EXHIBIT R-2, RDT&E Budget Item Justification							DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**					R-1 ITEM NOMENCLATURE 0604504N, AIR CONTROL			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	4.348	8.063	6.533					
0718 MARINE AIR TRAFFIC (MATCALS)	1.429	2.224	0.510					
0993 CARRIER ATC	2.919	5.394	5.580					
1657 ATC IMPROVEMENT		0.445	0.443					

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 (NASs) and Marine Corps Air Stations (MCASs) and Fleet Area Control and Surveillance Facilities (FACSFAC) worldwide. Funded programs are required to upgrade or replace aging ATC and landing system equipment on aircraft, aircraft carriers, amphibious ships, NASs, MCASs and Navy/Marine Corps tactical/expeditionary airfields and remote landing sites.

R-1 SHOPPING LIST - Item No. 107

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**	R-1 ITEM NOMENCLATURE 0604504N, AIR CONTROL

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	4.072	8.191	6.594
President's Budget FY 10:	4.348	8.063	6.533
Total Adjustments	0.276	-0.128	-0.061

Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		-0.106	
SBIR/STTR/FTT Assessments	0.010		
Program Adjustments	0.266		-0.056
Rate/Misc Adjustments		-0.022	-0.005
Subtotal	0.276	-0.128	-0.061

Schedule:

Project Unit 0718: The MATCALS Air Surveillance and Precision Approach Radar Control System (ASPARCS) Production Contract Award and Delivery milestones have been modified to reflect the most current program schedule. The MATCALS ATC Command and Control System (C2S) schedule has been extended out to FY 2012 due to a budget reduction in FY 2008 and to better align with the C2S program.

Project Unit 0993: From PB09 the AN/TPX-42 ATC Common Console Field Change 3 development effort was extended three months to accommodate integration and environmental testing issues. The Test Readiness Review (TRR), Operational Assessment (OA) and Production milestones have been modified to reflect the most current program schedule. The AN/TPX-42B ATC Common Console extended the System Development phase from 4Q FY10 to 3Q FY12 and also added a Pre-planned Product Improvement effort beginning 3Q FY12.

Technical: Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604504N, AIR CONTROL				PROJECT NUMBER AND NAME 0718, MARINE AIR TRAFFIC (MATCALS)			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
	1.429	2.224	0.510					
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 requirements for all-weather operation and improved flight safety of Air Traffic Control and Landing Systems at Marine Corps expeditionary airfields. Current program includes approved transition to 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 (HMMWV) 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), in accordance with Marine Corps Requirements Oversight Council (MROC) Decision Memorandum 11-2005 dated December 2004. P3I includes the design and development of software code to interface Command and Control System (C2S) input/output to existing software, incorporating Radar Range Extension and Mapping functionality, enhanced simulation and training and providing increased operator workstations.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N, AIR CONTROL	0718, MARINE AIR TRAFFIC (MATCALS)

B. Accomplishments/Planned Program

ASPARCS Improvements	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.921	0.639	0.510	
RDT&E Articles Quantity				

Investigate and resolve obsolescence issues. Perform studies and analyses to implement P3I and other evolutionary improvements. Develop criteria for existing ASPARCS software to achieve Defense Information Infrastructure-Common Operating Environment Level 5 compliance, Information Assurance, Radar Range Extension and Mapping functionality, and enhanced simulation and training into the existing ASPARCS software. Perform studies and analyses.

ATC Interface with C2S	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.508	1.585		
RDT&E Articles Quantity				

Develop the ATC interface increment for the Command and Control System (C2S) , which will allow the ATC detachment to exchange radar track data with the Marine Air Command and Control Squadron and joint agencies.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N, AIR CONTROL	0718, MARINE AIR TRAFFIC (MATCALS)

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
OPN BLI 2815 Marine Air Traffic Control and Landing Systems (MATCALS) P-1#56	44.594	76.601	17.868

D. ACQUISITION STRATEGY:

ASPARCS is an ACAT IVT program. Lockheed Martin was awarded the contract for this effort in June 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. An Acquisition Decision Memorandum was signed in Jan 2005 approving th procurement of the Army AN/TPN-31 System to fulfill the ASPARCS requirement for July 2006. The Marine Corps Requirements Oversight Council (MROC) Decision Memorandum 11-2005 of December 2004 outlined the evolutionary improvements envisioned by Headquarters Marine Corps (HQMC). This program has joined with the Army to implement Pre-Planned Product Improvement (P3I) and evolutionary product improvements.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604504N, AIR CONTROL				PROJECT NUMBER AND NAME 0993, CARRIER ATC			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**2.919**	**5.394**	**5.580**					
RDT&E Articles Qty								

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. Dual efforts are underway to improve the AN/SPN-46 system availability and supportability until at least September 2020. These efforts include various Engineering Change Proposals (ECPs), 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 three 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, integrating and interface with Mode 5 IFF, 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 Computer Group, a test article is required to perform a series of tests beginning December 2007 and completing in September 2009. 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 a test article is required to perform operational assessment in 4th quarter FY2008. The test article is best described primarily in terms of its functionality. It will combine 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 (JPALS).

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N, AIR CONTROL	0993, CARRIER ATC

B. Accomplishments/Planned Program

SPN-46 COMPUTER GROUP	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	2.919	4.520		
RDT&E Articles Quantity				

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 from December 2007 to September 2009. 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").

AN/TPX-42 Improvements	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		0.874	5.580	
RDT&E Articles Quantity				

Complete development of a Field Change 3 configuration to integrate Mode 5 capability, 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 'E', 'F' and 'G' Kits. Begin development of the final Air Traffic Control Console configuration in FY08 to include JPALS interface and replacement of SPN-35 Operator displays. 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 'H' Kits.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N, AIR CONTROL	0993, CARRIER ATC

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
OPN BLI 2831 Shipboard Air Traffic Control P-1#57	7.667	7.921	7.970
OPN BLI 2832 Automatic Carrier Landing Systems P-1#58	18.279	16.239	18.878

D. ACQUISITION STRATEGY:

AN/SPN-46 Computer Group replacement subprojects are part of the AN/SPN-46 Life Cycle Extension (LCE) project, which is an Engineering Change Proposal (ECP). Initial contract was awarded in November 2003 for the Radar Control Group, and the contract for the Computer Group was awarded in December 2005. AN/TPX-42 Common Console is an anticipated Engineer Change Proposal (ECP), 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.

Exhibit R-3 Cost Analysis (page 1) | DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL	0993 CARRIER ATC

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Primary HDW Develop- SPN-46	WX	NAWCAD, PAX River, MD	11.548									
Primary HDW Develop- SPN-46	SS-CPIF	SNC, Sierra, NV	6.356									
Primary HDW Develop- TPX-42	WX	NAWCAD, St Inigoes, MD	2.623									
Subtotal Product Development			20.527									

Remarks:

Software Development-SPN-46	WX	NAWCAD, PAX River, MD	6.554	0.384	12/08							
Software Development-SPN-46	WX	NAWCAD, PAX River, MD	3.119	3.063	12/08							
Software Development-TPX-42	WX	NAWCAD, PAX River, MD	2.929	0.874	12/08							
Integrated Logistics Support-TPX-42	WX	NAWCAD, PAX River, MD	0.632			4.800	12/09					
Studies & Analyses-SPN-46	WX	NAWCAD, PAX River, MD	0.273			0.231	12/09					
Subtotal Support			13.507	4.321		5.031						

Remarks:

EXHIBIT R-3
RDT&E PROJECT COST ANALYSIS

Exhibit R-3 Cost Analysis (page 2) | DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N AIR CONTROL	0993 CARRIER ATC

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 09 Cost	FY 09 Award Date	FY 10 Cost	FY 10 Award Date					
Develop Test & Evaluation-SPN-46	WX	NAWCAD, PAX River, MD	0.626	1.019	12/09							
Develop Test & Evaluation-TPX-42	WX	NAWCAD, PAX River, MD	0.748			0.143	12/09					
Operational Test & Evaluation-TPX-4	WX	OPTEVOR, Norfolk, VA	0.062									
Subtotal T&E			1.436	1.019		0.143						

Remarks:

Program Management Support	C-CPFF	TBD, Pax River, MD	1.420	0.039	12/09	0.406	12/09					
Travel	TO	NAVAIRHQ, Pax River, MD	0.090	0.015	11/09							
Subtotal Management			1.510	0.054		0.406						

Remarks:

Total Cost			36.980	5.394		5.580						

Remarks:

EXHIBIT R-3
RDT&E PROJECT COST ANALYSIS

CLASSIFICATION:

EXHIBIT R4, Schedule Profile		DATE:
AN/TPX-42B Air Traffic Control Common Console		**May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N, AIR CONTROL	0993, CARRIER ATC

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones												
System Requirements Review of AN/TPX-42B												
Preliminary Design Review												
System Development												
Pre-Planned Product Improvements												
Critical Design Review												
Quality Design and Build												
EDM Radar Delivery (Qty 1)												
Test Readiness Review												
Test & Evaluation Milestones												
Development Test												
Operational Test												
Production Milestones												
Full Rate Production (FRP)												
Production Deliveries												

CLASSIFICATION:

Exhibit R-4a, Schedule Detail AN/TPX-42B Air Traffic Control Common Console					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604504N, AIR CONTROL				PROJECT NUMBER AND NAME 0993, CARRIER ATC			
Schedule Profile	FY 2008	FY 2009	FY 2010					
System Requirement Review (SRR)		1Q-4Q						
Preliminary Design Review (PDR)			1Q					
System Development			1Q-4Q					
Pre-Planned Product Improvement								
Critical Design Review (CDR)			4Q					
Quality Design and Build			4Q					

R-1 SHOPPING LIST - Item No. 107

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604504N, AIR CONTROL				PROJECT NUMBER AND NAME 1657, ATC IMPROVEMENT			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
		0.445	0.443					
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 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 Air Traffic Control Systems. These systems are critical to Naval Aviation and provide for safe, efficient air operations. Additionally, the Federal Aviation Administration (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 Preplanned Product Improvements, with additional RDT&E efforts required for modified commercial-off-the-shelf (COTS) ATC systems and equipment for modernization and recapitalization of these systems at our NAS, MCAS & Fleet Area Control & Surveillance Facilities (FACSFACs) 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: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N, AIR CONTROL	1657, ATC IMPROVEMENT

B. Accomplishments/Planned Program

NAS MOD VIDS	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		0.419	0.421	
RDT&E Articles Quantity				

Continue engineering development of pre-planned product improvements for the Visual Information Display Systems (VIDS) and initiate efforts to incorporate VIDS into the FACSFACs. Research display alternatives for Navy ATC systems, and evaluate alternatives for future communication and radar systems.

FLEET ATC SYSTEMS	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost		0.026	0.022	
RDT&E Articles Quantity				

Research efforts to determine the best technical approach to integrate various data link and communication system upgrades into Navy/Marine Corps ATC Systems including but not limited to the Digital Airport Surveillance Radar into the FACSFAC FACTS 3200 system. Evaluate alternatives for future processor/display, sensor and communication systems.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: May 2009
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604504N, AIR CONTROL	1657, ATC IMPROVEMENT

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
OPN BLI 2840 National Air Space System P-1#59	25.236	28.980	28.988
OPN BLI 2845 Fleet Air Traffic Control Systems P-1# 60	12.832	8.214	8.203

D. 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 requirements or address supportability and cost of ownership problems.