EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2008	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**					R-1 ITEM NOMENCLATURE 0604512N Shipboard Aviation Systems			
COST ($ in Millions)		FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost		**32.297**	**27.499**	**42.843**	**62.670**	**19.661**	**48.025**	**20.520**
2232 - CV Launch & Recovery Systems		**29.353**	**27.499**	**42.843**	**62.670**	**19.661**	**48.025**	**20.520**
9999 - Congressional Adds		**2.944**						

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 element includes:

(1) Advanced Arresting Gear (AAG): AAG replaces the MK7 arresting gear, which has reached the limits of its operating capability.

(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.

(3) Technology insertion efforts for the Electromagnetic Aircraft Launch System (EMALS) and the steam catapult:

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: 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. It requires fleet personnel to separate each strand of wire from the cable, degrease and grit blast the strands, carefully reassemble them into a socket, and pour toxic molten zinc at 1000 degrees Fahrenheit into the socket on a moving ship. Additionally, recent inspections have uncovered instances of cable imperfections due to improper terminations, which could compromise the safety of recovery operations. The High-Density Swaging Machine would enable sailors to attach arresting cable terminal safely and decrease the potential for cable failure.

Congressional Adds:

Synthetic Material Arresting Cable Gear: This program will develop and test a new Synthetic Fiber Arresting Gear Cable to replace the current steel cable material with a lighter weight material having a higher strength to weight ratio. Conduct systems engineering tasks of requirements analysis and tracking, and specification development. Conduct design engineering and laboratory developmental testing on various novel materials and constructions. Conduct modeling and simulation, failure mode analysis, performance data analysis, and fatigue life testing. Award contract to cable manufacturer for various synthetic cables. Conduct advanced material sheave study to optimize cable to sheave performance.

Aircraft Carrier Launch and Recovery Support Equipment: This program is used to research modernization strategies for the Aircraft Launch and Recovery Equipment and Support Equipment systems aboard carriers in order to reduce the number of human operators, reduce human error, and thereby increase safety/reliability and reduce the fleet's operating costs.

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **February 2008**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**	R-1 ITEM NOMENCLATURE 0604512N Shipboard Aviation Systems

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 07	FY 08	FY 09
Previous President's Budget:	32.767	28.100	22.302
Current BES Budget:	32.297	27.499	42.843
Total Adjustments	-0.470	-0.601	20.541
Summary of Adjustments			
Congressional Reductions			
Congressional Rescissions			
Congressional Undistributed Reductions	-0.470	-0.179	
Congressional Increases			
Economic Assumptions			-0.288
Miscellaneous Adjustments		-0.422	20.829
Subtotal	-0.470	-0.601	20.541

Schedule:

2232 : AAG - The AAG Critical Design Review (CDR) was successfully completed in April 2007, five months later than the originally scheduled date of Nov2006, because of delays in defining shock and vibration requirements, delays in finalizing the design for system hardware and software, and clearing the backlog of technical documentation required for CDR. Some of the final manufacturing and check out of the test units had to be pushed into FY08, and Integrated Testing periods were forced into FY09 and FY10. As the design has been finalized, the manufacturing lead time for an AAG has increased from 18 to 27 months. Considering the development schedule slip and the increase in manufacturing lead time, advanced material orders for the initial shipset are will begin in FY09. The initial shipset will be used to conduct the Operational and Shipboard Technical Evaluation of AAG.

2232: ADMACS Block 2 : There is no MS B because it was decided that ADMACS Block 2 was so far advanced in development, it would enter acquisition Post MS B. MS C was moved to the left into FY08 in order to support the procurement and subsequent installation of the first Low Rate Initial Procurement (LRIP) ship, the CVN-72. If ADMACS did not meet the availability, the next availability would not be until 2013 and that availability would be for a refueling overhaul. Therefore, the CVN-72 would not be using ADMACS Block 2 until it came out of the Refueling Complex Overhaul (RCOH) which is in 2016. Need to have MS C prior to LRIP phase.

Technical:

Not Applicable

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2008**	
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 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost		**29.353**	**27.499**	**42.843**	**62.670**	**19.661**	**48.025**	**20.520**
RDT&E Articles Qty		**1**		**1**				

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 software subsystems and initial shipset.

(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.

(3) Technology Insertion Effort for the Electromagnetic Aircraft Launch System (EMALS) and the steam catapult:

(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: 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. It requires fleet personnel to separate each strand of wire from the cable, degrease and grit blast the strands, carefully reassemble them into a socket, and pour toxic molten zinc at 1000 degrees Fahrenheit into the socket on a moving ship. Additionally, recent inspections have uncovered instances of cable imperfections due to improper terminations, which could compromise the safety of recovery operations. The High-Density Swaging Machine would enable sailors to attach arresting cable terminal safely and decrease the potential for cable failure.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2008**
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 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost		25.693	25.774	41.463
RDT&E Articles Quantity		1		1

Complete Preliminary Design and Integrated Baseline Reviews. Complete initial Critical Design Reviews. Purchase one AAG production representative test system to support shorebased integrated testing. Complete remaining Critical Design Reviews. Fabricate test systems hardware. Initiate 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 initiate IT-B4. Provide engineering and management support to the program. Prepare Runway Arrested Landing Site (RALS). Procure advanced material for the initial ship set.

ADMACS		FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost		3.660	1.725	1.380
RDT&E Articles Quantity				

Conduct a series of preliminary and critical design reviews for the Block 2 upgrades. Purchase on 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. Conduct a system level critical design review. Integrate the test Block 2 software and hardware. Prepare for and conduct Milestone B and C for Block 2 upgrade.
ADMACS Block 2 was funded under Project 9071 (Congressional Add) and Project 3126 (ONR) in FY2002-200

R-1 LINE ITEM - Item No.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2008**
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 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Complete	Total Cost
OPN Line Item: 92 Aircraft Launch and Recovery Equipment	29.697	38.6	46.362	89.239	116.4	81.505	97.957	Continuing	Continuing

D. ACQUISITION STRATEGY:

AAG: The Navy competitively awarded two Cost Plus Fixed Fee (CPFF) TD 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 (CPAF) option to General Atomics for the System Development and Demonstration (SDD) 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 (FPI) 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 systems will be procured from multiple sources, and integrated and deployed by NAWCAD Lakehurst, N.J. or possibly by a systems integrator contractor.

Swaging Mach: The Navy will award a cost type contract to develop prototype 1. Prototype 1 will be tested to refine design. Prototype 2 will be built and tested by vendor and Navy.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1) | DATE: **February 2008**

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 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary H/W Development (AAG)	C/CPFF	Northrop Grum/Sunnyvale,CA	12.418								12.418	12.418
Primary H/W Development (AAG)	C/CPAF	Gen Atomics/San Diego, CA	44.173	19.020	12/06	16.423	12/07	11.909	12/08	0.606	92.131	92.131
H/W Fabrication/Install Initial shipset(AA	SS/TBD	Gen Atomics/San Diego, CA						16.000	01/09	55.168	71.168	
Award Fees (AAG)	C/CPAF	Gen Atomics/San Diego, CA	2.355	0.551	12/06	2.203	12/07	0.551	12/08	4.665	10.325	10.235
Primary H/W Development (AAG)	WX	NAWCAD, Lakehurst NJ	2.633	0.789	11/06	0.814	11/07	0.943	11/08	0.068	5.247	
Systems Engineering (AAG)	WX	NAWCAD, Lakehurst NJ	4.641	1.108	11/06	2.218	11/07	2.320	11/08	0.184	10.471	
Shipboard Integration (AAG)	WX	NAWCAD, Lakehurst NJ	0.563	0.341	11/06	0.290	11/07	0.300	11/08	0.024	1.518	
Primary H/W Dev (Tech Inserts)	Var	NAWCAD, Lakehurst NJ								73.724	73.724	
Primary H/W Dev (ADMACS)	Var	NAWCAD, Lakehurst NJ		3.120	11/06	0.325	11/07	0.500	11/08	0.000	3.945	
Shipboard Integration (ADMACS)	WX	NAWCAD, Lakehurst NJ				1.200	11/07	0.665	11/08		1.865	
Systems Engineering (ADMACS)	WX	NAWCAD, Lakehurst NJ		0.140	11/06						0.140	
Subtotal Product Development			66.783	25.069		23.473		33.188		134.439	282.952	

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

Integrated Logistics Support (AAG)	WX	NAWCAD, Lakehurst NJ	1.522	0.850	11/06	0.877	11/07	0.924	11/08	0.073	4.246	
Integrated Logistics Sup (ADMACS)	WX	NAWCAD, Lakehurst NJ		0.150	11/06						0.150	
Subtotal Support			1.522	1.000		0.877		0.924		0.073	4.396	

Remarks:

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2008**				
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 07 Cost	FY 07 Award Date	FY 08 Cost	FY 08 Award Date	FY 09 Cost	FY 09 Award Date	Cost to Complete	Total Cost	Target Value of Contract
DT&E (AAG)	WX	NAWCAD Lakehurst, NJ	0.386	1.777	11/06	1.608	11/07	8.342	12/08	0.651	12.764	
OT&E (AAG)	Var	Various	0.380	0.150	var.	0.150	var.	0.060	var.		0.740	
Facility Testing - JCTS (AAG)	WX	NAWCAD Lakehurst, NJ	0.947	1.000	04/07	1.080	04/08				3.027	
Developmental Test- Lab (ADMACS)	WX	NAWCAD Lakehurst, NJ		0.250	11/06	0.200	11/07				0.450	
Integrated Testing (ADMACS)	WX	NAWCAD Lakehurst, NJ						0.215	11/08		0.215	
Subtotal T&E			1.713	3.177		3.038		8.617		0.651	17.196	
Remarks:												
Program Management Support	CPFF	Eagle Systems/California,MD	0.180	0.082	11/06	0.091	11/07	0.094	11/08	Continuing	Continuing	
Travel	TO	NAVAIR Patuxent Rv, MD	0.077	0.025	var.	0.020	var.	0.020	var.	Continuing	Continuing	
Subtotal Management			0.257	0.107		0.111		0.114		Continuing	Continuing	
Remarks:												
Total Cost			70.275	29.353		27.499		42.843		Continuing	Continuing	
Remarks:												

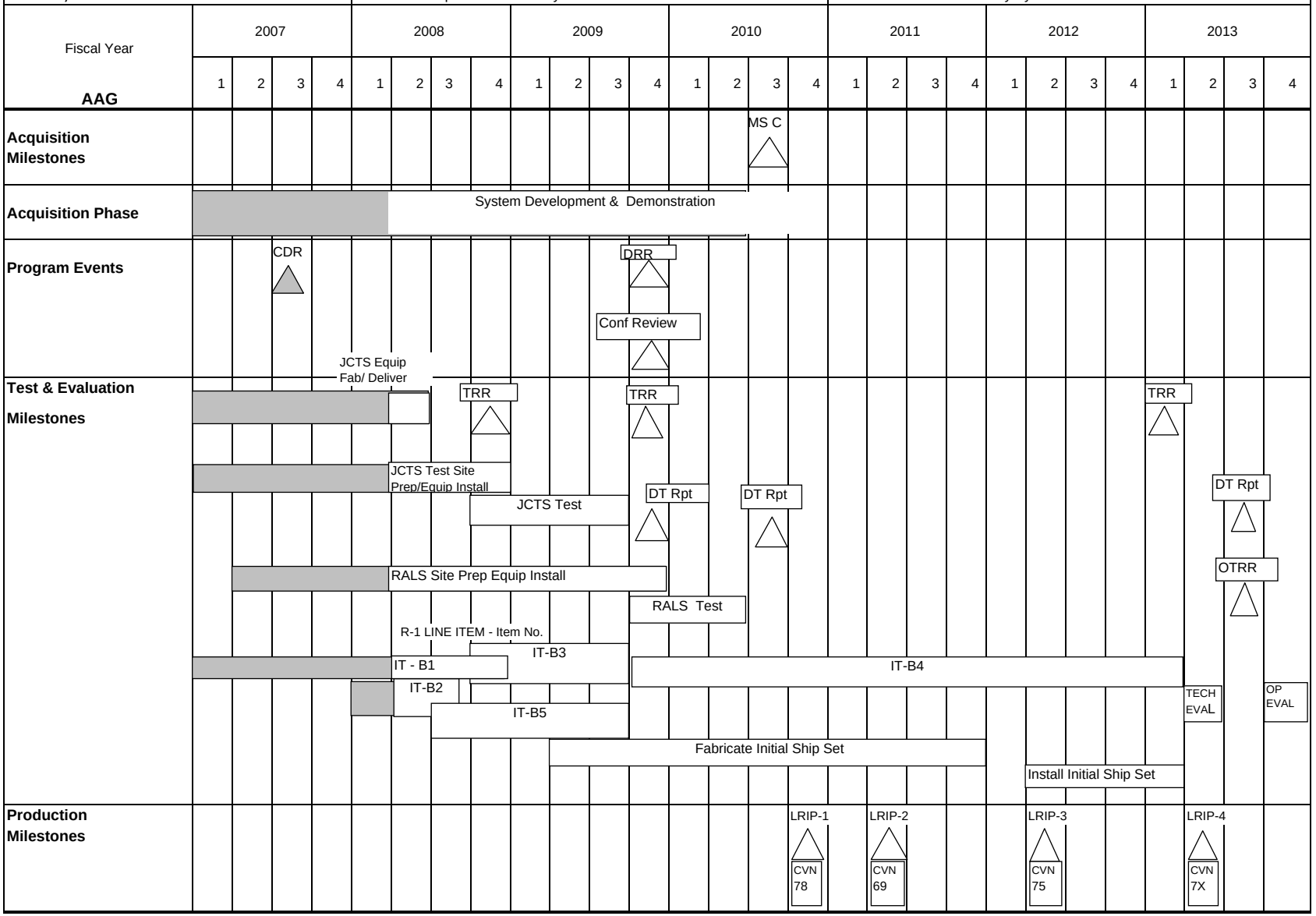
R-1 LINE ITEM - Item No. 107

EXHIBIT R4, Schedule Profile — AAG — DATE: **February 2008**

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



R-1 LINE ITEM - Item No. 107

CLASSIFICATION:

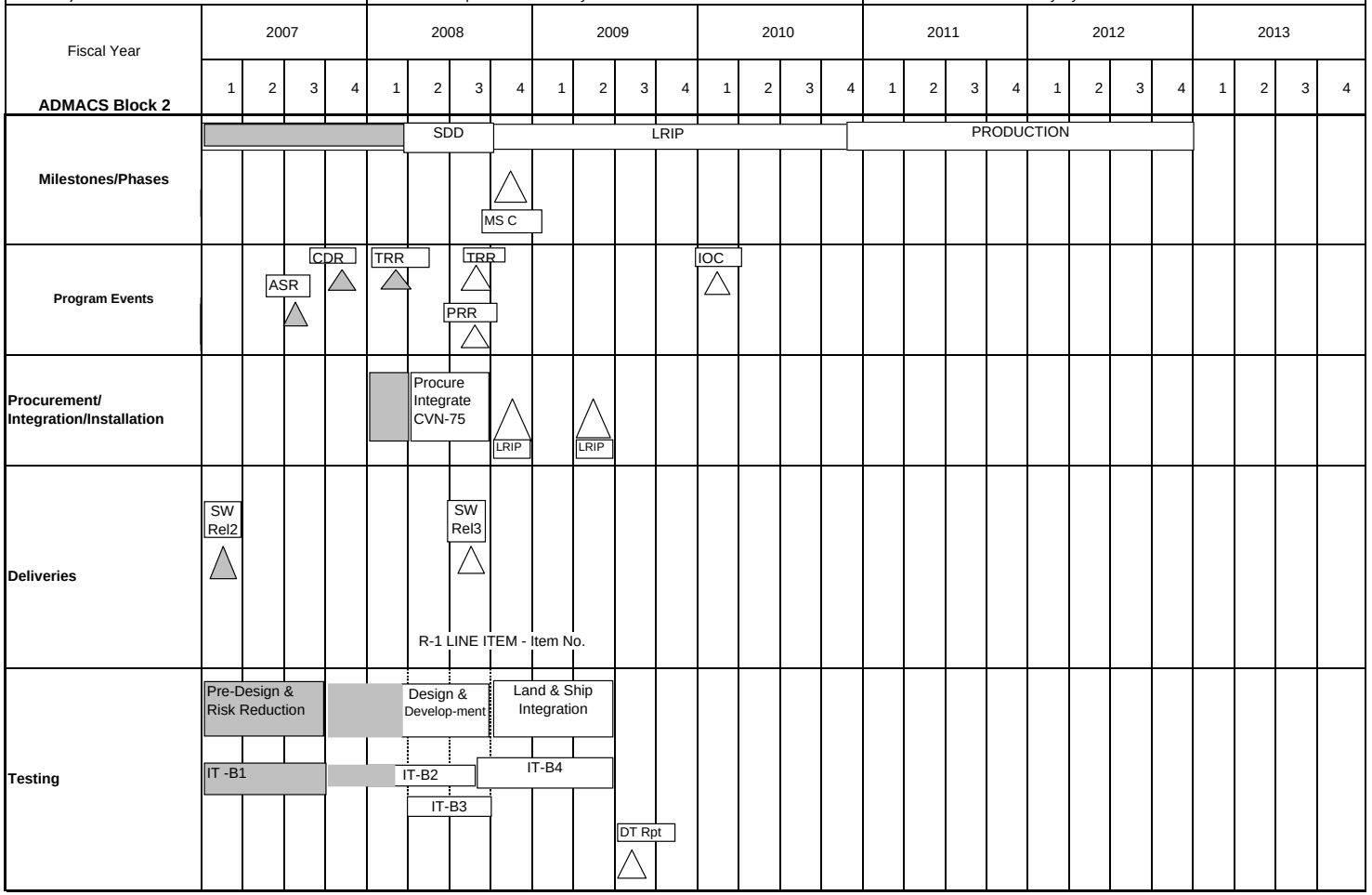
Exhibit R-4a, Schedule Detail						DATE:		
			AAG			**February 2008**		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT				PROJECT NUMBER AND NAME			
RDT& BA-5	0604512N Shipboard Aviation Systems				2232- CV Launch & Recovery Systems			
Schedule Profile		FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
SDD Phase		1Q-4Q	1Q-4Q	1Q-4Q	1Q-2Q			
Critical Design Review (CDR)		3Q						
Design Readiness Review (DRR)				4Q				
Configuration Review				4Q				
JCTS Equipment Fabrication/Deliver		1Q-4Q	1Q-2Q					
Test Readiness Review (TRR)			4Q	4Q				1Q
JCTS Test Site Prep & Equip Install		1Q-4Q	1Q-4Q					
JCTS Test			4Q	1Q-3Q				
Development Test Report (DTR)				4Q	3Q			3Q
RALS Site Prep Equip Install		2Q-4Q	1Q-4Q	1Q-4Q				
RALS Test				4Q	1Q-2Q			
Operational Test Readiness Review (OTRR)								3Q
IT B1 Integrated Test		1Q-4Q	1Q-4Q					
IT B2 Integrated Test			1Q-3Q					
IT B3 Integrated Test			4Q	1Q-3Q				
IT B4 Integrated Test				4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q
IT B5 Integrated Test			3Q-4Q	1Q-3Q				
Technical and Evaluation Test								2Q
Operational and Evaluation Test								4Q
Fabricate Initial Ship Set				2Q-4Q	1Q-4Q	1Q-4Q		
Install Initial Ship Set							2Q-4Q	1Q
Milestone C					3Q			
Low Rate Initial Production (LRIP) Award					4Q	2Q	2Q	2Q
NOTE:								
JCTS is the Jet Car Test Site, NAWCAD Lakehurst, NJ								
RALS is the Runway Arrested Landing Site, NAWCAD Lakehurst, NJ								
				R-1 LINE ITEM - Item No.				

EXHIBIT R4, Schedule Profile | ADMACS Block 2 | DATE: February 2008

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



CLASSIFICATION:

Exhibit R-4a, Schedule Detail	ADMACS Block 2				DATE: February 2008			
APPROPRIATION/BUDGET ACTIVITY **RDT&E BA-5**	PROGRAM ELEMENT 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 2232- CV Launch & Recovery Systems			
Schedule Profile		FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
SDD Phase		1Q-4Q	1Q-3Q					
Acquisition Strategy Review (ASR)		3Q						
Critical Design Review (CDR)		4Q						
Test Readiness Review (TRR)			1Q & 3Q					
Program Readiness Review (PRR)			3Q					
Initial Operating Capability (IOC)					1Q			
Procure/Integration			1Q-3Q					
Software Release 2		1Q						
Software Release 3			3Q					
Pre-Design & Risk Reduction		1Q-3Q						
Design & Development		4Q	1Q-3Q					
Land & Ship Integration			4Q	1Q-2Q				
IT-B1 Integrated Test		1Q-3Q						
IT-B 2 Integrated Test		4Q	1Q - 3Q					
IT-B 3 Integrated Test			2Q-3Q					
IT-B 4 Integrated Test			3Q-4Q	1Q-2Q				
Development Test Report (DTR)				3Q				
Milestone C			4Q					
Low Rate Initial Production (LRIP)			4Q	1Q-4Q	1Q-4Q			
LRIP Procurement			4Q	2Q				
Production					4Q	1Q-4Q	1Q-4Q	

R-1 LINE ITEM - Item No. 107 NE ITEM - Item No.

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2008		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-5**	PROGRAM ELEMENT NUMBER AND NAME 0604512N Shipboard Aviation Systems				PROJECT NUMBER AND NAME 9999-Congressional Adds			
COST ($ in Millions)		FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost		**2.944**						
RDT&E Article Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Congressional Adds

B. Accomplishments/Planned Program:

9565C Synthetic Matl Arresting Gear Cable				FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost				0.977		
RDT&E Articles Quantity						

Congressional Add:
Synthetic Material Arresting Gear Cable: This program will develop and test a new Synthetic Fiber Arresting Gear Cable to replace the current steel cable material with a lighter weight material having a higher strength to weight ratio. Conduct systems engineering tasks of requirements analysis and tracking, and specification development. Conduct design engineering and laboratory developmental testing on various novel materials and constructions. Conduct modeling and simulation, failure mode analysis, performance data analysis, and fatigue life testing. Awarded contract to Cortland cable for development and testing of 3/4" diameter cable samples. Based on data from 3/4" diameter cable test, the best three candidates were down selected for full scale cycle testing. Continue development and inclusion of design changes to reduce stretch and alleviate cause of premature failure. Evaluate best candidate to conduct full scale testing at Jet Car Track Site. Conduct advanced material sheave study to optimize cable to sheave performance.

9A43N Research Modernization Strategies				FY 07	FY 08	FY 09
Accomplishments/Effort/Subtotal Cost				1.967		
RDT&E Articles Quantity						

Congressional Add:
Aircraft Carrier Launch and Recovery Support Equipment: This program is used to research modernization strategies for the Aircraft Launch and Recovery Equipment and Support Equipment systems aboard carriers in orde to reduce the number of human operators, reduce human error, and thereby increase safety/reliability and reduce the fleet's operating costs.