:												
Development Support Equipment	Various	Various	12.710	0.000		0.000				Cont	Cont	
Software Development	Various	SSC-SD/Platform Primes				3.250	10/01	1.650	10/02	Cont	Cont	
Training Development	WX	SSC-SD						1.000	10/02	Cont	Cont	
Integrated Logistics Support	Various	SSC/NAWC/SIR/DCS				0.450	10/01	0.750	10/02	Cont	Cont	
Configuration Management												
Technical Data												
GFE												
Subtotal Support			12.710	0.000		3.700		3.400		0.000	0.000	
Remarks:												

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**Exhibit R-3, Project Cost Analysis**

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Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
T&E (NAWC PAX)	WX	NAWC PAX	9.514	0.655	10/00	0.800	10/01	0.900	10/02	CONT	CONT	
T&E (DCS Corp)	CPAF	DCS Corp, Pax	0.417	0.679	10/00	0.325	10/01	0.350	10/02	CONT	CONT	
T&E (SSC San Diego)	WX	SSC San Diego	0.000	0.695	10/00	0.450	10/01	0.410	10/02	CONT	CONT	
T&E Platform Testing	Various	Various Contractors				1.379	Various	4.187	Various	CONT	CONT	
Subtotal T&E			9.931	2.029		2.954		5.847		CONT	CONT	
Remarks:												
Contractor Engineering Support	Various	DCS, Other Contracts				1.500	10/01	1.813	10/02	CONT	CONT	
Government Engineering Support	Various	SSC, NAWC				0.700	10/01	1.120	10/02	CONT	CONT	
Program Management Support	CPAF	DCS Corp, San Diego	4.146	1.114	10/00	1.920	10/01	2.145	10/02	CONT	CONT	
Management Support Services												
Travel												
Labor (Research Personnel)												
Overhead												
Subtotal Management			4.146	1.114		4.120		5.078		CONT	CONT	
Remarks:												
Total Cost			783.678	12.807		13.624		19.144		CONT	CONT	
Remarks:												

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