

## EXHIBIT R-2, FY 2001 RDT&amp;E,N BUDGET ITEM JUSTIFICATION

## BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROGRAM ELEMENT TITLE: Navigation/ID

## Systems

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
F0253 Navigation and Electro-optical Support	9,410	4,040	1,575	2,288	3,118	1,684	1,717	CONT.	CONT.
W1253 Combat ID System	500	886	3,180	3,514	3,546	3,595	3,696	CONT.	CONT.
W2212 All Service Combat Identification Evaluation Test (ASCIET)	1,583	1,576	0	0	0	0	0	0	10,179
X0921 NAVSTAR GPS Equipment	26,749	10,235	13,732	12,185	23,780	26,699	23,973	CONT.	CONT.
X2313 Situational Awareness Beacon with Reply (SABER)	935	0	0	0	0	0	0	0	6,005
TOTAL	39,177	16,737	18,487	17,987	30,444	31,978	29,386	CONT.	CONT.

(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. 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. In addition to distinguishing friend from foe for weapons employment, the Navy requires secure,

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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 Combat Identification System(CIS) project (W1253) covers the Navy lead of a MK XII Mode5 upgrade to the existing Mark XII family of systems that is Joint and NATO interoperable. The All Service Combat Identification Evaluation Team (ASCIET) project (W2212) covers the Navy portion of a new joint service sponsored test and evaluation team effort, formerly the OSD sponsored Joint Air Defense Organization-Joint Engagement Zone (JADO-JEZ) program. The program is designed to evaluate cooperative and non-cooperative combat identification systems and tactics, as well as serve as a conduit for evaluating research and development in promising combat identification technologies. Per OSD direction, NATO participation is encouraged and performance data is exchanged to ensure the opportunity for interoperability with allied identification systems is maximized. 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 reception/Electronic Warfare Support Measures(ESM). The Situational Awareness Beacon with Reply (SABER) system, project (X2313), provides critical battlefield/operating area situational awareness and friendly ID capabilities by uniting GPS and UHF/SATCOM technologies. The SABER system consists of a GPS receiver and two-way radio capable of Over-The-Horizon (OTH) and Line-Of-Sight (LOS) secure and non-secure communications, plus a Collection Of Broadcast from Remote Assets (COBRA) transmitter.

B. (U) PROGRAM CHANGE SUMMARY: See individual projects.

**FY 1999** Reflected a net increase of (500) resulting from refinement of the Waveform characteristics of Mode 5, and a concept flight demonstration, Congressional reductions associated with Revised Economic Assumptions (-142),SBIR (-469), LOCO GPSI Reprogramming (-220), SABER sponsor adjustment/project Termination (-5,965),and Miscellaneous Departmental Adjustments (-518)

**FY 2000** Reflected a net increase of (886) for the ASCIET program to the Combat ID Systems for Mode 5, Congressional reductions (-943), SABER sponsor adjustment/project termination (-3,317K), Miscellaneous Departmental Adjustments (303), Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638 (119)

**FY 2001** Reflected Cooperative Aircraft Identification Mark XIIA Mode 5 (3215), ASCIET shifting program responsibility to CINCUSACOM(-4042).Congressional reductions (-88), Navigation Warfare (4,100K) SABER sponsor adjustment/project termination (-1147) and Departmental Adjustment(-140)

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BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N  
 PROGRAM ELEMENT TITLE: Navigation/ID Systems

C. (U) OTHER PROGRAM FUNDING SUMMARY:

	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0921									
(U) O&MN PE#: 0305164N	1,856	2,208	1,952	2,037	2,015	2,112	2,182	cont.	cont.
(U) OPN Line #26570	9,367	8,471	9,607	9,030	9,127	10,690	11,813	cont.	cont.
(U) APN-Common Avionics	27,400	9,200	13,128	16,191	13,819	15,142	10,092	cont.	cont.
(U) RELATED RDT&E: None									

	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
x2313:									
(U) OPN #285100: Cont	43	1	0	0	0	0	0	Cont	
(U) O&MN #AG/SAG 1A4A: Cont	841	395	0	0	0	0	0	Cont	
F0253:									
(U) SCN Line 201300	21,756	0	20,850	21,210	22,301	22,702	23,114	Cont	Cont
(U) RELATED RDT&E:									
(U) PE 0603226E (Experimental Evaluation of Innovative Technology)									
(U) PE 0604558N (The VIRGINIA Class Design Development)									

C. (U) ACQUISITION STRATEGY: See individual projects.

D. (U) SCHEDULE PROFILE: See acquisition strategy paragraph in each individual project.

EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROGRAM ELEMENT TITLE: Navigation/ID Systems

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA-5</b>	<b>Navigation/ID Systems/0604777N</b>			Navigation and Electro-Optical Support/F0253						
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		9.410	4.040	1.575	2.288	3.118	1.684	1.717	CONT.	CONT.
RDT&E Articles Qty		1	0	0	0	0	0	0		

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/thermal imaging and Electronic Support Measures (ESM)/Communications reception. It will provide major improvements in submarine stealth and infrared imaging capabilities. The non-hull penetrating design provides freedom in ship design as well as space savings for future design submarines. The system has been designed to satisfy Operational Requirement #365-87-94.

(U) Program Accomplishments and Plan:

1. (U) FY 1999 Accomplishments:

- (U) (\$6.991) Delivered Engineering Development Model.
- (U) (\$2.000) Commenced On-Board Team Trainer Development.
- (U) (\$.419) Performed Photonics System/Universal Modular Mast Developmental Testing.

2. (U) FY 2000 Plan:

- (U) (\$1.482) Complete Shore Based Testing of Engineering Development Model.
- (U) (\$1.024) Commence Photonics Mast At-Sea Test and Evaluation.
- (U) (\$0.992) Continue On-Board Team Trainer Development.
- (U) (\$0.542) System Engineering Support.

**EXHIBIT R-2a, FY 2001 RDT&E,N PROJECT JUSTIFICATION**

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604777N**

**PROGRAM ELEMENT TITLE: Navigation/ID Systems**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
<b>RDT&amp;E, N/BA-5</b>	<b>Navigation/ID Systems/0604777N</b>	Navigation and Electro-Optical Support/F0253
3. (U) FY2001 Plan: - (U) (\$0.384) Complete Photonics Mast At-Sea Test and Evaluation.  - (U) (\$0.542) Continue On-Board Team Trainer Development.  - (U) (\$0.200) System Removal/Deinstallation Planning.  - (U) (\$0.449) System Engineering Support.		
B. (U) Other Program Funding Summary		
		To To
	FY 1999 FY 2000 FY 2001 FY 2002 FY 2003 FY 2004 FY 2005	Complete Cost
(U) SCN Line 201300	21.756 0.000 20.850 21.210 22.301 22.702 23.114	CONT. CONT.
Related RDT&E		
(U) PE 0603226E (Experimental Evaluation of Innovative Technology)		
(U) PE 0604558N (The VIRGINIA Class Design Development)		
C. (U) Acquisition Strategy: Not applicable.		
D. (U) Schedule Profile: See attached.		

R-2a, RDT&E Project Justification

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification

DATE: February 2000

APPROPRIATION/BUDGET ACTIVITY

RDT&E, N/BA-5

PROGRAM ELEMENT NAME AND NUMBER

Navigation/ID Systems/0604777N

PROJECT NAME AND NUMBER

Navigation and Electro-Optical Support/F0253

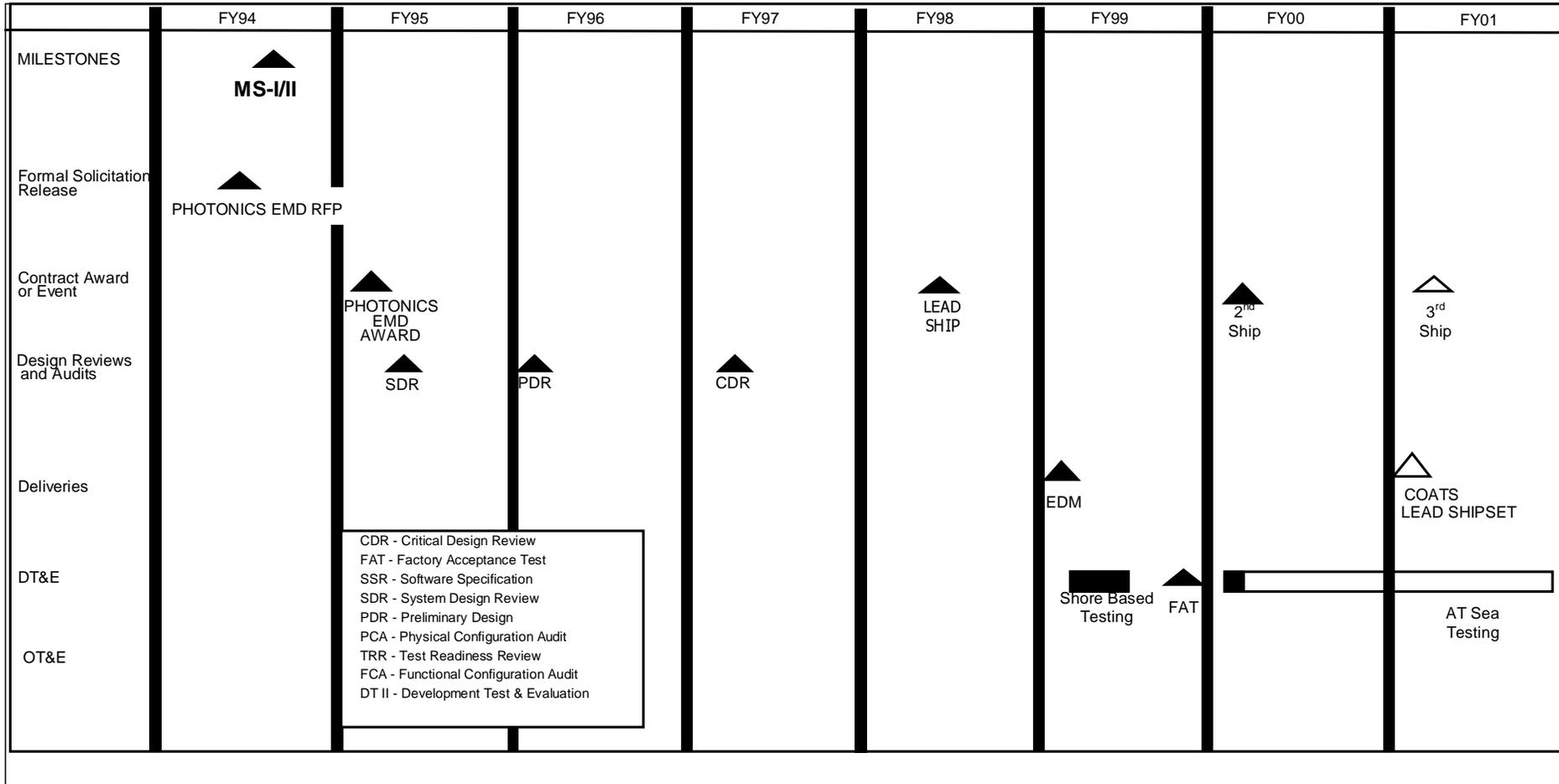


Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, page 3 of 5)

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UNCLASSIFIED

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604777N**  
**PROGRAM ELEMENT TITLE: Navigation/ID Systems**

APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA-5</b>			<b>Navigation/ID Systems/0604777N</b>			Navigation and Electro-Optical Support/F0253						
Cost Categories (Tailor to WBS, or System/ Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value Of Contract
Primary Hardware Development	CPIF	Kollmorgen, Northampton, MA	25.300	6.675	10/98	1.596	10/99	0.320	10/00	2.306	36.197	
Ancillary Hardware Development											0.000	
Systems Engineering	Various	Various	1.000	1.437		1.830		0.842		CONT.	CONT.	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			26.300	8.112		3.426		1.162		2.306	41.306	
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: Not Applicable.												

R-3 Project Cost Analysis

**EXHIBIT R-3, FY 2001 RDT&E,N PROJECT COST ANALYSIS**

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604777N  
PROGRAM ELEMENT TITLE: Navigation/ID Systems**

APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NAME AND NUMBER					
<b>RDT&amp;E, N/BA-5</b>			<b>Navigation/ID Systems/0604777N</b>				Navigation and Electro-Optical Support/F0253					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: Not Applicable.												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Mgt Spt Services & ETS	Various	Various	2.000	1.072		0.230		0.210		CONT.	CONT.	
Miscellaneous	Various	Various	0.098	0.156		0.314		0.143		CONT.	CONT.	
Travel			0.266	0.070		0.070		0.060		CONT.	CONT.	
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			2.364	1.298		0.614		0.413		0.000	CONT.	
Remarks:												
Total Cost			28.664	9.410		4.040		1.575		CONT.	CONT.	
Remarks:												

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W1253

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: Combat ID System

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W1253 Combat ID System	500	886	3,180	3,514	3,546	3,595	3,696	CONT.	CONT.
<b>TOTAL</b>	<b>500</b>	<b>886</b>	<b>3,180</b>	<b>3,514</b>	<b>3,546</b>	<b>3,595</b>	<b>3,696</b>	<b>CONT.</b>	<b>CONT.</b>

Quantity of RDT&amp;E Articles: 0

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: In 1995, the Under Secretary of Defense (Acquisition and Technology)/Vice Chairman, Joint Chiefs of Staff [USD(A&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 COMSEC group, led by NSA, developed a new cryptographic algorithm and associated Cryptographic Equipment Interoperability Requirements Specification. STANAG 4193, Parts V and VI were submitted to NATO in September 1998, for formal ratification. This STANAG is the standard that will ensure U.S./Allied interoperability for future Identification Friend or Foe (IFF) implementation programs that feature the new MK XIIA Mode 5 waveform.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

## 1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$305K) Participated in the NATO C<sup>3</sup> Board Identification Sub-Committee Ad Hoc Working Group Number 2. The work performed under AHWG#2 provided continued assistance in refinement of the basic, agreed MK XIIA Mode S waveform analysis design and follow-on demonstration/validation planning and support. These efforts were necessary to effect the timely development of a revised/validated STANAG 4193 which will assure Allied interoperability in future IFF implementation programs. Additionally, assisted with AHWG#2 tasking to write the Mark XIIA Mode 5 Implementation Guidance Report.
- (U) (\$100K) Performed a one-time only proof-of-concept flight demonstration to validate STANAG 4193 Parts V and VI.
- (U) (\$95K) Prepared to host and participate in the Mark XIIA Mode 5 NATO Interoperability Flight Trials, determined an implementation plan for cryptographic hardware development, and coordinated the Joint Operational Requirements Document.

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604777N**

**PROJECT NUMBER: W1253**

**PROGRAM ELEMENT TITLE: Navigation/ID Systems**

**PROJECT TITLE: Combat ID System**

2. (U) FY 2000 PLAN: N/A.

- (U) (\$192K) Develop Acquisition Strategy and required Mode 5 documentation.
- (U) (\$200K) Develop detailed Cost Estimates and conduct test planning and preparation for Mode 5 Navy implementation (ASCIET 02).
- (U) (\$369K) Conduct systems engineering for prototype IFF and Communication Security (COMSEC) hardware development to prepare for Mode 5 Tech Demo in conjunction with ASCIET 02.
- (U) (\$125K) Conduct frequency supportability, modeling and simulation in support of Mode 5 Stage III frequency assignment.

3. (U) FY 2001 PLAN:

- (U) (\$190K) Develop Test and Evaluation and platform integration strategy for MK XIIA Mode 5.
- (U) (\$1,973K) Begin development of Mode 5 prototype hardware in preparation for the Technical Demonstration in FY02.
- (U) (\$400K) Begin development of prototype cryptographic hardware.
- (U) (\$73K) Initiate Stage 3 Frequency Allocation waveform analysis and simulation.
- (U) (\$544K) Develop and coordinate program documentation.

(U) B. PROGRAM CHANGE SUMMARY	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	0	0	0
(U) Appropriated Value:	0		
(U) Adjustments from President's Budget:	500	886	+3,180
(U) FY 2001 OSD/OMB Budget Submit:	500	886	+3,180

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5                      PROGRAM ELEMENT: 0604777N                      PROJECT NUMBER: W1253  
PROGRAM ELEMENT TITLE: Navigation/ID SystemsPROJECT TITLE: Combat ID System

CHANGE SUMMARY EXPLANATION:

(U) Funding:

**FY 1999** net increase of \$500 thousand resulted from a \$400 thousand below threshold reprogramming for refinement of the waveform characteristics of Mode 5, and a \$100 thousand below threshold reprogramming for a Mode 5 proof of concept flight demonstration.

**FY 2000** net increase of \$886 thousand resulted from a BTR from the ASCIET program to the Combat ID Systems for Mode 5.

**FY 2001** net increase of \$3,180 thousand resulted from a \$3,215 thousand increase for Cooperative Aircraft Identification Mark XIIIA Mode 5, and a net decrease of \$8 thousand due to Strategic Sourcing Plan savings and Navy Working capital Fund (NWCF) adjustments, an increase of \$3 thousand for Military and Civilian pay, a decrease of \$22 thousand for revised economic assumptions and a decrease of \$8 thousand for reprioritization of requirement within the Navy.

(U) Schedule: N/A.

(U) Technical: N/A.

(U) C. OTHER PROGRAM FUNDING SUMMARY: N/A.

RELATED RDT&E: N/A.

(U) D. ACQUISITION STRATEGY: N/A.

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W1253

PROGRAM ELEMENT TITLE: Navigation/ID Systems PROJECT TITLE: Combat ID System

(U) E. SCHEDULE PROFILE:

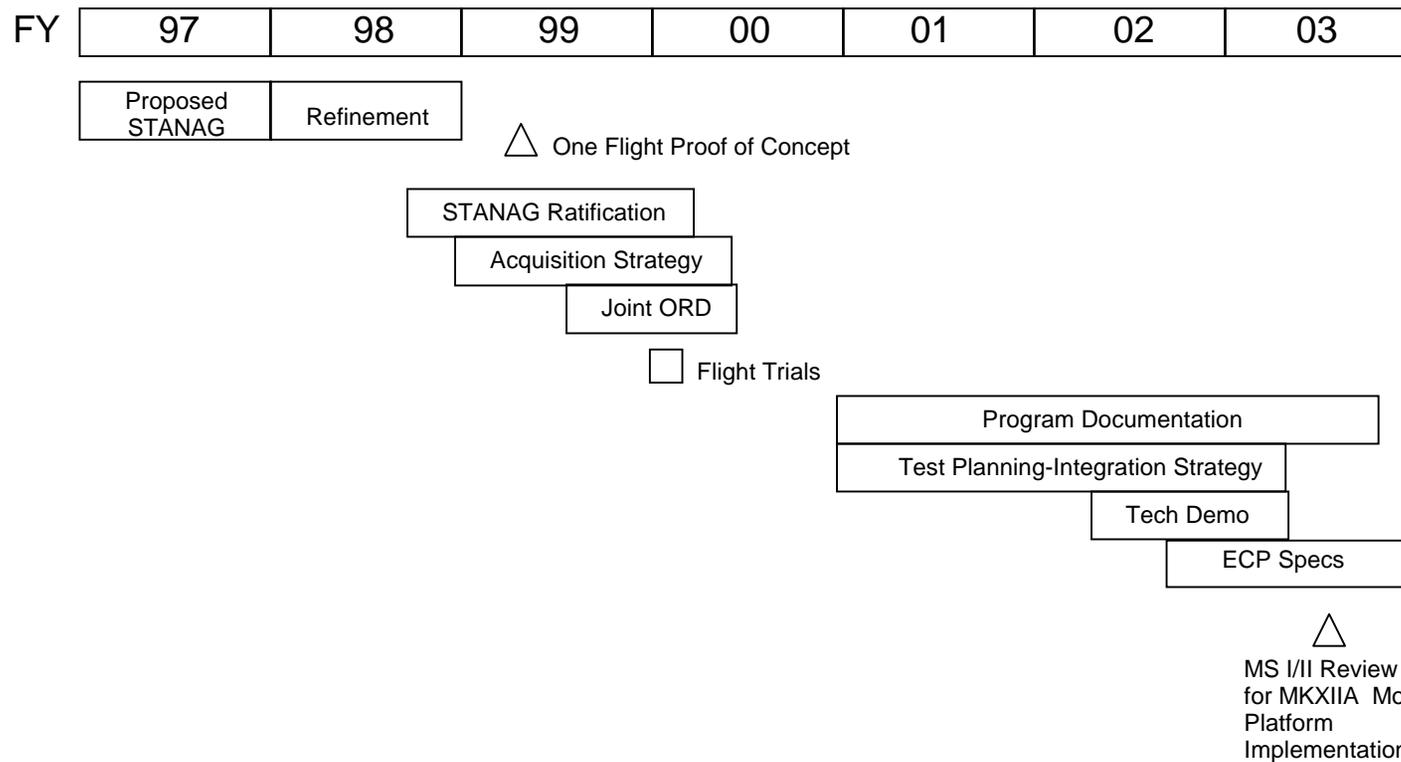


EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W1253

PROJECT TITLE: Combat ID System

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Primary Hardware	VAR.	VAR.	0	0	VAR	185	VAR	1873	VAR.	CONT.	CONT.	
Systems Engineering	VAR.	NAWCAD PAX	0	150	VAR	392	VAR	500	VAR.	CONT.	CONT.	
<b>Subtotal Project Development</b>			<b>0</b>	<b>150</b>		<b>577</b>		<b>2373</b>		<b>CONT.</b>	<b>CONT.</b>	

Remarks:

	<u>Method &amp; Type</u>	<u>Activity &amp; Location</u>	<u>Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>Award Date</u>	<u>FY 2000 Cost</u>	<u>Award Date</u>	<u>FY 2001 Cost</u>	<u>Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Value of Contract</u>
			0	0		0		0		0	0	
<b>Subtotal Support</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>	

Remarks:

UNCLASSIFIED

February 2000

EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W1253

PROJECT TITLE: Combat ID System

Cost Categories:	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value (Contra)</u>
T&E	VAR.	NAWCAD PAX	352	200	VAR.	75		190	VAR.	CONT.	CONT.	(
<b>Subtotal Test &amp; Evaluation</b>			<b>352</b>	<b>200</b>		<b>75</b>		<b>190</b>		<b>CONT.</b>	<b>CONT.</b>	<b>(</b>

Remarks:

	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value (Contra)</u>
Program Management	VAR.	NAWCAD PAX	VAR.	150	VAR.	234	VAR.	617	VAR.	CONT.	CONT.	
<b>Subtotal Management</b>				<b>150</b>		<b>234</b>		<b>617</b>		<b>CONT.</b>	<b>CONT.</b>	

Remarks:

<b>Total Cost</b>				<b>500</b>		<b>886</b>		<b>3180</b>		<b>CONT.</b>	<b>CONT.</b>	<b>(</b>
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UNCLASSIFIED

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N  
 PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT NUMBER: W2212  
 PROJECT TITLE: All Services Combat ID Evaluation Test (ASCIET)

(U) COST: (Dollars in Thousands)

<u>Project Number &amp; Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
W2212 All Service Combat Identification Evaluation Test (ASCIET)	1,583	1,576	0	0	0	0	0	0	11,263
<b>TOTAL</b>	<b>1,583</b>	<b>1,576</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11,263</b>

Quantity of RDT&E Articles: 0

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The All Services Combat Identification Evaluation Team (ASCIET) program is a Joint Requirements Oversight council (JROC) – directed, four-Service organization located at Eglin AFB, Florida. ASCIET reports to the Office of Joint Chiefs of Staff, J-8. Oversight of ASCIET activities, which includes annual evaluations of combat identification (ID) effectiveness on the Joint battlefield, is accomplished by the Director for Force Structure, Resources, and Assessment (DJ-8), in collaboration with the JROC Review Board (JRB).

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$1,583) Conducted test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas.

2. (U) FY 2000 PLAN:

- (U) (\$1,576) Conduct test and evaluation of combat identification platforms and systems in the air-to-air and ground-to-air mission areas.

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W2212

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: All Services Combat ID  
Evaluation Test (ASCIET)

(U) B. PROGRAM CHANGE SUMMARY	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	3,558	2,469	4,042
(U) Appropriated Value:	3,558	2,469	
(U) Adjustments from President's Budget:	-1,975	-893	-4,042
(U) FY 2001 OSD/OMB Budget Submit:	1,583	1,576	0

## CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 99 net decrease of \$1,975 resulted from a \$1,957 thousand decrease to reflect a reprioritization of requirements within the Navy and a \$18 thousand decrease for revised economic adjustments.  
 FY 2000 net decrease of \$893 thousand resulted from a decrease of \$7 thousand for an across-the-board Congressional rescission and a \$886 thousand decrease to reflect a reprioritization of requirements within the Navy.  
 FY 2001 decrease of \$4,042 thousand resulted from ASCIET shifting program responsibility to CINCUSACOM.

(U) Schedule: N/A.

(U) Technical: N/A.

(U) C. OTHER PROGRAM FUNDING SUMMARY: N/A.

RELATED RDT&amp;E: N/A.

(U) D. ACQUISITION STRATEGY: This is a non-ACAT program and requires no specific acquisition strategy.

(U) E. SCHEDULE PROFILE: N/A.

R-2a, RDTE, Project Justification

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: W2212

PROJECT TITLE: All Services Combat ID Evaluation Test (ASCIET)

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Project Development			0	0		0		0		0	0	
<b>Subtotal Project Development</b>			0	0		0		0		0	0	
<b>Remarks:</b>												
Support			0	0		0		0		0	0	
<b>Subtotal Support</b>			0	0		0		0		0	0	
<b>Remarks:</b>												
Test and Evaluation	VAR	Eglin AFB , FL	8,104	1,583	VAR.	1,576	VAR.	0		0	11,263	0
<b>Subtotal Test &amp; Evaluation</b>			8,104	1,583	VAR.	1,576	VAR.	0		0	11,263	0
<b>Remarks:</b>												
Management			0	0		0		0		0	0	
<b>Subtotal Management</b>			0	0		0		0		0	0	
<b>Remarks:</b>												
<b>Total Cost</b>			8,104	1,583		1,576		0	MISC.	0	11,263	0

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS Equipment

(U) COST: (Dollars in thousands)

PROJECT NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X0921 NAVSTAR Global Positioning System (GPS) Equipment	26,749	10,235	13,732	12,185	23,780	26,699	23,973	CONT.	CONT.

**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-187 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-187 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 systems to meet GIG requirements when existing systems are unsuitable (MAGR 2000 for the F-18 and MH-53; EGI for the EA-6B and F/A-18; the Digital Data Set (DDS); the Control Display Navigation Unit (CDNU) and associated software for many different aircraft) and the development of and modifications to the GPS Mission Planning Module for the Naval Mission Planning System (NAVMPMS)/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 operational requirement of integrating 226 systems on 147 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

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS Equipment

workstation required to perform fully integrated Electronic Chart Display Information System for the Navy (ECDIS-N) navigation. NAVSSI is an evolutionary acquisition development. 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 VME card technology

(GPS VME Receiver Card (GVRC)) combined with Fiber Optic Antenna Link (FOAL) antenna capability. For NAVSSI ships, this integration will be done in conjunction with NAVSSI integrations. For non-NAVSSI surface ships, PMW/PMA 187 is developing a low cost system to replace the AN/WRN-6. For submarine systems, PMW/PMA 187 is supporting ongoing NAVSEA initiatives for the replacement of the AN/WRN-6 systems with the GVRC card technology. The Operational Requirements Document for Global Positioning System - Navigation Warfare, specifies that the military forces shall have a jam resistance capability to meet mission requirements in an electronically challenged environment and the ability to fly in controlled airspace. Given the current threat to GPS navigation from jamming, and the increasing use of GPS by potential adversaries, RDT&E funds are required to design, develop, and test equipment for use on naval platforms. Funds are also required to integrate GPS modernization capabilities into naval platforms. All of the above efforts are directed by, tasked by and funded by PMW/PMA-187.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$11,880) Continued integration engineering on F-14B, F-14D, F/A-18A/B, EA-6B, SH-60R, MH-53E, C-20D, T-39N, C-12, C-9 and CT-39G.
- (U) (\$12,369) 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 Air Craft Carrier Platform Integrations, TBMD integration, radar overlay integration and Extended Range Guided Munitions (ERGM) integration. Testing of evolutionary upgrades include collection/distribution of precise navigation and time data from/to gun weapons systems (MK-160 and MK-86), the Joint Maritime Command Information System (via LAN), HAVEQUICK Radio (WSC-3), Ring Laser Gyro Navigator (RLGN), Combat DF, ATWCS, Battle Field Tactical Trainer (BFTT), Fiber Optic DMS, DSVL SQS-53 Sonar, calibration of all navigation positional data to Ship Own Ship Reference Point, integration of a precise time distribution unit, completion of year 2000 initiatives, integration of GPS VME Receiver Card (GVRC)/Fiber Optic Antenna Link (FOAL). Begin integration of Coast Guard COMDAC charting segment into NAVSSI and bathymetric data recording. Continued RDT&E support of CVN-76, LHD-8 and LPD-17 and DDG-51 Navigation integration efforts. Continue RDT&E support of NSSN integration of GVRC. Continue development of NAVSSI Computer Based Trainer (CBT) to meet the standards of the current NAVSSI Block. Continue development of Interactive Electronic Technical Manual (IETM) to meet the standards of the current NAVSSI Block.

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS Equipment

(U) (\$2,500) Begin efforts to develop solutions to the GPS vulnerability problem and develop complimentary navigation prevention capabilities for incorporation on selected Naval air, surface, and subsurface platforms. This effort includes the Research, Development, Test and Evaluation (RDT&E) of anti-jam GPS user equipment and prevention equipment that is fully interoperable with all land, sea, and air combat applications. Anti-jam user equipment enhancements and prevention capabilities have been identified as a requirement in the Navigation Warfare Mission Need Statement which has been validated by the Joint Oversight Requirements Council. The military forces must meet the precise position, velocity, and time requirements defined in the Operational Requirements Document (ORD) for Global Positioning System - Navigation Warfare. Tasks to accomplish these requirements include: (1) perform modeling and simulation to identify specific platforms in need of a Navigation Warfare capability, (2) coordinate research with the platforms to develop specifications and integration documents suitable for hardware designs, and (3) develop and test equipment necessary to satisfy the Navigation Warfare mission requirements. These RDT&E steps are necessary to develop hardware solutions so acquisition funds may be applied to the purchase and integration of the developed solutions. Continue efforts to modernize the navigation capability on Naval air, surface, and subsurface platforms. The Global Positioning System is managed by an Interagency GPS Executive Board (IGEB) which is comprised of members from the Department of Defense (DoD) and the Department of Transportation (DoT). A decision was made by the IGEB to modernize the GPS signals for enhanced civilian and military performance. The impacts of the various signal structure alternatives and the method to upgrade the user equipment must be identified. Funds for Research, Development, Test and Evaluation are needed to develop user equipment that will incorporate the National Air Space (NAS) Non-Precision Approach (NPA) sole/primary IFR navigation requirements into Naval aviation platforms. The NPA GPS requirement has been identified in the Federal Radionavigation Plan, chairman Joint Chiefs of Staff Master Navigation Plan, and CNO's Draft GPS Integration Guidance.

3.(U) FY 2000 PLAN:

- (U)(\$6,333) Continue 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 Platform Integrations, TBMD integration, radar overlay integration integration. Testing of evolutionary upgrades include collection/distribution of precise navigation and time data from/to Aircraft Carrier Systems, TBMD, radar overlay, COMDAC Charting integration, and bathymetric data recording and ERGM. Transition NAVSSI hardware/software into an NT compliant environment. Develop interface support for CVN-76, LHD-8, LPD-17 and DDG-51 Navigation integration efforts. Begin integrations with TESS,PLRS, weather tracking,IBS and TPX-42. Begin development of the low cost GPS replacement system. Begin integration of a Fiber Optic GPS initializer

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVST/ \_\_\_\_\_  
R-2a, RDTE, Project Justification

to support hot-starting GPS-guided munitions such as ERGM, Tomahawk, SM-3 and LAASM. Begin development for integration into emerging combat, combat support and support systems. Continue RDT&E support of NSSN integration of GVRC. Continue development of NAVSSI Computer Based Trainer (CBT) to meet the standards of the current NAVSSI Block. Continue development of Interactive Electronic Technical Manual (IETM) to meet the standards of the current NAVSSI Block.

- (U) (\$3,570) Continue aircraft integration effort.
- (U) (\$332) Continue efforts to develop solutions to the GPS vulnerability problem and develop complimentary navigation prevention capabilities for incorporation on selected Naval air, surface, and subsurface platforms. This effort includes the Research, Development, Test and Evaluation (RDT&E) of anti-jam GPS user equipment and prevention equipment that is fully interoperable with all land, sea, and air combat applications. Anti-jam user equipment enhancements and prevention capabilities have been identified as a requirement in the Navigation Warfare Mission Need Statement which has been validated by the Joint Oversight Requirements Council. The military forces must meet the precise position, velocity, and time requirements defined in the Operational Requirements Document (ORD) for Global Positioning System - Navigation Warfare. Tasks to accomplish these requirements include: (1) perform modeling and simulation to identify specific platforms in need of a Navigation Warfare capability, (2) coordinate research with the platforms to develop specifications and integration documents suitable for hardware designs, and (3) develop and test equipment necessary to satisfy the Navigation Warfare mission requirements. These RDT&E steps are necessary to develop hardware solutions so acquisition funds may be applied to the purchase and integration of the developed solutions. Continue efforts to modernize the navigation capability on Naval air, surface, and subsurface platforms. The Global Positioning System is managed by an Interagency GPS Executive Board (IGEB) which is comprised of members from the Department of Defense (DoD) and the Department of Transportation (DoT). A decision was made by the IGEB to modernize the GPS signals for enhanced civilian and military performance. The impacts of the various signal structure alternatives and the method to upgrade the user equipment must be identified. Funds for Research, Development, Test and Evaluation are needed to develop user equipment that will incorporate the National Air Space (NAS) Non-Precision Approach (NPA) sole/primary IFR navigation requirements into Naval aviation platforms. The NPA GPS requirement has been identified in the Federal Radionavigation Plan, chairman Joint Chiefs of Staff Master Navigation Plan, and CNO's Draft GPS Integration Guidance.

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS Equipment

(U) FY 2001 PLAN:

R-2a, RDTE, Project Justification

(U) (\$4,899) Continue 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 Platform Integrations, TBMD integration, radar overlay integration and ERGM integration. Testing of evolutionary upgrades include collection/distribution of precise navigation and time data from/to Aircraft Carrier Systems, TBMD, radar overlay, COMDAC Charting integration, ERGM and other GPS-guided munitions. Develop interface support for CVN-76, LHD-8, LPD-18 and DDG-51 Navigation integration efforts. Begin integrations with TESS, PLRS, weather tracking, IBS and TPX-42. Continue development of the low cost GPS replacement system. Begin development for integration into emerging combat, combat support and support systems. Continue RDT&E support of NSSN integration of GVRC. Continue development of NAVSSI Computer Based Trainer (CBT) to meet the standards of the current NAVSSI Block. Continue development of Interactive Electronic Technical Manual (IETM) to meet the standards of the current NAVSSI Block.

(U) (\$1,303) Continue aircraft integration effort.

(U) (\$7,530) Continue efforts to develop solutions to the GPS vulnerability problem and develop complimentary navigation prevention capabilities for incorporation on selected Naval air, surface, and subsurface platforms. This effort includes the Research, Development, Test and Evaluation (RDT&E) of anti-jam GPS user equipment and prevention equipment that is fully interoperable with all land, sea, and air combat applications. Anti-jam user equipment enhancements and prevention capabilities have been identified as a requirement in the Navigation Warfare Mission Need Statement which has been validated by the Joint Oversight Requirements Council. The military forces must meet the precise position, velocity, and time requirements defined in the Operational Requirements Document (ORD) for Global Positioning System - Navigation Warfare. Tasks to accomplish these requirements include: (1) perform modeling and simulation to identify specific platforms in need of a Navigation Warfare capability, (2) coordinate research with the platforms to develop specifications and integration documents suitable for hardware designs, and (3) develop and test equipment necessary to satisfy the Navigation Warfare mission requirements. These RDT&E steps are necessary to develop hardware solutions so acquisition funds may be applied to the purchase and integration of the developed solutions. Continue efforts to modernize the navigation capability on Naval air, surface, and subsurface platforms. The Global Positioning System is managed by an Interagency GPS Executive Board (IGEB) which is comprised of members from the Department of Defense (DoD) and the Department of Transportation (DoT). A decision was made by the IGEB to modernize the GPS signals for enhanced civilian and military performance. The impacts of the various signal structure alternatives and the method to upgrade the user equipment must be identified. Funds for Research, Development, Test and Evaluation are needed to develop user equipment that will incorporate the National Air Space (NAS) Non-Precision Approach (NPA) sole/primary IFR navigation requirements into Naval aviation platforms. The NPA GPS requirement has been identified in the Federal Radionavigation Plan, chairman Joint Chiefs of Staff Master Navigation Plan, and CNO's Draft GPS Integration Guidance.

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X0921

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: NAVSTAR GPS Equipment

B. (U) PROGRAM CHANGE SUMMARY

(U) FY 1999: Congressional reductions associated with Revised Economic Assumptions (-118), SBIR (-238), LOCO GPSI Reprogramming (-220), and Miscellaneous Departmental Adjustments (1470)

FY 2000: Congressional reductions (-57), Miscellaneous Departmental Adjustments (332), Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638 (119)

FY 2001: Congressional reductions (-66), Navigation Warfare (4,100K) and Departmental Adjustments (-121)

(U) Schedule: None.

(U) Technical: None.

(U) COST: (Dollars in thousands)

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
(U) O&MN PE#: 0305164N	1,856	2,208	1,952	2,037	2,015	2,112	2,182	cont.	cont.
(U) OPN Line #26570	9,367	8,471	9,607	9,030	9,127	10,690	11,813	cont.	cont.
(U) APN-Common Avionics	27,400	9,200	13,128	16,191	13,819	15,142	10,092	cont.	cont.

(U) RELATED RDT&E: None

D. (U) ACQUISITION STRATEGY: NOT APPLICABLE FOR PROJECT X0921, ALL MILESTONES AND SCHEDULES ARE COMPLETED

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Exhibit R-3 Cost Analysis (page 1)												
APPROPRIATION/BUDGET ACTIVITY: 5				PROGRAM ELEMENT: 0604777N					PROJECT NAME AND NUMBER: X0921 NAVSTAR GPS Equipment			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Product Dev (F-14B)	SS	Grumman Aero	9,466	1,700	12/98	0		0		0	11,166	
Product Dev (F-18B)	SS	Boeing	12,814	2,799	12/98	0		0		0	15,613	
Product Dev (S-3B, F-14D, C12, etc)	Various	Other Contracts	233,240	276	Var	120	Var	169	Var	Cont	Cont	
Product Dev (SSC-SD)	WX	SSC-SD	38,481	14,051	10/98	5,978	10/99	7,774	10/00	Cont	Cont	
Product Dev (Other Inhouse)	WX	Various Field Act	430,063	4,902	10/98	3,001	10/99	4,204	10/00	Cont	Cont	
Subtotal Product Development			724,064	23,728		9,099		12,147		Cont	Cont	
Remarks:												
Support	Various	Various	12,710			0				0	12,710	
Subtotal Support			12,710			0		0		0	12,710	
Remarks												

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Exhibit R-3 Cost Analysis (page 2)												
APPROPRIATION/BUDGET ACTIVITY: 5				PROGRAM ELEMENT: 0604777N					PROJECT NAME AND NUMBER: X0921 NAVSTAR GPS Equipment			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
T&E (NAWC PAX)	WX	NAWC PAX	8,353	752	10/98	409	10/99	571	10/00	Cont	Cont	
T&E (DCS Corp)	T&M	DCS Corp, Pax		300	10/98	117	10/99	163	10/00	Cont	Cont	
Subtotal T&E			8,353	1,052		526		734		Cont	Cont	
Remarks												
Project Management Support	T&M	DCS Corp, San Diego	1,600	1,969	10/98	610	10/99	851	10/00	Cont	Cont	
Subtotal Management			1,600	1,969		610		851		Cont	Cont	
Remarks												
Total Cost			746,727	26,749		10,235		13,732		Cont	Cont	
Remarks												

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**R-3 Project Cost Analysis**

## EXHIBIT R-2a, FY 2001 RDT&amp;E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2313

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: SABER

(U) COST: (Dollars in thousands)

PROJECT

NUMBER & TITLE	FY 1999 ACTUAL	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
X2313 Situational Awareness Beacon with Reply (SABER)	935	0	0	0	0	0	0	cont.	cont.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The SABER system provides critical battlefield/operating area situational awareness and friendly ID capabilities by uniting GPS and communications technologies. The SABER system consists of a GPS receiver and two-way radio capable of Over-The-Horizon (OTH) and Line-Of-Sight (LOS) secure and non-secure communications, plus a Collection of Broadcast From Remote Assets (COBRA) transmitter. The GPS receiver provides an accurate position of the user which is broadcast over the various RF links for reception by other SABER beacons. When a correctly encoded interrogation signal is received by the SABER, it transmits a reply via the radio of the users identification, position, heading, and speed. The interrogating system can be any member of the user's command and control structure. Additionally, SABER-equipped units who are preparing to launch an attack will send an intent-to-shoot LOS transmission indicating the target position and a kill radius. All SABER units on the network will compare the area with their own position. If an overlap exists, a "Don't Shoot" reply is sent to prevent fratricide. Three basic configurations will be developed and produced: self-contained (for amphibious forces and ground forces); integrated with NAVSSI (for ships so equipped); integrated with CDNU (in aircraft so equipped).

(U) PROGRAM PLANS AND ACCOMPLISHMENTS:

1. (U) FY 1999 ACCOMPLISHMENTS:

- (U) (\$85) Systems Engineering for C4ISR integration.
- (U) (\$375) System engineering for transition of SABER from ACTD to a formal acquisition program in conformance with DODINST 5000 series.
- (U) (\$225) Prototype development and demonstration of integrated SABER/aircraft and shipboard configuration. System engineering analysis of SABER/NAVSSI integration.
- (U) (\$250) System engineering management of EDM development and operational testing.

EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604777N

PROJECT NUMBER: X2313

PROGRAM ELEMENT TITLE: Navigation/ID Systems

PROJECT TITLE: SABER

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B. (U) PROGRAM CHANGE SUMMARY:

(U) FY 1999: SBIR (-93K), Saber SABER sponsor adjustment/project Termination (-5,965)

(U) FY 2000: Funding change -\$3,317K SABER sponsor adjustment/project termination.

(U) FY 2001: Funding change of -\$1,147K SABER sponsor adjustment/project termination.

(U) Schedule: None.

(U) Technical: None.

C. (U) OTHER PROGRAM FUNDING SUMMARY: (Dollars in thousands)

	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	TO	TOTAL
	ACTUAL	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	ESTIMATE	COMPLETE	PROGRAM
(U) OPN #285100:	43	1	0	0	0	0	0	0	44
(U) O&MN #AG/SAG 1A4A:	841	395	0	0	0	0	0	0	2,144

D. (U) SCHEDULE PROFILE:

	FY 1999	FY 2000	FY 2001
Program Milestones	2Q-Milestone II		
Engineering Milestones			
T&E Milestones			
Contract Milestones			

- The SABER program was an ACTD program. The Navy has provided the funds for concept design, test, and milestone accomplishment prior to FY98 through reprogramming within Navy PE#: 0604777N, project X0921 in the amount of \$796K in FY96 and \$700K in FY97.

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Exhibit R-3 Cost Analysis (page 1)												
FY 2001/ Budget Activity 5				PROGRAM ELEMENT : 0604777N						SABER Project Number:X2313		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
ACTD Hardware	CPFF	Southwest Research Inst.-San Antonio TX	1,228								1,228	
Engineering Development Model	CPI	Competitive										
System Engineering	WX	SPAWAR-SYS. CEN. San Diego	2,642	413	10/98						3,055	
Subtotal Product Development			3,870	413							4,283	
Remarks:												
ACTD Exercise Support	WX	SPAWAR-SYS. CEN. Charleston	700	100	10/98						800	
Logistics Support	WX	SPAWAR-SYS. CEN. San Diego		338	10/98						338	
ISEA Support	WX	SPAWAR-SYS. CEN. San Diego		84	10/98						84	
Subtotal Support			700	522							1,222	
Remarks												

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**R-3 Project Cost Analysis**

Exhibit R-3 Cost Analysis (page 2)												
FY 2001 / Budget Activity 5				PROGRAM ELEMENT : 0604777N						SABER Project Number:X2313		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY99 Cost	FY99 Award Date	FY00 Cost	FY00 Award Date	FY01 Cost	FY01 Award Date	Cost To Complete	Total Cost	Target Value of Contract
TEMP Development	WX	SPAWAR-SYS. CEN. San Diego	150								150	
Operational Evaluation		OPTEVFOR										
Subtotal T&E			150								150	
Remarks												
Project Management Support	CPFF	DCS Corp San Diego	350								350	
Subtotal Management			350								350	
Remarks												
Total Cost			5,070	935							6,005	
Remarks												