

**UNCLASSIFIED**

**EXHIBIT R-2, FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET**

**DATE: February 1999**

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604214N  
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**(U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1998 Actual</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
H0652 AV-8B	1,845	2,069	763	13,640	20,479	1,818	9,026	9,041	-	1,553,369
H2634 AV-8B (OSCAR)	8,470	38,353 *	37,836	25,086	6,194	2,196	0	0	-	145,353
<b>TOTAL</b>	<b>10,315</b>	<b>40,422</b>	<b>38,599</b>	<b>38,726</b>	<b>26,673</b>	<b>4,014</b>	<b>9,026</b>	<b>9,041</b>	<b>-</b>	<b>1,698,722</b>

Quantity of RDT&E Articles

\* This includes a Congressional plus up of \$26,800.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The program provides AV-8B integration and testing of various aircraft weapons improvements including: incorporation of common integrated Night Attack/Radar software; redesigned Inlet Guide Vane Controller for the F402-RR-406A/406B/408A engines; airframe vulnerability, susceptibility and survivability improvements; Common Missile Warning System (CMWS) integration; flight test modifications that improve aircraft flight performance; and limited evaluation of advance concepts and activities to coordinate with ongoing independent advance weapons development. The AN/APG-65 software and associated avionics will be upgraded to provide wiring, controllers and relays for advanced weapon interface. C1.0 software is a combined Operational Flight Program (OFP) for the Night Attack and Radar Aircraft, which establishes the baseline OFP for future weapons. The title of the Operational Flight Program software development effort which integrates the Joint Direct Attack Munitions (JDAM) and the Common Missile Warning System (CMWS) into the AV-8B was changed from C2.0 to OC1.2 to reflect the change of effort in accordance with the ASN (RD&A) approved AV-8B Open System Core Avionics Requirements (OSCAR) initiative. On 7 Oct 96 ASN (RD&A) directed the Program Manager to proceed immediately with the OSCAR initiative. OSCAR utilizes commercial components and modular high order language software. OSCAR successfully completed first flight 29 May 1998. On 4 Sep 98, Special Assistant to ASN(RDA) approved OSCAR program restructuring with capitalization on the Advanced Mission Computer and Displays Program (AMC&D). 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) 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 Item No. 83  
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**EXHIBIT R-2a, FY 2000 RDT&E,N PROJECT JUSTIFICATION SHEET**

**DATE: February 1999**

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604214N  
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**PROJECT NUMBER: H0652  
PROJECT TITLE: AV-8B**

**(U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
H0652 AV-8B	1,845	2,069	763	13,640	20,479	1,818	9,026	9,041	-	1,553,369
<b>TOTAL</b>	<b>1,845</b>	<b>2,069</b>	<b>763</b>	<b>13,640</b>	<b>20,479</b>	<b>1,818</b>	<b>9,026</b>	<b>9,041</b>	<b>-</b>	<b>1,553,369</b>

Quantity of RDT&E Articles

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The program provides AV-8B integration and testing of various aircraft weapons improvements including: incorporation of common integrated Night Attack/Radar software; redesigned Inlet Guide Vane Controller for the F402-RR-406A/406B/408A engines; airframe vulnerability, susceptibility and survivability improvements; Common Missile Warning System (CMWS) integration; flight test modifications that improve aircraft flight performance; and limited evaluation of advance concepts and activities to coordinate with ongoing independent advance weapons development. The AN/APG-65 software and associated avionics will be upgraded to provide wiring, controllers and relays for advanced weapon interface. C1.0 software is a combined Operational Flight Program (OFP) for the Night Attack and Radar Aircraft, which establishes the baseline OFP for future weapons. Advanced weapons coordination includes requirements and interface liaison with efforts such as Joint Stand-Off Weapon (JSOW), AIM-9X, Digital Multiple Carriage Bomb Rack (DMCBB), Advanced Expendables and Electronic Warfare suite upgrades. The Escape System will qualify a new ejection seat. The Laser Spot Tracker (LST) will provide the capability to deliver laser guided ordnance. The Zero Retention Force solenoid will be integrated to provide safe ordnance jettison. 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.

(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.

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**EXHIBIT R-2a, FY 2000 RDT&E,N BUDGET PROJECT JUSTIFICATION SHEET**

**DATE: February 1999**

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604214N**  
**PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**PROJECT NUMBER: H0652**  
**PROJECT TITLE: AV-8B**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1998 ACCOMPLISHMENTS:

- (U) (\$1,742) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$103) Orderly termination of all engineering studies/advanced weapons requirements.

2. FY 1999 PLAN:

- (U) (\$1,522) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$547) Commence integration of closure algorithm to all Weather Landing Systems Signal (AN/SPN-41) into common operational flight program.

3. FY 2000 PLAN:

- (U) (\$93) Continue aircraft handling and performance investigations to improve safety and increase operational performance.
- (U) (\$670) Commence design and development of the AV-8B Escape system to qualify a new ejection seat design.

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) FY 1999 President's Budget:	10,689	13,787	8,027
(U) Appropriated Value:	1,845	2,069	
(U) Adjustments from Pres. Budget:	-8,844	-11,718	-7,264
(U) FY 2000 PRES Budget Submit:	1,845	2,069	763

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DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N

PROJECT NUMBER: H0652

PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT

PROJECT TITLE: AV-8B

CHANGE SUMMARY EXPLANATION:

(U) Funding: The reduction from PRESBUD in FY 1998 of \$-8,844 thousand reflects the \$-244 thousand for Small Business Innovative Research adjustment, \$-130 thousand for minor adjustments, and \$-8,470 transferred to OSCAR project number H2634. The net decrease of \$-11,718 in FY99 reflects \$-103 thousand for minor pricing adjustments and \$-11,615 thousand transferred to OSCAR project number H2634. The net decrease of \$-7,264 thousand in FY00 reflects \$+670 thousand for ejection seat design, \$+29,902 for OSCAR program restructuring and \$-37,836 thousand transferred to OSCAR project number H2634.

(U) Schedule: N/A

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY

<u>Appn.</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>
APN-1	293,048	333,754	291,276	198,730	0	0	0	0
APN-5	21,196	86,257	39,126	40,109	29,871	15,288	5,323	1,892
APN-6/Spares	24,024	23,373	13,156	6,376	0	0	0	0

Related RDT&E: N/A

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**DATE: February 1999**

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604214N**

**PROJECT NUMBER: H0652**

**PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**PROJECT TITLE: AV-8B**

(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 is mainly provided on a reimbursable basis to NAWC-AD Patuxent River, MD. Funding plus-up provided by HaRP correction (PBD 752) in FY00 for the Escape System will qualify a new ejection seat design and will be placed on a cost plus fixed fee contract awarded to BF Goodrich. Funding plus-up in FY00 and FY01 provided by HaRP correction (PBD 752) for the Laser Spot Tracker (LST) will be placed on a cost plus fixed fee contract awarded to GEC Marconi to integrate the LST into the AV-8B to provide the capability of delivering laser-guided ordnance. Funding plus up in FY02 provided by HaRP correction (PBD 752) for the Zero Retention Force solenoid will be placed on a cost plus fixed fee contract awarded to Hughes to integrate the solenoid to provide safe ordnance jettison. Using the JSSA cost plus award fee contract to Boeing, funds for the avionics system Tactical Aircraft Moving Map Capability (TAMMAC) will replace the aging/obsolete AN/ASQ-196 digital map set and the AN/ASQ-194 data storage set presently installed.

(U) E. SCHEDULE PROFILE: TBD

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**EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS**

DATE: February 1999

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604214N**

**PROJECT NUMBER: H0652**

**PROJECT TITLE: AV-8B**

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Project Development	WX	NAWC-WD, CHLK, CA	19,189	0		0		15,276	34,465	
Project Development	Various	Miscellaneous	6,242	1,255	10/98	0		3,622	11,119	
Project Development	Various	In-house	3,738	270	10/98			1,420	5,428	
Contracts	Various	Miscellaneous	8,887	0		0			8,887	8,887
Contract- Ejection Seat		BF Goodrich				670			670	
Contracts- Laser Spot Tracker		GEC Marconi						8,379	8,379	
Contracts		Hughes						4,740	4,740	
Logistics								2,986	2,986	
Contracts	Various	Boeing	5,690	0		0		13,051	18,741	18,741
Award Fee	Various	Boeing	563					1,370	1,933	
Other FY98 & Prior Costs	Various	Various	1,355,159						1,355,159	
<b>Subtotal Project Development</b>			<b>1,399,468</b>	<b>1,525</b>		<b>670</b>		<b>50,844</b>	<b>1,452,507</b>	
Remarks:										
Support and Management Misc./Contracts	RX	NAWC-AD, PATUXENT RIVER, MD	1,535	220	10/98	93	10/99	625	2,473	
S&M	WX	Various	43,538						43,538	
S&M Misc./In-house	Various	Various	1,000						1,000	
<b>Subtotal Support</b>			<b>46,073</b>	<b>220</b>		<b>93</b>		<b>625</b>	<b>47,011</b>	
Remarks										

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DATE: February 1999

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**PROGRAM ELEMENT: 0604214N**

**PROJECT NUMBER:**

**H0652**

**PROJECT TITLE:**

**AV-8B**

<b>Cost Categories:</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Total Prior Yrs Cost</b>	<b>FY 1999 Cost</b>	<b>FY 1999 Award Date</b>	<b>FY 2000 Cost</b>	<b>FY 2000 Award Date</b>	<b>Cost to Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
T&E	WX	NAWC-WD, CHLK, CA	8,758	0		0		2,535	11,293	
	WX	Miscellaneous	42,234	324	10/98	0		0	42,558	
<b>Subtotal Test &amp; Evaluation</b>			<b>50,992</b>	<b>324</b>	<b>0</b>	<b>0</b>		<b>2,535</b>	<b>53,851</b>	
Remarks										
<b>Subtotal Management</b>				<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>	
Remarks										
<b>Total Cost</b>			<b>1,496,533</b>	<b>2,069</b>		<b>763</b>		<b>54,004</b>	<b>1,553,369</b>	

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**DATE: February 1999**

**BUDGET ACTIVITY: 5**

**PROGRAM ELEMENT: 0604214N  
PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**PROJECT NUMBER: H2634  
PROJECT TITLE: AV-8B (OSCAR)**

**(U) COST: (Dollars in Thousands)**

<u>Project Number &amp; Title</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
H2634 AV-8B (OSCAR)	8,470	38,353 *	37,836	25,086	6,194	2,196	0	0	-	145,353
<b>TOTAL</b>	<b>8,470</b>	<b>38,353</b>	<b>37,836</b>	<b>25,086</b>	<b>6,194</b>	<b>2,196</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>145,353</b>

Quantity of RDT&E Articles

\* This includes a Congressional plus up of \$26,800.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The title of the Operational Flight Program (OFP) software development effort which integrates the Joint Direct Attack Munitions (JDAM) and the Common Missile Warning System (CMWS) 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. On 7 Oct 96 ASN (RD&A) directed the Program Manager to proceed immediately with the Open System Core Avionics Requirement (OSCAR) initiative. OSCAR utilizes commercial components and modular high order language software. OSCAR successfully completed first flight 29 May 1998. On 4 Sep 98, Special Assistant to ASN(RDA) approved OSCAR program restructuring with capitalization on the Advanced Mission Computer and Displays Program (AMC&D). 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.

(V) 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.

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**PROGRAM ELEMENT: 0604214N**  
**PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**PROJECT NUMBER: H2634**  
**PROJECT TITLE: AV-8B (OSCAR)**

**(U) PROGRAM ACCOMPLISHMENTS AND PLANS:**

**1. FY 1998 ACCOMPLISHMENTS:**

- (U) (\$8,470) Continue the Open Systems 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.

**2. FY 1999 PLAN:**

- (U) (\$829) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
- (U) (\$2,000) Commence integration and test software to the ARC-210 HAVEQUICK and SINCGARS waveform full functionality.
- (U) (\$35,524) Continue the Open Systems Core Avionics Requirements (OSCAR) initiative replacing the Mission Computer and Stores Management System with Commercial off the shelf processors and memory; 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 2000 PLAN:**

- (U) (\$1,934) Continue integration and test software to the ARC-210 HAVEQUICK and SINCGARS waveform full functionality.
- (U) (\$35,902) 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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**DATE: February 1999**

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**PROGRAM ELEMENT: 0604214N**

**PROJECT NUMBER: H2634**

**PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**PROJECT TITLE: AV-8B (OSCAR)**

**(U) B. PROGRAM CHANGE SUMMARY**

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) FY 1999 President's Budget:	0	0	0
(U) Appropriated Value:	8,470	38,353	37,836
(U) Adjustments from Pres. Budget:	+8,470	+38,353	+37,836
(U) FY 2000 PRES Budget Submit:	8,470	38,353	37,836

**CHANGE SUMMARY EXPLANATION:**

(U) Funding: The increase in FY 1998 of \$8,470 reflects a transfer from AV-8B, project number H0652. The net increase of \$+38,353 thousand in FY 1999 reflects a congressional plus up of \$26,800 thousand for the OSCAR effort and a decrease of \$-62 thousand for minor pricing adjustments and an increase of \$11,615 thousand transferred from AV-8B, project number H0652. The net increase of \$+37,836 thousand in FY 2000 reflects additional funding for the OSCAR program restructuring.

(U) Schedule: Schedule changes reflect OSCAR program restructuring approved 4 SEP 98 by Special Assistant to ASN(RDA).

(U) Technical: N/A

**(U) C. OTHER PROGRAM FUNDING SUMMARY**

<u>Appn.</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Estimate</u>	<u>FY 2001 Estimate</u>	<u>FY 2002 Estimate</u>	<u>FY 2003 Estimate</u>	<u>FY 2004 Estimate</u>	<u>FY 2005 Estimate</u>
APN-1	6,127	0	0	0	0	0	0	0
APN-5	2,836	0	0	0	28,260	21,830	26,125	28,584
APN-6/Spares	700	1,000	3,300	2,000	0	0	0	0

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**PROGRAM ELEMENT: 0604214N**

**PROJECT NUMBER: H2634**

**PROGRAM ELEMENT TITLE: AV-8B AIRCRAFT**

**PROJECT TITLE: AV-8B (OSCAR)**

Related RDT&E

(U) P.E. 0604805 D8Z, Commercial O&S Savings Initiative (COSSI).

(U) D. ACQUISITION STRATEGY: PEO(A) ADM Ser DPEO(A)-ACQ2/015-97 dated 6 March 1997 approves the MSII acquisition strategy for OSCAR as an ACAT IVT program. OSCAR avionics CDR was held in January 1998 and successfully completed first flight 29 May 1998. Using the JSSA CPAF contract, funds will be used for basic design definition, drawing development, and OFP development and test. Four Mission System Computers and four Warfare Management Computer engineering models have been procured for bench validation. The JSSA/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. The ARC-210 will integrate a full electronic protection radio using the Army and Air Force developed waveform (UHF-AM HAVEQUICK/VHF-FM SINCGARS) using the JSSA/Boeing FY98 contract.

(U) E. SCHEDULE PROFILE:

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>To Complete</u>
(U) Program Milestones				OC1.1 MS III
(U) Engineering Milestones			1Q OC1.1 Begin Integration Test	OC1.2 Begin Integration Test
(U) T&E Milestones				OC1.1OT Complete FOT&E Complete
(U) Contract Milestones		1Q Follow On For OC1.1/OC1.2		

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EXHIBIT R-3, FY 2000 RDT&E,N COST ANALYSIS

DATE: February 1999

BUDGET ACTIVITY: 5

PROGRAM ELEMENT: 0604214N

PROJECT NUMBER: H2634

PROJECT TITLE: AV-8B (OSCAR)

<u>Cost Categories:</u>	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total Prior Yrs Cost</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Project Development	WX	NAWC-WD, CHLK, CA	13,146	5,249	10/98	6,667	10/99	6,281	31,343	
Project Development	WX	NAWC-AD, Patuxent, MD	0	231	12/98	570	10/99	1,500	2,301	
Project Development	Various	PMA-209				3,000	10/99	2,000	5,000	
Contracts	Various	Boeing	15,395	25,545	12/98	20,275	12/98	11,339	72,554	72,554
Award Fee	Various	Boeing	1,522	2,691		2,128		1,190	7,531	
<b>Subtotal Project Development</b>			<b>30,063</b>	<b>33,716</b>		<b>32,640</b>		<b>22,310</b>	<b>118,729</b>	
Remarks:										
Support and Management Misc./Contracts			0	0		0		0	0	
S&M			0	0		0		0	0	
S&M Misc./In-house			0	0		0		0	0	
<b>Subtotal Support</b>			<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>	
Remarks:										
T&E	WX	NAWC-WD, CHLK, CA	5,625	3,808		5,196		11,166	25,795	
<b>Subtotal Test &amp; Evaluation</b>			<b>5,625</b>	<b>3,808</b>		<b>5,196</b>		<b>11,166</b>	<b>25,795</b>	
Remarks:										
<b>Subtotal Management</b>				<b>0</b>		<b>0</b>		<b>0</b>	<b>0</b>	
Remarks:										
<b>SBIR Assessment</b>				<b>829</b>					<b>829</b>	
<b>Total Cost</b>			<b>35,688</b>	<b>38,353</b>		<b>37,836</b>		<b>33,476</b>	<b>145,353</b>	

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