EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2006	
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5**					R-1 ITEM NOMENCLATURE 0604512N Shipboard Aviation Systems			
COST ($ in Millions)		FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost		**25.512**	**37.784**	**33.392**	**21.972**	**20.130**	**19.664**	**19.935**
2232 - CV Launch & Recovery Systems		**24.552**	**32.534**	**33.392**	**21.972**	**20.130**	**19.664**	**19.935**
9565 - Synthetic Material Arresting Cable		**0.960**						
9999- Congressional Adds			**5.250**					

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 the funding of Production Representative Models (PRM) for:

(1) Advanced Arresting Gear (AAG): AAG replaces the MK7 arresting gear, which has reached the limits of its operating capability.
(2) 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.

Congressional Adds:
Aircraft Carrier Aviation Modernization: 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.
Machine Vision Confirmation of Launch Bar Engaement: This program will develop a system based on machine vision technology to verify the proper hook up of aircraft to the catapult under all operating conditions.
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 manaufacturer for various synthetic cables. Conduct advanced material sheave study to optimize cable to sheave performance.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification						DATE: **February 2006**		
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 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost		**24.552**	**32.534**	**33.392**	**21.972**	**20.130**	**19.664**	**19.935**
RDT&E Articles Qty			**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, including the funding of production representative models (PRM) for:

(1) Advanced Arresting Gear (AAG): AAG replaces the MK7 arresting gear, which has reached the limits of its operating capability. The test article consists of a single arresting gear wire with all associated hardware and software subsystems.

(2) 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.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2006**
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

(U) B. Accomplishments/Planned Program

AAG		FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost		24.552	32.534	29.732
RDT&E Articles Quantity			1	

AAG
Complete Preliminary Design and Integrated Baseline Reviews. Select SDD phase contractor. Receive MS B approval and award SDD contract. Complete initial Critical Design Reviews. Purchase one AAG production representative test system to support shorebased integrated testing. Complete remaining Critical Design Reviews. Fabricate test system 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 and IT-B2 integrated testing, and initiate IT-B3. Conduct OTRRs affiliated with the start of IT-B2 and IT-B3 integrated testing. Provide engineering and management support to the program.

ADMACS		FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost		0.000	0.000	3.660
RDT&E Articles Quantity				1

ADMACS
Conduct a series of preliminary and critical design reviews for the Block 2 upgrades. Purchase one 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 and test Block 2 software and hardware. Prepare for Milestone B for Block 3 upgrades. Conduct system functional review, system requirements review and preliminary design review for Block 3.
ADMACS Block 2 was funded under Project 9071 (Congressional Add) and Project 3126 (ONR) in FY 2002-2005.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2006**
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

(U) C. PROGRAM CHANGE SUMMARY:

(U) Funding:	FY 2005	FY 2006	FY 2007
Previous President's Budget:	28.340	33.029	31.490
Current BES/President's Budget	24.552	32.534	33.392
Total Adjustments	-3.788	-0.495	1.902
Summary of Adjustments			
Congressional Reductions			
Prorammatic changes			2.048
SBIR	-0.619		
Other general provisions	0.011	-0.495	
Other misc. changes	-0.385		-0.146
BTR	-2.795		
Subtotal	-3.788	-0.495	1.902

(U) Schedule:

AAG program slipped due to a one quarter delay in Milestone B approval. This resulted in a shift of most milestones and activities by one quarter to the right. Additionally, the start of System Design and Demonstration activity is now correctly aligned with Milestone B, causing Milestone C to shift two quarters to the right. RALS Modify/Refurbish/Install activity duration has been compressed about a quarter and a half, while the RALS test activity duration has been extended by one quarter.

ADMACS Blocks 2 and 3 are new starts for Project 2232. Therefore their schedules have not appeared before with this set of exhibits. Block 2 was previously funded under Program Elements 0604512N and 0203761N, project units 9071 and 3126 respectively.

(U) Technical:

Not applicable.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2006**
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

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
OPN Line Item: 4216 Aircraft Launch & Recovery Equip	21.130	23.642	29.817	37.175	42.566	130.578	114.516		Continuing

E. 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 SDD phase to develop and demonstrate a production representative AAG at the NAVAIR Lakehurst Jet Car and Runway Aircraft Landing test sites. After successuful 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, NJ.

R-1 SHOPPING LIST - Item No. 112

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)

DATE: **February 2006**

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 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary H/W Development (AAG)	C/CPFF	Northrop Grum/Sunnyvale,Ca	11.791	0.627	04/05						12.418	12.418
Primary H/W Development (AAG)	C/CPAF	Gen Atomics/San Diego,Ca		17.441	02/05	23.821	11/05	17.811	12/06	26.452	85.525	85.525
Award Fees (AAG)	C/CPAF	Gen Atomics/San Diego,Ca		2.417	08/05	2.871	11/05	2.255	12/06	2.926	10.469	10.469
Primary H/W Development (AAG)	WX	NAWCAD, Lakehurst	1.305	0.660	11/04	0.768	11/05	0.752	11/06	Continuing	Continuing	
Systems Engineering (AAG)	WX	NAWCAD, Lakehurst	0.880	1.952	11/04	2.109	11/05	2.511	11/06	Continuing	Continuing	
Shipboard Integration (AAG)	WX	NAWCAD, Lakehurst		0.200	11/04	0.433	11/05	0.438	11/06	Continuing	Continuing	
Primary H/W Development (ADMACS)	WX	NAWCAD, Lakehurst						2.300	11/06	1.540	3.840	
Shipboard Integration (ADMACS)	WX	various						1.220	11/06	0.230	1.450	
Subtotal Product Development			13.976	23.297		30.002		27.287		Continuing	Continuing	

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

Integrated Logistics Support (AAG)	WX	NAWCAD, Lakehurst		0.720	11/04	0.802	11/05	0.814	11/06		2.336	
Integrated Logistics Support (ADMACS)	WX	NAWCAD, Lakehurst								0.040	0.040	
Subtotal Support				0.720		0.802		0.814		0.040	2.376	

R-1 SHOPPING LIST - Item No. 112

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)									DATE: **February 2006**			
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 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
DT&E (AAG)	WX	NAWCAD Lakehurst, NJ		0.239	11/04	0.147	11/05	3.831	11/06	Continuing	Continuing	
OT&E (AAG)	var.	var.	0.005	0.175	var.	0.200	11/05	0.188	11/06	Continuing	Continuing	
Facility Testing - JCTS (AAG)	WX	NAWCAD Lakehurst, NJ				1.247	11/05	1.000	04/07	Continuing	Continuing	
DT&E (ADMACS)	WX	NAWCAD Lakehurst, NJ						0.140	11/06	0.630	0.770	
Subtotal T&E			0.005	0.414		1.594		5.159		Continuing	Continuing	
Program Management Support	RX	NAWCAD Patuxent Rv, MD		0.089	05/05	0.091	11/05	0.087	11/06	Continuing	Continuing	
Travel	TO	NAVAIR Patuxent Rv, MD		0.032	var.	0.045	var.	0.045	var.	Continuing	Continuing	
Subtotal Management				0.121		0.136		0.132		Continuing	Continuing	
Remarks:												
Total Cost			13.981	24.552		32.534		33.392		Continuing	Continuing	
Remarks:												

R-1 SHOPPING LIST Item No. 112

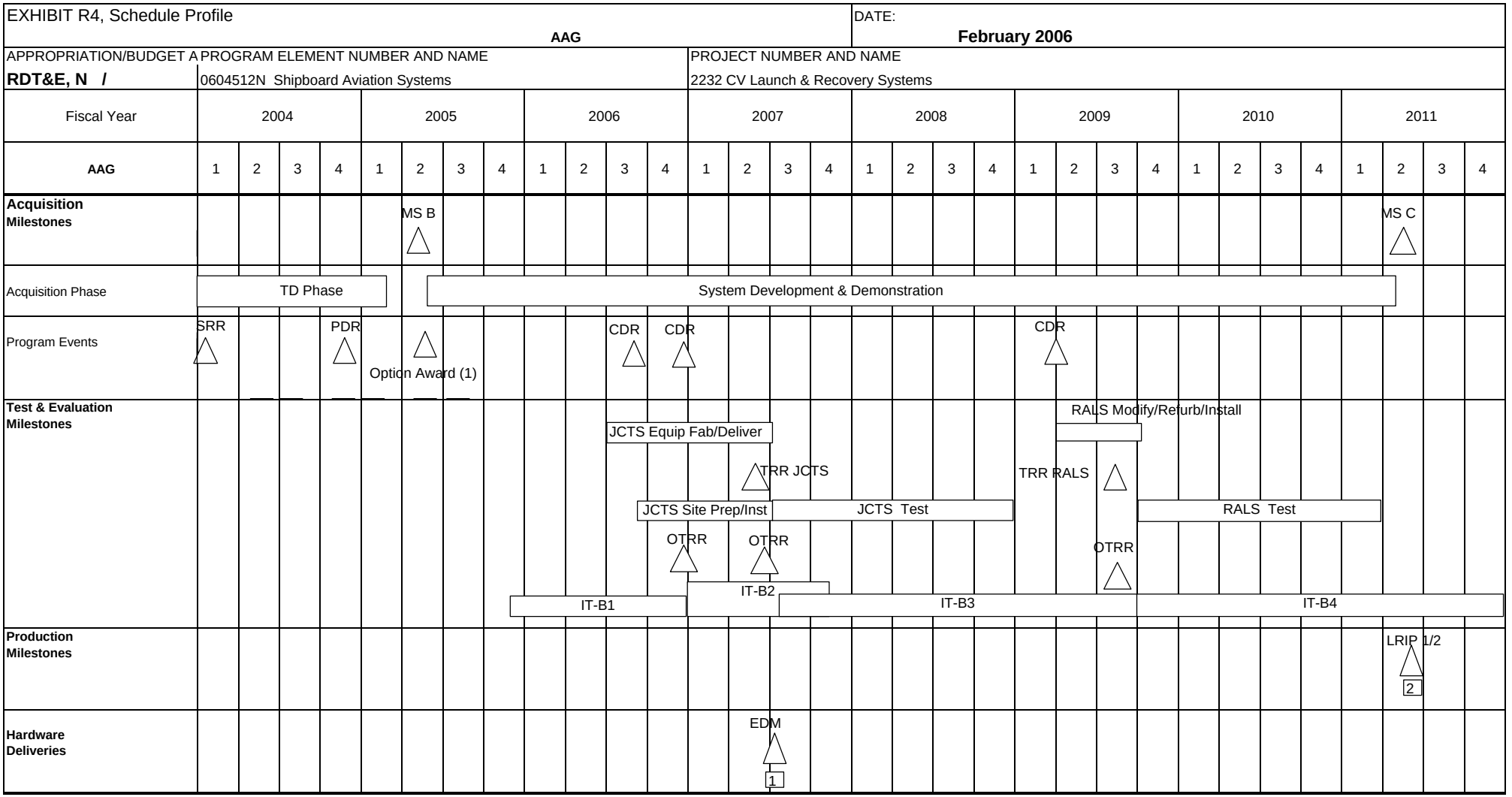
CLASSIFICATION:

EXHIBIT R4, Schedule Profile — **AAG** — DATE: **February 2006**

APPROPRIATION/BUDGET A: **RDT&E, N /**

PROGRAM ELEMENT NUMBER AND NAME: 0604512N Shipboard Aviation Systems

PROJECT NUMBER AND NAME: 2232 CV Launch & Recovery Systems



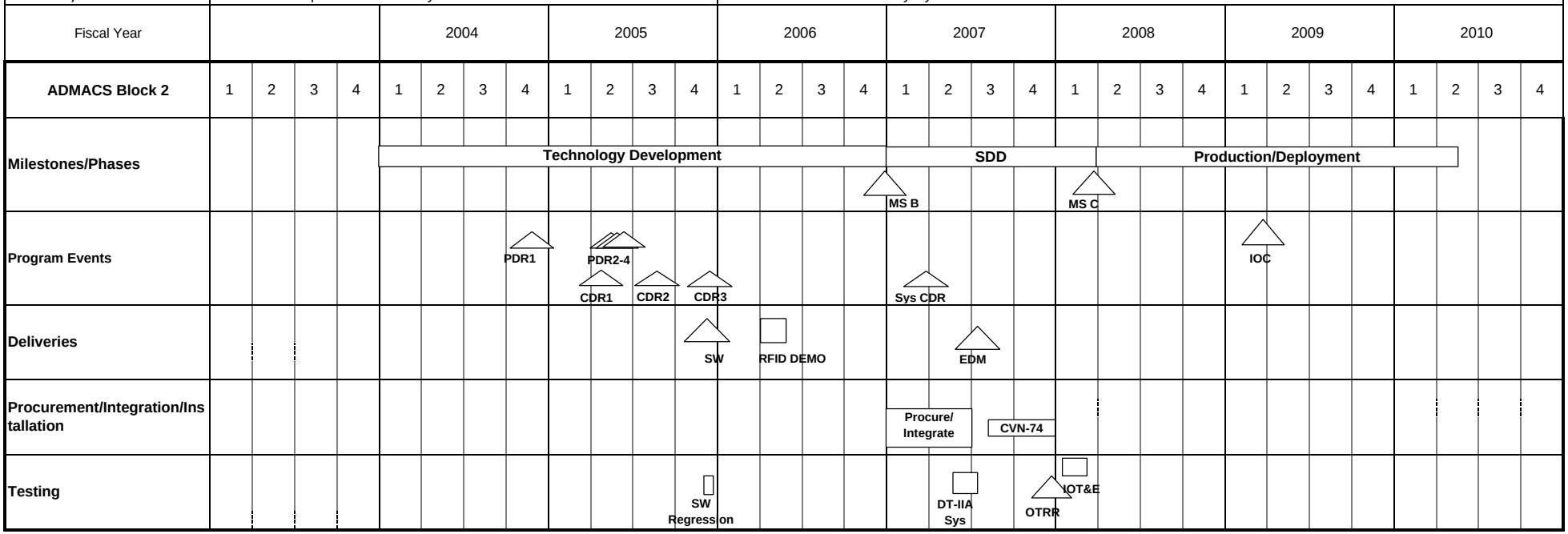
R-1 SHOPPING LIST - Item No. 112

CLASSIFICATION:

Exhibit R-4a, Schedule Detail **AAG**				DATE: **February 2006**					
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 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
TD Phase									
System Requirements Review (SRR)		1Q							
Preliminary Design Review (PDR)		4Q							
SDD Phase									
MS B			2Q						
Option Award - SDD Phase			2Q						
IT-B1 Intergrated Test			4Q	1Q-4Q					
Critical Design Review (CDR) - Multiple CDRs				2Q, 4Q			1Q		
JCTS Test Article Fabrication				3Q-4Q	1Q-3Q				
JCTS Test Site Preparation & Install				3Q-4Q	1Q-3Q				
Operational Test Readiness Reviews (OTRR)				4Q	2Q		3Q		
IT-B2 Intergrated Test					1Q-3Q				
Test Readiness Review (TRR) JCTS Test					2Q				
EDM Delivery					3Q				
JCTS Test					3Q-4Q	1Q-4Q	1Q		
IT-B3 Intergrated Test					3Q-4Q	1Q-4Q	1Q-3Q		
RALS System Mods/Refurbishment/Installation							1Q-3Q		
Test Readiness Review (TRR) RALS Test							3Q		
IT-B4 Intergrated Test							4Q	1Q-4Q	1Q-4Q
RALS Test							4Q	1Q-4Q	1Q
MS C									2Q
LRIP Awards									2Q
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		DATE:
ADMACS Block 2		**February 2006**
APPROPRIATION/BUDGET A	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. 112

CLASSIFICATION:

Exhibit R-4a, Schedule Detail **ADMACS Block 2**					DATE: **February 2006**				
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 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
TD Phase									
Preliminary Design Review (PDR) - Multiple PDRs			4Q	2Q					
Critical Design Review (CDR) - Multiple CDRs				2Q-4Q		1Q			
Software Delivery				4Q					
Software Regression Testing				4Q					
Radio Frequency Identification Demonstration					2Q				
SDD Phase									
MS B					4Q				
Hardware (EDM) Procure/Integrate (Lab)						1Q-2Q			
Hardware (EDM) Delivery						3Q			
Hardware (EDM) Installation (CVN-74)						3Q-4Q			
DT-IIA						2Q-3Q			
Operational Test Readiness Review (OTRR)						4Q			
IOT&E							1Q		
MS C							1Q		
Initial Operating Capability (IOC)								1Q	

R-1 SHOPPING LIST - Item No. 112

CLASSIFICATION:

EXHIBIT R4, Schedule Profile																																
ADMACS Block 3																															DATE: **February 2006**	
APPROPRIATION/BUDGET A	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	2004				2005				2006				2007				2008				2009				2010				2011			
ADMACS Block 3	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Milestones/Phases													**SDD**												**Production/Deployment**							
													MS B											**MS C**									
Program Events													**SFR**	**SRR**		**PDR**	**CDR**										**IOC**						
Deliveries																			**EDM**													
Procurement/Integration/Installation																	**Procure/ Integrate**				**CVN-68**											
Testing																			**DT-IIA**				**OTRR**	**FOT&E**								

CLASSIFICATION:

Exhibit R-4a, Schedule Detail **ADMACS Block 3**					DATE: **February 2006**				
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 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
SDD Phase									
MS B						1Q			
System Functional Review (SFR)						1Q			
System Requirments Review (SRR)						2Q			
Preliminary Design Review (PDR)						4Q			
Critical Design Review (CDR)							2Q		
Hardware (EDM) Procure/Integrate (Lab)							1Q-3Q		
Hardware Delivery (EDM)							3Q		
DT-IIA							3Q		
Hardware (EDM) Installation (CVN-68)								1Q-2Q	
Operational Test Readiness Review (OTRR)								3Q	
FOT&E								3Q	
MS C								4Q	
Initial Operating Capability (IOC)									3Q

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2006**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems	9999 / Congressional Adds: Various

(U) B. Accomplishments/Planned Program

9774N	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost			3.250	
RDT&E Articles Quantity				

Congressional Add:
Aircraft Carrier Aviation Modernization: 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.

9775N	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost			1.000	
RDT&E Articles Quantity				

Congressional Add:
Machine Vision Confirmation of Launch Bar Engaement: This program will develop a system based on machine vision technology to verify the proper hook up of aircraft to the catapult under all operating conditions.

R-1 SHOPPING LIST - Item No. 112

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2006**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-5	0604512N Shipboard Aviation Systems	9999 / Congressional Adds: Various

(U) B. Accomplishments/Planned Program

9565C	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost			1.000	
RDT&E Articles Quantity				

Congressional Add:
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 manaufacturer for various synthetic cables. Conduct advanced material sheave study to optimize cable to sheave performance.

R-1 SHOPPING LIST - Item No. 112