CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**					R-1 ITEM NOMENCLATURE 0604777N NAVIGATION/ID SYSTEMS			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**43.486**	**48.542**	**63.184**					
0253 Nav & Electro-Optical Supt	**7.369**	**7.886**	**7.996**					
0676 Improved ID Development	**3.366**	**2.841**	**2.894**					
0921 NAVSTAR GPS Equipment	**21.067**	**28.348**	**21.895**					
1253 Combat ID System	**11.684**	**9.467**	**30.399**					
Quantity of RDT&E Articles	**5**	**2**	**18**					

A. 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 Imaging System (0253) is a non-hull penetrating replacement for existing optical periscopes. The Photonics Imaging System exploits a wide portion of the electro-magnetic spectrum utilizing advanced Electro-Optic/thermal imaging, and communications intercept/Electronic Warfare Support (ES). The Integrated Submarine Imaging System (ISIS) (0253) is a back fit system to integrate all imaging capabilities on existing submarine classes. The Combat Identification System (CIS) project (1253) for Mark XIIA, and Improved Identification Development (0676) for AN/UPX-29, 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. Per OSD direction, NATO participation is encouraged and performance data is exchanged to ensure the opportunity for interoperability with allied identification systems is maximized. 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).

NAVSTAR Global Positioning System (GPS) project (0921) is a space-based positioning, navigation and timing (PNT) system that provides authorized users with secure, worldwide, all weather, three dimensional position, velocity and precise time data. Navy Air and Sea Navigation Warfare (NAVWAR) are major elements of the GPS program. NAVWAR's mission is to provide continued access to GPS information in a denied environment. NAVWAR accomplishes this through the use of enhanced user equipment (UE). GPS Modernization addresses the Navy's future integration of GPS Joint Program Office (JPO) Modernized User Equipment (MUE) products being developed that will enable the use of new signals in space. WRN-X is a modernized ship GPS equipment development program required to provide a replacement for the existing WRN-6 receiver and other shipboard receivers. Navigation Sensor System Interface (NAVSSI) is a surface based system that integrates shipboard position, navigation and timing data and distributes the processed output to user systems and networks.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**	R-1 ITEM NOMENCLATURE 0604777N NAVIGATION/ID SYSTEMS

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	41.226	49.007	48.498
Current BES	43.486	48.542	63.184
Total Adjustments	2.260	-0.465	14.686
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		-0.332	
SBIR/STTR/FTT Assessments	-0.063		
Program Adjustments	2.323		14.749
Rate/Misc Adjustments		-0.133	-0.063
Subtotal	2.260	-0.465	14.686

Schedule:

Proj 0676: FRPDR, IOC and LRIP and FRP delivery schedule changes are based on the Mode 5 Acquisition Program Baseline, dated 5 June 2008. The OE-120/UPX Antenna and the Navy Tactical Data System (NTDS) Interface Elimination schedule milestones have been added to the program schedule.

Proj 0921: Changes to the Advanced Digital Antenna Production (ADAP) development schedule are due to the delayed approval of acquisition documentation and technical issues. Changes caused the delay of the Full Rate Production schedule from 3Q08 to 1Q10.

Proj 1253: FRPDR, IOC, LRIP and FRP delivery schedule, and the OTRR and OPEVAL changes are based on the Mode 5 Acquisition Program Baseline, dated 5 June 2008.

Technical:

Not Applicable

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604777N/NAVIGATION/ID SYSTEM**		PROJECT NUMBER AND NAME **0253/Nav & Electro-Optical Supt**

COST (In Millions)	FY 2008	FY 2009	FY 2010
Project Cost	7.369	7.886	7.996
RDT&E Articles Qty	0	0	0

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Navigation and Electro-Optical Support program develops Submarine Electro-Optical and imagery systems and equipment that will improve submarine imaging capability in the areas of: ship safety, Intelligence, Surveillance and Reconnaissance (ISR), and tactical control (contact management in the littorals). The Photonics Imaging System, mounted on the Universal Modular Mast, will provide imaging capability for the VIRGINIA class submarine. The Photonics Imaging System 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. Specific efforts include: (1) Photonics Imaging System On-Board Team Trainer Development (2) Photonics Imaging System At Sea Test And Evaluation (3) Photonics Imaging System Sensors and image processing improvements.

The Department of the Navy established the Integrated Submarine Imaging System (ISIS) to rapidly field the Type 18 Periscope Patriot Rangefinder, Type 8IR Periscope systems, and integrate existing periscope imagery systems into a single system for installation on board submarines. The ISIS baseline includes the Type 18 Periscope Patriot Rangefinder, Type 8IR Periscope, and supports high intensity operations in the littoral and provides the submarine force with the tactical imaging systems necessary to safely and effectively employ its surveillance and weapons capabilities. Specific efforts undertaken to meet the ISIS requirements are: (1) Type 18 Periscope Automated Range Finder development. (2) Submarine Common Imagery System Development. Development of capabilities common to ISIS and Photonics, include: Image stitching, high resolution imaging, automatic visual detection, tracking and classification capabilities.

This program funds the development of Patriot Radar Range Finding for Photonics for SSGN and VIRGINIA Class Submarines. Patriot for Photonics will provide SSGN and VIRGINIA Class submarines with enhanced situations awareness and collision avoidance. Currently Patriot has only been developed for SSN 688 and SSN 21 Class submarines. This effort will provide Patriot Radar Range Finding to SSGN and VIRGINIA Class submarines on the Photonics Mast.

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604777N/NAVIGATION/ID SYSTEM**	PROJECT NUMBER AND NAME **0253/Nav & Electro-Optical Supt**	

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.154	0.147	0.139
RDT&E Articles Quantity	0	0	0
Upgrade/Resolve Obsolescent Photonics On-Board Team Trainer development.			

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.290	4.929	4.206
RDT&E Articles Quantity	0	0	0
ISIS and Photonics common hardware capabilities development and obsolescence.			

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.915	1.040	2.066
RDT&E Articles Quantity	0	0	0
Low Light Level TV development, digital sensor development and integration and displays.			

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	0.950	0.720	1.045
RDT&E Articles Quantity	0	0	0
Imaging System Test Efforts.			

	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.060	1.050	0.540
RDT&E Articles Quantity	0	0	0
Patriot Radar Range Finding Development for Photonics for SSGN and VIRGINIA Class Submarines.			

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604777N/NAVIGATION/ID SYSTEM**	PROJECT NUMBER AND NAME **0253/Nav & Electro-Optical Supt**

C. OTHER PROGRAM FUNDING SUMMARY:

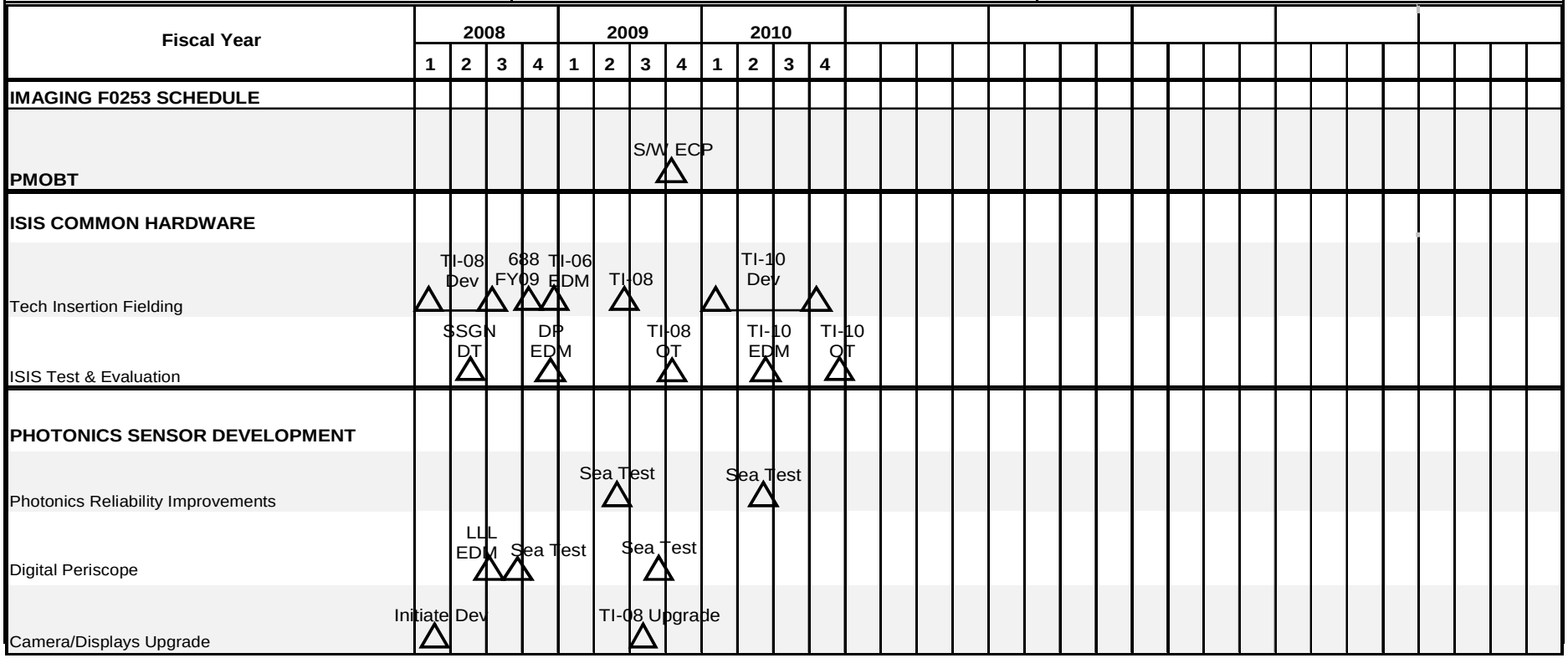
Line Item No. and Name	FY 2008	FY 2009	FY 2010					
(U) SCN Line 201300 (Photonics Mast only)	16.817	16.733	17.168					
OPN Line 083100 (PL022)	27.647	53.119	38.423					
OPN Line 083105	11.660	6.532	4.249					
(U) Related RDT&E	5.148	1.150	1.019					
PE 0604558N VIRGINIA Class Design Development	0.763	1.145	3.229					

D. ACQUISITION STRATEGY:

The Acquisition Strategy for AN/BVS-1 Photonics Mast Program (PMP) is dtd 24 Sept 2001. The PMP provides for the development and acquisition of a non-hull penetrating submarine electronic imaging system for VIRGINIA Class submarines. The Acquisition Strategy for Integrated Submarine Imaging System (ISIS) is dtd 07 Jul 2003. The ISIS will provide mission critical, all weather, visual, and electronic search, digital image management, indication, warning, and platform architecture interface capabilities for SSN 688, SSN 21, and SSGN class submarines.

CLASSIFICATION:	UNCLASSIFIED										
EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**		PROGRAM ELEMENT NUMBER AND NAME **0604777N/NAVIGATION/ID SYSTEM**					PROJECT NUMBER AND NAME **0253/Nav & Electro-Optical Supt**				
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost ($000)	FY 2009 Cost ($000)	FY 2009 Award Date	FY 2010 Cost ($000)	FY 2010 Award Date				
Primary Hardware Development	Various	Various	7.623	1.710	OCT-08	1.801	OCT-09				
Software Development	Various	Various	5.594	2.227	OCT-08	2.249	OCT-09				
Systems Engineering	Various	Various	6.534	2.053	OCT-08	2.006	OCT-09				
Miscellaneous	Various	Various	2.052	0.503	OCT-08	0.515	OCT-09				
Subtotal Product Development			**21.803**	**6.493**		**6.571**					
Remarks:											
Program Management Support	CPAF	AT&T	1.852	0.543	OCT-08	0.557	OCT-09				
Subtotal Support Costs			**1.852**	**0.543**		**0.557**					
Remarks:											
Development Test & Evaluation	Various	Various	3.005	0.800	OCT-08	0.817	OCT-09				
Subtotal Test and Evaluation			**3.005**	**0.800**		**0.817**					
Remarks:											
Travel	CPAF	AT&T	0.150	0.050		0.051					
Subtotal Management Services			**0.150**	**0.050**		**0.051**					
Remarks:											
Total Cost			**26.810**	**7.886**		**7.996**					

CLASSIFICATION:	UNCLASSIFIED	
EXHIBIT R-4, SCHEDULE PROFILE		DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604777N/NAVIGATION/ID SYSTEM**	PROJECT NUMBER AND NAME **0253/Nav & Electro-Optical Supt**



R-1 Line Item No 125 CLASSIFICATION: **UNCLASSIFIED** **EXHIBIT R-4 SCHEDULE PROFILE**

CLASSIFICATION:	UNCLASSIFIED		
EXHIBIT R-4a, SCHEDULE DETAIL			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY **RDTEN/BA 5**	PROGRAM ELEMENT NUMBER AND NAME **0604777N/NAVIGATION/ID SYSTEM**		PROJECT NUMBER AND NAME **0253/Nav & Electro-Optical Supt**

Schedule Profile	FY 2008	FY 2009	FY 2010
TI-08 Development	1Q		
Photonics Integration COntrol and Display Development	1Q		
ISIS SSGN DT	2Q		
LLL TV EDM	3Q		
Photonics Reality Sea Test	3Q		
ISIS 688	4Q		
TI-06-EDM	4Q		
Digital Periscope EDM	4Q		
TI-08 Fielding		2Q	
Test Photonics Reality Improvements		2Q	
Test Digital Periscope		3Q	
Upgrade Photonics Camera		3Q	
PMOBT Software ECP		4Q	
TI-08 OT		4Q	
TI-1- Development			1Q
TI-10 EDM			2Q
Test Photonics Reality Sea Test			4Q
TI-10-OT			4Q

R-1 Line Item No 125 CLASSIFICATION: **EXHIBIT R-4a**
UNCLASSIFIED **SCHEDULE DETAIL**

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION / ID SYSTEMS				PROJECT NUMBER AND NAME 0676 IMPROV IDENTIFICATION DEV			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
0676 IMPROV IDENTIFICATION	**3.366**	**2.841**	**2.894**					
RDT&E Articles Qty								

A. 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. In addition to providing platform identification 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. The Improved ID Development project addresses the Navy Lead of a Mark XIIA Mode 5 upgrade to the existing AN/UPX-29(V) Mark XII family of systems that is Joint and NATO interoperable. This exhibit also addresses the AN/UPX-29(V) antenna, the OE-120/UPX.

EXHIBIT R-2a
RDT&E PROJECT JUSTIFICATION

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION / ID SYSTEMS	PROJECT NUMBER AND NAME 0676 IMPROV IDENTIFICATION DEV

B. Accomplishments/Planned Program

AN/UPX-29 (V) - OE-120 Antenna Replacement	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.301	1.429	2.369	
RDT&E Articles Quantity				

Engineering and integration development of the new OE-120/UPX antenna. Develop design studies and test procedures, draft specifications, and perform system development and integration efforts.

Mark XIIA Mode 5 Improvements for AN/UPX-29(V)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.065	0.817	0.225	
RDT&E Articles Quantity				

Engineering, development, and integration of Mark XIIA Improvements to the AN/UPX-29 (V). Correct deficiencies from Integrated Test and Operational Test (IT - OT) and baseline software and documentation. Funds development and integration of Mark XIIA Improvement to the AN/UPX-29 (V) system on CG 47, DDG 51, LHD 1, LPD 17 and CV/CVN class ships. Provides core Integrated Logistics Support (ILS) documentation; formalizes hardware/software configuration; finalizes technical/design data, and resolves testing anomalies.

AN/UPX-29(V) Navy Tactical Data System elimination	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		0.595	0.300	
RDT&E Articles Quantity				

Development, test and integration of ethernet interface for the AN/UPX-29(V) to meet emergent needs of the Navy to eliminate all Navy Tactical Data System (NTDS) cables on CG 47, DDG 51, LHD 1, LPD 17 and, CV/CVN class ships.

EXHIBIT R-2a
RDT&E PROJECT JUSTIFICATION

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604777N NAVIGATION / ID SYSTEMS	0676 IMPROV IDENTIFICATION DEV

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
P-1 #62: Identification Systems - OPN	25.175	31.367	38.682

D. ACQUISITION STRATEGY:

The Acquisition Strategy is to develop Mode 5 Engineering Change Proposals (ECPs) for modern Mark XII Identification Friend or Foe (IFF) equipment and integrate into all Navy Combat Weapons systems platforms and transition the Navy's Cooperative Identification Capability to Mode 5.

EXHIBIT R-2a
RDT&E PROJECT JUSTIFICATION

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604777N NAVIGATION / ID SYSTEMS			PROJECT NUMBER AND NAME 0676 IMPROV IDENTIFICATION DEV						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hardware Development	WX	NAWCAD, St Inigoes, MD	1.841	0.605	11/08	1.671	11/09					
Ship Integration	WX	NAWCAD, St Inigoes, MD	1.674	0.445	11/08	0.090	11/09					
Systems Engineering	WX	NAWCAD, St Inigoes, MD	3.836	0.372	11/08	0.135	11/09					
Subtotal Product Development			7.351	1.422		1.896						
Remarks:												
Development Support												
Configuration Management	WX	NAWCAD, St Inigoes, MD	0.169			0.177	11/09					
ILS	WX	NAWCAD, St Inigoes, MD	1.867	0.251	11/08	0.115	11/09					
Software Development	WX	NAWCAD, St Inigoes, MD	2.758	0.200	11/08	0.231	11/09					
Technical Data	WX	NAWCAD, St Inigoes, MD	0.688	0.300	11/08	0.175	11/09					
Training	WX	NAWCAD, St Inigoes, MD	0.200	0.073	11/08							
Subtotal Support			5.682	0.824		0.698						
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604777N NAVIGATION / ID SYSTEMS			PROJECT NUMBER AND NAME 0676 IMPROV IDENTIFICATION DEV						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Developmental Test & Evaluation	WX	NAWCAD, St Inigoes, MD	0.400	0.100	11/08							
Operational Test & Evaluation	WX	NAWCAD, St Inigoes, MD	1.228	0.100	11/08							
Test Assets	WX	NAWCAD, St Inigoes, MD	0.631	0.100	11/08							
GFE												
Award Fees												
Subtotal T&E			2.259	0.300		0.000						
Remarks:												
Contractor Engineering Support												
Program Management Support	C-CPFF	American Elec, California, MD	0.837	0.295	12/08	0.300	12/09					
Subtotal Management			0.837	0.295		0.300						
Remarks:												
Total Cost			16.129	2.841		2.894						
Remarks:												

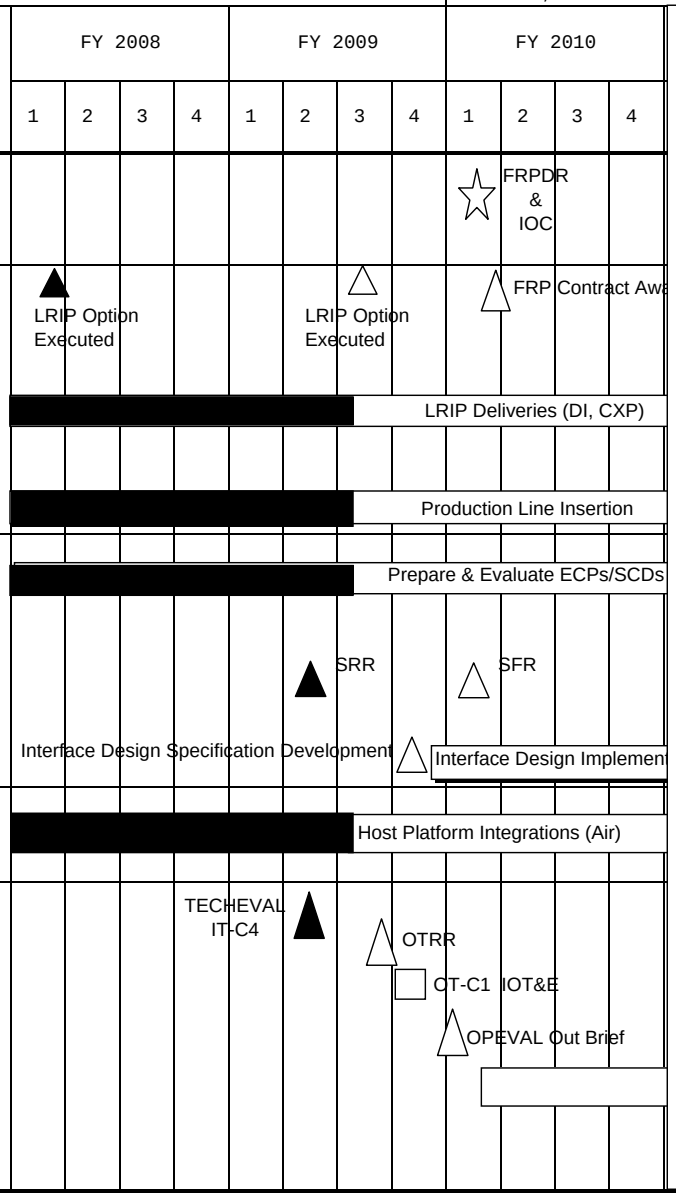
EXHIBIT R-3
RDT&E PROJECT COST ANALYSIS

EXHIBIT R4, Schedule Profile | DATE: May 2009

APPROPRIATION/BUDGET ACTIVITY: RDT&E, N / BA-5

PROGRAM ELEMENT NUMBER AND NAME: 0604777N, NAVIGATION/ID SYSTEM

PROJECT NUMBER AND NAME: 0676 IMPROV ID DEV



CLASSIFICATION:

Exhibit R-4a, Schedule Detail			DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604777N NAVIGATION / ID SYSTEMS		PROJECT NUMBER AND NAME 0676 IMPROV ID DEV

Schedule Profile	FY 2008	FY 2009	FY 2010
Mode 5			
Full Rate Production Decision Review (FRPDR) & IOC			1Q
FRP Contract Award & APX-119 Integration Begins			1Q
Low-Rate Initial Production Contract Award and Options	1Q	3Q	
Low-Rate Initial Production Deliveries (CXP, DI)	1Q-4Q	1Q-4Q	1Q-4Q
FRP Deliveries			
Prepare & Evaluate ECPs/SCDs	1Q-4Q	1Q-4Q	1Q-4Q
Production Line Insertion	1Q-4Q	1Q-4Q	1Q-4Q
Host Platform Integrations (Air)	1Q-4Q	1Q-4Q	1Q-4Q
TECHEVAL (IT-C4)		2Q	
Operational Test Readiness Review (OTRR)		3Q	
IOT&E		4Q	
OPEVAL Out Brief			1Q
Mode 5 Joint IOC			
Mode 5 Spiral Development			
Follow-on Test and Evaluation			1Q-4Q
OE-120/UPX Antenna			
Initial Technical Review (ITR)		1Q	
System Requirements Review (SRR)		1Q	
System Functional Review (SFR)			1Q
Preliminary Design Review (PDR)			4Q
Critical Design Review (CDR)			
Test Readiness Review (TRR)			
Production Readiness Review (PRR)			
Functional Configuration Audit (FCA)			
Physical Configuration Audit (PCA)			
NTDS Interface Elimination			
Interface Design Specification (IDS) Development		4Q	
Interface Design Implementation			1Q-4Q
Test Readiness Review (TRR)			
Integration and Baseline Certification Testing			

EXHIBIT R-4a
SCHEDULE DETAIL

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME			PROJECT NUMBER AND NAME					
RDT&E, N / BA 5	0604777N NAVIGATION/ID SYSTEMS			0921 NAVSTAR GPS EQUIPMENT					
COST ($ in Millions)	FY 2008	FY 2009	FY 2010						
Project Cost	**21.067**	**28.348**	**21.895**						
RDT&E Articles Qty	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The mission of the Global Positioning System (GPS) program efforts is to provide assured and protected navigation solutions to the war fighters through supported, affordable, and integrated systems. Research, Development, Testing and Evaluation (RDT&E) funds are used to perform all the non-recurring GPS Surface Ship, Submarine and Aircraft Integration efforts. GPS continues to be integrated in all DoD platforms and the development of enhanced GPS is an urgent national security priority in accordance with US Code - 10USC2281 of 15 November 2005. As stated in the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6130.01D, 2007 Master Positioning, Navigation, and Timing Plan (MPNTP), the "GPS is the primary source of Positioning Navigation and Timing (PNT) information for the DoD". In accordance with OPNAVINST 9420.1B "GPS Precise Positioning Service (PPS) systems shall be used for all combat, combat support, and combat service support operations and training" to provide assured access to accurate position and performance under intentional and unintentional interference. This direction is in keeping with the National Security/Presidential Directive (NSPD)-39 of 15 December 2004 and current solutions are well-supported by numerous studies and analyses that include Defense Science Board Task Force reports (October 2005), the DoD's GPS III System Architecture/Requirements Definition (SA/RD) of January 2003, and various DoD and Navy requirements documents.

NAVSTAR Global Positioning System (GPS) project (0921) is a space-based positioning, navigation, and timing (PNT) system that provides authorized users with secure, worldwide, all weather, three dimensional position, velocity, and precise time data. Navy Air and Sea Navigation Warfare (NAVWAR) are major elements of the GPS program. NAVWAR's mission is to provide continued access to GPS information in a denied environment. NAVWAR accomplishes this through the use of modernized User Equipment (UE). Beginning in FY 10, the Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) system will integrate modernized GPS UE being developed by the GPS Wing into a complete NAVWAR solution for Navy surface and subsurface platforms. The GPNTS will be scalable to replace stand-alone WRN-6 systems as well as integrated Navigation Sensor System Interface (NAVSSI) systems. Additionally, future capability will migrate toward a Common Computing Environment (CCE) such as Consolidated Afloat Networks Enterprise Services (CANES).

The Naval Research Advisory Committee (NRAC) GPS Vulnerability Study Panel assessed the Navy's GPS Vulnerabilities and recommended specific actions to resolve serious issues to ensure the continued availability of GPS information in a high risk hostile jamming environment. As a result, the Navy Enhanced GPS User Equipment ORD was drafted to address operational requirements. These were validated and the ORD was approved on June 7, 2000. With this beginning, OSD directed the first phase of the Navy's overall GPS upgrade program with RDT&E leading to initial procurements of GPS anti-jam (AJ) antennas beginning in 2001 for aircraft and 2002 for ships. RDT&E continues to support platform integration requirements, Developmental Test/Operational Test (DT/OT), as well as the GPS Wing development of an Advanced Digital Antenna Production (ADAP), the Navy's development of a smaller Anti-Jam (AJ) antenna and a conformal low-observable AJ antenna for aircraft with unique requirements, new technology AJ solutions for submarines (Frequency Excision Filter (FEF)), and the integration of AJ protection into handheld receivers. Two similar but separate ACAT III programs (Air and Sea NAVWAR) have been established and have become the basis for the Navy's Air and Sea Navigation Warfare (NAVWAR) programs. The Sea NAVWAR Program is executed in 3 increments. The GPS Antenna System (GAS-1) is integrated on surface platforms in Increment 1. Increment 2 is ADAP. It is an enhanced adaptive AJ antenna system based on advanced digital electronics and digital signal processing planned for surface ship integrations. Increment 3 addresses anti-jam (AJ) capabilities for submarines. The Air NAVWAR program is a single increment with GAS-1, ADAP, and other efforts continuing.

The primary Global Positioning System (GPS) shipboard receivers fielded on the majority of U.S. Navy ships today include the AN/WRN-6 and the GPS VME Receiver Card (GVRC). These military GPS receivers provide precise Position, Navigation, and Time (PNT) data required for many combat weapons and navigation systems, as well as providing the time synchronization critical to the network environments. The failure of the GPS receiver ultimately means the loss of GPS for the ship and those systems that depend upon it. However, as GPS devices have proliferated throughout the commercial community, it has become more readily available not only to civilians, but to adversaries as well. As a result, even the military GPS Precise Positioning System (PPS) is more vulnerable today to unintentional and intentional jamming. The new security architecture, known as Selective Availability Anti-Spoof Module (SAASM), addresses this vulnerability, and has been mandated for all military combat GPS receiver procurements beginning in FY07. Additionally, the GPS satellite constellation is being modernized to incorporate new GPS signals from space for both military and civilian users (e.g., M-code and L5). While SAASM-capable GPS receivers are available commercially today, they require modification to support the various combat system requirements and interfaces required by the Navy shipboard systems, and will require modification in the future to implement the new GPS modernized signals. The GPNTS system will be engineered for immediate implementation of SAASM, and will be an open architecture allowing for modification to implement modernized GPS signals when they become available; thus making it backwards and forwards compatible with all GPS systems (e.g., Y code, M code, (C/A) code (YMCA)). Similarly, SAASM is required for GPS receivers in aircraft, and aircraft related SAASM integration and test will be required.

The Navy's overall GPS User Equipment upgrade is modernization of all GPS systems on Air and Sea platforms. This will require RDT&E to support the replacement of existing legacy GPS receivers with enhanced capability receivers and antennas based upon and coordinated with the GPS Wing program. These new receivers and antennas will incorporate GPS Wing and Navy directed and developed technology enhancements to support new signals in the maritime domain, in space, enhanced receiver security, aircraft operations within controlled airspace and future weapons, combat, and C4I systems requirements.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 5**	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS		PROJECT NUMBER AND NAME 0921 NAVSTAR GPS EQUIPMENT

(U) B. Accomplishments/Planned Program

Air Navigation Warfare (NAVWAR)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	10.339	13.720	9.465	
RDT&E Articles Quantity	0	0	0	

(U) FY08 ACCOMPLISHMENTS: Completed development of conformal array for F/A-18 E/F/G. Completed initial antenna integration efforts on E-2D. Continued integration/testing of antenna on F/A-18 E/F/G. Continued Advanced Digital Antenna Production (ADAP) testing and NAVWAR integration on H-53 (IOC). Continued monitoring potential Small Antenna System (SAS)/Miniaturized - Controlled Reception Pattern Antenna (M-CRPA) solutions. Continued participation in joint NAVWAR Memorandum Of Understanding (MOU) initiatives with Canada, United Kingdom and Australia.
(U) FY09 PLANS: Continue integration of conformal array on F/A-18 E/F/G and NAVWAR on other Air platforms. Continue Selective Anti-Spoof Module (SAASM) integration and testing on Air platforms. Continue monitoring of SAS/M-CRPA development. Participate in joint NAVWAR MOU initiatives with Canada, United Kingdom and Australia. Complete NAVWAR testing on H-53.
(U) FY10 PLANS: Continue integration of conformal array on F/A-18 E/F/G and NAVWAR on other Air platforms. Continue developmental testing of NAVWAR on F/A-18 E/F/G. Continue SAASM integration and testing on Air platforms. Monitor of SAS/M-CRPA development. Participate in joint NAVWAR MOU initiatives with Canada, United Kingdom and Australia.

Sea Navigation Warfare (NAVWAR)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	4.274	4.964	4.450	
RDT&E Articles Quantity	0	0	0	

(U) FY08 ACCOMPLISHMENTS: Continued modeling and simulation, integration, and Developmental Testing (DT) efforts for ADAP on DDG, LCAC, and surface ships integrated with AN/WRN-6 (FFG, MCM, MHC). Continued participation in joint Navigation Warfare (NAVWAR) Memorandum of Understanding (MOU) initiatives with Canada, United Kingdom and Australia.
(U) FY09 PLANS: Increment 2 (ADAP): Conduct DT for ADAP on DDG, CVN, CG47 platforms. Support Operational Testing (OT) on DDG. Increment 3 (Submarine Anti Jam (AJ) Capability): Revise submarine AJ capability Analysis of Alternatives (AoA). Develop pre-Milestone B acquisition documents. Initiate contract planning for submarine AJ capability System Development and Demonstration contract. Participation in joint NAVWAR MOU initiatives with Canada, United Kingdom and Australia.
(U) FY10 PLANS: Increment 2 (ADAP): Conduct DT and integration for ADAP on LHD. Increment 3 (Submarine AJ): finalize acquisition documents for Milestone B. Conduct milestone decision review for Increment 2. Finalize submarine AJ technical specifications and award System Development & Demo (SD&D) contract. Continue participation in joint NAVWAR MOU initiatives with Canada, United Kingdom and Australia.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME		PROJECT NUMBER AND NAME
RDT&E, N / BA 5	0604777N NAVIGATION/ID SYSTEMS		0921 NAVSTAR GPS EQUIPMENT

(U) B. Accomplishments/Planned Program

Global Positioning System (GPS) Modernization	FY08	FY09	FY10	
Accomplishments/Effort/Subtotal Cost	2.148	4.540	0.000	
RDT&E Articles Quantity	0	0	0	

(U) FY08 ACCOMPLISHMENTS: Performed Pre Milestone B market research, acquisition strategies and plans were performed in preparation for Milestone B. Performed acquisition document development and planning for the various entities of the modernization program.

(U) FY09 PLANS: Global Positioning System (GPS) Modernization Pre-Acquisition activities will support the GPS- Based Positioning, Navigation and Timing (PNT) Service (GPNTS) increment 2 fielding of M-Code. Finalize Air and Sea modernized GPS user equipment (UE) specifications. Develop technical requirements for the Maritime Domain for GPS User Equipment (MGUE). Support the development of modernized interface documents, the MGUE Enterprise Test and Evaluation Master Plan (TEMP), and modernized GPS user equipment for the Maritime and Air domains. Participate in down select activities conducted by the GPS Wing (GPSW) for Air and Maritime MGUE. Begin platform integration groundwork, such as identification of new capabilities to be incorporated, physical platform modification design, software requirements specification development, platform audits to determine suitability for transition, refining the platform capability roadmaps.

(U) FY10 PLANS: GPS Modernization funding and acquisition program efforts will merge into Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) program.

WRN X	FY08	FY09	FY10	
Accomplishments/Effort/Subtotal Cost	4.306	5.124	0.000	
RDT&E Articles Quantity	0	0	0	

(U) FY08 ACCOMPLISHMENTS: Developed pre Milestone B acquisition documents. Released request for information (RFI). Conducted contracting planning conference. Completed WRN-X requirements documents. Developed Draft request for proposal (RFP) in preparation for WRN-X System Development and Demonstration (SDD) contract. Finalized mandatory acquisition documentation to obtain a Milestone B decision. Finalized the WRN-X technical specifications.

(U) FY09 PLANS: WRN-X Pre-Acquisition activities will support the GPNTS increment 1 fielding of a new scalable military GPS receiver with Selective Availability Anti-Spoof Module (SAASM). These efforts will include the completion of all statutory and regulatory acquisition requirements to include the Capabilities Development Document (CDD), Test and Evaluation Master Plan (TEMP), Programmatic, Environmental, Safety, and Health Assessment (PESHE), Information Assurance (IA) Strategy, Information Support Plan (ISP), Human Systems Integration (HSI), Systems Engineering Plan (SEP), Independent Logistics Support Plan (ILSP), Independent Logistics Assessment (ILA), Performance Based Logistics (PBL), Acquisition Strategy (AS)/Acquisition Plan (AP), Project Life Cycle Cost Estimate (PLCCE), and Navy Training Service Plan (NTSP) documents. Attainment of a Milestone B decision to move into the next phase of the program. Development and release of an RFP followed by a System Development and Demonstration (SDD) contract award. Activities necessary to support post contract award activities.

(U) FY10 PLANS: WRN-X funding and acquisition program efforts will merge into Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) program.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME		PROJECT NUMBER AND NAME
RDT&E, N / BA 5	0604777N NAVIGATION/ID SYSTEMS		0921 NAVSTAR GPS EQUIPMENT

(U) B. Accomplishments/Planned Program

Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS)	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	7.980	
RDT&E Articles Quantity	0	0	0	

All WRN-X and Global Positioning System (GPS) Modernization acquisition efforts in FY08 and FY09 will merge into the Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) program.

(U) FY10 PLANS: Complete design review (System Requirement Review -SRR, Preliminary Design Review-PDR, and Critical Design Review-CDR) to support a Design Readiness Review decision meeting. Complete initial, system, and combined Developmental Testing and Evaluation/ Operational Assessment (DT&E/OA). Prepare/update documents to obtain a favorable Milestone C decision, to include completion of a Capability Production Document (CPD). Release a Low Rate Initial Production (LRIP) Request For Proposal (RFP). Begin research for new receivers onboard tactical aircraft. Continue aircraft modernization impact assessments. Efforts may involve studies or development/testing of potential technologies for future program insertion.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA 5	0604777N NAVIGATION/ID SYSTEMS	0921 NAVSTAR GPS EQUIPMENT

(U) C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
(U) OPN Line #2657	7.021	10.861	10.845
(U) APN - Common Avionics Line # 0577	9.203	9.074	7.716

(U) D. ACQUISITION STRATEGY:

NAVWAR: Participate in Global Positioning System (GPS) Wing and Warner Robbins Air Logistics Center (ALC) FY 01-FY 12 procurements for the GAS-1 anti-jam antenna. Initiate Navy contracting options for smaller array anti-jam antennas and conformal/low observable arrays for selected aircraft. Initiate Navy contracting for the shipboard ground plane and submarine array. Participate with the GPS Wing in their development of an Advanced Digital Antenna Program (ADAP) Line Replaceable Unit (LRU) and identify potential Navy candidate platforms.

GPNTS: Develop a new scalable Positioning, Navigation and Timing (PNT) system that is anticipated to replace the current WRN-6 and Navigation Sensor System Interface (NAVSSI) systems. Integrate GPS modernized capabilities into Global Positioning System (GPS) Based Positioning, Navigation Timing (PNT) Service (GPNTS) and aircraft platforms. Support the development of the Navy's Modernized GPS User Equipment (UE) efforts as they apply to GPNTS shipboard applications and aircraft platforms. Participate in GPS Wing procurements wherever applicable for GPS Modernization Enhancements. Develop the Navy's specifications necessary to capture and implement future GPS enhancements.

(U) F. Metrics:

Quarterly program reviews, monthly financial reviews to evaluate cost, schedule, performance, and award fee inputs.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)												DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME								PROJECT NUMBER AND NAME			
RDT&E, N / BA 5	0604777N NAVIGATION/ID SYSTEMS								0921 NAVSTAR GPS EQUIPMENT			
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY's Cost	FY09 Cost	FY09 Award Date	FY10 Cost	FY10 Award Date					Target Value of Contract
Product Development	Various	Product Vendors	279.576	5.346	Various	4.000	Various					
Product Development (SSC-SD)	WX	SSC-SD	68.759	0.850	10/08	0.800	10/09					
Product Dev (other in house)	WX	Various Field Activities	439.397									
Systems Engineering	Various	Various Govt/Contractor	13.468	2.923	Various	2.000	Various					
Subtotal Product Development			801.200	9.119		6.800						
Remarks:												
Development Support	Various	Various	12.710									
Software Development	Various	SSC-SD/Platform Primes	9.100	1.000	10/08	0.200	10/09					
Integrated Logistics Support	Various	SSC-SD/NAWC/Various Contractors	4.857	0.900	10/08	0.645	10/09					
Training Development	WX	SSC-SD/NAWC	3.525	0.600	10/08	0.800	10/09					
Technical Data	Various	Platform PMO's	3.100	0.600	10/08	0.500	10/09					
Subtotal Support			33.292	3.100		2.145						
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME								PROJECT NUMBER AND NAME	
RDT&E, N / BA 5	0604777N NAVIGATION/ID SYSTEMS								0921 NAVSTAR GPS EQUIPMENT	

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					Target Value of Contract
Test & Evaluation (NAWC PAX)	WX	NAWC PAX	23.429	2.500	10/08	2.000	10/09					
Test & Evaluation (DCS)	CPAF	DCS CORP PAX	3.826	0.450	10/08	0.500	10/09					
Test & Evaluation (SSC-SD)	WX	SSC-SD	5.831	1.144	10/08	1.000	10/09					
Test & Evaluation Platform Testing	Various	VARIOUS CONTRACTORS	19.377	6.188	Various	3.850	Various					
Subtotal T&E			52.463	10.282		7.350						

Remarks:

Contractor Engineering Support	Various	DCS, SAIC, ARINC	10.157	1.800	10/08	1.800	10/09					
Government Engineering Support	WX	SSC, NAWC, WR	8.799	2.200	10/08	2.000	10/09					
Program Management Support	CPAF	DCS, Price Systems	15.053	1.847	10/08	1.800	10/09					
Subtotal Management			34.009	5.847		5.600						
Total Cost			920.964	28.348		21.895						

Remarks:

Exhibit R-3 Cost Analysis

CLASSIFICATION:

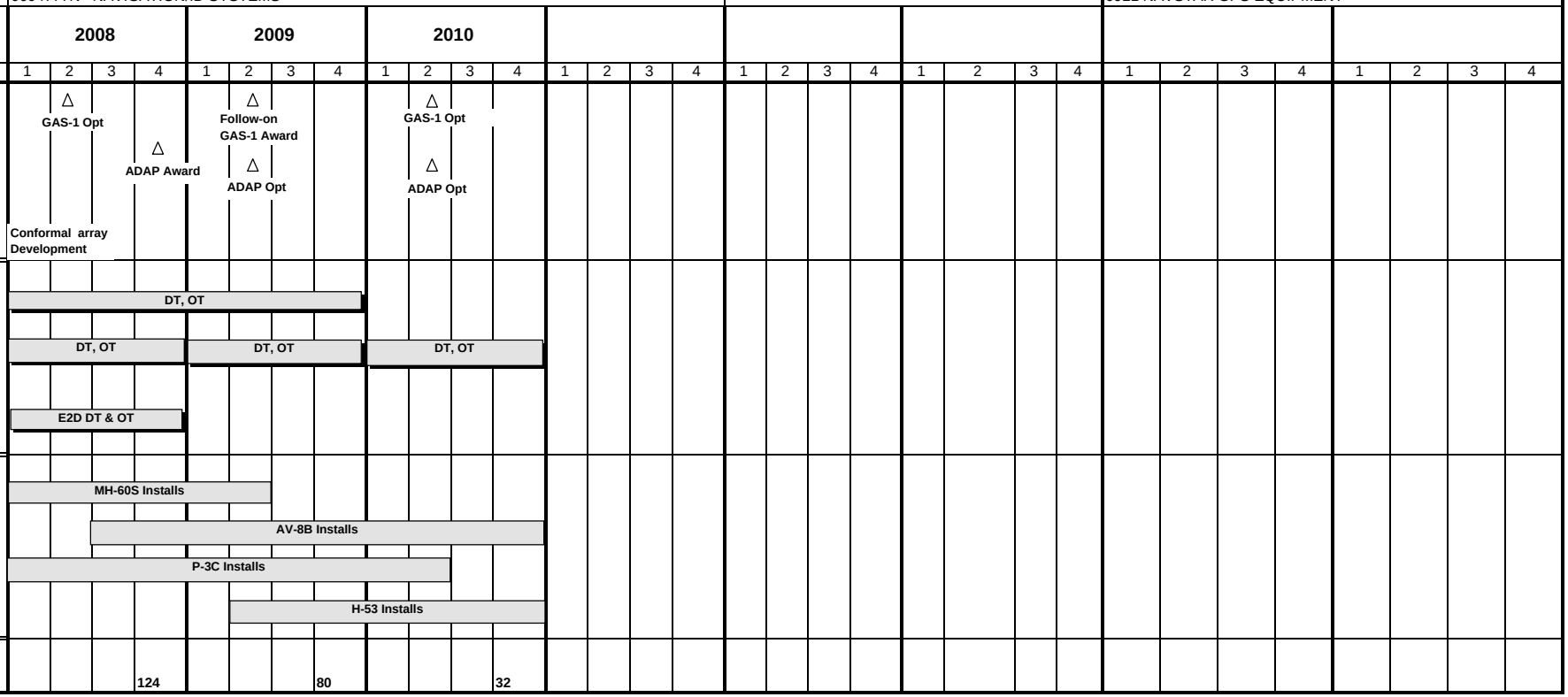
EXHIBIT R-4, Schedule Profile

DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-5**

PROGRAM ELEMENT NUMBER AND NAME: 0604777N NAVIGATION/ID SYSTEMS

PROJECT NUMBER AND NAME: 0921 NAVSTAR GPS EQUIPMENT



R-1 Shopping L

* ADAP (Advanced Digital Antenna Production), C-CRPA (Conformal Controlled Reception Pattern Antenna), GAS-1/1N (GPS Antenna System /Navy) are Anti-Jam (AJ) antenna solutions for designated platforms.

* ADAP (Advanced Digital Antenna Production) Contract award has moved from 2Q FY08 to 4Q FY 08

* MDA direction of 3/30/06 directed streamlining Air NAVWAR program from three phases to one. Milestone C decision of Oct 2001 applies to all current phases. Anticipate NAVWAR Air Phase 2 to integrate Modernized (M-Code) GPS Receivers.

** APN quantities are approximate year-end total number of NAVWAR system deliveries. Quantities do not include RDT&E units, Spares, or those projected for new construction aircraft.

Exhibit R-4, Schedule Profile

EXHIBIT R-4, Schedule Profile **UNCLASSIFIED** DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVI	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604777N NAVIGATION/ID SYSTEMS	0921 NAVSTAR GPS EQUIPMENT

Fiscal Year	2008				2009				2010																			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sea Navigation Warfare (NAVWAR)																												
Acquisition M/S							△ M/S C		△ FRP			△ IOC																
Sea Increment 2 (ADAP)										△ M/S B																		
Sea Increment 3 (Sub)																												
Sea Navigation Warfare (NAVWAR)																												
Submarine AJ Capability																												
Sea Navigation Warfare (NAVWAR)																												
Platform T&E M/S																												
Sea Increment 2 (ADAP) DT& OT	DT/OT (DDG)						DT (Surface Ships)																					
Sea Increment 3 (Sub)																												
Sea Navigation Warfare (NAVWAR)																												
Platform Installation																												
Sea Increment 1 (GAS-1)																												
Sea Increment 2 (ADAP)							Surface Ships																					
Sea Increment 3 (Sub)																												
System Deliveries **				20				37				50																

* ADAP is the Advanced Digital Antenna Production program, the Navy's development of a smaller Anti-Jam (AJ) antenna.

* ADAP (Advanced Digital Antenna Production) M/S C moved from 2Q FY08 to 3Q FY 09

* NAVWAR Sea has been restructured to reflect program changes. Phase 1A has been redesignated as Increment 1. Phase 1B has been terminated and installations planned for this phase are deferred to ADAP (Increment 2).

* Submarine integrations have been redesignated as Increment 3.

**Quantities are approximate year-end total number of NAVWAR system deliveries. Quantities do not include RDT&E units, SCN or Spares.

Exhibit R-4, Schedule Profile

CLASSIFICATION:

EXHIBIT R-4, Schedule Profile | DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-5**

PROGRAM ELEMENT NUMBER AND NAME: 0604777N NAVIGATION/ID SYSTEMS

PROJECT NUMBER AND NAME: 0921 NAVSTAR GPS EQUIPMENT

Fiscal Year	FY08				FY09				FY10																							
Quarter	1	2	3	4	1	2	3	4	1	2	3	4																				
Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) Milestone/Acquisition Increment 1					△ AS/AP	△ APB △ TEMP	△ MS B			△ CDR △ DRR		△ LRIP RFP																				
GPNTS Milestone/Acquisition Increment 2																																
GPNTS CONTRACTS								△ Increment 1 AWARD																								
GPNTS TEST & EVALUATION									△ In DT&E																							

* Global Positioning System (GPS) Positioning, Navigation, Timing (PNT) Service GPNTS will be a single Program of Record (POR), which will receive, process, and distribute three dimensional position, velocity, acceleration, time, and frequency in the formats required by shipboard user systems. GPNTS will be scaleable to accommodate back fit of current legacy PNT systems as well as forward fit of new platforms.

* GPNTS Acquisition Strategy (AS)/Acquistion Plan (AP), Acqusition Program Baseline (APB), and Milestone B in FY09 are WRN-X and Global Positioning System (GPS) Modernization pre-acquisition activities.

* Increment 1 will develop, acquire, and field a baseline GPNTS integrating current Selective Availability Anti-Spoof Module (SAASM) GPS receiver. GPNTS will be based on open standards in a Service Oriented Architecture (SOA) that will provide an open, extensible, and modernized replacement for the current fleet PNT systems, while targeting Common Computing Environments (CCE) such as Consolidated Afloat Networks Enterprise Services (CANES).

* Increment 2 will integrate Military GPS User Equipment (MGUE), which will allow the U.S. Navy to leverage current and future technology that will allow the U.S. Navy to leverage current and future technology development provided by the GPS Wing (GPSW), including Military Code (M-Code) and Protection of Navigation (PRONAV) security architecture.

Exhibit R-4, Schedule Profile

EXHIBIT R-4a, Schedule Detail	UNCLASSIFIED	DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA 5**	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION/ID SYSTEMS	PROJECT NUMBER AND NAME 0921 NAVSTAR GPS EQUIPMENT

Air Navigation Warfare (Navwar) Profile	FY 2008	FY 2009	FY 2010
Conformal Array Development	1-4Q		
H-53 DT/OT	1-4Q	1-4Q	
AV-8B DT/OT			
F/A 18 E/F/G DT/OT	1-4Q	1-4Q	1-4Q
E-2D DT/OT	1-4Q		
Sea Navigation Warfare (Navwar) Profile			
Increment 3 (Phase 2) M/S B (FEF)			2Q
Increment 3 (Phase 2) DT/OT			
Increment 3 (Phase 2) M/S C LRIP			
Increment 3 (Phase 2) FRP			
Increment 3 (Phase 2) IOC			
Increment 2 (ADAP) DT/OT	1-4Q	1-4Q	1-4Q
Increment 2 (ADAP) M/S C LRIP		3Q	
Increment 2 (ADAP) FRP			1Q
Increment 2 (ADAP) IOC			3Q
Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS)			
Increment 1			
MS B		3Q	
MS C			
M/S C LRIP			
FRP			
IOC			
Increment 2			
MS B			
MS C			

*GPNTS Acquisition Strategy (AS)/Acquisition Plan (AP), Acquisition Program Baseline (APB), and Milestone B in FY09 are WRN-X and Global Positioning System (GPS) Modernization pre-acquisition activities.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION / ID SYSTEMS				PROJECT NUMBER AND NAME 1253 COMBAT IDENTIFICATION SYSTEMS			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
1253 Combat Identification Systems	**11.684**	**9.467**	**30.399**					
RDT&E Articles Qty	**5**	**2**	**18**					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

In 1995, the Under Secretary of Defense (Acquisition and Technology)/Vice Chairman, Joint Chiefs of Staff {USD(A7T)/VCJCS} tasked the Services to develop a high-level plan and long-range strategy for migrating to new Mark XII equipment. The services were also tasked to work with participating NATO Allies to develop a new MK XII waveform and document it in 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 Communications 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 January 2002.

In August 2003 the Navy MK XIIA Mode 5 program was approved for entry in Systems Development and Demonstration (SDD) phase with approval to develop prototypes.
In July 2006, the Navy MK XIIA Mode 5 program was approved for entry into the Production and Deployment Phase and Low Rate Initial Production. In March 2007, Joint Requirements Oversight Council Memorandum (JROCM 047-07) endorsed a Mode 5 Joint Initial Operational Capability (IOC) in FY14 and Joint Full Operational Capability (FOC). An amendment to the LRIP Acquisition Program Baseline was signed in June 2008 to reschedule IOT&E in support of DoD synchronization efforts.

The FY 2008 and out RDT&E articles include Mode 5 cryptographic modules and associated hardware and software changes to AN/APX-123, AN/APX-119, and AN/APX-111. These RDT&E units are to support hardware, software, and integration efforts to host systems on remaining aircraft T/M/S, including AH-1Z/UH-1Y, E-2D, KC-130J, MV-22, VH-71A, and F/A-18E/F and EA-18G.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604777N NAVIGATION / ID SYSTEMS	PROJECT NUMBER AND NAME 1253 COMBAT IDENTIFICATION SYSTEMS	

B. Accomplishments/Planned Program

Mode 5 prototype hardware, cryptographic module	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	4.372	2.450	18.364	
RDT&E Articles Quantity	5	2	18	

Perform development of kits for installation into existing fleet assets including AN/UPX-37/41C Interrogator, AN/APX-118/123 Common Digital Transponder, and AN/APX-111 Combined Interrogator Transponder. Repair and correct deficiencies identified during testing and procure low rate initial production (LRIP) units to support testing and platform integration. LRIP units include Mode 5 cryptographic module install kits for AN/UPX-37/41C, AN/APX-118/123, AN/APX-119, and AN/UPX-24 with associated hardware and software changes to the host boxes. Perform platform integration efforts on AN/UPX-37/41C Interrogator, AN/APX-118/123 Common Digital Transponder, AN/APX-119 Transponder, and AN/APX-111 Combined Interrogator Transponder.

Mode 5 systems engineering and ILS	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.798	3.453	5.248	
RDT&E Articles Quantity				

Perform systems engineering and analysis in support of Mode 5 hardware/software development on AN/UPX-37/41C Interrogator, AN/APX-118/123 Common Digital Transponder, AN/APX-119 Transponder, AN/APX-111 Combined Interrogator Transponder, Cryptographic Module, Mode 5 Engineering Test Equipment, and Mode 5 support equipment. The Cryptographic Module includes, but is not limited to, activities such as Integrated Logistics Support, Design and Engineering Studies and Analysis, and Configuration Management performed as the Lead Service.

Mode 5 Upgrade DT & OT	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	3.514	3.564	6.787	
RDT&E Articles Quantity				

Perform Mode 5 developmental and operational test phases for AN/UPX-37/41C Interrogator, AN/APX-118/123 Common Transponder, AN/APX-119 Transponder, and AN/APX-111 Combined Interrogator Transponder.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604777N NAVIGATION / ID SYSTEMS	1253 COMBAT IDENTIFICATION SYSTEMS

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
P-1 #62: Identification Systems - OPN	25.175	31.367	38.682
P-1 #55: Identification Systems - APN-5	10.213	11.997	24.125

D. ACQUISITION STRATEGY:

The Acquisition Strategy is to develop Mode 5 Engineering Change Proposals (ECPs) for modern Mark XII Identification Friend or Foe (IFF) equipment and integrate into all Navy Combat Weapons systems platforms and transition the Navy's Cooperative Identification Capability to Mode 5.

CLASSIFICATION:

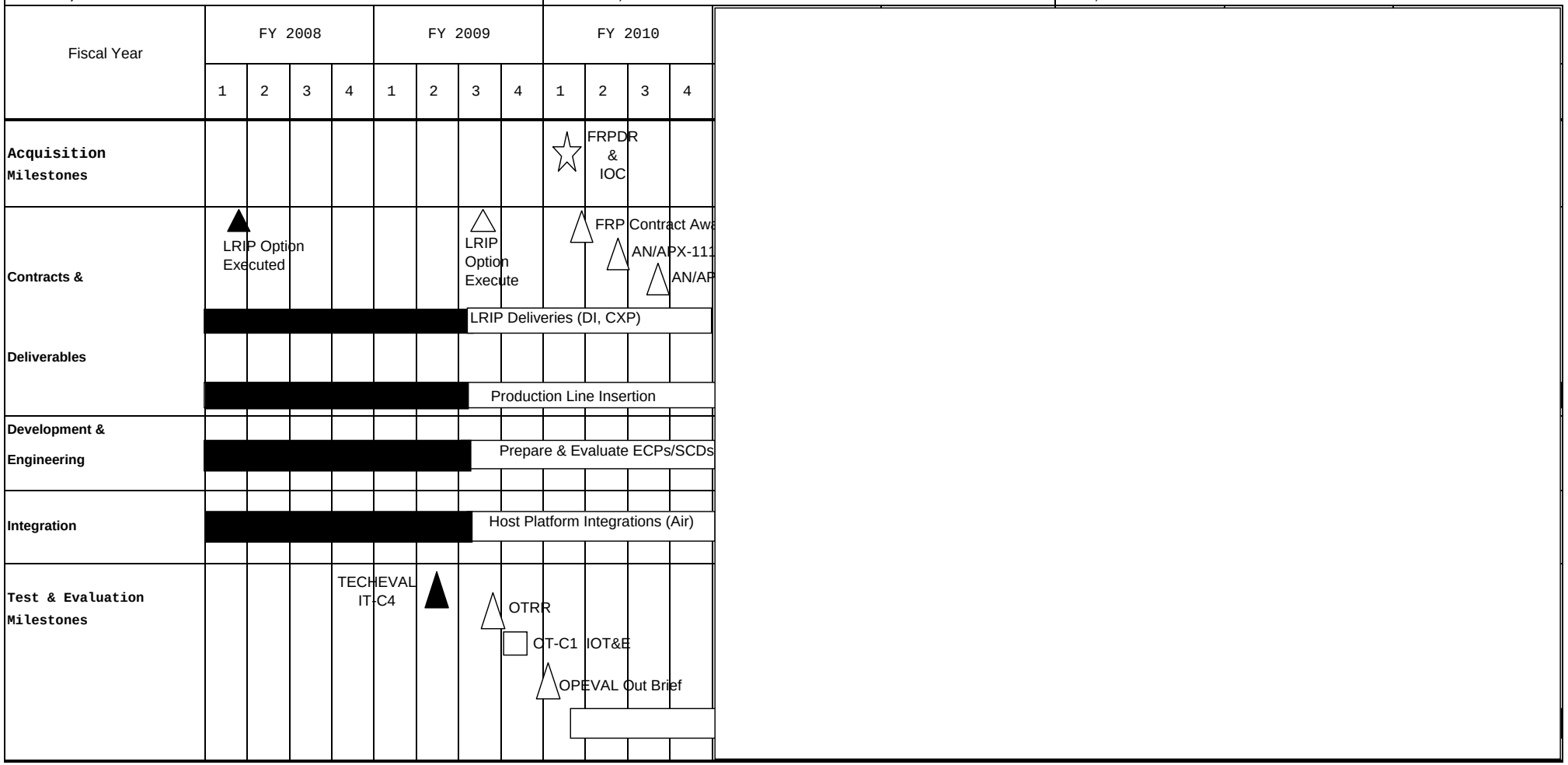
Exhibit R-3 Cost Analysis (page 1)							DATE: **May 2009**					
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604777N NAVIGATION / ID SYSTEMS			PROJECT NUMBER AND NAME 1253 COMBAT IDENTIFICATION SYSTEMS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary Hardware Development	FFP	LOCKHEED, OWEGO, NY	3.047	0.490	12/08	1.100	12/09					
Primary Hardware Development	WX	NAWCWD, CHINA LAKE CA	3.623	0.180								
Primary Hardware Development	CPFF	NG , BETHPAGE, NY	2.200	1.692	12/08		12/09					
Primary Hardware Development	VAR	BAE, GREENLAWN NY	26.283			0.264						
Primary Hardware Development	TBD	BOEING, PHIL, PA	0.000			16.200	12/09					
Primary Hardware Development	TBD	L-3, WACO, TX	0.000				01/10					
Primary Hardware Development	TBD	RAYTHEON, TOWSON, MD	0.000	0.088	12/08	0.800	12/09					
Systems Engineering	WX	NAWCAD, PAX RIVER MD	4.100	1.740	11/08	2.833	11/09					
Systems Engineering	WX	NAWCWD, CHINA LAKE				1.200						
Systems Engineering	WX	NAWCAD, ST INDIGOES MD	9.428	1.351	11/08	0.465	11/09					
GFE												
Award Fees												
Subtotal Product Development			48.681	5.541		22.862						
Remarks:												
Development Support												
ILS	VAR	VAR	1.097	0.362	11/08	0.750	11/09					
Software Development	VAR	VAR	2.708									
Technical Data	VAR	VAR	0.053									
Subtotal Support			3.858	0.362		0.750						
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604777N NAVIGATION / ID SYSTEMS			PROJECT NUMBER AND NAME 1253 COMBAT IDENTIFICATION SYSTEMS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Operational Test & Evaluation	WX	NAWCAD, PAX RIVER MD	1.871	2.411	11/08	0.400	11/09					
Developmental Test & Evaluation	WX	NAWCAD, PAX RIVER MD	11.979	1.007	11/08	2.657	11/09					
Test Assets	VAR	VAR	1.638	0.146	11/08	3.730	11/09					
Subtotal T&E			15.488	3.564		6.787						
Remarks:												
Contractor Engineering Support	VAR	VAR	0.450									
Government Engineering Support	VAR	VAR	1.811									
Program Management Support	VAR	VAR	1.961									
ETS (Non-FFRDC)	WX	NAWCAD, PAX RIVER MD	0.174									
Subtotal Management			4.396	0.000		0.000						
Remarks:												
Total Cost			72.423	9.467		30.399						
Remarks:												

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604777N, NAVIGATION/ID SYSTEM	PROJECT NUMBER AND NAME 1253, COMBAT IDENTIFICATION SYSTEMS	



R-1 SHOPPING LIST - Item No. 125

CLASSIFICATION:

Exhibit R-4a, Schedule Detail			DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604777N NAVIGATION / ID SYSTEM		PROJECT NUMBER AND NAME 1253 COMBAT IDENTIFICATION SYSTEMS

Schedule Profile	FY 2008	FY 2009	FY 2010
Full Rate Production Decision Review (FRPDR) & IOC			1Q
FRP Contract Award & APX-119 Integration Begins			1Q
Low-Rate Initial Production Contract Award and Options	1Q	3Q	
Low-Rate Initial Production Deliveries (CXP, DI)	1Q-4Q	1Q-4Q	1Q-4Q
FRP Deliveries			
Prepare & Evaluate ECPs/SCDs	1Q-4Q	1Q-4Q	1Q-4Q
Production Line Insertion	1Q-4Q	1Q-4Q	1Q-4Q
Host Platform Integrations (Air)	1Q-4Q	1Q-4Q	1Q-4Q
TECHEVAL (IT-C4)		2Q	
Operational Test Readiness Review (OTRR)		3Q	
IOT&E		4Q	
OPEVAL Out Brief			1Q
Mode 5 Joint IOC			
Mode 5 Spiral Development			
Follow-on Test and Evaluation			1Q-4Q

R-1 SHOPPING LIST - Item No. 125