CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification								DATE: **June 2001**			
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**						R-1 ITEM NOMENCLATURE 0604512N Shipboard Aviation Systems					
COST ($ in Millions)	Prior Years 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		**8.675**	**9.627**	**16.375**						**Continuing**	**Continuing**
W2232 CV Launch & Recovery Systems		**8.675**	**9.627**	**16.375**						**Continuing**	**Continuing**
Quantity of RDT&E Articles		**1**	**2**	**3**							**6**

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Navy unique project addresses the Engineering and Manufacturing Development (EMD) of all systems required to recover and launch Navy/Marine Corps aircraft (fixed/rotary wing and Vertical/Short Take-Off and Landing (VSTOL) operating aboard aircraft carriers (CV/CVN), amphibious assault ships (LHA/LHD) and aviation facility ships. This program is funded under EMD because it encompasses engineering and manufacturing development of new end-items prior to production approval decision. This program includes the EMD phase of the following systems under Project W2232, including the funding of engineering development models (EDM):

- (U) Improved Carrier Optical Landing System (ICOLS), includes the Improved Fresnel Lens Optical Landing System (IFLOLS) and the Long Range Line-up System (LRLS).
- (U) Aviation Data Management and Control System (ADMACS), including the Integrated Shipboard Information System (ISIS), the Advanced Launch and Recovery Control System (ALRCS), and Virtual Imaging System for Approach and Landing (VISUAL) increments.
- (U) Moriah, the integrated wind measurement and meteorological system.
- (U) Advanced Arresting Gear Engine (AAGE): The AAGE replaces the MK7 arresting gear engine, which has reached the limits of its operating capability.
- (U) Cost Reduction and Effectiveness Improvement Initiative (CREI) Aircraft Carrier Arresting Gear Hydraulic Fluid: This program seeks to replace the unique hydraulic fluid used in the arresting gear systems with a commercially available product. The commercial product will be less expensive, contain system component protection and will reduce the life cycle cost of the system.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING AND MANUFACTURING DEVELOPMENT because it encompasses engineering and manufacturing development of new end items prior to production approval decision.

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604512N Shipboard Aviation Systems					PROJECT NUMBER AND NAME W2232 CV Launch & Recovery Systems					
COST ($ in Millions)	Prior Years Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		**8.675**	**9.627**	**16.375**						**Continuing**	**Continuing**
RDT&E Articles Qty		**1**	**2**	**3**							**6**

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Navy unique project addresses the Engineering and Manufacturing Development (EMD) of all systems required to recover and launch Navy/Marine Corps aircraft (fixed/rotary wing and Vertical/Short Take-Off and Landing (VSTOL) operating aboard aircraft carriers (CV/CVN), amphibious assault ships (LHA/LHD) and aviation facility ships. This program is funded under EMD because it encompasses engineering and manufacturing development of new end-items prior to production approval decision. This program includes the EMD phase of the following systems under Project W2232, including the funding of engineering development models (EDM):

- (U) Improved Carrier Optical Landing System (ICOLS): ICOLS provides longer range, higher accuracy visual landing aids (VLA) for pilots landing on aircraft carriers and includes the Improved Fresnel Lens Optical Landing System (IFLOLS) and the Long Range Line-up System (LRLS).

- (U) Aviation Data Management and Control System (ADMACS): ADMACS is a real-time, tactical, local area network (LAN) configuration managed for the specific support of the Air Department and the Aircraft Launch and Recovery Equipment (ALRE) data requirements on ships. It also provides connectivity among ALRE systems such as ICOLS, ISIS, ALRCS, and VISUAL; and links Air Operations with other onboard tactical and support networks.

- (U) Integrated Shipboard Information System (ISIS): ISIS employs existing and emerging technology to enable rapid input, collection, processing and distribution of relevant air operations information and then display this information on electronic monitors in all air operations work centers throughout the ship.

- (U) Advanced Launch and Recovery Control System (ALRCS): ALRCS introduces modern, modularized computer control systems to the catapults and arresting gear on aircraft carriers, which will support Condition Based Maintenance (CBM), enhance performance, and reduce life cycle costs.

- (U) Moriah: Moriah integrates standardized digital wind and meteorological sensors to produce an affordable, LAN compatible, wind suite for all classes of air capable Navy ships.

- (U) Virtual Imaging System for Approach and Landing (VISUAL): VISUAL provides ship's force, Landing Signal Officer (LSO), and pilots with enhanced images of the aircraft and ship during launch and recovery operations in low visibility, day and night conditions.

- (U) Advanced Arresting Gear Engine (AAGE): The AAGE replaces the MK7 arresting gear engine, which has reached the limits of its operating capability.

- (U) Cost Reduction and Effectiveness Improvement Initiative (CREI) (Aircraft Carrier Arresting Gear Hydraulic Fluid): This program seeks to replace the unique hydraulic fluid used in the arresting gear systems with a commercially available product. The commercial product will be less expensive, contain system component projection, and will reduce the life cycle cost of the systems.

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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	0604512N Shipboard Aviation Systems	W2232 CV Launch & Recovery Systems

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

- (U) ($4.042) Initiated the EMD phase of the VISUAL program. Achieved Milestone II , awarded EMD contract, and conducted Preliminary Design Review (PDR). Provided engineering and management support to the program.

- (U) ($1.559) Continued pre-Milestone I/II activities for Moriah. Coordinated with SPAWAR and NAVSEA finalizing acquisition strategy implementation, initated Requst for Procurement (RFP) package and provided engineering and management support to the program.

- (U) ($1.351) Completed design of shore-based IFLOLS and produced EDM unit. Conducted Technical and Operational Evaluations and achieved Milestone III decision and transition to Full Rate Production (FRP).

- (U) ($1.273) ALRCS: Assessed hardware and software architecture for Condition Based Maintenance, embedded training, and operator workload reduction. Implemented process modeling and simulation of catapult launch evolution and system performance specification development. Provided engineering and management support to the program.

- (U) ($ 0.450) Completed the design and integration documentation for the CV/CVN ADMACS/ISIS. Achieved Milestone III. Provided engineering and management support to the program.

2. FY 2001 PLANS:

- (U) ($6.329) Conduct VISUAL Critical Design Review (CDR) and produce two (2) CV/CVN EDM units. Provide engineering and management support to the program.

- (U) ($1.400) Finalize and release RFP for the wind portion of the Moriah program. Achieve MS I/II and award EMD contract. Complete PDR and initiate Engineering and Manufacturing Development (EMD) of the wind system. Provide engineering and management support to the program.

- (U) ($1.608) Continue development of ALRCS system architectiure and performance specification. Develop Interface Control Document to support AAGE development program. Expand process modeling and simulation effort to include catapult maintenance functions and "man-in-the-loop" functions. Stand up ALRCS Development Lab and initiate sensor/software studies to determine workload and manning reduction impacts for candidate automation initiatives. Provide engineering and management support to the program.

- (U) ($0.290) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 68.

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APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604512N Shipboard Aviation Systems	PROJECT NUMBER AND NAME W2232 CV Launch & Recovery Systems

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: continued

3. FY 2002 PLANS:

- (U) ($6.172) Conduct VISUAL Developmental Testing on CV/CVN E&MD units and produce two (2) LHA/LHD EMD units. Provide engineering and management support to the program.

- (U) ($0.696) Moriah - Complete CDR, deliver EMD unit and conduct DT and OT for E&MD of wind system. Achieve MS III and provide engineering and management support to the program.

- (U) ($ 1.744) ALRCS -Continue modeling and simulation effort. Complete system specification and solicit industry for technology and system solutions. Prepare Request for Proposals and Milestone documentation. Solicit for ALRCS system development contract and complete source selection process. Complete Milestone II approval process. Provide engineering and management support to the program.

- (U) ($7.688) Evaluate AAGE proposals and select contractor. Achieve Milestone II authorization. Award contract and initiate system design effort. Complete System Requirements Review. Evaluate critical technologies through subscale component, subsystem and system testing. Initiate preliminary design of full scale hardware. Provide engineering and management support to the program. *

-(U) ($0.075) Conduct PDR for Commercial Arresting Gear in support of Cost Reduciton & Effectiveness Improvement Initiative (CREI).

*** THIS PROGRAM WAS TRANSFERRED FROM THE 603512N PROGRAM ELEMENT TO PROPERLY EXECUTE THE ADVANCED ARRESTING GEAR ENGINE (AAGE) PROGRAM. FY2001 PROGRAM PLANS WERE REFLECTED IN THE 603512N P.E. , PROJECT UNIT W1723.**

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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	0604512N Shipboard Aviation Systems	W2232 - CV Launch & Recovery Systems

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	9.002	9.833	8.669
(U) Adjustments from the President's Budget:	-0.327	-0.206	7.706
(U) FY 2002 President's Budget Submit:	8.675	9.627	16.375

CHANGE SUMMARY EXPLANATION:

(U) Funding:

- (U) The FY 2000 net decrease of $0.327 million reflects a decrease of $0.089 million for a Small Business Innovative Research assessment, a decrease of $0.203 million for a reprioritization of requirements within the Navy, and a $0.035 million decrease for a Congressional Recission.
- (U) The FY 2001 net decrease of $0.206 million reflects a $0.115million decrease for reprioritization of requirements within the Navy, a $0.069 million decrease for a Congressional Reduction, a $0.001 million decrease for economic assupmtions, and a $0.021 million decrease for a Congressional Recission.
- (U) The FY 2002 net increase of $7.702 million consists of a $0.075 million increase for CREI Arresting Gear Fluid Improvement, an increase of $7.688 million transfer from 603512N to properly reflect execution of the AAGE program, and a $0.061 million decrease for economic assumption.

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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	0604512N Shipboard Aviation Systems	W2232 - CV Launch & Recovery Systems

(U) Schedule: The ADMACS/ISIS MSIII was delayed from 4Q/99 to 1Q/00 due to delay in resolution of software and integration issues. The ALRCS MSII was delayed from 4Q FY01 to 4Q FY02 and MSIII was delayed from 3Q/04 to 2Q/08 due to emergent technical issues on other projects which reprioritized program effort. Moriah program has slipped due to delays in receiving program documentation and directed changes to the acquisition strategy. VISUAL slipped milestone II from 2Q FY00 to 3Q FY00 due to delays in source selection. VISUAL DT/OT and MSIII delays reflect new EMD contractor's planned schedule. Separate VISUAL test events and Milestone III's for CV/CVN and LHA/LHD are planned.

(U) Technical: Not Applicable

(U) C. OTHER PROGRAM FUNDING SUMMARY:

	FY 2000	FY 2001	FY 2002	To Complete	Total Cost
OPN, BLI 421600, A/C Launch & Recovery)	39.618	35.801	27.500	Continuing	Continuing

Related RDT&EP.E. 0603512N (Carrier Systems Development)

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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	0604512N Shipboard Aviation Systems	W2232 CV Launch & Recovery

(U) D. ACQUISITION STRATEGY:

IFLOLS is a Technical Data Package (TDP) procurement. The Navy prepared a complete technical data package, based on the EDMs delivered in FY 1997. A production contract was awarded to Hughes Technical Service, Indianapolis, IN in May 1999 (now Raytheon Technical Services).

LRLS: The Navy prepared a performance specification and competitively awarded a fixed-price contract to deliver three EDMs in FY 1997, with fixed-price production options.

ADMACS/ISIS is being designed and integrated by the Navy. The Navy will procure hardware/software from multiple sources, integrate the hardware/software, and deliver the system to Navy shipyards for installation.

Moriah: The Navy is preparing a performance specification and will competitively award a contract for EMD with production options.

VISUAL: The Navy prepared a performance specification and competitively awarded a cost plus incentive fee contract to develop/deliver EDMs, with fixed-price successive target production options.

ALRCS: The Navy is preparing a performance specification and will complete the system integration contract. Production systems will be competitively procured.

AAGE: The Navy will competitively award up to two EMD contracts to develop the AAGE for evaluation at the NAWCADLKE Runway Arrested Landing Site followed by a single fixed price contract award for production.

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APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604512N Shipboard Aviation Systems	PROJECT NUMBER AND NAME W2232 CV Launch & Recovery Systems	

(U) E. SCHEDULE PROFILE:

	FY 2000	FY 2001	FY 2002	TO COMPLETE
(U) Program Milestones	IFLOLS: 2Q/00 MSIII ADMAC/ISIS: 1Q/00 MSIII VISUAL: 3Q/00 MSII	Moriah: 3Q/01 MS I/II	Moriah: 4Q/02 MSIII ALRCS: 4Q/02 MSII AAGE: 2Q/02 MSII	VISUAL(CV): 3Q/03 MSIII VISUAL(LH): 3Q/04 MSIII ALRCS: 2Q/08 MSIII AAGE: 2Q/08 MSIII
(U) Engineering Milestones	VISUAL: 4Q/00 PDR	Moriah: 4Q/01 PDR VISUAL: 4Q/01 CDR	CREI: 2Q/02 PDR AAGE: 2Q/02 SRR Moriah: 1Q/02 CDR AAGE: 2Q/02-2Q/03 PDR	CREI: 4Q/03 CDR ALRCS: 2Q/03 SRR ALRCS: 4Q/03 PDR
(U) T&E Milestones	IFLOLS: (Shore) 2Q/00 DT/OA		Moriah: 1Q-3Q/02 DT Moriah: 3Q/02 OT VISUAL(CV): 3Q-4Q/02 DT	VISUAL(LH): 1Q/04 OT VISUAL(CV):1Q/03 OT VISUAL(LH): 3Q-4Q/03 DT
(U) Contract Milestones	VISUAL: 3Q/00 EMD Award	Moriah: 1Q/01 RFP Moriah: 3Q/01 EMD Award	ALRCS: 2Q/02 RFP AAGE: 2Q/02 EMD AWARD*	ALRCS: 1Q/03 EMD Award

*Pre-Award efforts in FY01 under 603512N Program Element, transferred to 604512N FY2002

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)											DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604512N Shipboard Aviation Systems			PROJECT NUMBER AND NAME W2232 CV Launch & Recovery Systems							
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	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
Systems Engineering													
(ALRCS/Moriah/CREI)	WX	NAWCAD, Lakehurst	32.369	2.216	11/00	3.415	11/01			Continuing	Continuing		
VISUAL (Primary Hdwe Dev)	SS/CPIF	Boeing	4.042	6.179	11/00	3.616	11/01				13.837	17.931	
IFLOLS (Pimary Hdwe Dev)	SS/FFP	Raytheon	4.475								4.475	4.475	
Moriah	TBD	TBD		0.550	05/01						0.550	0.550	
AAGE (Primary Hdwe Dev)	TBD	TBD				5.548	03/02				5.548		
AAGE-Sys Engineering	WX	NAWCAD, Lakehurst				1.696	11/01			Continuing	Continuing		
Subtotal Product Development			40.886	8.945		14.275		0.000		Continuing	Continuing		

Remarks:

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)											DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604512N Shipboard Aviation Systems			PROJECT NUMBER AND NAME W2232 CV Launch & Recovery Systems						
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	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental testing(VISUAL/Moria	WX	NAWCAD,Lakehurst		0.150	11/00	1.551	11/01			1,650.000	1,651.701	
Operational testing(Moriah)	WX	NAWCAD,Lakehurst				0.300	11/01				0.300	
Subtotal T&E			0.000	0.150		1.851		0.000		1,650.000	1,652.001	
Remarks:												
Program Management Support	RX	NAWCAD Patuxent River		0.207	03/01	0.210	03/02			Continuing	Continuing	
Travel	WX	NAWCAD Patuxent River		0.035	11/00	0.035	11/01			Continuing	Continuing	
SBIR Assessment				0.290								
Subtotal Management			0.000	0.532		0.245		0.000		Continuing	Continuing	
Remarks:												
Total Cost			40.886	9.627		16.371		0.000		Continuing	Continuing	
Remarks:												

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