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 0604512N Shipboard Aviation Systems			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Total PE Cost	**37.495**	**45.301**	**80.623**					
2232 - CV Launch & Recovery System	**37.495**	**42.509**	**80.623**					
9999 - Congressional Adds		**2.792**						

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

2232 - CV Launch & Recovery System - This Navy unique project addresses the System Development and Demonstration (SDD) 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 element includes:

(1). Advanced Arresting Gear (AAG): AAG replaces the MK7 arresting gear, which has reached the limits of its operating capability. AAG will provide the U.S. Navy with important new operational advances for safety and efficiently recover all existing and projected carrier based tailhook-equipped air vehicles well into the 21st century.

(2). Aviation Data Management and Control System (ADMACS): ADMACS will use state-of-the-art information technology and decision support systems to automate collection and distribution of information , enabling aviation operations on board aircraft carriers to be accomplished in a more efficient manner.

(a). ADMACS Block 2: Is a shipboard aviation information management system providing CVN aviation planning, execution & readiness assessment using integrated decision aids and supporting systems built into a highly adaptive Net-Centric comprehensive system for sea & land. ADMACS Block 2 provides real time, fault tolerant (redundant), tactical information management system.

(b). ADMACS Block 3: This is new start for FY 2010. ADMACS Block 3 begins to automate data input through various system interfaces. It also adds intelligent agent and decision aides. These are added to the Block 2 architecture established during the development and installation.

(3). Technology insertion for the Electromagnetic Aircraft Launch System (EMALS):

(a). EMALS Advanced Control Technology Insertion: Introduction of sensorless control technologies, resulting in removal of a significant number of feedback sensors in the system; improving reliability, maintainability and availability.

(b). EMALS High Density Energy Storage: Introduction of solid state energy storage technology to replace the first generation rotary inertial systems. This will result in a 300 Long Ton reduction in ship system installed weight with a corresponding reduction in Height of Center of Gravity above the Baseline, and enhanced reliability, availability and maintainability.

(c). Advanced Catapult Control System for Steam Catapults: Introduce EMALS control, prognostics and health monitoring technology into the steam catapult, providing a common operator interface, reduced maintenance and enhanced availability. This effort compliments the improvements introduced into the arresting gear through AAG.

(4). Swaging Machine: This program funded by ONR (OSD PE# 060051D8Z) in FY 2009. The High-Density Swaging Machine replaces the current process for attaching the terminal on the arresting gear purchase cable and will produce 2200 Tons of pressing force in a compact, lightweight package. The current process for attaching the terminal on the arresting gear purchase cable is very workload intensive and hazardous. The High-Density Swaging Machine would enable sailors to attach arresting cable terminal safely and decrease the potential for cable failure.

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 0604512N Shipboard Aviation Systems	

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(5). Aircraft Launch & Recovery Equipment (ALRE) Modernization: This is new start for FY 2010. Enhance ADMACS horizontal integration with Improved Fresnel Lens Optical Landing System (IFLOLS), Improved Manually Operated Visual Landing Aid System (IMOVLAS), Embarked Aircraft Track System (EATS) and other shipboard systems to improve carrier aviation operations through a network-centric environment able to transform and deliver critical data directly to the warfighter as actionable knowledge. The combination of the following improvements will enable ADMACS to serve as an overarching Horizontal Integrator, creating an Aircraft Launch & Recovery System "system-of systems" that enables the warfighter to execute missions more efficiently and effectively.

(a). Improved Fresnel Lens Optical Landing System (IFLOLS) Phase 4: Control system processor and digital interfaces upgrades to support Built-In-Test (BIT), ADMACS integration & maintenance /obsolescence reduction. Development is required to introduce integration with IFLOLS Phase 4 Control System Processor, digital interfaces, and to support IFLOLS built in test (BIT) maintenance concepts.

(b). Embarked Aircraft Track System (EATS): Automate and improve aircraft on -deck tracking throughout flight and transitions. EATS integration will improve aircraft tracking and situational awareness.

(c). Improved Manually Operated Visual Landing Aid System (IMOVLAS): This will be the manual backup for IFLOLS which is the primary carrier Visual Landing Aid (VLA). Used in high sea states or if IFLOLS is inoperable and will mirror current IFLOLS configuration 100% in size & display, light source, transmission performance & reliability.

(d). ALRE MK-7 System: This effort involves the re-design of the two (2) components below for the MK-7 Arresting Gear system that were identified as major maintenance intensive components by the TYCOM:

1. Replacement of 7 of 10 Retractable Sheaves on the flight deck with a fixed deck sheave design and
2. Design of a new sheave with a sealed bearing which would eliminate the requirements to periodically lubricate the bearings.

9D80A - Sensorless Control of Linear Motors in EMALS - The Navy will initiate the development of advanced sensorless control capability for the Electromagnetic Aircraft Launch System (EMALS) program.

R-1 SHOPPING LIST - Item No. 108

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 0604512N Shipboard Aviation Systems

B. PROGRAM CHANGE SUMMARY:

Funding:	FY08	FY09	FY10
Previous President's Budget:	27.499	42.843	62.670
FY 10 President's Budget	37.495	45.301	80.623
Total Adjustments	9.996	2.458	17.953
Summary of Adjustments			
Congressional Rescissions			
Congressional Adjustments		2.582	
SBIR/STTR/FTT Assessments	-0.004		
Program Adjustments	10.000		17.971
Rate/Misc Adjustments		-0.124	-0.018
Subtotal	9.996	2.458	17.953

Schedule:

2232: AAG - The AAG Critical Design Review (CDR) was successfully completed in April 2007, five months later than the originally scheduled date of Nov 2006, because of contractor difficulty in establishing the product baseline which included delays in utilizing the design for system hardware and software, and clearing the backlog of technical documentation required for CDR. Additionally the contractor did not complete production drawings until March 2008. AAG's funding changes across FYDP since PB-09 reflect the net result of the program cost growth and removal of the Operational Evaluation (OPEVAL) ship set. AAG cannot be installed during a Docking Planned Incremental Availability (DPIA) installation as planned in PB-09 for initial (OPEVAL) shipset. Retrofits must be completed during a Refueling Complex Overhaul (RCOH) availability. In order to live within the FY08 & 09 budgets, the schedule was slipped two years in order to POM for the cost growth. Combined with an increase in production lead time in the manufacturing of test unit hardware and software which will continue through FY 2009 which forced Integrated Testing into FY 2010 through FY 2012. Completed Integrated Baseline Review (IBR), Schedule Risks Assessment (SRA), and revised Estimate At Completion (EAC) in Oct 2008. Updated Acquisition Program Baseline (APB) is in routing.

2232: ADMACS Block 2: ADMACS Block 2 procurement and subsequent installation of the first Low Rate Initial Procurement (LRIP) ship, the CVN-72 in FY09.

Technical:

Not Applicable

EXHIBIT R-2a, RDT&E Project Justification							DATE: **May 2009**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost	**37.495**	**42.509**	**80.623**					
RDT&E Articles Qty			**2**					

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

This Navy unique project addresses the System Development and Demonstration (SDD) 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 includes the following systems under Project 2232, including the funding of production representative models (PRM) for:

(1). Advanced Arresting Gear (AAG): AAG replaces the MK-7 arresting gear, which has reached the limits of its operating capability. The test articles consist of single land based arresting gear wire with all associated hardware and system components to use for reliability and environment qualification testing. FY09 quantity one (1) for RDT&E article was removed. AAG cannot be retrofit during docking planned incremental (DPIA) carrier availability due to length of time to install. Will only be retrofit on Nimitz class carriers during Refueling Complex Overhaul (RCOH) availabilities (will be funded by Shipbuilding and Conversion, Navy (SCN)).

(2). Aviation Data Management and Control System (ADMACS): ADMACS will use state-of-the-art information technology and decision support systems to automate collection and distribution of information, enabling aviation operations on board aircraft carriers to be accomplished in a more efficient and effective manner.

(a). ADMACS Block 2: Is a shipboard aviation information management system providing CVN aviation planning, execution & readiness assessment using integrated decision aids and supporting systems built into a highly adaptive Net-Centric comprehensive system for sea & land. ADMACS Block 2 provides real time, fault tolerant (redundant), tactical information management system.

(b). ADMACS Block 3: This is new start for FY 2010. ADMACS Block 3 begins to automate data input through various system interfaces. It also adds intelligent agent and decision aides. These are added to the Block 2 architecture established during that development and installation.

(3). Technology Insertion Effort for the Electromagnetic Aircraft Launch System (EMALS):

(A). EMALS Advanced Control Technology Insertion: Introduction of sensorless control technologies, resulting in removal of a significant number of feedback sensors in the system; improving reliability, maintainability and availability.

(b). EMALS High Density Energy Storage: Introduction of solid state energy storage technology to replace the first generation rotary inertial systems. This will result in a 300 Long Ton reduction in ship system installed weight with a corresponding reduction in Height of Center of Gravity above the Baseline, and enhanced reliability, availability and maintainability.

(c). Advanced Catapult Control System for Steam Catapults: Introduce EMALS control, prognostics and health monitoring technology into the steam catapult, providing a common operator interface, reduced maintenance and enhanced availability. This effort compliments the improvements introduced into the arresting gear through AAG.

(4). Swaging Machine: This program funded by ONR (OSD PE# 060051D8Z) in FY 2009. Replaces the current process for attaching the terminal on the arresting gear purchase cable and will produce 2200 Tons of pressing force in a compact, lightweight package. The current process for attaching the terminal on the arresting gear purchase cable is very workload intensive and hazardous. The High-Density Swaging Machine would enable sailors to attach arresting cable terminal safely and decrease the potential for cable failure.

(5). Aircraft Launch & Recovery Equipment (ALRE) Modernization: This is new start for FY 2010. This will enable ADMACS to serve as an overarching Horizontal Integrator, creating an Aircraft Launch & Recovery System "system-of systems" that enables the warfighter to execute missions more efficiently and effectively.

(a). Improved Fresnel Lens Optical Landing System (IFLOLS) Phase 4: Control system processor and digital interfaces upgrades to support Built-In-Test (BIT), ADMACS integration & maintenance /obsolescence reduction.

(b). Embarked Aircraft Track System (EATS): Automate and improve aircraft on -deck tracking throughout flight and transitions.

(c). Improved Manually Operated Visual Landing Aid System (IMOVLAS): This will be the manual backup for IFLOLS which is the primary carrier Visual Landing Aid (VLA). Used in high sea states or if IFLOLS is inoperable and will mirror current IFLOLS configuration 100% in size & display, light source, transmission performance & reliability.

(d). ALRE MK-7 System: This effort involves the re-design of two (2) components for the MK-7 Arresting Gear system that were identified as major maintenance intensive components by the TYCOM. (1). Replace 7 of 10 Retractable Sheaves on the flight deck with a fixed deck sheave design. (2). Design a new sheave with a sealed bearing which would eliminate the requirements to periodically lubricate the bearings.

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	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems

B. Accomplishments/Planned Program

AAG	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	35.770	41.129	66.604	
RDT&E Articles Quantity				

Close out Critical Design Review. Purchase one (1) AAG production representative test system to support shorebased integrated testing. Fabricate test systems hardware. Complete test site upgrades. Deliver test system to the NAVAIR Lakehurst Jet Car Test Site. Install test system. Conduct Test Readiness Review. Conduct IT-B1, IT-B2, IT-B3, IT-B5 integrated testing, and initiates IT-B4. Provide engineering and management support to the program. Prepare Runway Arrested Landing Site (RALS). FY09 quantity one (1) for RDT&E article was removed. AAG cannot be retrofit during docking planned incremental (DPIA) carrier availability due to length of time to install. Will only be retrofit on Nimitz class carriers during Refueling Complex Overhaul (RCOH) availabilities (will be funded by Shipbuilding and Conversion, Navy (SCN)).

ADMACS Block 2	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	1.725	1.380	0.000	
RDT&E Articles Quantity				

Purchase an ADMACS Block 2 production representative test system to support developmental testing. The Block 2 test article will consist of network servers, switches, a router, workstations and affiliated database and communications software. Integrate the test Block 2 software and hardware.

ADMACS Block 2 was funded under Project 9071 (Congressional Add) and Project 3126 (ONR) in FY 2002-2005

ADMACS Block 3	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	4.513	
RDT&E Articles Quantity				

ADMACS Block 3 begins to automate data input through various system interfaces. It also adds intelligent agent and decision aides. These are added to the Block 2 architecture established during the development and installation. Build one (1) Engineering Developmental Model (EDM) for developmental test (software).

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	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems

B. Accomplishments/Planned Program (Cont.)

TECHNOLOGY INSERTION FOR EMALS	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	4.056	
RDT&E Articles Quantity				

Re-Code EMALS Advanced Control algorithm into Capability Maturity Model (CMM) Level 3 coding. Design new production board populated with new chips and manufacture new production board. Install new production board into Circuit Card Assembly (CCA) in motor controller. Conduct development testing of CCA. Install CCA at SDD land based site. Conduct SDD site testing. Continue to develop process to produce a large quantity of the Nano Particle Barium Titanate Impregnated Dielectric to be tested and manufactured into capacitors for EMALS. Re-design power train system for integration into ship-set design. Manufacture, install, and test the capacitors. Conduct high cycle, life, environmental qualification and system integration testing Provide development, management, system engineering, test and ship integration support. Conduct sensor prototype testing and algorithm development.

SWAGING MACHINE	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	1.400	
RDT&E Articles Quantity			1	

This program will replace the current process for attaching the terminal on the arresting gear purchase cable and will produce 2200 tons of pressing force in a compact, lightweight package. Conduct performance test on prototype 1 which will have been developed under Defense Acquisition Challenge Program funding (OSD PE 0604051D8Z). Conduct Electro-Magnetic Interference (EMI) shock/environmental test. Develop prototype #2, which will be optimized for manufacturability, maintainability and production cost. Prepare for MS C.
This program will be funded by ONR (OSD PE# 060051D8Z) in FY 2009.

ALRE MODERNIZATION	FY 08	FY 09	FY 10	
Accomplishments/Effort/Subtotal Cost	0.000	0.000	4.050	
RDT&E Articles Quantity			1	

Enhance ADMACS horizontal integration with IFLOLS, IMOVLAS, EATS and other shipboard systems to improve carrier aviation operations through a network-centric environment able to transform and deliver critical data directly to the warfighter as actionable knowledge. These improvements will enable ADMACS to serve as an overarching Horizontal Integrator, creating an Aircraft Launch & Recovery System "system-of systems" that enables the warfighter to execute missions more efficiently and effectively.

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	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems

C. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2008	FY 2009	FY 2010
OPN Line Item: **P-1 # 94** Aircraft Launch and Recovery Equipment, OPN BLI 4216	**38.600**	**46.225**	**48.670**

D. ACQUISITION STRATEGY:

AAG: The Navy competitively awarded two Cost Plus Fixed Fee Technical Development phase contracts to develop the AAG. Upon completion of the Preliminary Design and Integrated Baseline Reviews, the Navy awarded a single Cost Plus Award Fee option to General Atomics for the System Development and Demonstration phase to develop and demonstrate a production representative AAG at the NAVAIR Lakehurst Jet Car and Runway Aircraft Landing test sites. After successful demonstration of the production representative AAG, the Navy will award Fixed Price Incentive contracts for LRIP and full rate production quantities.

ADMACS: The Navy will develop ADMACS internally, using commercially available servers, switches, routers, workstations and database and communications software. Production system will be procured from multiple sources, and integrated and deployed by NAWCAD Lakehurst, N.J. or possibly by a system integrator contractor.

Technology Insertion for the Electromagnetic Aircraft Launch System (EMALS):

EMALS Advanced Energy Storage: The Navy will develop an advanced capability of energy storage for the EMALS program. Capacitor material will be developed and tested by SBIR phase 3 contractor. After a successful demonstration of the advanced material's capability, the Navy will award a CPFF type contract to develop and test advanced energy storage as it specifically relates to the EMALS system. Components will be installed at the EMALS test site and tested for performance and system integration. After a successful development and test program, the Navy will award a FFP for production quantities. This is to further the development and insertion of the high density storage devices into EMALS. Recent developments in energy storage technologies will allow significant weight reductions for EMALS, creating additional service life margin for the CVN-21 Class Ships. Additional improvements in reliability, maintainability, availability and efficiency will improve CVN-21 operational capabilities.

EMALS Advanced Control: The Navy will develop an advanced control capability for the EMALS program. An SBIR contractor will complete development and test of advanced control algorithms. The Navy will award a CPFF contract to design and test a new controller board. EMALS test site will be used to demonstrate performance and system integration. After a successful development and test program, the Navy will award a FFP for production quantities.

Swaging Machine: The Navy will amend an existing Small Business Technology Transfer (STTR) Phase III contract in order to test Prototype #1, which will have been developed under Defense Acquisition Challenge Program funding (OSD PE 060051D8Z), and develop Prototype # 2, which will be optimized for manufacturability, maintainability and production cost.

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

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-5** | PROGRAM ELEMENT: 0604512N Shipboard Aviation Systems | PROJECT NUMBER AND NAME: 2232 - CV Launch & Recovery Systems

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 H/W Development (AAG)	C/CPFF	Northrop Grum/Sunnyvale, CA	12.418									
Primary H/W Development (AAG)	C/CPAF	Gen Atomics/San Diego, CA	91.102	27.545	12/08	39.130	12/09					
H/W Fabrication/Install Initial Shipset (AAG)	SS/TBD	Gen Atomics/San Diego, CA										
Award Fees (AAG)	C/CPAF	Gen Atomics/San Diego, CA	1.548	0.175	12/08	3.400	12/09					
Primary H/W Development (AAG)	WX	NAWCAD, Lakehurst NJ	4.236	2.177	11/08	5.028	11/09					
Systems Engineering (AAG)	WX	NAWCAD, Lakehurst NJ	8.017	3.400	11/08	5.350	11/09					
Shipboard Integration (AAG)	WX	NAWCAD, Lakehurst NJ	1.194	3.659	11/08	5.350	11/09					
Primary H/W Development (ADMACS)	Var	NAWCAD, Lakehurst NJ	3.445	0.500	11/08	3.513	11/09					
Shipboard Integration (ADMACS)	WX	NAWCAD, Lakehurst NJ	1.200	0.665	11/08							
System Engineering (ADMACS)	WX	NAWCAD, Lakehurst NJ	0.140			1.000	11/09					
Primary H/W Development (Tech Insert- EMALS)	CPFF	TBD				1.500	12/09					
Primary H/W Development - (Tech Insert- Adv CAT Cntrl)	Var	NAWCAD, Lakehurst NJ				0.866	11/09					
Primary S/W Development - (Tech Insert-Adv CAT Cntrl)	Var	NAWCAD, Lakehurst NJ				0.500	11/09					
System Engineering (Tech Insert-EMALS)	WX	NAWCAD, Lakehurst NJ				0.187	11/09					
System Engineering (Tech Insert-Adv CAT Cntrl)	WX	NAWCAD, Lakehurst NJ				0.453	11/09					
Shipboard Integration (Tech Insert-Adv CAT Cntrl)	WX	NAWCAD, Lakehurst NJ				0.100	11/09					
H/W Fabr/Install Initial Shipset (Tech Insert-Adv CAT Cntr	Var	NAWCAD, Lakehurst NJ				0.100	11/09					
Primary H/W Development (Swaging Machine)	SS/Ccst	Creare Inc/Hanover, NH				0.500	01/10					
Shipboard Integration (Swaging Machine)	SS/Ccst	Creare Inc/Hanover, NH				0.200	01/10					
System Engineering (Swaging Machine)	WX	NAWCAD, Lakehurst NJ				0.347	11/09					
Development Support (Swaging Machine)	WX	NAWCAD, Lakehurst NJ				0.300	11/09					
Primary H/W Development (ALRE Modern - IFLOLS)	WX	NAWCAD, Lakehurst NJ				0.250	11/09					
System Engineering (ALRE Modern - IFLOLS)	WX	NAWCAD, Lakehurst NJ				1.150	11/09					
Primary H/W Development (ALRE Modern - EATS)	CPFF	Develosoft Corp				0.800	01/10					
System Engineering (ALRE Mod - EATS)	WX	NAWCAD, Lakehurst NJ				0.400	11/09					
Primary Hardware Development (ALRE Modern - MK7)	WX	NAWCAD, Lakehurst NJ				0.800	11/09					
System Engineering (ALRE Modern - MK7)	WX	NAWCAD, Lakehurst NJ				0.100	11/09					
Subtotal Product Development			123.300	38.121		71.324						

Remarks: .
Award fee is 0% fixed and 12% (max) of total contract.

Integrated Logistics Support (AAG)	WX	NAWCAD, Lakehurst NJ	3.249	1.449	11/08	2.179	11/09					
Integrated Logistics Support (ADMACS)	WX	NAWCAD, Lakehurst NJ	0.150									
Integrated Logistics Supt (Tech Insert-EMALS)	WX	NAWCAD, Lakehurst NJ				0.050	11/09					
Integrated Logistics Supt (Tech Insert-Adv CAT Cntrl)	WX	NAWCAD, Lakehurst NJ				0.200	11/09					
Integrated Logistics Support (Swaging Machine)	WX	NAWCAD, Lakehurst NJ				0.053	11/09					
Integrated Logistics Supt (ALRE Modern IFLOLS)	WX	NAWCAD, Lakehurst NJ				0.050	11/09					
Integrated Logistics Supt (ALRE Modern EATS)	WX	NAWCAD, Lakehurst NJ				0.200	11/09					
Integrated Logistics Supt (ALRE Modern MK7)	WX	NAWCAD, Lakehurst NJ				0.050	11/09					
Subtotal Support			3.399	1.449		2.782						

Remarks:

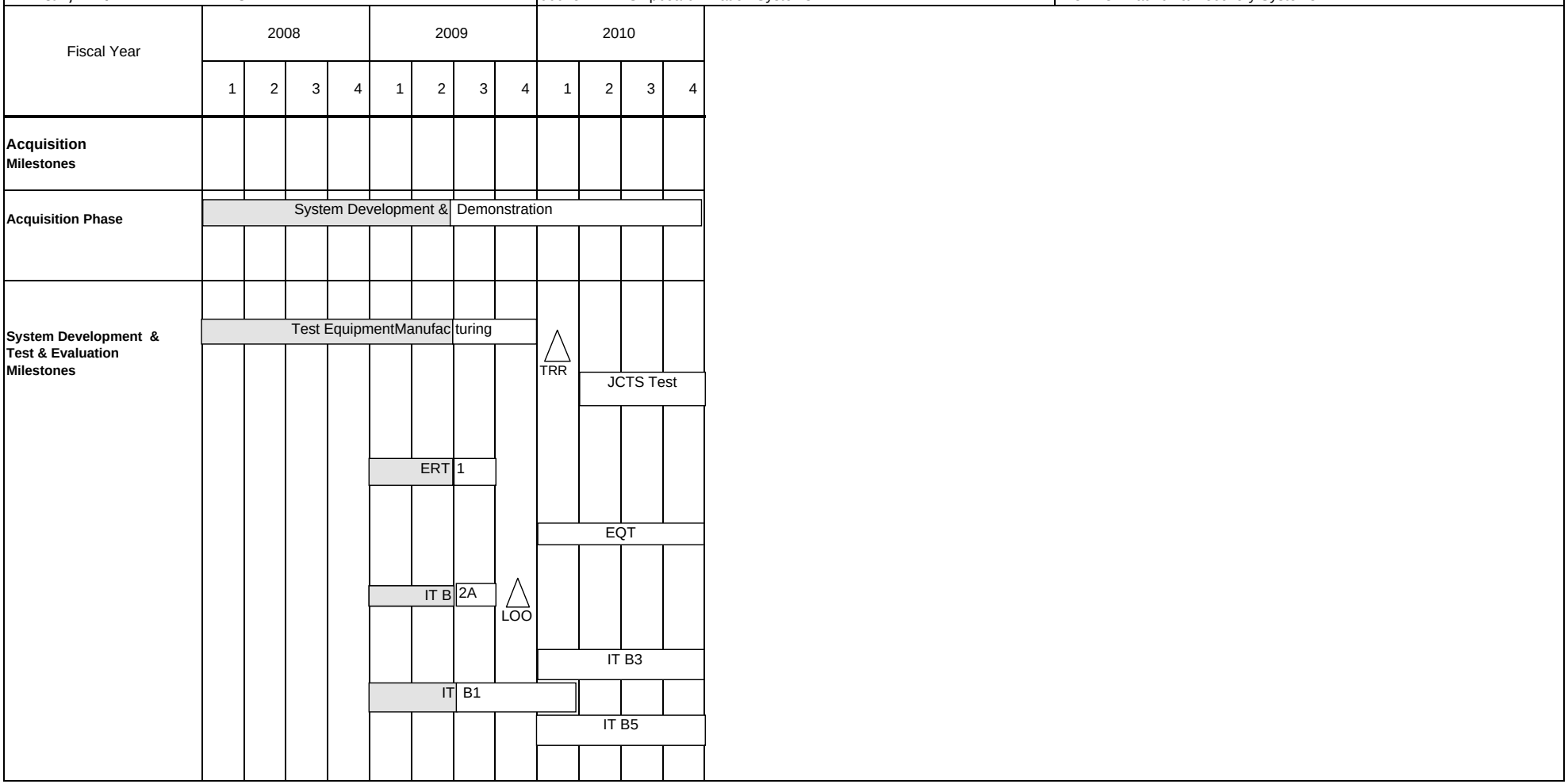
CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)						DATE: **May 2009**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**			PROGRAM ELEMENT 0604512N Shipboard Aviation Systems			PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems						
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					
Dev Test &Eval (AAG)	WX	NAWCAD Lakehurst, NJ	3.527	0.842	11/08	1.308	11/09					
Operational Test & Evaluation (AAG)	Var	Various	0.680	0.150	Var.							
Facility Testing - JCTS (AAG)	WX	NAWCAD Lakehurst, NJ	2.799	1.518	11/08	4.642	11/09					
Dev Test Lab (ADMACS)	WX	NAWCAD Lakehurst, NJ	0.450									
Integrated Testing (ADMACS)	WX	NAWCAD Lakehurst, NJ		0.215	11/08							
Dev Test & Eval (Tech Insert-EMALS)	WX	NAWCAD Lakehurst, NJ										
Dev Test & Eval (Tech Insert-Adv CAT Cntrl)	WX	NAWCAD Lakehurst, NJ				0.100	11/09					
Dev Test & Eval (ALRE Modern-IFLOLS)	WX	NAWCAD, Lakehurst NJ				0.250	11/09					
Dev Test & Eval (ALRE Modern-MK7)	WX	NAWCAD, Lakehurst NJ										
Subtotal T&E			7.456	2.725		6.300						
Remarks:												
Program Management Support	CPFF	TBD	0.416	0.154	11/08	0.157	11/09					
Travel	TO	NAVAIR Patuxent River, MD	0.552	0.060	Var	0.060	Var					
Subtotal Management			0.968	0.214		0.217						
Remarks:												
Total Cost			135.123	42.509		80.623						
Remarks:												

R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			DATE:
	AAG*		**May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems	



R-1 SHOPPING LIST - Item No. 108

*Completed Integrated Baseline Review (IBR), Schedule Risks Assessment (SRA) and revised Estimate at Completion (EAC) in Oct 2008. Above is the current schedule for AAG program.

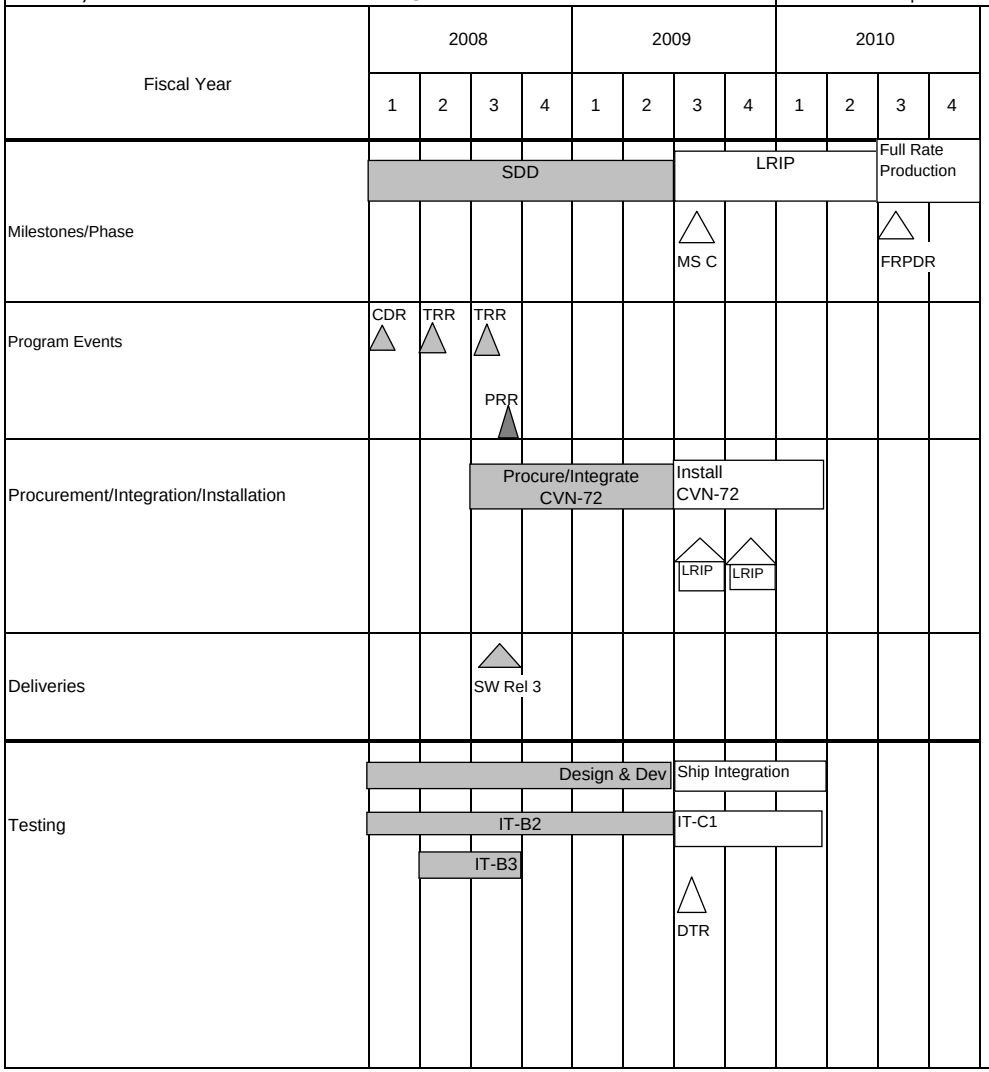
CLASSIFICATION:

Exhibit R-4a, Schedule Detail					DATE:			
AAG					**May 2009**			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems				2232 - CV Launch & Recovery Systems			
Schedule Profile	FY 2008	FY 2009	FY 2010					
System Design & Development (SDD Phase)	1Q-4Q	1Q-4Q	1Q-4Q					
Test Equipment Manufacturing	1Q-4Q	1Q-4Q						
Test Readiness Review (TRR)			1Q					
Jet Car Test Site (JCTS) Test			2Q-4Q					
Extended Reliability Testing 1 (ERT1)		1Q-3Q						
Environmental Qualification Test (EQT)			1Q-4Q					
Letter of Observation (LOO)		4Q						
Integration Testing (IT B2A)		1Q-3Q						
Integration Testing (IT B1)		1Q-4Q	1Q					
Integration Testing (IT B3)			1Q-4Q					
Integration Testing (IT B5)			1Q-4Q					
Note:								
JCTS is the Jet Car Test Site, NAWCAD Lakehurst NJ								
RALS is the Runway Arrested Landing Site, NAWCAD Lakehurst NJ								

CLASSIFICATION:

EXHIBIT R4, Schedule Profile **ADMACS BLOCK 2** DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems



R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

Exhibit R-4a, Schedule Detail **ADMACS Block 2**					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems			
Schedule Profile	FY 2008	FY 2009	FY 2010					
System Design & Development (SDD Phase)	1Q-4Q	1Q-2Q						
Critical Design Review (CDR)	1Q							
Test Readiness Review (TRR)	2Q & 3Q							
Preproduction Readiness Review (PRR)	3Q							
Initial Operational Capability (IOC)								
Procure/Integration CVN-72	3Q-4Q	1Q-2Q						
Design & Development Test	1Q-4Q	1Q-2Q						
Ship Integration Test		3Q-4Q	1Q					
IT-B2 Integrated Test	1Q-4Q	1Q-2Q						
IT-B3 Integrated Test	2Q-3Q							
IT-C1 Integrated Test		3Q-4Q	1Q					
Development Test Report (DTR)		3Q						
Milestone C (MS-C)		3Q						
Low-Rate Initial Production (LRIP)		3Q-4Q	1Q-2Q					
LRIP Procurement		3Q-4Q						
Software Release 3 (SW Rel3)	3Q							
Full Rate Production Decision Review (FRPDR)			3Q					
Full Rate Production (FRP)			3Q-4Q					
Install CVN-72		3Q-4Q	1Q					

CLASSIFICATION:

EXHIBIT R4, Schedule Profile	**ADMACS BLOCK 3**	DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N /** **BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604512N Shipboard Aviation Systems	PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Milestones/Phases									Development & Testing			
Program Events											PDR △	
Procurement/Integration/Installation												
Deliveries												
Testing												

R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

Exhibit R-4a, Schedule Detail **ADMACS Block 3**					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Development and Testing			1Q-4Q					
Deployment								
Preliminary Design Review (PDR)			3Q					
Critical Design Review (CDR)								

R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

EXHIBIT R4, Schedule Profile	**TECHNOLOGY INSERTION FOR THE EMALS (CONT'D)**	DATE: **May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
a). Advanced Catapult Control for Steam Catapult												
Acquisition/Milestone											SRR SFR	
Program Event											HW Design SW Design Algorithm Dev	
Test & Evaluation												Proto-type Sensor Test

Exhibit R-4a, Schedule Detail **TECHNOLOGY INSERTION FOR EMALS**					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems			
Schedule Profile	FY 2008	FY 2009	FY 2010					
a). Advanced Catapult Control for Steam Catapult								
System Requirement Review (SRR)			3Q					
System Functional Review (SFR)			3Q					
Program Design Review (PDR)								
Critical Design Review (CDR)								
Test Readiness Review (TRR)								
Program Event:								
Hardware Design			3Q-4Q					
Software Design			3Q-4Q					
Algorithm Development			3Q-4Q					
Hardware Integration								
Software Coding								
Test & Evaluation:								
Prototype Sensor Testing			4Q					

CLASSIFICATION:

EXHIBIT R4, Schedule Profile

SWAGING MACHINE

DATE: **May 2009**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
Milestones/Phases											Proto-type 2 Build	
Testing & Evaluation										Perf Test EMI Shock Env Test		

R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

Exhibit R-4a, Schedule Detail **SWAGING MACHINE**						DATE: **May 2009**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems			
Schedule Profile	FY 2008	FY 2009	FY 2010					
Performance Test			2Q					
ElectroMagnetic Interference (EMI) Shock/Environmental Test			2Q					
Prototype Build #2			3Q					

R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

EXHIBIT R4, Schedule Profile													DATE:
ALRE MODERNIZATION													**May 2009**
APPROPRIATION/BUDGET ACTIVITY									PROGRAM ELEMENT NUMBER AND NAME				PROJECT NUMBER AND NAME
RDT&E, N / **BA-5**									0604512N Shipboard Aviation Systems				2232 - CV Launch & Recovery Systems
Fiscal Year	2008				2009				2010				
	1	2	3	4	1	2	3	4	1	2	3	4	
a) Embarked Aircraft Track Sys (EATS)													
Acquisition Milestone												CDR △	
Test & Evaluation													
Production Milestone													

R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

EXHIBIT R4, Schedule Profile			DATE:
	ALRE MODERNIZATION (CONT'D)		**May 2009**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems	2232 - CV Launch & Recovery Systems	

Fiscal Year	2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4
b). ALRE MK-7 Systems												
Acquisition Milestone												TR △
Test & Evaluation												
Production Milestone												

R-1 SHOPPING LIST - Item No. 108

CLASSIFICATION:

Exhibit R-4a, Schedule Detail **ALRE MODERNIZATION**					DATE: **May 2009**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 2232 - CV Launch & Recovery Systems			
Schedule Profile	FY 2008	FY 2009	FY 2010					
A). Embarked Aircraft Track Sys (EATS)								
Critical Design Review (CDR)			4Q					
Test Readiness Review (TRR)								
Integrated Test								
Milestone C (MS C)								
Full Rate Production (FRP)								
B). ALRE MK-7 Systems								
Technical Review (TR)			4Q					
Prototype Build								
Test Readiness Review (TRR)								
Integrated Test								
Full Rate Production (FRP)								

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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	0604512N Shipboard Aviation Systems				9999 - Congressional Adds			
COST ($ in Millions)	FY 2008	FY 2009	FY 2010					
Project Cost		2.792						
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Congressional Add

B. Accomplishments/Planned Program:

9D80A Sensorless Control of Linear Motors in EMALS	FY08	FY09	FY10	
Accomplishment/Effort/Subtotal Cost		2.792		
RDT&E Article Quantity				

The Navy will initiate the development of advanced sensorless control capability for the Electromagnetic Aircraft Launch System (EMALS) program.