

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification								DATE:			
								June 2001			
APPROPRIATION/BUDGET ACTIVITY						R-1 ITEM NOMENCLATURE					
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5						0604504N, Air Control Engineering					
COST (\$ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Total PE Cost	3.389	14.537	13.394	12.820						Continuing	Continuing
W0718 MARINE AIR TRAFFIC CONTROL AND LANDING SYSTEMS (MATCALs)		5.874	9.291	8.058						Continuing	Continuing
W0993 CARRIER AIR TRAFFIC CONTROL (CATC)		1.667	1.776	2.410						Continuing	Continuing
W1657 AIR TRAFFIC CONTROL IMPROVEMENTS (ATC IMPROVEMENTS)		2.042	2.327	2.352						Continuing	Continuing
W2643 EXPEDITIONARY COMMON AUTOMATIC RECOVERY SYSTEM (ECARS)	3.389	4.954									8.343
Quantity of RDT&E Articles	2	1									3
(U) 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 capabilities ashore and afloat. Funded programs are required to upgrade or replace aging ATC and approach/landing 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. Development of a Global Positioning System (GPS) data link is required to enable the transfer of precise positioning information between ships and aircraft.											
(U) B. JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end-items prior to production approval decision.											

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EXHIBIT R-2a, RDT&E Project Justification								DATE:				
								June 2001				
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME						
RDT&E, N / BA-5		0604504N, Air Control Engineering				W0718 Marine Air Traffic Control and Landing System (MATCALs)						
COST (\$ in Millions)		Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost			5.874	9.291	8.058						Continuing	Continuing
RDT&E Articles Qty		1	1									2
(U) 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 (ATC&LS) at Navy/Marine Corps (MC) expeditionary airfields. Current program includes approved transition to Air Surveillance and Precision Approach Radar Control System (ASPARCS).												
(U) PROGRAM ACCOMPLISHMENTS AND PLANS:												
1. FY 2000 ACCOMPLISHMENTS:												
- (U) (2.860) Provided systems integration, and non-recurring engineering support to procure and integrate communicaitons, displays, processors, and shelters for the Operation Subsystem/Communications Subsystem (OS/CS) portion of the Air Surveillance and Precision Approach Radar Control System (ASPARCS).												
- (U) (1.217) Provided studies/analysis incident to refining requirements of the ASPARCS . These tasks included providing assistance in acquisition documentation, participation in briefing and program reviews, source selection, and technical oversight.												
- (U) (1.577) Provided systems integration and non-recurring engineering support to develop, integrate and demonstrate the Air Surveillance Radar and the Precision Approach Radar subsystem in the First Article ASPARCS.												
- (U) (.220) Provided engineering and management support to the program office for the development of the ASPARCS.												
2. FY 2001 PLANS:												
- (U) (7.983) Continue to provide systems integration, incremental funding for the First Article and demonstrate the Air Surveillance Radar and the Precision Approach Radar Subsystem in the ASPARCS.												
- (U) (.965) Perform systems integration engineering in support of systems engineering functions for the ASPARCS. This effort is to include assistance in test and evaluation, and technical oversight of the ASPARCS program.												
- (U) (.100) Continue management support to the program office for the development of the ASPARCS.												
- (U) (.243) Portion of extramural program reserved for Small Business Innovation Research (SBIR) assessment in accordance with 15 USC 68.												

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering	PROJECT NUMBER AND NAME W0718 Marine Air Traffic Control and Landing System (MATCALs)
<p>3. FY 2002 PLANS:</p> <p>(U) (2.722) Final incremental funding for the First Article to provide systems integration and demonstration of the Air Surveillance Radar and the Precision Approach Radar System (ASPARCS).</p> <p>(U) (5.196) Perform systems integration engineering in support of systems engineering functions for the ASPARCS. This effort will include assistance in test and evaluation, Developmental Testing (DT), and technical oversight of the ASPARCS program.</p> <p>(U) (.140) Continue management support to the program office for the development of the ASPARCS.</p>		

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APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering		PROJECT NUMBER AND NAME W0718 Marine Air Traffic Control and Landing System (MATCAL)																													
<p>(U) B. PROGRAM CHANGE SUMMARY:</p> <table style="width: 100%; margin-top: 10px;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY2000</u></th> <th style="text-align: center;"><u>FY2001</u></th> <th style="text-align: center;"><u>FY2002</u></th> </tr> </thead> <tbody> <tr> <td>(U) FY 2001 President's Budget:</td> <td style="text-align: center;">4.678</td> <td style="text-align: center;">9.391</td> <td style="text-align: center;">8.171</td> </tr> <tr> <td>(U) Adjustments from the President's Budget:</td> <td style="text-align: center;">1.196</td> <td style="text-align: center;">-0.100</td> <td style="text-align: center;">-0.113</td> </tr> <tr> <td>(U) FY 2002 President's Budget Submit:</td> <td style="text-align: center;">5.874</td> <td style="text-align: center;">9.291</td> <td style="text-align: center;">8.058</td> </tr> </tbody> </table> <p style="margin-top: 20px;">CHANGE SUMMARY EXPLANATION:</p> <p>(U) Funding: The FY 2000 net increase of \$1.196 million reflects a \$1.500 million increase for the ASPARCS System, a \$.196 million decrease for reprioritization of requirements within the Navy, a \$.090 million decrease for a Small Business Innovative Research Assessment, and a \$.018 million for Congressional Recission. The FY 2001 net decrease of \$.100 million reflects a \$.014 million decrease for reprioritization of requirements within the Navy, a \$.066 million decrease for a Congressional Reduction, and a \$.020 million decrease for a Congressional Recission. The FY 2002 net decrease of \$.113 million reflects a \$.034 million decrease for reprioritization of requirements within the Navy and a \$.079 million decrease for economic assumptions</p> <p>(U) Schedule: Not Applicable</p> <p>(U) Technical: Not Applicable</p> <p style="margin-top: 20px;">(U) C. OTHER PROGRAM FUNDING SUMMARY:</p> <table style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;"><u>Line Item No. &amp; Name</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>To Complete</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>OPN BLI 281500, MATCAL</td> <td style="text-align: center;">10.590</td> <td style="text-align: center;">3.674</td> <td style="text-align: center;">1.005</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">Continuing</td> </tr> </tbody> </table>							<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	(U) FY 2001 President's Budget:	4.678	9.391	8.171	(U) Adjustments from the President's Budget:	1.196	-0.100	-0.113	(U) FY 2002 President's Budget Submit:	5.874	9.291	8.058	<u>Line Item No. &amp; Name</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>To Complete</u>	<u>Total Cost</u>	OPN BLI 281500, MATCAL	10.590	3.674	1.005	Continuing	Continuing
	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>																														
(U) FY 2001 President's Budget:	4.678	9.391	8.171																														
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<u>Line Item No. &amp; Name</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>To Complete</u>	<u>Total Cost</u>																												
OPN BLI 281500, MATCAL	10.590	3.674	1.005	Continuing	Continuing																												

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			June 2001
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-5	0604504N, Air Control Engineering	W0718 Marine Air Traffic Control and Landing System (MATCALs)	
(U) D. ACQUISITION STRATEGY: Not Applicable			
(U) E. SCHEDULE PROFILE:			
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
			<u>TO COMPLETE</u>
(U) Program Milestones	3Q/00 MSII (ASPARCS)		2Q/03 MSIII (ASPARCS)
(U) Engineering Milestones	3Q/00 Complete DII/COE/IT21 Analysis	2Q/01 CDR (ASPARCS)	
	4Q/01 PDR (ASPARCS)		
(U) T&E Milestones		3Q/02 DT (ASPARCS)	
		4Q/02 OT (ASPARCS)	
(U) Contract Milestones	3Q/00 award for NRE First Article (ASPARCS)		

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Exhibit R-3 Cost Analysis (page 1)								DATE:				
APPROPRIATION/BUDGET ACTIVITY								June 2001				
RDT&E, N / BA-5			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
			0604504N, Air Control Engineering			W0718 Marine Air Traffic Control and Landing System (MATCALs)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/FFP	Lockheed Martin	3.000	7.660	11/00	2.983	11/01			Continuing	Continuing	Continuing
Systems Engineering	WX	NAWCAD S.I.	2.391	0.459	11/00	1.714	11/01			Continuing	Continuing	Continuing
MATCALs Related Prog. Devel.	WX	SPAWAR San Diego										
MATCALs Related Prog. Devel.	WX	NAWCAD S.I.										
SBIR				0.243						Continuing	Continuing	Continuing
Subtotal Product Development			5.391	8.362		4.697				Continuing	Continuing	Continuing
Remarks:												
Training Development	WX	NAWCAD S.I.		0.100	11/00	0.242	11/01			Continuing	Continuing	
Integrated Logistics Support	WX	NAWCAD S.I.		0.191	10/00	0.363	10/01			Continuing	Continuing	
Configuration Management	WX	NAWCAD S.I.	0.205	0.100	11/00	0.048	11/01			Continuing	Continuing	
Technical Data	WX	NAWCAD S.I.		0.200	11/00	0.194	11/01			Continuing	Continuing	
MATCALs Support	WX	NAWCAD S.I.	0.205							Continuing	Continuing	
MATCALs Support	WX	NAWCAD S.I. & San Diego										
Subtotal Support			0.410	0.591		0.847				Continuing	Continuing	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>June 2001</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604504N, Air Control Engineering			PROJECT NUMBER AND NAME W0718 Marine Air Traffic Control and Landing System (MATCALs)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NAWCAD S.I.		0.100	10/00	2.044	10/01			0.532	2.676	
Operational Test & Evaluation	WX	MCOTEA	0.056	0.100	11/00	0.160	11/01			0.094	0.410	
Subtotal T&E			0.056	0.200		2.204				0.626	3.086	
Remarks:												
Program Management Support	WX	NRL AND NAWCAD S.I.		0.100	07/01	0.280	11/01			Continuing	Continuing	
Travel	WX	NAVAIR	0.017	0.038	10/00	0.030	10/01			0.025	0.110	
Subtotal Management			0.017	0.138		0.310				Continuing	Continuing	
Remarks:												
Total Cost			5.874	9.291		8.058				Continuing	Continuing	
Remarks:												

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering				PROJECT NUMBER AND NAME W0993, Carrier Air Traffic Control (CATC)					
COST (\$ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		<b>1.667</b>	<b>1.776</b>	<b>2.410</b>						<b>Continuing</b>	<b>Continuing</b>
RDT&E Articles Qty	1										1

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Shipboard Air Traffic Control Centers identify, marshal, and direct aircraft within 50 Nautical Miles (NM) to a ship's Automatic Carrier Landing System (ACLS) and Independent Landing Monitor (ILM). The ACLS and ILM then provide precise automatic control and verification of aircraft during their final approach and landing sequence. Due to the AN/SPN-46 radar's acquisition limitations in rain, a Moving Target Detection (MTD) capability was developed in prior years. This technology is also being adapted for use in the AN/SPN-43 search surveillance radar and in the AN/SPN-35B precision approach radar. The insertion of MTD technology plus an antenna control upgrade constitute the AN/SPN-35C upgrade. This AN/SPN-35C configuration will require development of an interface with the Battle Force Tactical Trainer (BFTT). The AN/SPN-46 radar currently functions in cooperation with an active beacon on the controlled aircraft, and this beacon has an obsolescence problem. Passive Point Source (PPS) development will replace the beacon. Performance Support Systems (PSS) tailored to specific air traffic control systems, such as AN/SPN-43, AN/SPN-35 and AN/SPN-46, are required to improve the performance of system maintainers. PSS includes supplemental training, technical references and logistics information.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

- (U) ( .318) Continued systems engineering and test & evaluation for Passive Point Source for AN/SPN-46.
- (U) ( .398) Completed development of AN/SPN-35 MTD (part of AN/SPN-35C).
- (U) ( .297) Initiated development of technical documentation for AN/SPN-35C.
- (U) ( .600) Completed AN/SPN-35C testing.
- (U) ( .054) Continued systems engineering and test & evaluation for AN/SPN-43 MTD.

2. FY 2001 PLANS:

- (U) ( .090) Initiate development engineering for AN/SPN-43 halyard protection.
- (U) ( .589) Continue systems engineering, design and development of AN/SPN-43 MTD.
- (U) ( .342) Develop AN/SPN-35C/Battle Force Tactical Trainer interface.
- (U) ( .290) Complete development of technical documentation for AN/SPN-35C.
- (U) ( .271) Initiate development of AN/SPN-46 Power Monitor engineering change.
- (U) ( .150) Initiate development of AN/SPN-46 Test Support Fixtures.
- (U) ( .020) Complete systems engineering and test & evaluation for Passive Point Source for AN/SPN-46.
- (U) ( .024) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 68.

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APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering	PROJECT NUMBER AND NAME W0993, Carrier Air Traffic Control (CATC)
<p>1. FY 2002 PLANS:</p> <ul style="list-style-type: none"><li>(U) ( .023) Complete development of AN/SPN-46 Test Support Fixtures.</li><li>(U) ( .203) Complete development of AN/SPN-46 Power Monitor.</li><li>(U) ( .657) Complete development of AN/SPN-43 MTD.</li><li>(U) ( .904) Continue development of AN/SPN-43 Antenna/Halyard Protection.</li><li>(U) ( .623) Conduct shipboard testing (DT-IIC), OPEVAL support, and safety certification for AN/SPN-35C.</li></ul>		

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(U) B. PROGRAM CHANGE SUMMARY:

	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>
(U) FY 2001 President's Budget:	1.785	1.796	1.824
(U) Adjustments from the President's Budget:	-0.118	-0.020	0.586
(U) FY 2002 President's Budget Submit:	1.667	1.776	2.410

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2000 net decrease of \$.118 million reflects a decrease of \$.098 million for reprioritization of requirements within the Navy, a decrease of \$.013 million for a Small Business Innovation Research assessment, and a decrease of \$.007 million for a Congressional Rescission. FY 2001 net decrease of \$.020 million includes a decrease of \$.003 million for reprioritization of requirements within the Navy, a decrease of \$.004 million for a Congressional Rescission, and a decrease of \$.013 million for a Congressional Reduction. FY 2002 net increase of \$.586 million reflects an increase of \$.623 million for additional AN/SPN-35C (now an ACAT-IVT program) test requirements, a decrease of \$.016 million for reprioritization of requirements within the Navy, and a decrease of \$.021 million for economic assumptions.

(U) Schedule: In FY 2000 the Passive Point Source production decision has slipped one quarter due to a technical problem which required correcting and retesting. This correction and retesting caused the test completion milestone to slip three quarters. FY 2001 funding adjustments have resulted in rephasing (one quarter slippage) two AN/SPN-46 engineering changes, Test Support Fixtures and Power Monitor. A decision in February 2000 to upgrade the AN/SPN-35C Upgrade from an Abbreviated Acquisition Program to an ACAT-IVT program has necessitated a restructure of this program's schedule. The production start that had been planned for third quarter FY 2000 has been replaced by a Milestone III/Full Rate Production decision in third quarter FY 2003. In the interim an LRIP decision was introduced in third quarter FY 2000, DT-IIC testing in third quarter FY 2002, and OPEVAL in third quarter FY 2003.

(U) Technical: Not Applicable.

(U) C. OTHER PROGRAM FUNDING SUMMARY:

<u>Line Item No. &amp; Name</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>To Complete</u>	<u>Total Cost</u>
OPN BLI 283200 Automatic Carrier Landing Sys	17.940	18.188	15.617	Continuing	Continuing
OPN BLI 283100 Shipboard Air Traffic Control	7.361	7.807	8.036	Continuing	Continuing

Related RDT&E:

(U) P.E. 0603512N (Carrier Systems Development)

(U) P.E. 0604512N (Shipboard Aviation Systems)

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RDT&E, N / BA-5		0604504N, Air Control Engineering	W0993, Carrier Air Traffic Control (CATC)	
<p>(U) D. ACQUISITION STRATEGY: The AN/SPN-35C upgrade acquisition will consist of several commercial procurements that will be integrated by the NAWCAD into the final configuration. Four primary contracts will be used, with CLINs for a base year and four options. A list of those anticipated is provided below. 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).</p> <p>Anticipated vendors for the AN/SPN-35C hardware procurement, fabrication, integration and assembly:</p> <p>1. A BOA with Communications and Power Industries. (transmitter from the AN/SPN-46(V)2 precision approach radar program, with a firm fixed price (FFP) contract to follow)</p> <p>2. A BOA with General Kenetics, Inc. (shipboard equipment racks)</p> <p>3. A BOA with Sierra Nevada Corp. (new receiver and RPC, FFP contract to follow)</p> <p>4. An existing contract with BAE (Marconi) provides support for assembly, fabrication and integration of equipment with ancillary materials, e.g. cables and connectors.</p> <p>NAWCAD Air Traffic Control Branch has designed and produced the Main I/O Processor, the console and integrated the COTS display ( in house work).</p> <p>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 (all weather operation) or address supportability and cost of ownership problems.</p>				
(U) Program Milestones	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>TO COMPLETE</u>
	3Q/00 SPN-35C LRIP Decision	3Q-4Q01 SPN-35C Documentation Release		2Q/03 SPN-43 MTD Production
		4Q/01 SPN-35C BFTT Specification Release		2Q/03 SPN-46 Test Fixtures Production
		4Q/01 PPS Production Decision		2Q/03 SPN-46 Power Monitor Production
				3Q/03 SPN-35C Milestone III Decision
(U) Engineering Milestones				2Q/04 SPN-43 Antenna/Halyard Protection Production
				2Q/05 TPX-42 Flat Panel Display Production
				2Q/06 SPN-35 Antenna Pedestal and Interface Production
	2Q/00 SPN-35C Complete Prototype	4Q/01 SPN-46 Test Support Fixture PECP &Prod. Prototype	3Q/02 Complete SPN-46 Test Support Fixtures ECP	4Q/03 Complete SPN-43 Ant. Halyard Protection design
	3Q/00 PPS Production Prototype	4Q/01 SPN-46 Power Monitor PECP and Prototype	3Q/02 Complete SPN-46 Power Monitor ECP	4Q/04 Complete TPX-42 Flat Panel Display design and test
		4Q/02 Complete SPN-43 MTD development	4Q/05 Complete SPN-35 Antenna Pedestal and Interface design	

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RDT&E, N / BA-5		0604504N, Air Control Engineering	W0993, Carrier Air Traffic Control (CATC)	
(U) E. SCHEDULE PROFILE CONTINUED:				
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>TO COMPLETE</u>
(U) T&E Milestones	2Q-3Q/00 SPN-35C Prototype Testing	3Q/01 Complete PPS Testing	2Q/02 Complete SPN-46 Test Spt Fixtures Prototype Tests 2Q/02 Complete SPN-46 Pwr Monitor Prototype testing 4Q/02 Complete SPN-43 MTD testing 3Q/02 Complete SPN-35C DT-IIC Testing	3Q/03 SPN-35C OPEVAL
(U) Contract Milestones				

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Exhibit R-3 Cost Analysis (page 1)								DATE: <b>June 2001</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
<b>RDT&amp;E, N / BA-5</b>			0604504N, Air Control Engineering			W0993, Carrier Air Traffic Control (CATC)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWCAD Pax River MD	24.029	1.518	11/00	1.308	11/01			Continuing	Continuing	
Subtotal Product Development			24.029	1.518		1.308				Continuing	Continuing	
Remarks:												
Subtotal Support			0.000	0.000		0.000				0.000	0.000	
Remarks:												

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: <b>June 2001</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604504N, Air Control Engineering			PROJECT NUMBER AND NAME W0993, Carrier Air Traffic Control (CATC)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD Pax River MD	1.417	0.020	11/00	0.856	11/01			Continuing	Continuing	
Subtotal T&E			1.417	0.020		0.856				Continuing	Continuing	
Remarks:												
Program Management Support	Various	NAVAIR & NAWCAD Pax	0.866	0.214	11/00	0.246	11/01			Continuing	Continuing	
Small Business Innovation Research				0.024								
Subtotal Management			0.866	0.238		0.246				Continuing	Continuing	
Remarks:												
Total Cost			26.312	1.776		2.410				Continuing	Continuing	
Remarks:												

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 14 of 23)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: <b>June 2001</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering				PROJECT NUMBER AND NAME W1657, Air Traffic Control Improvements					
COST (\$ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		<b>2.042</b>	<b>2.327</b>	<b>2.352</b>						<b>Continuing</b>	<b>Continuing</b>
RDT&E Articles Qty	<b>NOT APPLICABLE</b>										
<p>(U) 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 communications systems (for example, Navy and Marine air traffic control facilities including Fleet Area Control and Surveillance Facility (FACSFAC)). These systems must be modified to ensure continued interoperability with the National Airspace System (NAS), which is undergoing a major modernization. NAS Modernization initiatives in Project W1657 include the Visual Information Display System (VIDS), as well as incorporating a Navy ground control approach radar capability in the Standard Terminal Automated Replacement System (STARS). Automatic Carrier Landing System (ACLS) Improvements include performance upgrades to various components of the AN/SPN-46, including rearchitecture of the Unit 19 processor, replacement of AN/AYK-14 hardware and software, and IT-21 technology improvements to the radar display. The IT-21 improvements have been allocated to this program as a client of the Advanced Display System (AN/UYQ-70) program. Performance upgrades to the AN/TPX-42A(V) Direct Altitude and Identity Readout (DAIR) systems will provide improved flight data processing, tracking and display capabilities for ATC centers on carriers and L-class ships.</p> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. FY 2000 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> <li>(U) ( .200) Completed development of AN/TPX-42 computer upgrade. (see NOTE below)</li> <li>(U) ( 1.100) Provided systems engineering and test support for ACLS Improvements upgrade.</li> <li>(U) ( .442) Initiated development of AN/TPX-42 track processor and associated software upgrade.</li> <li>(U) ( .300) Continued engineering development for NAS Modernization.</li> </ul> <p>2. FY 2001 PLANS:</p> <ul style="list-style-type: none"> <li>(U) ( 1.375) Continue development of AN/TPX-42 track processor and associated software upgrade prototype.</li> <li>(U) ( .635) Continue development and testing of ACLS Improvements upgrade.</li> <li>(U) ( .297) Continue engineering development for NAS Modernization.</li> <li>(U) ( .020) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 68.</li> </ul> <p>NOTE: the computer upgrade will be inserted into production of the CATCC-to-AATC field change (OPN subhead 42MP, project unit MP042) beginning in FY 2001.</p>											

R-1 SHOPPING LIST - Item No. 117

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Exhibit R-2a, RDTEN Project Justification  
(Exhibit R-2a, page 15 of 23)

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>June 2001</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering	PROJECT NUMBER AND NAME W1657, Air Traffic Control Improvements
<div>1. FY 2002 PLANS:</div> <div><div>(U) ( .937) Continue development and testing of ACLS Improvements upgrade.</div><div>(U) ( 1.118) Initiate integration of Track Processor into AN/TPX-42 system and begin testing.</div><div>(U) ( .297) Continue engineering development of NAS Modernization improvements.</div></div>		

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UNCLASSIFIED

# UNCLASSIFIED

**CLASSIFICATION:**

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>June 2001</b>																																			
APPROPRIATION/BUDGET ACTIVITY <b>RDTE, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering	PROJECT NUMBER AND NAME W1657, Air Traffic Control Improvements																																				
<p>(U) B. PROGRAM CHANGE SUMMARY:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY2000</u></th> <th style="text-align: center;"><u>FY2001</u></th> <th style="text-align: center;"><u>FY2002</u></th> </tr> </thead> <tbody> <tr> <td>(U) FY 2001 President's Budget:</td> <td style="text-align: center;">2.185</td> <td style="text-align: center;">2.351</td> <td style="text-align: center;">2.411</td> </tr> <tr> <td>(U) Adjustments from the President's Budget:</td> <td style="text-align: center;">-0.143</td> <td style="text-align: center;">-0.024</td> <td style="text-align: center;">-0.059</td> </tr> <tr> <td>(U) FY 2002 President's Budget Submit:</td> <td style="text-align: center;">2.042</td> <td style="text-align: center;">2.327</td> <td style="text-align: center;">2.352</td> </tr> </tbody> </table> <p>CHANGE SUMMARY EXPLANATION:</p> <p>(U) Funding: The FY 2000 net decrease of \$.143 million reflects a decrease of \$.120 million for reprioritization of requirements within the Navy, a decrease of \$.009 million for a Congressional Rescission, and a decrease of \$.014 million for Small Business Innovative Research assessment. The FY 2001 net decrease of \$.024 million includes a decrease of \$.016 million for a Congressional Reduction, a decrease of \$.005 million for a Congressional Rescission, and a decrease of \$.003 million for reprioritization of requirements within the Navy. The FY 2002 net decrease of \$.059 million includes a decrease of \$.031 million for reprioritization of requirements within the Navy, a net decrease of \$.028 million for economic assumptions,</p> <p>(U) Schedule: FY 2000 funding adjustments have delayed by one quarter the development efforts of the AN/TPX-42 Track Processor in FY 2000 and subsequent delivery of the prototype in FY 2001. FY 2001 funding adjustments have delayed by one quarter the production start for AN/TPX-42 Computer Upgrade.</p> <p>(U) Technical: Not Applicable.</p> <p>(U) C. OTHER PROGRAM FUNDING SUMMARY:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Line Item No. &amp; Name</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>To Complete</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>OPN BLI 284000 National Air Space System</td> <td style="text-align: center;">34.274</td> <td style="text-align: center;">30.019</td> <td style="text-align: center;">43.618</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">Continuing</td> </tr> <tr> <td>OPN BLI 283100 Shipboard Air Traffic Contr</td> <td style="text-align: center;">7.361</td> <td style="text-align: center;">7.807</td> <td style="text-align: center;">8.036</td> <td style="text-align: center;">Continuing</td> <td style="text-align: center;">Continuing</td> </tr> </tbody> </table> <p>Related RDT&amp;E: Not Applicable</p>						<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	(U) FY 2001 President's Budget:	2.185	2.351	2.411	(U) Adjustments from the President's Budget:	-0.143	-0.024	-0.059	(U) FY 2002 President's Budget Submit:	2.042	2.327	2.352	<u>Line Item No. &amp; Name</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>To Complete</u>	<u>Total Cost</u>	OPN BLI 284000 National Air Space System	34.274	30.019	43.618	Continuing	Continuing	OPN BLI 283100 Shipboard Air Traffic Contr	7.361	7.807	8.036	Continuing	Continuing
	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>																																			
(U) FY 2001 President's Budget:	2.185	2.351	2.411																																			
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(U) FY 2002 President's Budget Submit:	2.042	2.327	2.352																																			
<u>Line Item No. &amp; Name</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>To Complete</u>	<u>Total Cost</u>																																	
OPN BLI 284000 National Air Space System	34.274	30.019	43.618	Continuing	Continuing																																	
OPN BLI 283100 Shipboard Air Traffic Contr	7.361	7.807	8.036	Continuing	Continuing																																	

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# UNCLASSIFIED

**Exhibit R-2a, RDTE Project Justification**  
(Exhibit R-2a, page 17 of 23)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>June 2001</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering	PROJECT NUMBER AND NAME W1657, Air Traffic Control Improvements		
(U) 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 user requirements or address supportability and cost of ownership problems.				
(U) E. SCHEDULE PROFILE:				
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>TO COMPLETE</u>
(U) Program Milestones	2Q/00 NAS Modernization VIDS Production	2Q/01 NAS Modernization Program Milestone III (Production Decision)	2Q/02 IT21 insertion into SPN-46 PIP Production	2Q/04 ACLS Unit 19 Mod Kit Production
		2Q/01 TPX-42 Computer Upgrade Production		3Q/04 TPX-42 Track Processor Production
(U) Engineering Milestones	3Q/00 ACLS Improvement Unit 19 Prototype Delivery	3Q/01 TPX-42 Track Proc. Production Prototype		2Q/06 SPN-46 Computer (AYK-14) Mod Kit Production
(U) T&E Milestones	3Q/00 ACLS Improvement IT-21 Testing	4Q/01 ACLS Unit 19 complete test bed installation		4Q/05 Complete SPN-46 H/W and S/W Upgrade (AYK-14)
	3Q-4Q/00 TPX-42 Computer Upgrade Testing			4Q/03 Complete ACLS Unit 19 flight testing and ILS documentation update
				2Q/04 TPX-42 Track Processor system test completed
(U) Contract Milestones				

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Exhibit R-2a, RDTEN Project Justification  
(Exhibit R-2a, page 18 of 23)

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: <b>June 2001</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
<b>RDT&amp;E, N / BA-5</b>			0604504N, Air Control Engineering			W1657, Air Traffic Control Improvements						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWCAD Pax River MD	36.713	1.914	11/00	1.135	11/01			Continuing	Continuing	
Primary Hardware Development	WR	SPAWARCEN Chasn SC	0.328	0.297	11/00	0.297	11/01			Continuing	Continuing	
Systems Engineering	WR	SPAWARCEN S.Diego CA	0.050									
Primary Hardware Development	WR	NAWCTSD Orlando FL	0.075									
Subtotal Product Development			37.166	2.211		1.432				Continuing	Continuing	
Remarks:												
Training Development	Cmp/TM	Apex Technology	0.060	0.030	01/00	0.030	01/02				0.120	0.120
Subtotal Support			0.060	0.030		0.030				0.000	0.120	
Remarks:												

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UNCLASSIFIED

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 19 of 23)

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: <b>June 2001</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>				PROGRAM ELEMENT 0604504N, Air Control Engineering			PROJECT NUMBER AND NAME W1657, Air Traffic Control Improvements					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD Pax River MD	2.456			0.815	11/01			Continuing	Continuing	
Subtotal T&E			2.456	0.000		0.815				Continuing	Continuing	
Remarks:												
Program Management Support	Various	NAVAIR & NAWCAD Pax	2.854	0.066	11/00	0.075	11/01			Continuing	Continuing	
Small Business Innovation Research				0.020						0.000		
Subtotal Management			2.854	0.086		0.075				Continuing	Continuing	
Remarks:												
Total Cost			42.536	2.327		2.352				Continuing	Continuing	
Remarks:												

R-1 SHOPPING LIST - Item No. 117

UNCLASSIFIED

Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 20 of 23)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification								DATE: <b>June 2001</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>		PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering				PROJECT NUMBER AND NAME W2643, Expeditionary Common Automatic Recovery System					
COST (\$ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost	<b>3.389</b>	<b>4.954</b>	<b>0.000</b>	<b>0.000</b>							<b>8.343</b>
RDT&E Articles Qty	<b>Not Applicable</b>										
<p>(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The USMC's Marine Air Ground Task Force (MAGTF) requires the capability to recover Aviation Combat Element (ACE) aircraft and Unmanned Aerial Vehicles (UAVs) reliably in an expeditionary environment. The current landing aid systems are antiquated, require considerable lift and setup time, and are primarily fixed base systems. The objectives of the Expeditionary Common Automatic Recovery System (ECARS) specifically include the development of a landing systems beacon replacement for both manned and unmanned aircraft.</p> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. FY 2000 ACCOMPLISHMENTS:</p> <p>(U) ( 1.329) Continued systems engineering, test and evaluation of ECARS.</p> <p>(U) ( 1.121) Completed development of a prototype landing system beacon for manned/unmanned aircraft.</p> <p>(U) ( 2.381) Continued developing system upgrades for extended range capability.</p> <p>2. FY 2001 PLANS: Not applicable.</p> <p>3. FY 2002 PLANS: Not applicable</p>											

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Exhibit R-2a, RDTEN Project Justification  
(Exhibit R-2a, page 21 of 23)

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>June 2001</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604504N, Air Control Engineering	PROJECT NUMBER AND NAME W2643, Expeditionary Common Automatic Recovery System	
(U) B. PROGRAM CHANGE SUMMARY:			
	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>
(U) FY 2001 President's Budget:	4.973	0.000	0.000
(U) Adjustments from the President's Budget:	-0.019	0.000	0.000
(U) FY 2002 President's Budget Submit:	4.954	0.000	0.000
CHANGE SUMMARY EXPLANATION:			
(U) Funding: The FY 2000 reduction of \$.019 million for a Congressional Rescission.			
(U) Schedule: Not Applicable.			
(U) Technical: Not Applicable.			
(U) C. OTHER PROGRAM FUNDING SUMMARY:			
Related RDT&E:			
(U) P.E. 0603860F (JPALS)			
(U) P.E. 0603860N (JPALS)			
(U) P.E. 0603640M (MARINE CORPS ADVANCED TECHNOLOGY DEMONSTRATIONS)			

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Exhibit R-2a, RD TEN Project Justification  
(Exhibit R-2a, page 22 of 23)

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification			DATE:
			June 2001
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-5	0604504N, Air Control Engineering	W2643, Expeditionary Common Automatic Recovery System	
(U) D. ACQUISITION STRATEGY: Purpose of project is to develop capability demonstrations. Acquisition approach will direct efforts toward providing useful avionics off-the-shelf alternatives.			
(U) E. SCHEDULE PROFILE:			
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>
(U) Program Milestones		TBD	<u>TO COMPLETE</u>
(U) Engineering Milestones	TBD		
(U) T&E Milestones		TBD	
(U) Contract Milestones	TBD		

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