

# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification								DATE:			
								June 2001			
APPROPRIATION/BUDGET ACTIVITY						R-1 ITEM NOMENCLATURE					
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-5						0604214N / AV-8B AIRCRAFT					
COST (\$ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Total PE Cost	1,572.297	36.410	28.654	32.897							
H0652 AV-8B	1,498.417	0.708	6.188	26.875							
H2634 AV-8B (OSCAR)	73.880	35.702	22.466	6.021							
Quantity of RDT&E Articles	Not Applicable										
(U) A. - MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: (U) (H0652) The program provides AV-8B Design, Development, Integration and Test of the following improvements, including: The Engine Life Management Program (ELMP), Zero Retention Force (ZRF), Escape System, Joint Mission Planning System, and Tactical Aircraft Moving Map Capability. The Engine Life Management Program (ELMP) provides safety of flight and operational readiness improvements for the F402 Engine. The Escape System will qualify an improved ejection seat to reduce the risk of injury to aircrew. The Zero Retention Force Solenoid will be interchangeable with the SA-122 on all AV-8B models to provide reliable and dependable operation for in-flight selectability safe ordinance jettison. The Joint Mission Planning System (JMPS) is required as part of the DON directed migration to a common Navy and Marine Corps mission planning system. The Self Contained Approach (SCA) will provide the capability to decelerate and hover Instrument Meteorological Conditions and will direct pilot to proper conditions vice situational guidance. The Tactical Aircraft Moving Map Capability (TAMMAC) is the avionics system that will replace the aging/obsolete AN/ASQ-196 digital map set and the AN/ASQ-194 data storage set presently installed. Advanced weapons coordination includes requirements and interface liaison with efforts such as Joint Stand-Off Weapon (JSOW), AIM-9X, Digital Multiple Carriage Bomb Rack (DMCBR), Advanced Expendables and Electronic Warfare suite upgrades. (U) (H2634) The program provides AV-8B Integration and Test of the following improvements, including: Open System Core Avionics Requirement (OSCAR), Joint Direct Attack Munition (JDAM), HAVEQUICK SINGGARS, and Advanced Mission Computer (AMC). The Open System Core Avionics Requirement (OSCAR) is a form-fit-function replacement of the existing AV-8B mission and stores management computers that would capitalize on commercial-off-the-shelf hardware components and modular high order software language which will provide the necessary computer memory and throughput to integrate current modifications such as JDAM and HAVEQUICK/SINGGARS. On 7 Oct 96 ASN (RD&A) directed the Program Manager to proceed immediately with the OSCAR initiative. On 4 Sep 98, Special Assistant to ASN(RDA) approved OSCAR program restructuring with capitalization on the Advanced Mission Computer (AMC). The title of the Operational Flight Program (OFP) software development effort which integrates the Joint Direct Attack Munitions (JDAM) and HAVEQUICK/SINGGARS into the AV-8B was changed from C2.0 to OC 1.2 to reflect the change of effort in accordance with the ASN (RDA) approved AV-8B Open System Core Avionics Requirements (OSCAR) initiative. OSCAR completed first flight 29 May 1998. Successfully completed Iteration 4 and 5 flight testing and commenced Iteration 6 in first quarter FY01 for OC1.1. Starting flight testing of OC1.2 in fourth quarter of FY01 to continue through to third quarter FY02. (U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ENGINEERING & MANUFACTURING DEVELOPMENT to encompass engineering and manufacturing development of new end items prior to the production approval decision											

R-1 SHOPPING LIST - Item No. 96

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**Exhibit R-2, RD TEN Budget Item Justification**  
(Exhibit R-2, page 1 of 13)

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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	0604214N / AV-8B AIRCRAFT					H0652 / AV-8B					
COST (\$ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost	1,498.417	0.708	6.188	26.875							
RDT&E Articles Qty											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The program provides AV-8B Integration and Test of the following improvements, including: Engine Life Management Program (ELMP), Ejection Seat, Zero Retention Force (ZRF), Tactical Aircraft Moving Map Capability (TAMMAC) and Aircraft handling performance improvements. The Engine Life Management Program (ELMP) provides safety of flight and operational readiness improvements for the F402 Engine. The Escape System will qualify a new improved ejection seat to reduce the risk of injury to aircrew. The Zero Retention Force Solenoid will be interchangeable with the SA-122 on all AV-8B models to provide reliable and dependable operation for in-flight selectability safe ordinance jettison. The Joint Mission Planning System (JMPS) is required as part of the DON directed migration to a common Navy and Marine Corps mission planning system. The Self Contained Approach (SCA) will provide the capability to decelerate and hover Instrument Meteorological Conditions and will direct pilot to proper conditions vice situational guidance. The Tactical Aircraft Moving Map Capability (TAMMAC) is the avionics system that will replace the aging/obsolete AN/ASQ-196 digital map set and the AN/ASQ-194 data storage set presently installed. A/C Handling and performance is all engineering activities for development and design to support aircraft safety flight clearance and concept exploration to support POM objectives.

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS (\$K):

#### 1. FY 2000 ACCOMPLISHMENTS:

- (U) (\$0.038) Continued aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$0.670) Commenced design and development of the AV-8B Escape system to qualify an improved ejection seat design.

#### 2. FY 2001 PLANS:

- (U) (\$0.250) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$2.998) Commence design, development, and integration of the AV-8B JMPS.
- (U) (\$2.940) Continue design, development, and testing of the Escape System Performance upgrade.

#### 3. FY 2002 PLANS:

- (U) (\$3.058) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$7.623) Commence analysis and integration to improve safety of flight and operational readiness of the AV-8B Engine Life Management Program (ELMP).
- (U) (\$2.200) Continue design, development, and integration of the AV-8B JMPS.
- (U) (\$5.740) Commence design, development, and integration of the AV-8B Zero Retention Force (ZRF) solenoid Harrier Action Review Panel (HARP) initiative.
- (U) (\$8.250) Commence development and test of the SCA project.

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**Exhibit R-2a, RDTEN Project Justification**  
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Exhibit R-2a, RDTE Project Justification  
(Exhibit R-2a, page 3 of 13)

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>June 2001</b>																				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604214N / AV-8B AIRCRAFT	PROJECT NUMBER AND NAME H0652 / AV-8B																				
<p>(U) D. ACQUISITION STRATEGY: All efforts under Aircraft Handling provide investigations and analysis of testing and flight clearance authorization necessary to assess overall system capability and integration of projects. Funding for the Escape System will qualify an improved ejection seat design and will be placed on a cost type fee contract awarded to UPCO and HARCO. Funding for the Engine Life Management Program (ELMP) will be placed on a cost type contract to Rolls Royce to address top readiness degraders, safety of flight issues, engine removal and mission failure drivers, assess life management program issues, and design fixes for any service revealed deficiencies. NAWCWD, China Lake will begin integration of the AVJMPS program and the SCA program in FY01. Funding for the ZRF solenoid will be placed on a cost type contract awarded to Raytheon to integrate the solenoid to provide safe ordnance jettison and selectable weapons.</p> <p>(U) E. SCHEDULE PROFILE:</p> <table border="1"> <thead> <tr> <th></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> </tr> </thead> <tbody> <tr> <td>(U) Program Milestones</td> <td></td> <td>1Q/01 AVJMPS PIR/IBR/PDR</td> <td></td> </tr> <tr> <td>(U) Engineering Milestones</td> <td></td> <td>3Q/01 AVJMPS CDR</td> <td>1Q/02 Begin ZRF Integration 1Q/02 SCA S/W Development</td> </tr> <tr> <td>(U) T&amp;E Milestones</td> <td>4Q/00 Begin Ejection Seat DT-I</td> <td>1Q/01 Begin Ejection Seat DT-II 3Q/01 Ejection SeatV/V</td> <td>3Q/02 Initiate ASMET Testing</td> </tr> <tr> <td>(U) Contract Milestones</td> <td>1Q/00 Award Ejection Seat Contract</td> <td></td> <td>1Q/02 Award ELMP Contract</td> </tr> </tbody> </table> <p>* Not required for Budget Activities 1, 2, 3, and 6.</p>				<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	(U) Program Milestones		1Q/01 AVJMPS PIR/IBR/PDR		(U) Engineering Milestones		3Q/01 AVJMPS CDR	1Q/02 Begin ZRF Integration 1Q/02 SCA S/W Development	(U) T&E Milestones	4Q/00 Begin Ejection Seat DT-I	1Q/01 Begin Ejection Seat DT-II 3Q/01 Ejection SeatV/V	3Q/02 Initiate ASMET Testing	(U) Contract Milestones	1Q/00 Award Ejection Seat Contract		1Q/02 Award ELMP Contract
	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>																			
(U) Program Milestones		1Q/01 AVJMPS PIR/IBR/PDR																				
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(U) T&E Milestones	4Q/00 Begin Ejection Seat DT-I	1Q/01 Begin Ejection Seat DT-II 3Q/01 Ejection SeatV/V	3Q/02 Initiate ASMET Testing																			
(U) Contract Milestones	1Q/00 Award Ejection Seat Contract		1Q/02 Award ELMP Contract																			

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Exhibit R-2a, RDTEEN Project Justification  
(Exhibit R-2a, page 4 of 13)

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Remarks: Prior year award fee earned was 96.6%

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**Exhibit R-3, Project Cost Analysis**  
(Exhibit R-3, page 6 of 13)

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>June 2001</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>				PROGRAM ELEMENT 0604214N / AV-8B AIRCRAFT			PROJECT NUMBER AND NAME H0652 / AV-8B					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NAWC-WD CHINA LAKE	32.234	0.220	10/00	1.550	10/01					
Operational Test & Evaluation	WX	NAWC-WD CHINA LAKE	19.258	0.200	10/00							
Subtotal T&E			51.492	0.420		1.550						
Remarks:												
Contractor Engineering Support	RX	NAWC-AD PATUXENT RIV	46.324	0.125	10/00	0.100	10/01					
Subtotal Management			46.324	0.125		0.100						
Remarks:												
Total Cost			1,499.125	6.188		24.971						
Remarks:												

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 7 of 13)

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## CLASSIFICATION:

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N / BA-5	PROGRAM ELEMENT NUMBER AND NAME 0604214N / AV-8B AIRCRAFT					PROJECT NUMBER AND NAME H2634 / AV-8B (OSCAR)					
COST (\$ in Millions)	Prior Year Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost	73.880	35.702	22.466	6.021							
RDT&E Articles Qty											

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Program provides AV-8B Integration and Test of the following improvements, including: Open System Core Avionics Requirement (OSCAR), Joint Direct Attack Munition (JDAM), HAVEQUICK/SINGGARS, and Advanced Mission Computer (AMC). OSCAR is a form-fit-function replacement of the existing AV-8B mission and stores management computers that would capitalize on commercial-off-the-shelf hardware components and modular high order software language which will provide the necessary computer memory and throughput to integrate current modifications such as JDAM and HAVEQUICK/SINGGARS. On 7 Oct 96 ASN (RD&A) directed the Program Manager to proceed immediately with the OSCAR initiative. On 4 Sep 98, Special Assistant to ASN(RDA) approved OSCAR program restructuring with capitalization on the Advanced Mission Computer (AMC). The title of the Operational Flight Program (OFP) software development effort which integrates the Joint Direct Attack Munitions (JDAM) and HAVEQUICK/SINGGARS into the AV-8B was changed from C2.0 to OC 1.2 to reflect the change of effort in accordance with the ASN(RDA) approved AV-8B Open System Core Avionics Requirements (OSCAR) initiative. OSCAR completed first flight 29 May 1998. Successfully completed Iteration 4 and 5 flight testing and commenced Iteration 6 in first quarter FY01 for OC1.1. Starting flight testing of OC1.2 in fourth quarter of FY01 to continue through to third quarter FY02.

### (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

#### 1. FY 2000 ACCOMPLISHMENTS:

- (U) (\$1.934) Continued integration and test software to the ARC-210 HAVEQUICK and SINGGARS waveform full functionality.
- (U) (\$33.768) Continued the Open System Core Avionics Requirements (OSCAR) initiative replacing the Mission Computer and Stores Management System with Commercial components and continued development of the common integrated Night Attack/Radar software to include integration of the 1000lb Joint Direct Attack Munitions (JDAM) weapon.

#### 2. FY 2001 PLANS:

- (U) (\$1.000) Continue integration and test software to the ARC-210 HAVEQUICK and SINGGARS waveform full functionality.
- (U) (\$21.466) Continue the Open System Core Avionics Requirements (OSCAR) initiative replacing the Mission Computer and Stores Management System with Commercial components and continue development of the common integrated Night Attack/Radar software to include integration of the 1000lb Joint Direct Attack Munitions (JDAM) weapon.

#### 3. FY 2002 PLANS:

- (U) (\$6.021) Continue the Open System Core Avionics Requirements (OSCAR) initiative replacing the Mission Computer and Stores Management System with Commercial components and continue development of the common integrated Night Attack/Radar software to include integration of the 1000lb Joint Direct Attack Munitions (JDAM) weapon.

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**Exhibit R-2a, RDTEN Project Justification**  
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>	PROGRAM ELEMENT NUMBER AND NAME 0604214N / AV-8B AIRCRAFT	PROJECT NUMBER AND NAME H2634 / AV-8B (OSCAR)																										
<p>(U) D. ACQUISITION STRATEGY: PEO(A) ADM Ser DPEO(A)-ACQ2/015-97 dated 6 March 1997 approved the MSII acquisition strategy for OSCAR as an ACAT IVT program. OSCAR avionics CDR was held in January 1998 and completed first flight 29 May 1998. Using the NAWC-WD CPAF contract, funds will be used for basic design definition, drawing development, and OFP development and test Twelve Mission System Computers and fourteen Warfare Management Computer engineering models have been procured for laboratory and flight test. The NAWC-WD/Boeing follow-on CPAF Contract was awarded on 16 December 1998. The period of performance will be for five years based on the need to complete Open System Core Avionics Requirement (OSCAR) and begin OC1.3. As directed during 4 September 1998 program restructuring, an ACAT redesignation letter was approved changing the OSCAR program from an ACAT IVT program to an ACAT II program. The schedule was revised due to impact of AV-8B F402-RR-408 engine red stripe which resulted in a 5-month developmental test impact delay. Revised schedule has been approved and is currently being executed, however the program requires an additional \$12.4M to complete the program with full functionality.</p> <p>(U) E. SCHEDULE PROFILE:</p> <table border="1"> <thead> <tr> <th></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> <th><u>TO COMPLETE</u></th> </tr> </thead> <tbody> <tr> <td>(U) Program Milestones</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Engineering Milestones</td> <td>2Q/00 OC1.1 Begin Integration</td> <td>3Q/01 Begin OC1.2 Integration</td> <td>1Q/02 HW LRIP Decision</td> <td></td> </tr> <tr> <td>(U) T&amp;E Milestones</td> <td></td> <td>4Q/01 Begin DT OC1.1</td> <td>3Q/02 OC1.2 DT Complete 3Q/02 OC1.2 OTRR 3Q/02 OC1.2 Integration Complete 4Q/02 Begin OT OC1.1</td> <td></td> </tr> <tr> <td>(U) Contract Milestones</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>TO COMPLETE</u>	(U) Program Milestones					(U) Engineering Milestones	2Q/00 OC1.1 Begin Integration	3Q/01 Begin OC1.2 Integration	1Q/02 HW LRIP Decision		(U) T&E Milestones		4Q/01 Begin DT OC1.1	3Q/02 OC1.2 DT Complete 3Q/02 OC1.2 OTRR 3Q/02 OC1.2 Integration Complete 4Q/02 Begin OT OC1.1		(U) Contract Milestones				
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R-1 SHOPPING LIST - Item No.

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Exhibit R-2a, RDTEN Project Justification  
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**CLASSIFICATION:**

[illegible]

**UNCLASSIFIED**

**CLASSIFICATION:**

[illegible]

# UNCLASSIFIED

## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: <b>June 2001</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-5</b>			PROGRAM ELEMENT 0604214N / AV-8B AIRCRAFT			PROJECT NUMBER AND NAME H2634 / AV-8B (OSCAR)						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date			Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WX	NAWC-WD CHINA LAKE	13.472	0.228	10/00	1.270	10/01					
Operational Test & Evaluation	WX	NAWC-WD CHINA LAKE	2.503	0.188	10/00	1.311	10/01					
Subtotal T&E			15.975	0.416		2.581						
Remarks:												
Subtotal Management			0.000	0.000		0.000						
Remarks:												
Total Cost			109.582	22.466		6.021						
Remarks:												

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Exhibit R-3, Project Cost Analysis  
(Exhibit R-3, page 13 of 13)