Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*				R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	46.053	62.886	66.636	0.000	66.636	67.420	51.994	45.363	50.691	Continuing	Continuing
0253: *Nav & Electro-Optical Supt*	7.725	7.938	7.470	0.000	7.470	8.061	8.131	8.210	8.376	Continuing	Continuing
0676: *Improve ID Development*	2.754	2.882	2.662	0.000	2.662	2.564	2.662	2.731	2.781	Continuing	Continuing
0921: *NAVSTAR GPS Equipment*	24.400	21.804	20.021	0.000	20.021	27.550	23.964	24.107	24.591	Continuing	Continuing
1253: *Combat Ident System*	9.179	30.262	36.483	0.000	36.483	29.245	17.237	10.315	14.943	Continuing	Continuing
9999: *Congressional Adds*	1.995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.311

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. Navigation Sensor System Interface (NAVSSI) is a system that provides an integrated navigation message structure for network distribution to support combat, command and control, information and other mission critical capabilities. 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	**R-1 ITEM NOMENCLATURE** PE 0604777N: *Navigation/Id System*

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	48.542	63.184	0.000	0.000	0.000
Current President's Budget	46.053	62.886	66.636	0.000	66.636
Total Adjustments	-2.489	-0.298	66.636	0.000	66.636
• Congressional General Reductions		-0.262			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.036			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-3.899	0.000			
• SBIR/STTR Transfer	-0.584	0.000			
• Program Adjustments	0.000	0.000	66.636	0.000	66.636
• Rate/Misc Adjustments	-0.001	0.000	0.000	0.000	0.000
• Congressional Recision Adjustments	-0.005	0.000	0.000	0.000	0.000
• Congressional Add Adjustments	2.000	0.000	0.000	0.000	0.000

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2009	FY 2010
Project: 9999: *Congressional Adds*		
Congressional Add: *Sure Track Re-Architecture and Sensor Augmentation*	1.995	0.000
Congressional Add Subtotals for Project: 9999	1.995	0.000
Congressional Add Totals for all Projects	1.995	0.000

Change Summary Explanation

Technical: Not applicable.

Schedule: None required.

Project 0676: Changes in the schedule reflect the revised Acquisition Program Baseline.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	**R-1 ITEM NOMENCLATURE** PE 0604777N: *Navigation/Id System*

Project 1253: Changes in the schedule reflect the revised Acquisition Program Baseline.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0253: *Nav & Electro-Optical Supt*	7.725	7.938	7.470	0.000	7.470	8.061	8.131	8.210	8.376	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Navigation and Electro-Optical (E-O) 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 SSGN and VIRGINIA Class submarines. 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 Infra-Red (IR) imaging capability. The non-hull penetrating design provides freedom in Ship design and space savings for SSGN and VIRGINIA Class and future submarines designs. The system was designed to satisfy Operational Requirement #365-87-94. Specific efforts include: (1) Low Light Level TV development, digital sensor development and integration, and displays, and (2) Imaging System Test Efforts.

The Department of the Navy established the Integrated Submarine Imaging System (ISIS) to rapidly field the Type 18 Periscope Patriot Rangefinder, Type 8 Mod 4 IR Periscope systems, and integrate existing periscope imagery systems into a single system for installation on board SSN 688 Class and SEAWOLF Class submarines. The ISIS baseline includes the Type 18 Periscope Patriot Rangefinder, Type 8 Mod 4 IR Periscope, and supports high intensity operations in the littorals 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) Development of hardware capabilities common to ISIS and Photonics via the Technology Insertion process.

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 situational 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.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Upgrade/Resolve Obsolescent Photonics On-Board Team Trainer development. *FY 2009 Accomplishments:* Continued improvements to the PMOBT system to provide on board training capability for the Photonics Mast Periscope (AN/BVS-1) system with no interference to tactical operations. Includes development of an Image Generator to send visual scenes to the Photonics Mast system in response to received scenarios and mast control data. *FY 2010 Plans:* Further develop the PMOBT system and necessary interface components to allow simulation of future capabilities of the Photonics Mast. In addition, update hardware and software for obsolescence and other associated improvements.	0.127	0.139	0.000	0.000	0.000
ISIS and Photonics common hardware capabilities development and obsolescence. *FY 2009 Accomplishments:* Initial development efforts of hardware capabilities common to both ISIS and Photonics via the Technology Insertion process. *FY 2010 Plans:* ISIS Technical Insertion (TI-10) development for LOS ANGELES and SEAWOLF Classes. ISIS Inboard System Development (TI-10) for VIRGINIA Class. *FY 2011 Base Plans:* ISIS Technical Insertion (TI-12) development for LOS ANGELES and SEAWOLF Classes.	4.759	4.206	3.759	0.000	3.759
Low Light Level TV development, digital sensor development and integration and displays. *FY 2009 Accomplishments:* Low Light Level TV Camera Module Development for Photonics MTI-10. High Definition Color Camera Development for Photonics MTI-10.	1.020	2.008	2.071	0.000	2.071

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: High Definition Color Camera Integration into ISIS TI-10. Infrared Camera Upgrade Development. *FY 2011 Base Plans:* Incorporation of IR Camera Upgrades into ISIS Inboard Systems.					
Imaging Systems Test Efforts. *FY 2009 Accomplishments:* Conduct imaging systems testing. *FY 2010 Plans:* Continuation of imaging systems testing. *FY 2011 Base Plans:* Continuation of imaging systems testing.	0.687	1.045	1.050	0.000	1.050
Patriot Radar Range Finder Development for Photonics for SSGN and VIRGINIA Class Submarine. *FY 2009 Accomplishments:* Type 18 Periscope Automated Rangefinder Integration. VA Class Patriot Stand-alone Rangefinder Integration. *FY 2010 Plans:* Type 18 Periscope Automated Rangefinder Software Upgrades. VA Class MTI-10 Patriot Rangefinder Integration and Software Development. *FY 2011 Base Plans:* Type 18 Periscope Automated Rangefinder Software Upgrades.	1.066	0.540	0.590	0.000	0.590

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
ISIS TI-10 Patriot Rangefinder Integration and Software Development for VIRGINIA and SSGN Classes.					
Defense Acqusition Workforce Defense Fund (DAWDF) *FY 2009 Accomplishments:* Defense Acquisition Workforce Defense Fund requirement satisfied.	0.066	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	7.725	7.938	7.470	0.000	7.470

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• SCN/201300: *Photonics Mast*	14.109	14.477	28.382	0.000	28.382	29.119	29.876	30.342	31.039	Continuing	Continuing
• OPN/0831: *Sub Periscopes & Imaging Equip.*	67.179	69.812	85.619	0.000	85.619	68.175	62.850	50.591	57.081	Continuing	Continuing
• RDT&E/0604558N: *VIRGINIA Class Design Development*	1.150	1.019	1.038	0.000	1.038	1.058	1.078	1.098	1.119	Continuing	Continuing

D. Acquisition Strategy

The Acquisition Strategy for AN/BVS-1 Photonics Mast Program (PMP) is dated 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 dated 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, SSN 774 and SSGN class submarines.

E. Performance Metrics

Successful application of system engineering processes. Design and development of improvements. Site acceptance of product improvements with no Priority 1 or 2 problem reports. Completion of 2 upgrade per year. Acceptance of product improvements with no Priority 1 or 2 problem reports.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	**R-1 ITEM NOMENCLATURE** PE 0604777N: *Navigation/Id System*	**PROJECT** 0253: *Nav & Electro-Optical Supt*

The RDD program goal is to respond to urgent operational needs within 30 days and provide for rapid development and fielding of prototype solutions within 270 days.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*	

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various/ Various	Various Not Specified	9.233	1.801	Oct 2009	1.822	Oct 2010	0.000		1.822	Continuing	Continuing	Continuing
Software Development	Various/ Various	Various Not Specified	7.721	2.125	Oct 2009	1.546	Oct 2010	0.000		1.546	Continuing	Continuing	Continuing
Systems Engineering	Various/ Various	Various Not Specified	8.573	2.072	Oct 2009	2.129	Oct 2010	0.000		2.129	Continuing	Continuing	Continuing
Miscellaneous	Various/ Various	Various Not Specified	2.555	0.515	Oct 2009	0.519	Oct 2010	0.000		0.519	Continuing	Continuing	Continuing
		Subtotal	28.082	6.513		6.016		0.000		6.016			

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Managemnet Support	C/CPAF	AT&T Not Specified	2.395	0.557	Oct 2009	0.569	Oct 2010	0.000		0.569	Continuing	Continuing	Continuing
		Subtotal	2.395	0.557		0.569		0.000		0.569			

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*	

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	Various/ Various	Various Not Specified	3.805	0.817	Oct 2009	0.833	Oct 2010	0.000		0.833	Continuing	Continuing	Continuing
		Subtotal	3.805	0.817		0.833		0.000		0.833			

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	C/CPAF	AT&T Not Specified	0.200	0.051		0.052		0.000		0.052	Continuing	Continuing	Continuing
Defense Acquisition Workforce Fund	Various/ Various	Not Specified Not Specified	0.066	0.000		0.000		0.000		0.000	0.000	0.066	Continuing
		Subtotal	0.266	0.051		0.052		0.000		0.052			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	34.548	7.938		7.470		0.000		7.470			

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
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	Total Prior Years Cost	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks								

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*

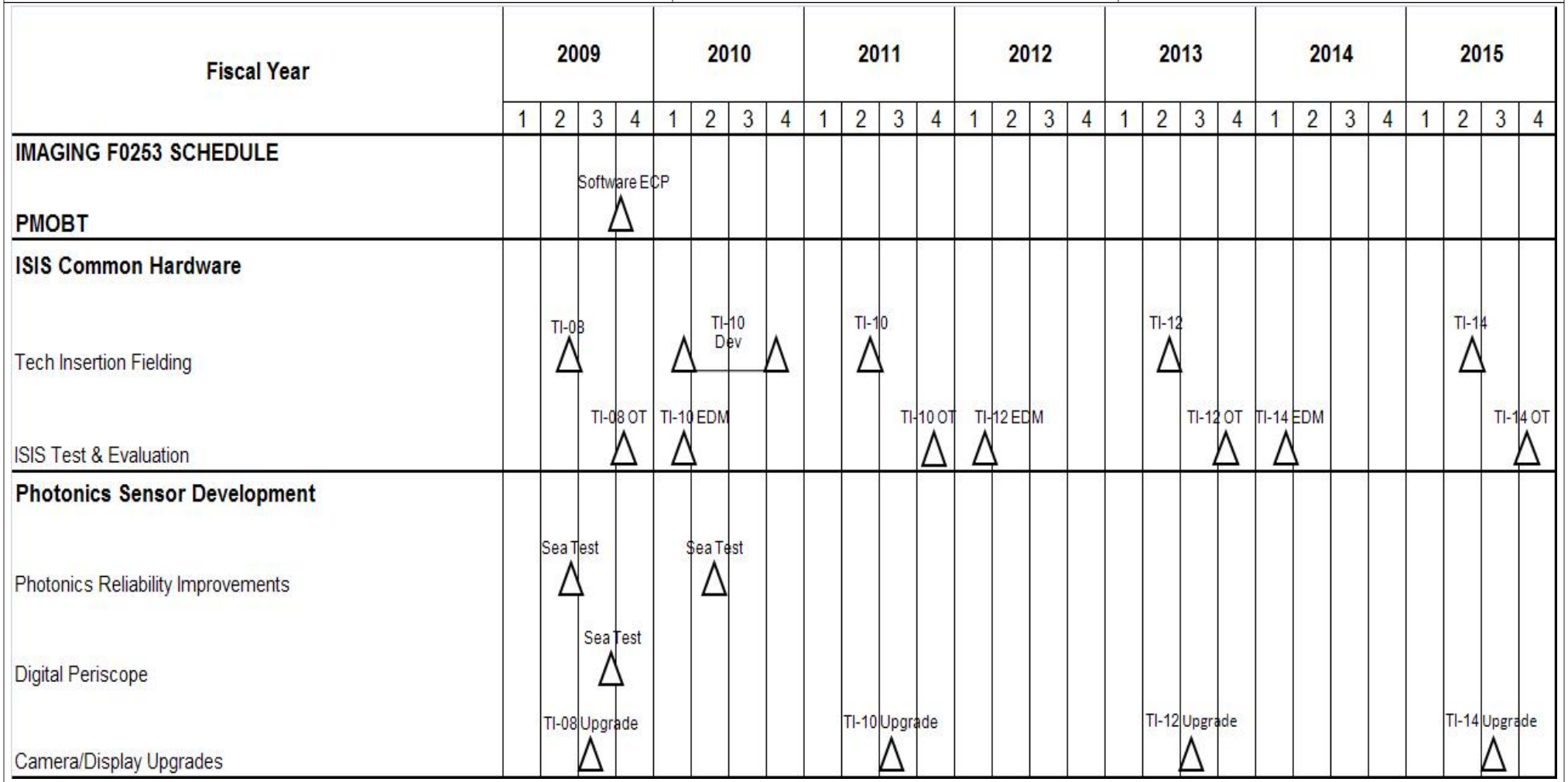

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Imaging PMOBT Software ECP	4	2009	4	2009
ISIS Tech Insertion Fielding - TI-08	2	2009	2	2009
ISIS Tech Insertion Fielding- TI-10 Development	1	2010	4	2010
ISIS Tech Insertion Fielding - TI-10	2	2011	2	2011
ISIS Tech Insertion Fielding - TI-12	2	2013	2	2013
ISIS Tech Insertion Fielding - TI-14	2	2015	2	2015
ISIS Test & Evaluation - TI-08 OT	4	2009	4	2009
ISIS Test & Evaluation - TI-10 EDM	1	2010	1	2010
ISIS Test & Evaluation - TI-10 OT	4	2011	4	2011
ISIS Test & Evaluation - TI-12 EDM	1	2012	1	2012
ISIS Test & Evaluation - TI-12 OT	3	2013	3	2013
ISIS Test & Evaluation - TI-14 EDM	1	2014	1	2014
ISIS Test & Evaluation - TI-14 OT	4	2015	4	2015
Photonics Reliability Improvements - Sea Test	2	2009	2	2010
Photonics Digital Periscope - Sea Test	3	2009	3	2009
Photonics Camera/Displays Upgrade - TI-08	3	2009	3	2009
Photonics Camera/Displays Upgrade - TI-10	3	2011	3	2011
Photonics Camera/Displays Upgrade - TI-12	3	2013	3	2013

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0253: *Nav & Electro-Optical Supt*

	Start		End	
Event	Quarter	Year	Quarter	Year
Photonics Camera/Displays Upgrade - TI-14	3	2015	3	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0676: *Improve ID Development*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0676: *Improve ID Development*	2.754	2.882	2.662	0.000	2.662	2.564	2.662	2.731	2.781	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

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.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
AN/UPX-29 (V) - OE-120 Antenna Replacement	0.491	0.877	1.590	0.000	1.590
Engineering and integration development for antenna group OE-120/UPX modernization. Develop design studies and Analysis of Alternitives (AoA), draft specifications, and perform system development and integration efforts.					
FY 2009 Accomplishments: Developed systems requirements. Conducted BAE Systems Nashua Modernization studies and prospective Risk Mitigation for including Mode S capability in the antenna group including draft specification. Performed a digital trade study and identified modernization risks.					
FY 2010 Plans: Perform Initial Technical Review (ITR). Conduct AoA. Perform risk mitigation for parts and component obsolescence, evaluate phase shifter and power divider redesign alternatives, and evaluate conceptual antenna architectures.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0676: *Improve ID Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Develop Antenna Group OE-120/UPX system requirements and determine system architecture. Consider incorporating product improvements into the Interrogator System AN/UPX-29(V) as a part of Ship ID Systems. Convene Systems Requirement Review (SRR) and System Functional Review (SFR). Review results of the final concept refinement phase and assess the technology development plan and preferred system concept.					
Mark XIIA Mode 5 Improve for AN/UPX-29(V)	1.604	1.675	0.772	0.000	0.772
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. 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.					
FY 2009 Accomplishments: AN/UPX-29(V) Mode 5 Operational Assessment (OA). Integrated AN/UPX-29(V) Mode 5 in AEGIS baseline 7.1. Resolved PRIORITY 1 Trouble Reports in preparation for OA. Developed, tested and received approval for installation for AN/UPX-24(V) M5V054. Participated in Mode 5 OA. Addressing OA feedback/issues.					
FY 2010 Plans: Develop and test AN/UPX-24(V) SW V2.1.2 to correct DT Deficiencies/OA Risk items. Develop/ Test Jitter fix to meet FAA requirements. Address integration issues on LHD 1, LPD, and CV/CVN. Design: Complete final IDS review and approval, Complete CDR, initiate Unit and System level testing. Participate in testing, test planning and issue resolution for tech eval and IOT&E.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0676: *Improve ID Development*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Prepare systems and platforms for IOT&E. Final deficiency resolution. Resolve any remaining system deficiencies and any final ILS documentation updates. Continue integration on LHD 1 class and begin LPD 17 integration Certification testing. Conduct interface certification testing and qualification with CEC/7.1					
AN/UPX-29 Management Support Engineering and Program Management of the AN/UPX 29 (V). Perform system integration efforts. *FY 2009 Accomplishments:* Manage engineering investigations, provide engineering assessments and recommend resolution. Participate in Test Working Integrated Product Team (TWIPT), Technical Interchange Meetings (TIM) and Program Management Reviews (PMR). Review and evaluate reports. *FY 2010 Plans:* Manage engineering investigations, provide engineering assessments, and recommend resolution. Review and evaluate reports. *FY 2011 Base Plans:* Manage engineering investigations, provide engineering assessments, and recommend resolution. Review and evaluate reports.	0.659	0.330	0.300	0.000	0.300
Accomplishments/Planned Programs Subtotals	2.754	2.882	2.662	0.000	2.662

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0676: *Improve ID Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2851: *Identification Systems*	31.367	37.563	29.572	0.000	29.572	33.687	36.355	39.370	36.242	Continuing	Continuing

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 augment the Navy's Cooperative Identification Capability to include Mode 5.

E. Performance Metrics

Successfully complete Initial Technical Review and IT Regression Test in FY 2010. Complete System Requirements Review (SRR) and Systems Functional Review (SFR) in FY 2011.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0676: *Improve ID Development*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWCAD St Inigoes, MD	2.332	0.877	Nov 2009	1.590	Nov 2010	0.000		1.590	0.000	4.799	Continuing
Ship Integration	WR	NAWCAD St Inigoes, MD	1.854	0.146	Nov 2009	0.150	Nov 2010	0.000		0.150	0.000	2.150	Continuing
Systems Engineering	WR	NAWCAD St Inigoes, MD	4.072	0.397	Nov 2009	0.199	Nov 2010	0.000		0.199	0.000	4.668	Continuing
		Subtotal	8.258	1.420		1.939		0.000		1.939	0.000	11.617	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAWCAD St Inigoes, MD	0.169	0.000		0.000		0.000		0.000	0.000	0.169	Continuing
ILS	WR	NAWCAD St Inigoes, MD	2.146	0.188	Nov 2009	0.190	Nov 2010	0.000		0.190	0.000	2.524	Continuing
Software Development	WR	NAWCAD St Inigoes, MD	3.367	0.945	Nov 2009	0.233	Nov 2010	0.000		0.233	0.000	4.545	Continuing
Technical Data	WR	NAWCAD St Inigoes, MD	0.859	0.202	Nov 2009	0.200	Nov 2010	0.000		0.200	0.000	1.261	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Training	WR	NAWCAD St Inigoes, MD	0.200	0.000		0.000		0.000		0.000	0.000	0.200	Continuing
		Subtotal	6.741	1.335		0.623		0.000		0.623	0.000	8.699	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD St Inigoes, MD	0.500	0.000		0.000		0.000		0.000	0.000	0.500	Continuing
Operational Test & Evaluation	WR	NAWCAD St Inigoes, MD	1.328	0.000		0.000		0.000		0.000	0.000	1.328	Continuing
Test Assets	WR	NAWCAD St Inigoes, MD	0.731	0.000		0.000		0.000		0.000	0.000	0.731	Continuing
		Subtotal	2.559	0.000		0.000		0.000		0.000	0.000	2.559	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	American Electric California, MD	1.081	0.127	Dec 2009	0.100	Dec 2010	0.000		0.100	0.000	1.308	Continuing
Engineering Support	WR	NAWCAD PAX River, MD	0.244	0.000		0.000		0.000		0.000	0.000	0.244	Continuing
		Subtotal	1.325	0.127		0.100		0.000		0.100	0.000	1.552	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.883	2.882		2.662		0.000		2.662	0.000	24.427	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0676: *Improve ID Development*

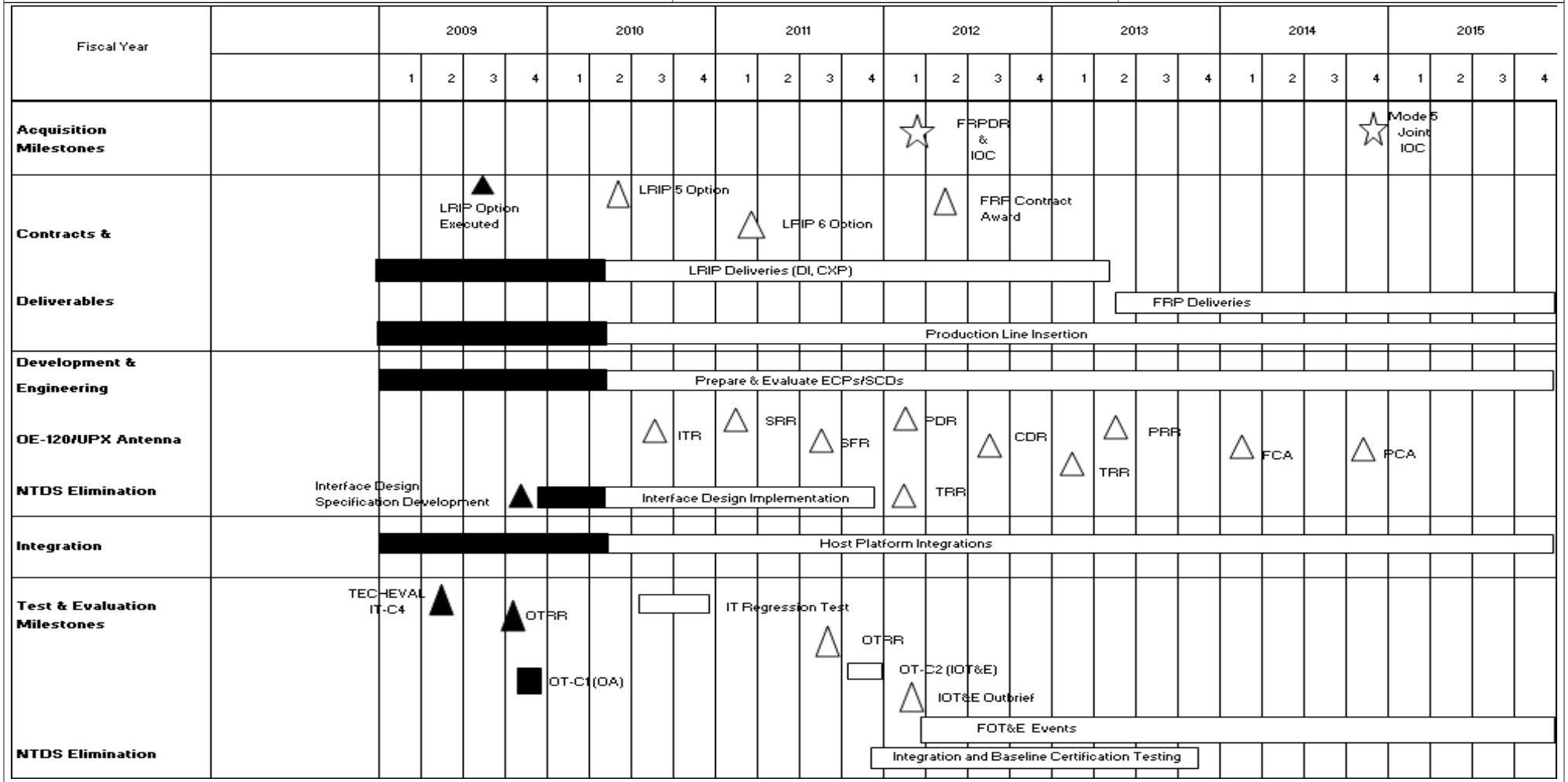

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0676: *Improve ID Development*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Mode 5 - Full rate Production Decision Review (FRPDR) & IOC	1	2012	1	2012
Mode 5 - FRP Contract Award	2	2012	2	2012
Mode 5 - Low-Rate Initial Production (LRIP) 4 Contract Award	3	2009	3	2009
Mode 5 - Low-Rate Initial Production Deliveries (CXP, DI)	1	2009	2	2013
Mode 5 - LRIP 5 Contract Award	2	2010	2	2010
Mode 5 - FRP Deliveries	2	2013	4	2015
Mode 5 - LRIP 6 Contract Award	1	2011	1	2011
Mode 5 - Prepare and Evaluate ECPs/SCDs	1	2009	4	2015
Mode 5 - Production Line Insertion	1	2009	4	2015
Mode 5 - Host Platform Integrations	1	2009	4	2015
Mode 5 - TECHEVAL (IT-C4)	2	2009	2	2009
Mode 5 - Operational Test Readiness Review (OTRR)	4	2009	4	2009
Mode 5 - OT-C1 (OA)	4	2009	4	2009
Mode 5 - IT Regression Test	3	2010	4	2010
Operational Test Readiness Review (OTRR)	3	2011	3	2011
Mode 5 - OT-C2 (IOT&E)	4	2011	4	2011
Mode 5 - IOT&E Outbrief	1	2012	1	2012
Mode 5 - Joint IOC	4	2014	4	2014

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
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	Start		End	
Event	Quarter	Year	Quarter	Year
Mode 5 - Follow-on Test and Evaluation	1	2012	4	2015
OE-120/UPX Antenna - Initial Technical Review (ITR)	3	2010	3	2010
OE-120/UPX Antenna - Systems Requirements Review (SRR)	1	2011	1	2011
OE-120/UPX Antenna - System Functional Review (SFR)	3	2011	3	2011
OE-120/UPX Antenna - Preliminary Design Review (PDR)	1	2012	1	2012
OE-120/UPX Antenna - Critical Design Review (CDR)	3	2012	3	2012
OE-120/UPX Antenna - Test Readiness review (TRR)	1	2013	1	2013
OE-120/UPX Antenna - Production Readiness Review (PRR)	2	2013	2	2013
OE-120/UPX Antenna - Functional Configuration Audit (FCA)	1	2014	1	2014
OE-120/UPX Antenna - Physical Configuration Audit (PCA)	4	2014	4	2014
NTDS - Interface Design Specification (IDS) Development	4	2009	4	2009
NTDS - Interface Design Implementation	4	2009	4	2011
NTDS - Test Readiness Review (TRR)	1	2012	1	2012
NTDS - Integration and Baseline Certification Testing	4	2011	4	2013

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
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COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
0921: *NAVSTAR GPS Equipment*	24.400	21.804	20.021	0.000	20.021	27.550	23.964	24.107	24.591	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

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 11, 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

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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), 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 capability production document for Sea NAVWAR Increment 2 (12/08) was approved to support the ADAP development.

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 (expected to become available in FY11). 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.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Air Navigation Warfare (NAVWAR)	12.904	9.596	7.233	0.000	7.233

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: Completed development of Conformal - Controlled Reception Pattern Antenna (C-CRPA) for F/A-18 E/F/G. Continued integration of C-CRPA and Advanced Digital Antenna Production (ADAP) on F/A-18 E/F/G. Completed initial antenna integration efforts on E-2D. Continued ADAP testing and NAVWAR integration on H-53. 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. *FY 2010 Plans:* Continue integration of C-CRPA and ADAP on F/A-18 E/F/G and NAVWAR on other Air platforms to include unmanned air systems (UAS) and weapons. Start developmental testing of C-CRPA and ADAP on F/A-18 E/F/G. Continue SAASM integration and testing on Air platforms. Monitor SAS/M-CRPA development. Start GPS Modernization platform impact studies and provide Navy unique requirements to GPS Wing. Develop Navy Air GPS Modernization Acquisition Strategy, Systems Engineering Plan and Test and Evaluation Master Plan (TEMP). Coordinate GPS Modernization efforts with other programs and DoD services to reduce impacts to platform navigation systems. Participate in joint NAVWAR MOU initiatives with Canada, United Kingdom and Australia. *FY 2011 Base Plans:* Complete integration of NAVWAR on F/A-18 E/F/G. Complete developmental testing and start operational testing of NAVWAR on F/A-18 E/F/G. Monitor SAS/M-CRPA development. Continue integration of NAVWAR on other Air platforms to include unmanned air systems (UAS) and weapons. Continue GPS Modernization platform impact studies and provide Navy unique requirements to GPS Wing. Continue to coordinate GPS Modernization efforts with other programs and DoD services to reduce impacts to platform navigation systems. Start studies for integration of GPS Wing developed modernized user equipment into Air platforms. Participate in joint NAVWAR MOU initiatives with Canada, United Kingdom and Australia.					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Sea Navigation Warfare (NAVWAR)	4.765	4.132	4.776	0.000	4.776
FY 2009 Accomplishments: Increment 2 Advanced Digital Antenna Production (ADAP): Completed Increment 2 Development Test (DT) for Landing Craft Air Cushioned (LCAC) and Mine Countermeasures Ship (MCM). Continued modeling and simulation, integration and DT for ADAP in support of Milestone C. Continued participation in joint Navigation Warfare (NAVWAR) Memorandum of Understanding (MOU) initiatives with Canada, United Kingdom, and Australia. *FY 2010 Plans:* Increment 2 (ADAP): Complete DT and support Operational Assessment in support of Milestone C scheduled for 2Q10. Conduct DT for Increment 2 ADAP on DDG. Support Operational Test (OT) on DDG. Participation in joint NAVWAR MOU initiatives with Canada, United Kingdom, and Australia. *FY 2011 Base Plans:* Increment 2 (ADAP): Conduct DT and integration for ADAP on CG and CVN. Participation in joint NAVWAR MOU initiatives with Canada, United Kingdom, and Australia.					
Global Positioning System (GPS) Modernization	4.030	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: Global Positioning System (GPS) Modernization Pre-Acquisition activities supported 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). Supported 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. Participated in source selection activities at the GPS Wing (GPSW) for Air and Maritime MGUE. Began platform integration groundwork, such as identification of new capabilities to be incorporated, physical platform modification design, software					

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
requirements specification development, platform audits to determine suitability for transition, refining the platform capability.					
Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) *FY 2010 Plans:* Beginning in FY10 attain a Milestone B decision to move into the next phase of the program. Approval of an Acquisition Program Baseline (APB) and the Acquisition Plan (AP). Completion of source selection activities and a contract award for system development. Support of post contract award activities including tracking of contractor deliverables, earned value management, and financial management. Oversee the contractor and review deliverables through initial design analysis against the Technical Requirements Document (TRD) and complete the System Requirements Review (SSR) and the System Functional Reviews (SFR) to prepare for the Preliminary Design Review. The metrics that will be used to determine if objectives are met will be: Obtainment of a Milestone B decision from the Milestone Decision Authority (MDA), an approved APB and AP, successful completion of the system development contract award, completion of the SRR and SFR review events. *FY 2011 Base Plans:* Work to update or develop statutory and regulatory acquisition requirements in accordance with the Milestone B Acquisition Decision Memorandum (ADM). Complete Preliminary Design Review (PDR) and Critical Design Review (CDR). Prepare Capability Production Document (CPD) complete comment resolution and submit for approval. Metrics that will be used to determine if the objectives are met will be: Completion of the PDR and CDR review events, completion of the draft CPD, completion of quarterly integrated test team meetings to prepare for the OTRR event in FY12, and initial updates to the programs acquisition documents.	0.000	8.076	8.012	0.000	8.012
WRN X	2.701	0.000	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: WRN-X Pre-Acquisition activities supported the GPNTS increment 1 fielding of a new scalable military GPS receiver with Selective Availability Anti-Spoof Module (SAASM). These efforts included completion or solid drafts 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. A Contract Planning Conference (CPC) was conducted and an Industry Day was held. A draft of the Request for Proposal (RFP) documents were released to Industry.					
Accomplishments/Planned Programs Subtotals	24.400	21.804	20.021	0.000	20.021

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN / 2657, 0604777N: *Other Procurement, Navy*	8.749	7.941	9.319	0.000	9.319	12.355	16.652	16.960	17.383	434.498	523.857
• APN / 0577: *Common Avionics*	9.954	4.316	8.952	0.000	8.952	9.079	9.270	9.672	9.880	0.000	61.123

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-controlled reception pattern antenna (C-CRPA) 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.

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GPNTS: The GPNTS program will be conducted in two increments. This Acquisition Strategy is in support of Increment I. Increment I will develop, acquire, and field the GPNTS, a scalable SAASM GPS based SOA PNT system that will provide an open, extensible, modernized replacement for the current fleet PNT systems, while targeting Common Computing Environments (CCE). Increment II will integrate modernized GPS UE that will allow the U.S. Navy to leverage current and future technology development provided by the GPS Wing, formerly known as the GPS Joint Program Office (JPO), including M-Code and GPS security architecture. GPNTS will operate at the UNCLASSIFIED level, and can provide the PNT data to higher classified systems. Procurements for Increment 1 systems (with the SAASM capability) will begin in FY13 with LRIP units, full rate production will begin in FY15.

E. Performance Metrics

The primary metric used for the Air NAVWAR Program is acceptable system performance in a GPS denied environment which is defined by classified values of jamming to signal ratio (J/S) identified in the Enhanced GPS User Equipment (UE) Operational Requirements Document (ORD) 562-06-00 of 7 June 2000. The performance goal is met if acceptable system performance is achieved in the threshold J/S environment cited in the classified appendix.

The primary metric used for the Sea NAVWAR is acceptable system performance in a GPS denial environment defined by classified values of jamming to signal ratio (J/S) identified in the Sea NAVWAR Increment 2 CPD (12/08). The performance goal is met if acceptable system performance is achieved in the threshold J/S environment cited in the CPD.

The primary metrics used for the GPNTS is obtainment of a Milestone B decision from the MDA, an approved APB and AP, successful completion of the system development contract award, completion of the SRR and SFR review events.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0921: *NAVSTAR GPS Equipment*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various/ Various	Product Vendors Various	284.922	4.000	Oct 2009	4.891	Oct 2010	0.000		4.891	0.000	293.813	Continuing
Product Development (SSC-SD)	WR	SSC PAC San Diego	69.609	0.800	Oct 2009	0.600	Oct 2010	0.000		0.600	0.000	71.009	Continuing
Product Dev (other in house)	WR	Various Field Activities Various	439.397	0.000		0.000		0.000		0.000	0.000	439.397	Continuing
Systems Engineering	Various/ Various	Various Govt/ Contractor Various	16.391	2.000	Oct 2009	1.750	Oct 2010	0.000		1.750	0.000	20.141	Continuing
		Subtotal	810.319	6.800		7.241		0.000		7.241	0.000	824.360	

Remarks

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various/ Various	Various Various	12.710	0.000		0.000		0.000		0.000	0.000	12.710	Continuing
Software Development	Various/ Various	SSC PAC San Diego	10.100	0.200	Oct 2009	0.150	Oct 2010	0.000		0.150	0.000	10.450	Continuing
			5.757	0.645	Oct 2009	0.700	Oct 2010	0.000		0.700	0.000	7.102	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0921: *NAVSTAR GPS Equipment*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	Various/ Various	SSC PAC/ NAWC/Various Contractors Various											
Training Development	WR	SSC PAC/NAWC Various	4.125	0.800	Oct 2009	0.450	Oct 2010	0.000		0.450	0.000	5.375	Continuing
Technical Data	Various/ Various	Platform PMOs Various	3.700	0.500	Oct 2009	0.450	Oct 2010	0.000		0.450	0.000	4.650	Continuing
		Subtotal	36.392	2.145		1.750		0.000		1.750	0.000	40.287	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation (NAWC PAX)	WR	NAWC PAX PAX River	25.929	2.000	Oct 2009	1.800	Oct 2010	0.000		1.800	0.000	29.729	Continuing
Test & Evaluation (DCS)	C/CPAF	DCS CORP PAX PAX River	4.276	0.500	Oct 2009	0.500	Oct 2010	0.000		0.500	0.000	5.276	Continuing
Test & Evaluation (SSC-SD)	WR	SSC PAC San Diego	6.975	1.000	Oct 2009	0.900	Oct 2010	0.000		0.900	0.000	8.875	Continuing
		Various	24.996	3.759	Oct 2009	3.272	Oct 2010	0.000		3.272	0.000	32.027	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0921: *NAVSTAR GPS Equipment*

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation Platform Testing	Various/ Various	Various											
		Subtotal	62.176	7.259		6.472		0.000		6.472	0.000	75.907	

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various/ Various	DCS, SAIC, ARINC Various	11.957	1.800	Oct 2009	1.400	Oct 2010	0.000		1.400	0.000	15.157	Continuing
Government Engineering Support	WR	SSC, NAWC, WR Various	10.860	2.000	Oct 2009	1.800	Oct 2010	0.000		1.800	0.000	14.660	Continuing
Program Management Support	C/CPAF	DCS, Price Systems Various	17.039	1.800	Oct 2009	1.358	Oct 2010	0.000		1.358	0.000	20.197	Continuing
Acquistion Workforce	Allot	Not Specified Not Specified	0.139	0.000		0.000		0.000		0.000	0.000	0.139	Continuing
		Subtotal	39.995	5.600		4.558		0.000		4.558	0.000	50.153	

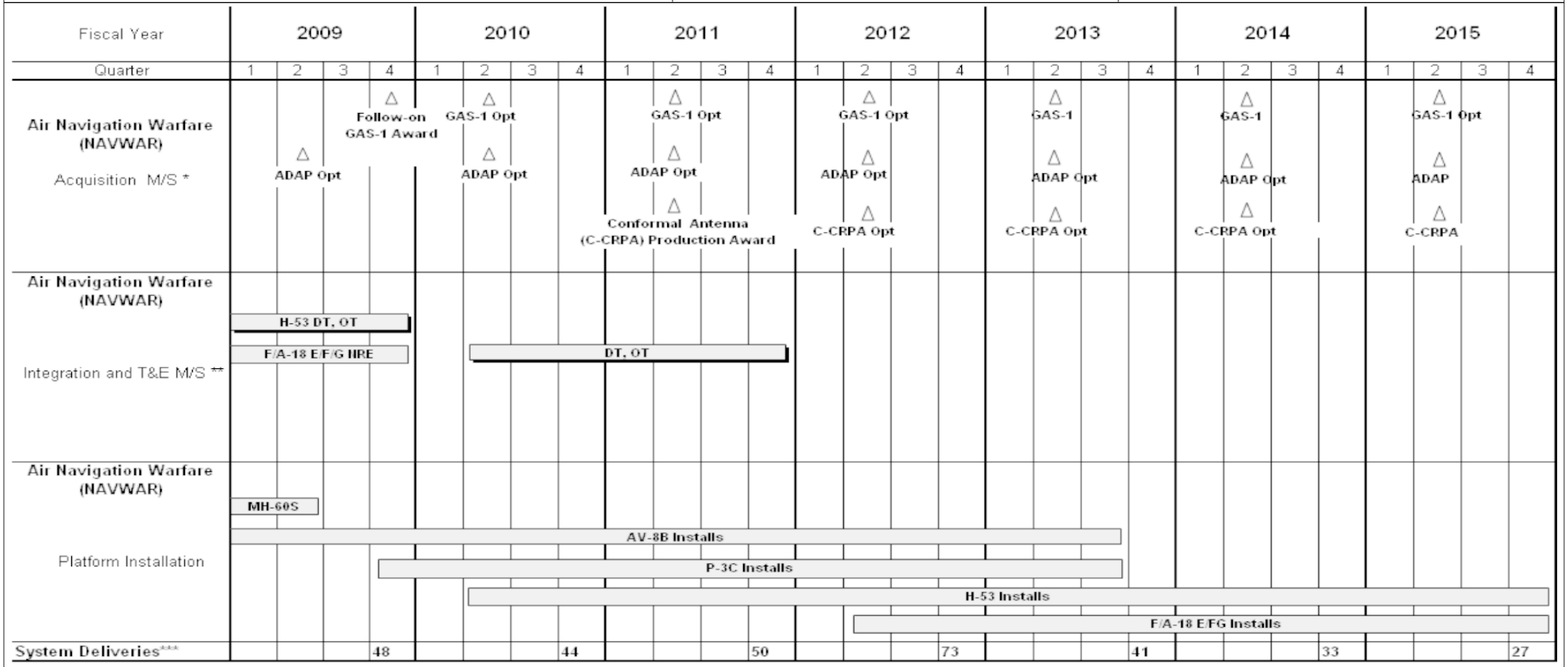
Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0921: *NAVSTAR GPS Equipment*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	948.882	21.804		20.021		0.000		20.021	0.000	990.707	

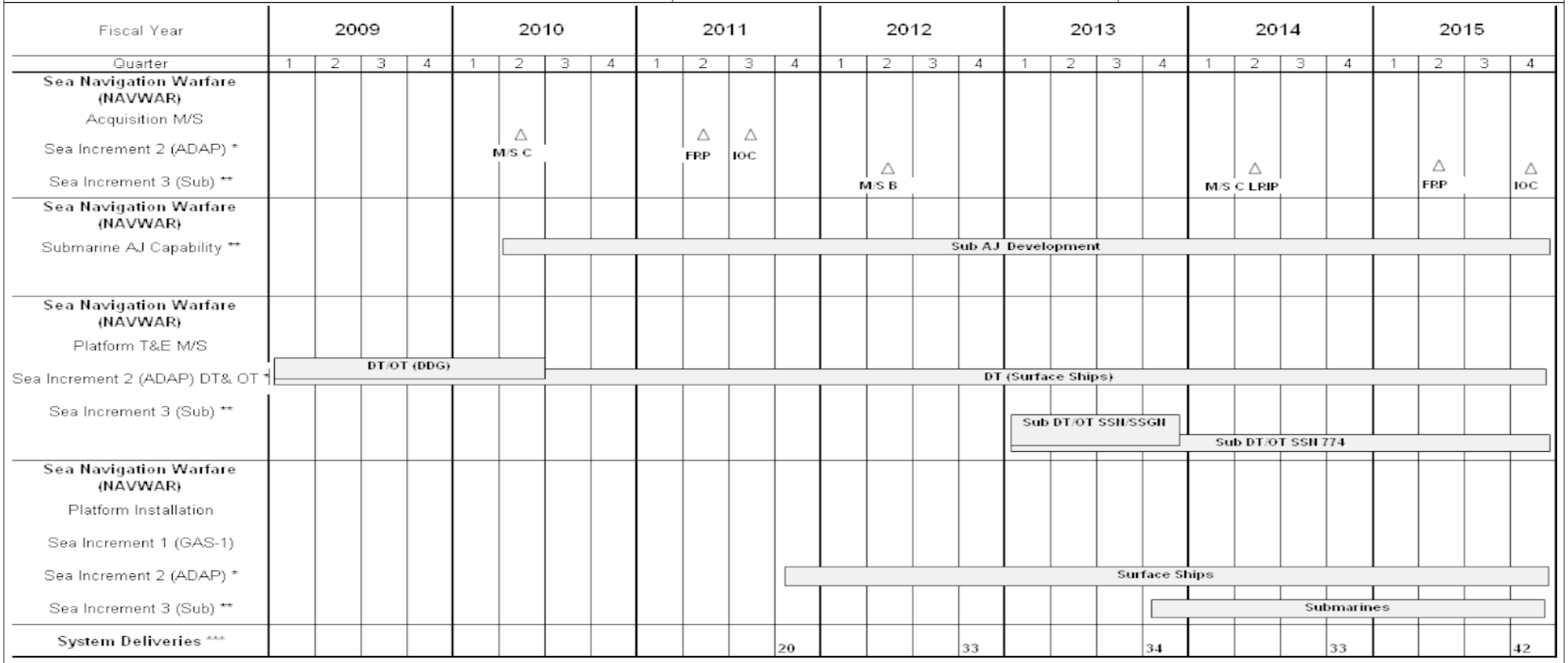
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	**R-1 ITEM NOMENCLATURE** PE 0604777N: *Navigation/Id System*	**PROJECT** 0921: *NAVSTAR GPS Equipment*



*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.
**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, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	**R-1 ITEM NOMENCLATURE** PE 0604777N: *Navigation/Id System*	**PROJECT** 0921: *NAVSTAR GPS Equipment*



* 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 3Q FY 09 to 2Q FY10

* 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

** 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, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0921: *NAVSTAR GPS Equipment*

Fiscal Year	FY09				FY10				FY11				FY12				FY13				FY14				FY15			
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
Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) Milestone/Acquisition Increment 1 *			△ AS		△ APB △ AP		△ MS B					△ CDR							△ MS C				△ IOC	△ FRP DR				
GPNTS Milestone/Acquisition Increment 2 **																				△ MS B Prep Activities Begin								
GPNTS CONTRACTS			△ RFP Release			△ Increment 1 AWARD								△ EDM Delivery					△ LRIP Option Award						△ FRP Option A			
GPNTS TEST & EVALUATION Increment 1 *				△ TEMP	△ Integrated Test									△ Combined DT&E/Operational Assessment							△ TECH EVAL/ENV	△ OTRR	△ IOT&E △ JITC Testing					

* 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 scalable to accommodate back fit of current legacy PNT systems as well as forward fit of new platforms.
* 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).
** 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).

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 0921: *NAVSTAR GPS Equipment*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Air Navigation Conformal Array Development	1	2009	4	2009
Air Navigation H-53 DT/OT	1	2009	4	2009
Air Navigation AV-8B DT/OT	1	2010	1	2010
Air Navigation F/A 18 E/F/G DT/OT	1	2010	4	2011
Sea Navigation Increment 2 (ADAP) DT/OT	1	2010	1	2015
Sea Navigation Increment 2 (ADAP) M/S C LRIP	2	2010	2	2010
Sea Navigation Increment 2 (ADAP) FRP	2	2011	2	2011
Sea Navigation Increment 2 (ADAP) IOC	3	2011	3	2011
Sea Navigation Increment 3 (Sub A/J) M/S B	2	2012	2	2012
Sea Navigation Increment 3 (Sub A/J)DT/OT	1	2013	4	2015
Sea Navigation Increment 3 (Sub A/J) M/S C LRIP	2	2014	2	2014
Sea Navigation Increment 3 (Sub A/J)FRP	2	2015	2	2015
Sea Navigation Increment 3 (Sub A/J)IOC	4	2015	4	2015
GPNTS INCREMENT 1 MS B	3	2010	3	2010
GPNTS MS C	2	2013	2	2013
GPNTS M/S C LRIP	3	2013	3	2013
GPNTS FRP	4	2014	4	2014
GPNTS IOC	3	2014	3	2014

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
1253: *Combat Ident System*	9.179	30.262	36.483	0.000	36.483	29.245	17.237	10.315	14.943	Continuing	Continuing
Quantity of RDT&E Articles	2	19	0	0	0	0	0	0	0		

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) in 2020. A Program Deviation Report was submitted in July 2009 reporting a schedule breach to Operational Evaluation (OPEVAL) and IOC due to joint asset participations and on-going resolution of DT deficiencies. The IOT&E is replanned for FY2011 with additional DT events planned in FY10 to address system-of-system OA deficiencies.

Beginning in FY08 the RDT&E articles include Mode 5 cryptographic modules and associated hardware and software changes, 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.

B. Accomplishments/Planned Program ($ in Millions)

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Mode 5 prototype hardware, cryptographic module	1.665	19.619	21.632	0.000	21.632
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 for the AN/UPX-37/41C Interrogator, AN/APX-118/123 Common Digital Transponder, AN/APX-119 Transponder, and AN/APX-111 Combined Interrogator Transponder. *FY 2009 Accomplishments:* Procure AN/APX-123 for MV-22. Continue AN/APX-123 integration on the E-2D. *FY 2010 Plans:* Procure AN/APX-123 for MV-22, AN/APX-119 for lab, and AN/APX-111 for labs and F/A-18 test aircraft. Initiate AN/APX-123 integration on the MV-22. Initiate AN/APX-119 integration on the KC-130J. Commence development of the Mode 5 kit in the AN/APX-111 and integration into the F/A-18E/F and EA-18G. *FY 2011 Base Plans:* Continue AN/APX-123, AN/APX-119 and AN/APX-111 integrations.					
Mode 5 systems Engineering and ILS	2.872	3.397	7.786	0.000	7.786
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					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
is not limited to, activities such as Integrated Logistics Support, Design and Engineering Studies and Analysis, and Configuration Management performed as the Lead Service. *FY 2009 Accomplishments:* Continue systems engineering and analysis on multiple aircraft platforms (including H-1, MH-60, E-2D, and MV-22) and deficiency correction on transponders and interrogators. *FY 2010 Plans:* Continue systems engineering and analysis on multiple aircraft platforms (including H-1, MH-60, E-2D, MV-22, KC-130J, and F/A-18) and deficiency correction on transponders and interrogators. *FY 2011 Base Plans:* Continue systems engineering and analysis on multiple aircraft platforms (including E-2D, MV-22, KC-130J, and F/A-18).					
Mode 5 Upgrade DT & OT 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. *FY 2009 Accomplishments:* Conduct an Operational Assessment on the AN/APX-123 and AN/UPX-41C. *FY 2010 Plans:* Conduct Regression Testing on the AN/APX-123 and AN/UPX-41C. Test the AN/APX-123 as integrated on the E-2D.	4.642	7.246	7.065	0.000	7.065

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: Conduct an Operational Test and begin testing of the AN/APX-123 as integrated on the MV-22.					
Accomplishments/Planned Programs Subtotals	9.179	30.262	36.483	0.000	36.483

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• OPN/2851: *Identification Systems*	31.367	37.563	29.572	0.000	29.572	33.687	36.355	39.370	36.242	Continuing	Continuing
• APN/0582: *Identification Systems*	11.997	24.051	20.397	0.000	20.397	37.927	39.208	41.687	35.903	Continuing	Continuing

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.

E. Performance Metrics

Award LRIP 5 Contract Option in 2nd Quarter FY 2010 and LRIP 6 Contract Option in 1st Quarter FY 2011. Complete Operational Test Readiness Review (OTRR) in 3rd Quarter FY 2011.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
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Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/FFP	Lockheed Owego, NY	3.167	0.062	May 2010	0.125	May 2011	0.000		0.125	3.640	6.994	6.994
Primary Hardware Development	WR	NAWCWD China Lake CA	3.200	3.648	May 2010	6.179	May 2011	0.000		6.179	20.042	33.069	Continuing
Primary Hardware Development	SS/CPFF	Northrup Grumman Bethpage NY	3.508	0.378	Jun 2010	0.000		0.000		0.000	1.701	5.587	5.587
Primary Hardware Development	Various/ Various	BAE Greenlawn NY	26.343	0.000		0.000		0.000		0.000	0.597	26.940	26.940
Primary Hardware Development	C/TBD	Boeing Philiadelphia, PA	0.000	5.190	May 2010	2.289	Jun 2011	0.000		2.289	0.639	8.118	8.118
Primary Hardware Development	C/TBD	Raytheon Towson, MD	0.000	1.027	Dec 2009	0.137	Mar 2011	0.000		0.137	0.277	1.441	1.441
Primary Hardware Development	C/TBD	Boeing St Louis. MO	0.000	9.314	May 2010	12.902	Jun 2011	0.000		12.902	19.233	41.449	41.449
Systems Engineering	WR	NAWCAD PAX River, MD	5.420	1.963	Nov 2009	4.288	Nov 2010	0.000		4.288	7.131	18.802	Continuing
Systems Engineering	WR	NAWCAD St Inigoes, MD	10.611	0.534	Nov 2009	2.312	Nov 2010	0.000		2.312	2.121	15.578	Continuing
Systems Engineering	WR	NAWCWD China Lake	0.600	0.000		0.000		0.000		0.000	0.000	0.600	Continuing
		Subtotal	52.849	22.116		28.232		0.000		28.232	55.381	158.578	90.529

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*

Support ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ILS	Various/ Various	Various Various	1.466	0.900	Nov 2009	1.186	Nov 2010	0.000		1.186	0.000	3.552	Continuing
Software Development	Various/ Various	Various Various	2.708	0.000		0.000		0.000		0.000	0.000	2.708	Continuing
Technical data	Various/ Various	Various Various	0.053	0.000		0.000		0.000		0.000	0.000	0.053	Continuing
		Subtotal	4.227	0.900		1.186		0.000		1.186	0.000	6.313	

Remarks

Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T & E	WR	NAWCAD PAX River MD	4.030	6.612	Nov 2009	3.970	Nov 2010	0.000		3.970	0.000	14.612	Continuing
Operational T & E	WR	NAWCAD PAX River MD	14.426	0.362	Nov 2009	1.645	Nov 2010	0.000		1.645	0.000	16.433	Continuing
Test Assets	Various/ Various	Various Various	1.674	0.272	Nov 2009	1.450	Nov 2010	0.000		1.450	0.000	3.396	Continuing
		Subtotal	20.130	7.246		7.065		0.000		7.065	0.000	34.441	

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Engineering Support	Various/ Various	Various Various	0.450	0.000		0.000		0.000		0.000	0.000	0.450	Continuing
Government Engineering Support	Various/ Various	Various Various	1.811	0.000		0.000		0.000		0.000	0.000	1.811	Continuing
Program Management Support	Various/ Various	Various Various	1.961	0.000		0.000		0.000		0.000	0.000	1.961	Continuing
ETS (Non-FFRDC)	WR	Various PAX River MD	0.174	0.000		0.000		0.000		0.000	0.000	0.174	Continuing
		Subtotal	4.396	0.000		0.000		0.000		0.000	0.000	4.396	

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	81.602	30.262		36.483		0.000		36.483	55.381	203.728	90.529

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*

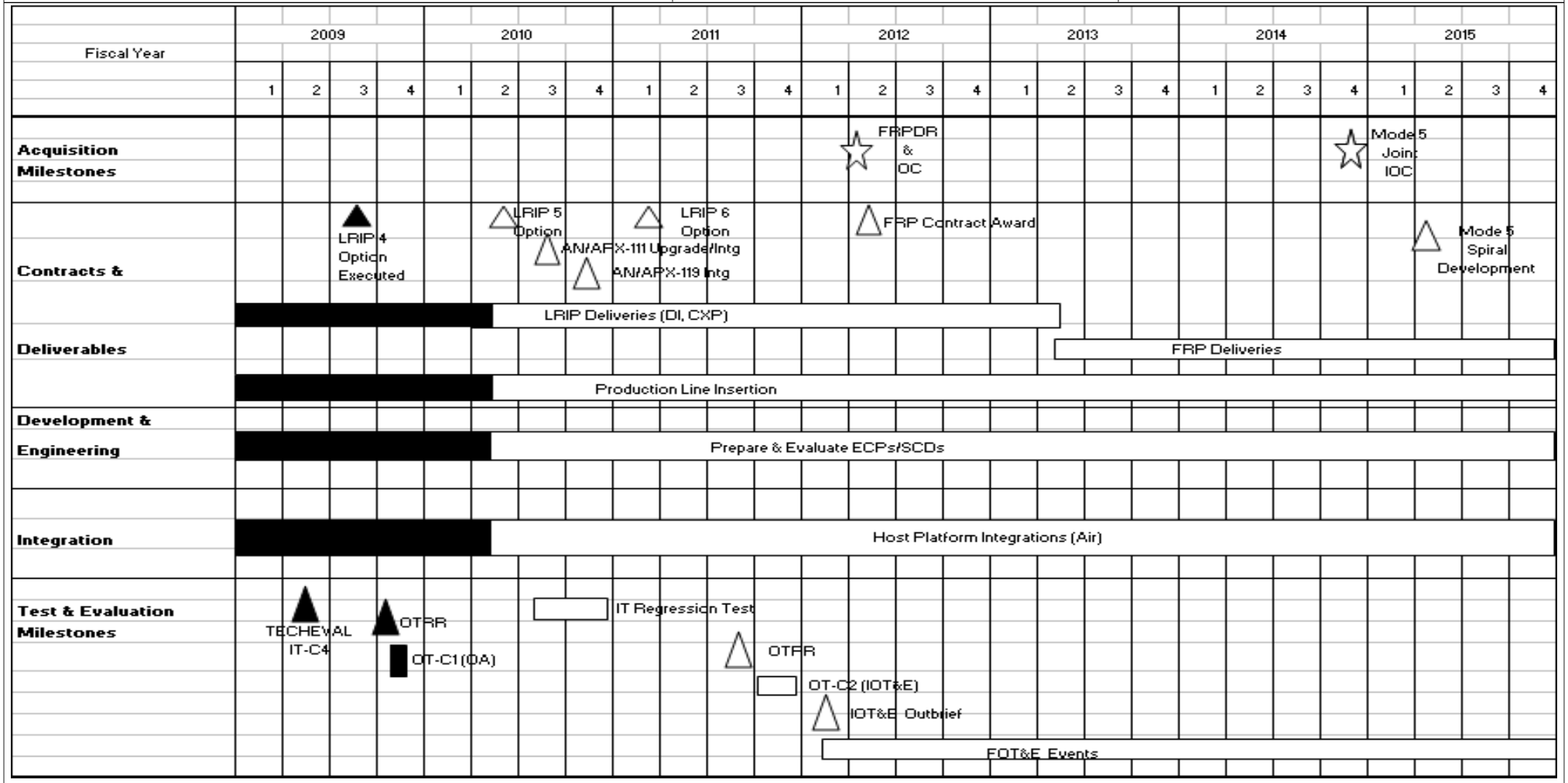

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Full Rate Production Decision Review (FRPDR) & IOC	2	2012	2	2012
FRP Contract Award	2	2012	2	2012
AN/APX-111 Upgrade/Integration Begins	3	2010	3	2010
AN/APX 119 Integration Begins	4	2010	4	2010
Low-Rate Initial Production (LRIP) 4 Contract Award	3	2009	3	2009
Low-Rate Initial Production (LRIP) 5 Contract Award	2	2010	2	2010
Low-Rate Initial Production (LRIP) 6 Contract Award	1	2011	1	2011
Low-Rate Initial Production Deliveries (CXP, DI)	1	2009	2	2013
FRP Deliveries	2	2013	4	2015
Prepare & Evaluate ECPs/SCDs	1	2009	4	2015
Production Line Insertion	1	2009	4	2015
Host Platform Integrations	1	2009	4	2015
TECHEVAL (IT-C4)	2	2009	2	2009
Operational Test Readiness Review (OTRR)	4	2009	4	2009
OT-C1 (OA)	4	2009	4	2009
IT Regression Test	3	2010	4	2010
Operational Test Readiness Review (OTRR-2)	3	2011	3	2011
OT-C2 (IOT&E)	4	2011	4	2011

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 1253: *Combat Ident System*

	Start		End	
Event	Quarter	Year	Quarter	Year
Mode 5 Joint IOC	4	2014	4	2014
Mode 5 Spiral Development	2	2015	2	2015
IOT&E Outbrief	1	2012	1	2012
Follow-on Test and Evaluation	1	2012	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 5: *Development & Demonstration (SDD)*	R-1 ITEM NOMENCLATURE PE 0604777N: *Navigation/Id System*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: *Congressional Adds*	1.995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.311
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010
Congressional Add: Sure Track Re-Architecture and Sensor Augmentation *FY 2009 Accomplishments:* Funds provided to enhance the SURETRAK capabilities and improve system supportability. Project will implement the new Open Map Display, with respect to Atlantic Test Range (ATR) requirements, in a manner that makes it compatible with the new Services Oriented Architecture (SOA).	1.995	0.000
Congressional Adds Subtotals	1.995	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not required for Congressional Adds.

E. Performance Metrics

Not required for Congressional Adds.