CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**					R-1 ITEM NOMENCLATURE 0604504N AIR CONTROL ENGINEERING			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	**10.100**	**16.432**	**10.151**	**4.977**	**5.344**	**7.010**	**7.125**	**7.268**
0718 MARINE AIR TRAFFIC CONTROL AND LANDING SYSTEMS (MATCALS)	**5.219**	**4.637**	**4.663**	**0.704**	**0.723**	**0.729**	**0.745**	**0.764**
0993 SHIPBOARD AIR TRAFFIC CONTROL SYSTEMS	**4.595**	**7.998**	**5.102**	**3.834**	**4.175**	**5.829**	**5.918**	**6.035**
1657 SHORE AIR TRAFFIC CONTROL (ATC) SYSTEMS	**0.286**	**0.329**	**0.386**	**0.439**	**0.446**	**0.452**	**0.462**	**0.469**
9564 TRANSPORTABLE TRANSPONDER LANDING SYSTEMS (TTLS)		**3.468**						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element provides for the development, integration, and testing of automated Air Traffic Control (ATC) hardware and software required to provide improved flight safety and more reliable all-weather ATC and landing system capabilities at Naval Air Stations and Marine Corps Air Stations and Fleet Area Control & Surveillance Facilities (FACSFAC) worldwide. Funded programs are required to upgrade or replace aging ATC and landing system equipment on aircraft, aircraft carriers, amphibious ships, Naval Air Stations, Marine Corps Air Stations and Navy/Marine Corps tactical/expeditionary airfields and remote landing sites.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604504N AIR CONTROL ENGINEERING				PROJECT NUMBER AND NAME 0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	**5.219**	**4.637**	**4.663**	**0.704**	**0.723**	**0.729**	**0.745**	**0.764**
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program provides for continued development, integration, and testing of hardware and software to meet requirement for all-weather operation and improved flight safety of Air Traffic Control and Landing Systems at Navy/Marine Corps expeditionary airfields. Current program includes approved transition to the Air Surveillance and Precision Approach Radar Control System (ASPARCS). The ASPARCS will replace the legacy Air Traffic Control (ATC) Precision Approach Radar (PAR), Air Surveillance Radar (ASR), and Communications and Control Subsystem with a High Mobility Multipurpose Wheeled Vehicle based PAR, ASR, and Command and Control (C2) Subsystem. Efforts will commence for requirements definition, development and engineering for the ASPARCS Preplanned Product Improvements (P3I). P3I includes, but is not limited to, the design and development of software code to interface Tactical Digital Information Link (TADIL-J) input/output to existing software; to incorporate National Imagery Mapping Agency (NIMA) functionality; and enhanced simulation and training.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)

B. Accomplishments/Planned Program

	FY04	FY05	FY06	FY07
Accomplishments/Effort/Subtotal Cost	5.219	4.637	0.350	
RDT&E Articles Quantity				

Perform systems engineering functions in support of the ASPARCS program. This effort includes coordination and planning with US Army and contractor for ASPARCS P3I, technical oversight of the ASPARCS program and ILS planning and implementation for ASPARCS.

	FY04	FY05	FY06	FY07
Accomplishments/Effort/Subtotal Cost			0.536	
RDT&E Articles Quantity				

Improve maintenance concept and reduce life cycle costs associated with field level repairs for ASPARCS.

	FY04	FY05	FY06	FY07
Accomplishments/Effort/Subtotal Cost			3.777	0.704
RDT&E Articles Quantity				

Perform studies and analyses to implement P3I and other evolutionary improvements. Develop criteria to integrate Tactical Digital Information Link (TADIL-J) input/output to existing ASPARCS software. Develop criteria for existing ASPARCS software to achieve Defense Information Infrastructure-Common Operating Environment (DII-COE) level 5 compliance, National Imagery Mapping Agency (NIMA) functionality, and enhanced simulation and training into the existing ASPARCS software. Perform studies and analyses to integrate the Multi Function Information Distribution System (MIDS) data link terminal into the ASPARCS system.

R-1 SHOPPING LIST - Item No. 109

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget:	5.288	4.686	4.783	0.860
Current BES/President's Budget	5.219	4.637	4.663	0.704
Total Adjustments	-0.069	-0.049	-0.120	-0.156
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions		-0.043		
Congressional rescissions				
SBIR/STTR Transfer				
OSD		-0.006	-0.004	
Navy (FMB/Sponsor/NAVAIR)			-0.162	-0.165
Economic Assumptions			0.046	0.009
Reprogrammings	-0.069			
Congressional increases				
Subtotal	-0.069	-0.049	-0.120	-0.156

Schedule:

Schedule and technical issues with the precision approach radar (PAR) and air surveillance radar (ASR) and integration with the operation subsystem/communication subsystem resulted in a no-cost close out to the Lockheed Martin contract in November 2004. The program is pursuing an acqusition decision for an existing Army PAR, ASR and C2 node in January 2005 for IOC in FY2006 to fulfill the ASPARCS requirement. This program will join with the US Army for pre-planned product improvements (P3I).

Technical:

Not Applicable.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
* OPN BLI 281500, MATCALS	3.373	15.519	19.584	20.238	19.958	17.523	17.958	18.414	Continuing	Continuing

* OPN BLI 281500, MATCALS is not limited to ASPARCS.

E. ACQUISITION STRATEGY:

Air Surveillance and Precision Approach Radar System (ASPARCS) is an ACAT IVT program. Lockheed Martin was awarded the contract for this effort in June of 2000. This effort included First Article development (Fixed Price Incentive) with (Firm Fixed Priced) production options. Schedule delays and technical issues with the precision approach radar (PAR) and air surveillance radar (ASR) and integration with the operation subsystem/communication subsystem resulted in a no-cost close out to the Lockheed Martin contract in November 2004. The program is pursuing an acqusition decision for an existing Army PAR, ASR and C2 node in January 2005 for IOC in FY2006 to fulfill the ASPARCS requirement. This program will join with the Army for pre-planned product improvements (P3I) and evolutionary improvements.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2005**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**		PROGRAM ELEMENT 0604504N AIR CONTROL ENGINEERING			PROJECT NUMBER AND NAME 0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Devel Phase I	C/FFP	Lockheed Martin	13.806								13.806	13.806
Primary Hardware Devel	TBD	Raytheon									0.000	
Training Development	WX	NAWCAD S.I.	0.175	0.025	01/05	0.115	11/05				0.315	
Systems Engineering	WX	NAWCAD S.I.	5.131	0.551	01/05	0.641	11/05	0.242	11/06	Continuing	Continuing	
Ancillary Hardware Deveopment	SS/FFP	Rockwell Collins	0.424								0.424	0.424
Primary Hardware Devel TTLS	FFP	ANPC	2.000								2.000	2.000
GFE	WX	NAWCAD				1.000	11/05				1.000	
Subtotal Product Development			21.536	0.576		1.756		0.242		Continuing	Continuing	
Remarks:												
Software Development	TBD	Raytheon		2.428	01/05	0.517	01/06	0.200	01/07	4.214	7.359	7.359
Integrated Logistics Support	WX	NAWCAD S.I.	0.336	0.858	01/05	0.732	11/05			Continuing	Continuing	
Configuration Management	WX	NAWCAD S.I.	0.284								0.284	
Technical Data	WX	NAWCAD S.I.	0.479	0.165	01/05					Continuing	Continuing	
Development Support MATCALS	WX	NAWCAD S.I.	0.205								0.205	
Studies and Analyses	TBD	Raytheon				0.800	11/05				0.800	0.800
Studies and Analyses	WX	NAWCAD S.I.				0.418	11/05				0.418	
											0.000	
Subtotal Support			1.304	3.451		2.467		0.200		Continuing	Continuing	
Remarks:												

CLASSIFICATION:

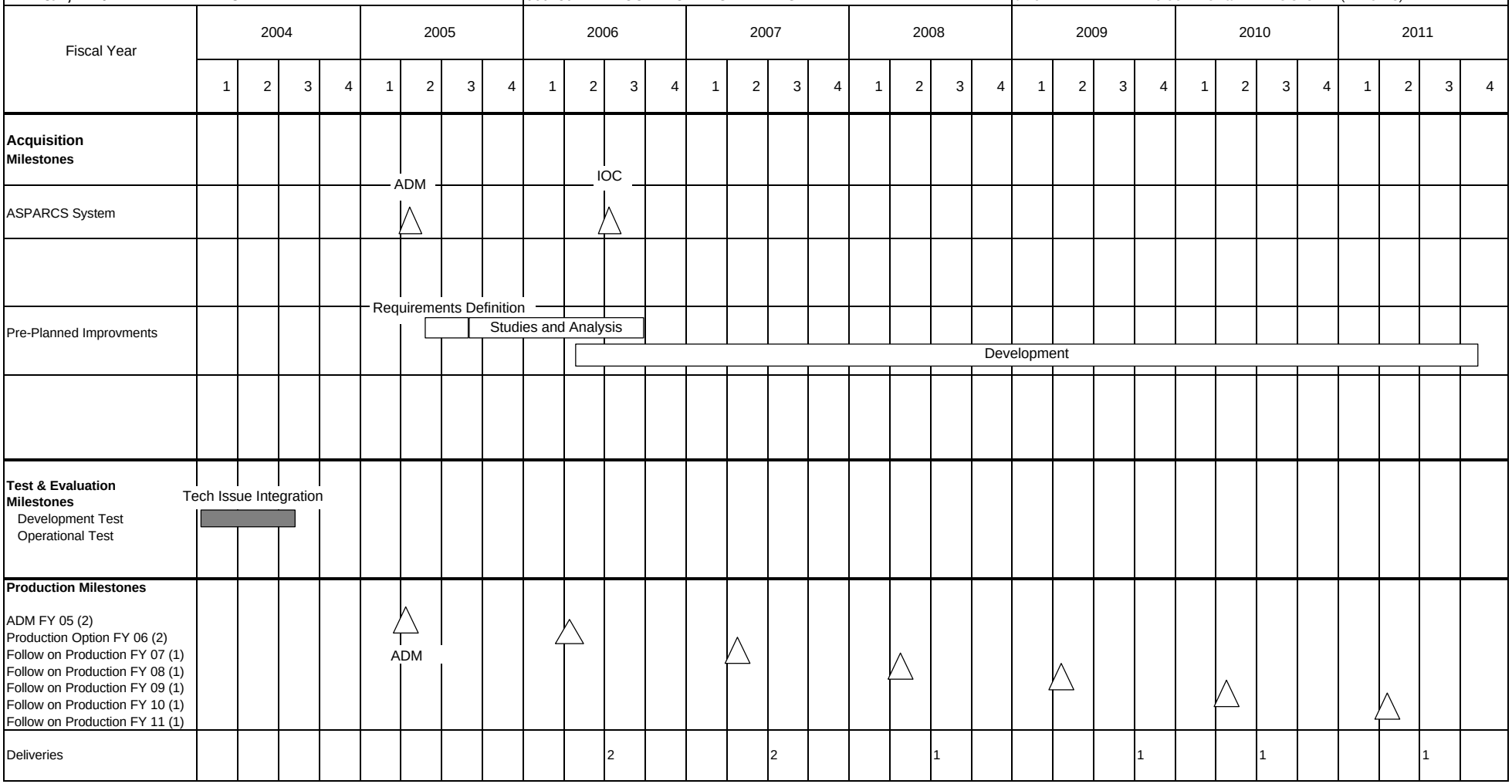
Exhibit R-3 Cost Analysis (page 2)										DATE: **February 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**		PROGRAM ELEMENT 0604504N AIR CONTROL ENGINEERING				PROJECT NUMBER AND NAME 0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NAWCAD S.I.	7.261								7.261	
Operational Test & Evaluation	WX	MCOTEA	1.072								1.072	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal T&E			8.333	0.000		0.000		0.000			8.333	
Remarks:												
Program Management Support	WX	NAWCAD S.I.	0.467	0.360	01/05	0.400	11/05	0.262	11/06	Continuing	Continuing	
Travel	WX	NAVAIR	0.081	0.050	01/05	0.040	11/05			Continuing	Continuing	
Contractor Engineering Support	TBD	Raytheon		0.200	01/05						0.200	0.200
											0.000	
											0.000	
											0.000	
Subtotal Management			0.548	0.610		0.440		0.262		Continuing	Continuing	
Remarks:												
Total Cost			31.721	4.637		4.663		0.704		Continuing	Continuing	
Remarks:												

R-1 SHOPPING LIST - Item No. 109

CLASSIFICATION:

EXHIBIT R4, Schedule Profile — DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)



* Not required for Budget Activities 1, 2, 3, and 6

CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE: **February 2005**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604504N AIR CONTROL ENGINEERING				PROJECT NUMBER AND NAME 0718 MARINE AIR TRAFFIC CONTROL & LANDING SYSTEM (MATCALS)			
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Developmental Testing (DT-IIB) Phase I	1Q-3Q							
Acquisition Decision Memorandum		2Q						
IOC			3Q					
First Deployment			3Q					
Requirements Definition P3I		2Q-3Q						
Studies and Analyses		3Q-4Q	1Q-3Q					
P3I Development			2Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

R-1 SHOPPING LIST - Item No. 109

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604504N AIR CONTROL ENGINEERING				PROJECT NUMBER AND NAME 0993, Shipboard Air Traffic Control Systems			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	**4.595**	**7.998**	**5.102**	**3.834**	**4.175**	**5.829**	**5.918**	**6.035**
RDT&E Articles Qty		**4**		**1**				

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Shipboard Air Traffic Control Central systems, interfacing with versions of the AN/TPX-42(V) Direct Altitude and Identity Readout system (DAIR) allow Shipboard Air Traffic Controllers to identify, marshal, and direct aircraft within a 50 Nautical Mile (NM) radius of the ship. At closer range (8NM) a ship's Automatic Carrier Landing System (ACLS) and Independent Landing Monitor (ILM) are operationally required to effect safe landing on the moving decks of ships. The AN/SPN-41 ILM and AN/SPN-46 ACLS provide verification of aircraft approach glideslope position and precise aircraft automatic control respectively during its final approach and landing sequence to an aircraft carrier. Due to acquisition limitations in rain, the Moving Target Detection (MTD) technology used in the AN/SPN-46 is being adapted for the AN/SPN-43 search surveillance radar and in the AN/SPN-35B precision approach radar. The insertion of MTD technology plus an antenna pedestal upgrade constitute the AN/SPN-35C upgrade. Dual efforts are underway to improve AN/SPN-46 system availability and supportability until at least 2020. These efforts include various Engineering Change Proposals (ECP's), and the Life Cycle Extension (LCE) program transitional changes include a re-architecture of its radar control group process with COTS technology, replacement of the computer group processing hardware, and conversion of system program software from CMS-2 to the more commonly used 'C' programming language. In recent years, the top 25% of the AN/SPN-43 frequency band has been reallocated to the Fixed Wireless Access community. Because the Navy requires an air traffic control radar, this project unit will include engineering efforts to identify requirements and develop a suitable replacement before the AN/SPN-43 becomes operationally ineffectual. Finally, the AN/TPX-42A(V)14 DAIR underwent several phased upgrades that have resulted in two field changes. System improvements include replacing militarized front-end equipment in the track processor with COTS technology, converting the operational program software to more commonly used and flexible 'C' language, and integrating a flat panel monitor into the AN/UYQ-70 console. The development of an Air Traffic Control common console will reduce operational costs, improve reliability, and provide compatible interfaces and commonality for all ATC workstations.

Test Article Descriptions:

For AN/SPN-46 Radar Control Group three test articles are required to perform concurrent testing in FY 2005. Currently the test article can best be described as a direct replacement of the Radar Control Group equipment rack, employing a set of Versa Module Eurocards to improve the performance of antenna control, antenna position reporting and radar timing control functions.

For AN/SPN-46 Computer Group the test article is required to perform a series of tests in FY 2008. This test article will replace two existing computer racks with a single rack utilizing a set of state-of-the-art Versa Module Eurocard processors and software rewritten in a high order program language ("C").

For AN/TPX-42 Air Traffic Control Common Console the test article is required to perform operational assessment in FY 2006. Currently the test article can be described primarily in terms of its functionality. It will combine in the existing AN/TPX-42 console's hardware with the functionality to display targets processed by AN/TPX-42, AN/SPN-46 and the Joint Precision Approach and Landing System.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0993, Shipboard Air Traffic Control Systems

B. Accomplishments/Planned Program

	FY 04	FY 05	FY 06	FY 07
Shipboard testing for AN/SPN-35C.	0.290			
RDT&E Articles Quantity				

Provide OPEVAL support and develop a test bed. Obtain Milestone III approval and begin Full Rate Production.

	FY 04	FY 05	FY 06	FY 07
AN/SPN-46 Radar Control Group	2.196	5.794	2.567	
RDT&E Articles Quantity		3		

Conduct critical design review, complete system development, build test articles and conduct environmental testing, conduct configuration audits, conduct a test readiness review and operational assessment, and obtain Full Rate Production decision.
The three test articles are required to perform concurrent testing. Currently these test articles can best be described as a direct replacement of the Radar Control Group equipment rack, employing a set of Versa Module Eurocards to improve the performance of antenna control, antenna position reporting and radar timing control functions.

	FY 04	FY 05	FY 06	FY 07
AN/SPN-46 Computer Group Replacement		0.797	1.699	3.834
RDT&E Articles Quantity				1

This subproject replaces the AN/AYK-14 processor and converts software from CMS to "C" language. Conduct a software requirements review and develop a specification. Develop software and hardware, build a test article, and integrate and test it in a lab environment. Conduct a test readiness review, developmental test and operational test.
The test article is required to perform a series of tests in FY 2008. This test article will replace two existing computer racks with a single rack utilizing a set of state-of-the-art Versa Module Eurocard processors and software rewritten in a high order program language ("C").

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0993, Shipboard Air Traffic Control Systems

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY 06	FY 07
AN/TPX-42 Improvements	2.109	1.407	0.836	
RDT&E Articles Quantity		1		

Complete development and test of AN/TPX-42 Track Processor Upgrade and complementary software conversion (CMS to 'C'), with the resulting design applied to production of the AN/TPX-42A(V)14 'A' Kits and 'C' Kits. Develop an ATC Common Console, using the console from AN/TPX-42A(V)14 with Field Change 2 as the core technology. Conduct requirements and design reviews, and conduct an Operational Assessment. Following successful Full Rate Production approval, the design change will be introduced into the production of 'A' Kits and 'C' Kits. It is anticipated that this technology insertion will result in a formal nomenclature change for the AN/TPX-42 system, so the identification of the modification kits will change to 'F' and 'G' Kits, respectively.
The test article is required to perform operational assessment in FY 2006. Currently the test article can be described primarily in terms of its functionality. It will combine in the existing AN/TPX-42 console's hardware with the functionality to display targets processed by AN/TPX-42, AN/SPN-46 and the Joint Precision Approach and Landing System.

	FY 04	FY 05	FY 06	FY 07
Reprogrammings				
RDT&E Articles Quantity				

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0993, Shipboard Air Traffic Control Systems

C. PROGRAM CHANGE SUMMARY:

Funding:	FY2004	FY2005	FY2006	FY2007
FY 2005 President's Budget:	4.770	8.079	3.092	3.122
FY 2006 President's Budget:	4.595	7.998	5.102	3.834
Total Adjustments	-0.175	-0.081	2.010	0.712
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions		-0.074		
Congressional rescissions				
SBIR/STTR Transfer	-0.021			
OSD		-0.007	-0.032	-0.021
Navy (FMB/Sponsor/NAVAIR)			1.991	0.659
Economic Assumptions			0.051	0.074
Reprogrammings	-0.154			
Congressional increases				
	-0.175	-0.081	2.010	0.712

Schedule:

For TPX-42 ATC Common Console, the major schedule changes reflect reassessment of scope from an ACAT-IVT to an Abbreviated Acquisition Program. Therefore, instead of Technical and Operational Evaluations there now appears an Operational Assessment (OA). A previous element, mislabelled "Development Test", was the unit and integration testing performed by the system designers and is continuous throughout development. It did not constitute a significant effort or event and has been dropped from the current schedule. TRR has been moved to 4Q06, to immediately precede OA. Also, the previous schedule did not take into account the need for a test article, which has been added in FY 2006.

For SPN-46 Radar Control Group the schedule has been reworked completely, based on engineering analysis performed in FY 2004 to determine the scope and priority of various SPN-46 modifications. Thus, not only is this subproject described differently in the current schedule, but some of the elements retained form the previous schedule are now depicted with different timing. However, the conclusion of the subproject has remained constant: FRP in 2Q 07.

For SPN-46 Computer Group the schedule is new with this submission, because it meets the dollar reporting threshold in FY 2006.

Technical:

Not Applicable.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0993, Shipboard Air Traffic Control Systems

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
OPN BLI 283200 Automatic Carrier Landing Systems	17.339	12.438	17.388	18.162	18.755	19.236	19.745	20.281	Continuing	Continuing
OPN BLI 283100 Shipboard Air Traffic Control	7.791	8.642	7.307	7.537	7.772	7.995	8.228	9.554	Continuing	Continuing

E. ACQUISITION STRATEGY:

The AN/SPN-35C upgrade acquisition will consist of several commercial procurements that will be integrated by NAWCAD into the final configuration. Four primary contracts will be used, with CLINs for a base year and four options. In addition, several miscellaneous or ancillary hardware requirements will also be required that will take the form of small purchases, to be made from the open market (for items such as cables, connectors and backshells).

AN/SPN-46 Radar Control Group redesign and AN/SPN-46 Computer Group replacement subprojects are part of the AN/SPN-46 Life Cycle Extension (LCE) project, which is anticipated to be designated ACAT IV. Initial contract was awarded in FY 2004 for the Radar Control Group, and is expected to be awarded in FY 2006 for the Computer Group.

AN/TPX-42 Common Console is an anticipated ACAT IV-T program, with improvements being incorporated into the production of AN/TPX-42 upgrade kits.

All other projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce these technology advancements that either satisfy user requirements, such as all weather operation, or address supportability and cost of ownership problems.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **February 2005**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**		PROGRAM ELEMENT 0604504N AIR CONTROL ENGINEERING			PROJECT NUMBER AND NAME 0993, Shipboard Air Traffic Control Systems							
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary H/W Dev - SPN-35	WR	NAWCAD, Pax River, MD	4.845								4.845	
Primary H/W Dev - SPN-41	WR	NAWCAD, Pax River, MD	6.890								6.890	
Primary H/W Dev - SPN-43	WR	NAWCAD, Pax River, MD	7.503								7.503	
Primary H/W Dev - SPN-46	WR	NAWCAD, Pax River, MD	10.524	0.548	11/04			0.310	11/06	Continuing	Continuing	
Primary H/W Dev - SPN-46	SS/CR	SNC, Sierra, NV		4.925	12/04	0.550	12/05	0.270	12/06		5.745	5.745
Primary H/W Dev - TPX-42	WR	NAWCAD, Pax River, MD	2.035	0.473	11/04						2.508	
Training Development - SPN-35	C/T&M	IDSI Indian Head, MD	0.030								0.030	0.030
Training Development - SPN-46	C/T&M	IDSI Indian Head, MD	0.090								0.090	0.090
											0.000	
											0.000	
											0.000	
Subtotal Product Development			31.917	5.946		0.550		0.580		Continuing	Continuing	
Remarks:												
Software Development - SPN-46	WR	NAWCAD, Pax River, MD	0.255	0.225	11/04	0.293	11/05	0.332	11/06	Continuing	Continuing	
Software Development - SPN-46	C/CPFF	TBD		0.594	01/05	2.740	12/05	2.864	12/06	Continuing	Continuing	
Software Development - TPX-42	WR	NAWCAD, Pax River, MD	2.265	0.664	11/04						2.929	
Integrated Log Spt - SPN-46	WR	NAWCAD, Pax River, MD	0.072								0.072	
Integrated Log Spt - TPX-42	WR	NAWCAD, Pax River, MD	0.362	0.270	11/04						0.632	
Studies & Analyses - SPN-43	WR	NAWCAD, Pax River, MD	0.315								0.315	
Studies & Analyses - TPX-42	WR	NAWCAD, Pax River, MD									0.000	
Studies & Analyses - SPN-46	WR	NAWCAD, Pax River, MD	0.030	0.243							0.273	
Subtotal Support			3.299	1.996		3.033		3.196		Continuing	Continuing	
Remarks:												

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)											DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**		PROGRAM ELEMENT 0604504N AIR CONTROL ENGINEERING				PROJECT NUMBER AND NAME 0993, Shipboard Air Traffic Control Systems						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Eval - SPN-35	WR	NAWCAD, Pax River, MD	0.967								0.967	
Developmental Test & Eval - SPN-46	WR	NAWCAD, Pax River, MD				0.626	11/05				0.626	
Developmental Test & Eval - TPX-42	WR	NAWCAD, Pax River, MD				0.774	11/05				0.774	
Operational Test & Eval - SPN-35	WR	OPTEVFOR, Norfolk, VA	0.058								0.058	
Operational Test & Eval - TPX-42	WR	OPTEVFOR, Norfolk, VA				0.062	11/05				0.062	
											0.000	
											0.000	
Subtotal T&E			1.025	0.000		1.462		0.000		0.000	2.487	
Remarks:												
Logistics Management Support	C/CR	NTA, Patuxent River, MD	1.213	0.041	11/04	0.042	12/05	0.043	12/06	Continuing	Continuing	
Travel	WR	NAWCAD, Pax River, MD	0.030	0.015	11/04	0.015	11/05	0.015	11/06	Continuing	Continuing	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Management			1.243	0.056		0.057		0.058		Continuing	Continuing	
Remarks:												
Total Cost			37.484	7.998		5.102		3.834		Continuing	Continuing	
Remarks:												

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EXHIBIT R4, Schedule Profile
AN/TPX-42 Air Traffic Control Common Console

DATE: **February 2005**

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

PROGRAM ELEMENT NUMBER AND NAME
0604504N AIR CONTROL ENGINEERING

PROJECT NUMBER AND NAME
0993, Shipboard Air Traffic Control Systems

Fiscal Year	2004				2005				2006				2007				2007				2008				2009				2010			
	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	1	2	3	4
Prototype Phase	■	■	■	■																												
System Requirements Review	SRR ▲		SRR ▲	SRR ▲																												
Preliminary Design Review						PDR △																										
System Development				■	■	▭	▭	▭	▭																							
Critical Design Review						CDR △																										
Quality Design and Build						□																										
Test Article (EDM) Delivery (Qty 1)										1 △																						
Test Readiness Review											TRR △																					
Test & Evaluation Milestones Operational Assessment												□																				
Production Milestones Full Rate Production Decision												△																				
First Lot Deliveries (see Note below)																3 △																

* NOTE: changes to console introduced in production of AN/TPX-42A(V)14 'F' Kit and 'G' Kit.

CLASSIFICATION:

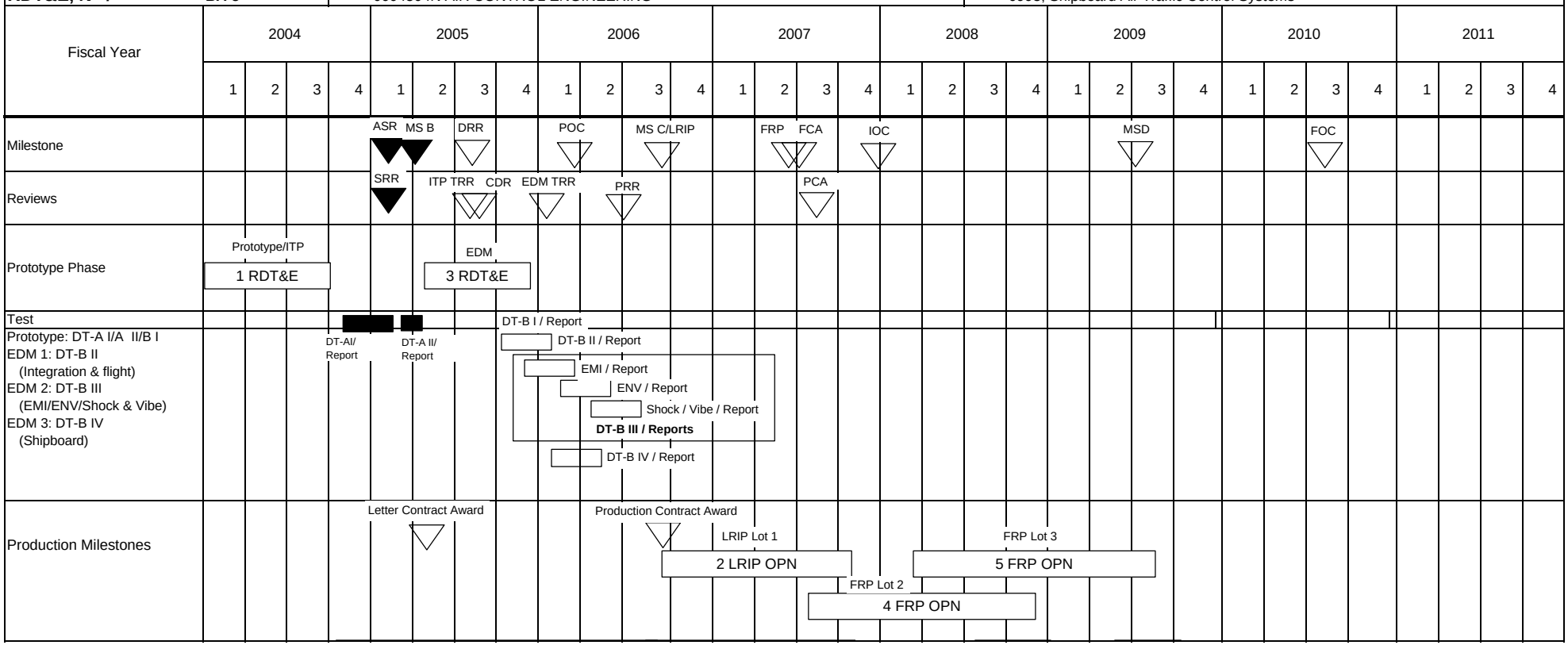
Exhibit R-4a, Schedule Detail **AN/TPX42 Air Traffic Control Common Console**						DATE: **February 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /BA-5**	PROGRAM ELEMENT 0604504N Air Control Engineering				PROJECT NUMBER AND NAME 0993, Shipboard Air Traffic Control Systems			
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Prototype Phase	1Q-4Q							
System Requirements Review (SRR)	1Q,3Q,4Q							
Preliminary Design Review (PDR)		2Q						
System Development	4Q	1Q-4Q						
Critical Design Review (CDR)		2Q						
Quality Design and Build		2Q						
Test Article (EDM) Delivery			2Q					
Test Readiness Review (TRR)			4Q					
Operational Assessment			4Q					
Full Rate Production Decision				1Q				
Full Rate Production (First Lot) Deliveries				4Q				

CLASSIFICATION:

EXHIBIT R4, Schedule Profile
AN/SPN-46 Radar Control Group

DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0993, Shipboard Air Traffic Control Systems



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* Not required for Budget Activities 1, 2, 3, and 6

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-4a, Schedule Detail **AN/SPN-46 RADAR CONTROL GROUP**						DATE: **February 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-05**	PROGRAM ELEMENT 0604504N Air Control				PROJECT NUMBER AND NAME 0993 Carrier ATC			
Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Reviews:								
System Requirements Review (SRR)		1Q						
Integrated Test Plan Technical Readiness Review (ITP TRR)		3Q						
Configuation Design Review (CDR)		3Q						
Engineering Demonstration Model (EDM TRR)			1Q					
Production Readiness Review (PRR)			2Q					
Physical Configuration Audit (PCA)				3Q				
Test Events								
DT-A I, DT-A II, DT B-1 Testing	4Q	1Q-4Q						
DT-B II		4Q	1Q					
DT-B III		4Q	1Q-3Q					
DT-B IV			1Q-2Q					
Radar Control Group Redesign Development								
Milestones:								
1. Acquisition Strategy Review (ASR)		1Q						
2. Milestone Decision B		2Q						
3. Demonstation Readiness Review (DRR)		3Q						
4. Preliminary Operational Capibility (POC)			1Q					
5. Milestone Decision C			3Q					
6. Full Rate Production (FRP)				2Q				
7. Functional Configuration Audit (FCA)				3Q				
8. Initial Operational Capibility (IOC)					1Q			
9. Material Support Date (MSD)						3Q		
10. Full Operational Capibility (FOC)							3Q	
Production Milestones								
1. Letter Contract Award		2Q						
2. Production Contract Award			3Q					
3. Low Rate Initial Production Lot 1			3Q-4Q	1Q-4Q				
4. Full Rate Production Lot 2				3Q-4Q	1Q-4Q			
5. Full Rate Production Lot 3					1Q-4Q	1Q-3Q		
Deliveries:								
Prototype	3Q							
EDM 1, EDM 2, and EDM 3		4Q						

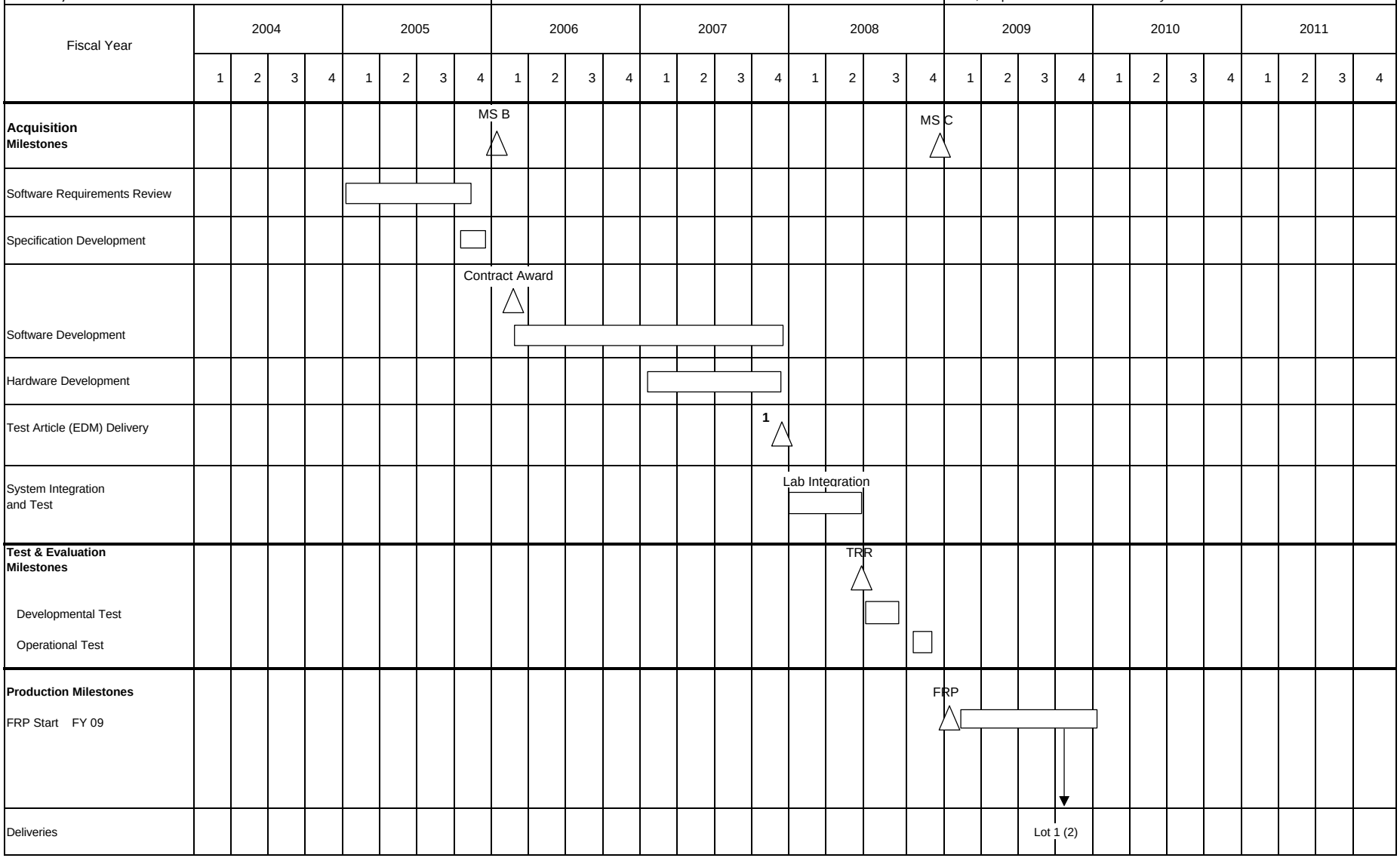
R-1 SHOPPING LIST - Item No. 109

CLASSIFICATION:

EXHIBIT R4, Schedule Profile
AN/SPN-46 COMPUTER GROUP

DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	0993, Shipboard Air Traffic Control Systems



CLASSIFICATION:

UNCLASSIFIED

Exhibit R-4a, Schedule Detail **AN/SPN-46 COMPUTER GROUP**						DATE: **February 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-05**	PROGRAM ELEMENT 0604504N Air Control				PROJECT NUMBER AND NAME 0993, Shipboard Air Traffic Control Systems			
Schedule Profile	FY2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Software Requirements Review		1-4Q						
Specification Development		4Q						
Milestone B			1Q					
Software Development Contract Award			1Q					
Software Development			1-4Q	1-4Q				
Hardware Development				1-4Q				
Test Article (EDM) Delivery				4Q				
Lab Integration and Test					1-2Q			
Test Readiness Review					2Q			
Developmental Test					3Q			
Operational Test					4Q			
Full Rate Production Decision						1Q		
Full Rate Production Deliveries (First Lot)						4Q		

R-1 SHOPPING LIST - Item No. 109

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604504N AIR CONTROL ENGINEERING				PROJECT NUMBER AND NAME 1657, Shore Air Traffic Control Systems			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	**0.286**	**0.329**	**0.386**	**0.439**	**0.446**	**0.452**	**0.462**	**0.469**
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This program provides for engineering development, integration, adaptation, and testing of new and/or modernized real-time Air Traffic Control (ATC) systems, air navigational aids, landing systems, and ATC communication systems for Naval and Marine Corps Air Stations (NAS/MCAS) and Fleet Area Control and Surveillance Facilites (FACSFAC). These systems are critical to Naval Aviation and provide for safe, efficient air operations. Additionally the FAA is effecting major modernization of the National Airspace System (NAS). The Navy must maintain compatibility with FAA developed ATC systems in order to ensure seamless interoperability within the NAS. NAS modernization initiatives in Project 1657 include the Visual Information Display System (VIDS) and follow-on Pre-planned Product Improvements, with additional RDT&E efforts required for modified commerical-off-the-shelf (COTS) ATC systems and equipment for modernization and recapitalization of these systems at our NAS, MCAS & FACSFAC facilities worldwide. Landing Systems initiatives include re-engineering and technology insertion efforts for the Precision Approach Radar (PAR), Tactical Air Navigation System (TACAN), and other landing systems.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	1657, Shore Air Traffic Control Systems

(U) B. Accomplishments/Planned Program

VIDS	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.160	0.262	0.186	0.220
RDT&E Articles Quantity				

Continue engineering development of pre-planned product improvements for the Visual Information Display System (VIDS) and initiate efforts to incorporate VIDS into the FACSFACs.

	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost			0.100	0.100
RDT&E Articles Quantity				

Initiate re-engineering and technology insertion efforts for the Precision Approach Radar, the Tactical Air Navigation System and other Landing Systems.

FACSFAC	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	0.126	0.067	0.100	0.119
RDT&E Articles Quantity				

Initiate research efforts to determine the best technical approach to integrate various data link and communication system upgrades into the FACSFAC System including the Digital Airport Surveillance Radar into the FACSFAC FACTS 3200 system.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	1657, SHORE AIR TRAFFIC CONTROL SYSTEM

C. PROGRAM CHANGE SUMMARY:

Funding:	FY2004	FY2005	FY2006	FY2007
Previous President's Budget:	0.297	0.337	0.382	0.434
Current BES/President's Budget:	0.286	0.329	0.386	0.439
Total Adjustments	-0.011	-0.008	0.004	0.005

Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions		-0.008		
Congressional rescissions				
SBIR/STTR Transfer				
OSD				-0.001
Navy (FMB/Sponsor/NAVAIR)				
Economic Assumptions			0.004	0.006
Reprogrammings	-0.011			
Congressional increases				
	-0.011	-0.008	0.004	0.005

(U) Schedule:

Not Applicable.

(U) Technical:

Not Applicable.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	1657, Shore Air Traffic Control Systems

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
OPN BLI 284000 National Air Space System	15.912	13.042	18.446	27.589	25.446	29.114	29.834	30.588	Continuing	Continuing
OPN BLI 284500 Air Station Support Equip	7.969	3.618	3.870	3.968	4.081	4.175	4.274	4.379	Continuing	Continuing
OPN BLI 284600 Microwave Landing System	0.000	7.188	7.733	9.140	9.374	10.396	10.681	10.980	Continuing	Continuing
OPN BLI 284700 FACSFAC	3.859	3.690	3.609	3.775	3.890	4.014	4.133	4.260	Continuing	Continuing

E. ACQUISITION STRATEGY:

All projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce technology advancements that either satisfy emergent user requirements or address supportability and cost of ownership problems.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604504N AIR CONTROL ENGINEERING				PROJECT NUMBER AND NAME 9564 TRANSPORTABLE TRANSPONDER LANDING SYSTEM			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost		**3.468**						
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This funding will support development and testing of hardware and software modifications to the existing Transportable Transponder Landing System (TTLS) product to enhance operational capabilities compatible with expeditionary U.S. Marine Corps Air Traffic Control requirements. Improvements include interoperability, software compatibility, and hardware upgrades including miniaturization to support improved transportability.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	9564 TRANSPORTABLE TRANSPONDER LANDING SYSTEM

B. Accomplishments/Planned Program

	FY04	FY05	FY06	FY07
Accomplishments/Effort/Subtotal Cost		3.468		
RDT&E Articles Quantity				

Provide engineering, logistical and technical services in support of evaluation of Transportable Transponder Landing System (TTLS).

	FY04	FY05	FY06	FY07
Accomplishments/Effort/Subtotal Cost				
RDT&E Articles Quantity				

	FY04	FY05	FY06	FY07
Accomplishments/Effort/Subtotal Cost				
RDT&E Articles Quantity				

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	9564 TRANSPORTABLE TRANSPONDER LANDING SYSTEM

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2004	FY 2005	FY 2006	FY 2007
Previous President's Budget:	0.000	0.000	0.000	0.000
Current BES/President's Budget	0.000	3.468	0.000	0.000
Total Adjustments	0.000	3.468	0.000	0.000
Summary of Adjustments				
Congressional program reductions				
Congressional undistributed reductions		-0.032		
Congressional rescissions				
SBIR/STTR Transfer				
OSD				
Navy (FMB/Sponsor/NAVAIR)				
Economic Assumptions				
Reprogrammings				
Congressional increases		3.500		
Subtotal	0.000	3.468	0.000	0.000

Schedule:

Not Applicable.

Technical:

Not Applicable.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL ENGINEERING	9564 TRANSPORTABLE TRANSPONDER LANDING SYSTEM

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
N/A										

E. ACQUISITION STRATEGY:

N/A. This is a technology demonstration to determine the applicability of this equipment to Marine Corps Expeditionary Air Traffic Control.