

UNCLASSIFIED

EXHIBIT R-2, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

(U) COST: (Dollars in Thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</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>
A2478 Tactical Control Station	31,925*	27,401***	41,378***	18,954	9,245	9,386	9,582	CONT.	CONT.
A2479 Applied Technology (AT)	8,986*	9,647**	7,832	7,335	7,914	8,084	8,292	CONT.	CONT.
A2671 Multiple Participant Competitive Demonstration	9,932	0	0	0	0	0	0	0	9,932
A2768 VTUAV (formerly VTOL UAV A2467) Quantity of RDT&E Articles	0	38,277	63,842	48,478	19,422	0	0	0	170,019
			1						
TOTAL	50,843	75,325	113,052	74,767	36,581	17,470	17,874	CONT.	CONT.

* The FY99 budget reflects a \$32,144K Congressional add for the Tactical Control Station (A2478) executed under A2669, which has been revised by \$74K for Congressional undistributed adjustments and \$145K for Inflation Savings. The FY99 budget reflects a \$5,048K Congressional transfer from the Defense Airborne Reconnaissance Office (DARO) for AT (A2479) executed under A2668, which has been revised by \$12K for Congressional undistributed adjustments and \$23K for Inflation savings. The FY99 budget reflects a \$4,000K Congressional add for the multi-function self aligned gate array technology (A2479) executed under A2670, which has been revised by \$9K for Congressional undistributed adjustments and \$18K for inflation savings.

** The FY00 Budget reflects a \$3,000K Congressional add for the multi-function self, aligned gate array technology (A2479) will be executed under A2670.

*** Funding for the Joint Technology Center/Systems Integration Lab is listed under project A2478 for this submission. A new project (A2910) has been created and will be used in future submissions. Funding associated with the JTC/SIL in A2478 is \$1,500 thousand in FY00 and \$2,300 thousand in FY01.

(U) A.MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program provides for the development of tactical unmanned aerial vehicle (TUAV) systems for DoD that provide warfighters with a dedicated capability for day/night aerial reconnaissance, surveillance and target acquisition (RSTA); intelligence, communications/data dissemination; electronic warfare; weather data collection to support combat operations; minefield detection; and nuclear, biological and chemical reconnaissance in limited adverse weather. Specifically:

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- VTUAV (formerly VTOL UAV): The Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicle (VTUAV) will provide users real-time and near-real-time data required to support intelligence surveillance and reconnaissance (ISR) efforts without the use of manned aircraft or reliance on limited joint theater or national assets. Missions supported under ISR and accomplished by a VTUAV include over-the-horizon classification and targeting, mine countermeasures, battle management, chemical/biological agent reconnaissance and signals intelligence. The VTUAV would be an organic asset of the ship to which it is attached or deployed. The forte of the VTUAV is that it launches and recovers vertically and it can operate from any/all air capable ships as well as confined land based areas.

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(U) COST: (Dollars in Thousands)

Other capabilities of the VTUAV include: autonomous waypoint navigation; automatic launch and recovery of the vehicle both ashore and afloat; incorporation of a heavy fuel engine and the ability to incorporate modular mission payloads. The data from the VTUAV System would be provided to the user through standard DoD Command, Control, Communications, Computers and Intelligence (C4I) systems, architectures and protocols.

- TCS: Efforts are underway to develop a Tactical Control System (TCS) to provide an interoperable capability for control of the Medium Altitude Endurance (MAE) and the spectrum of present and future Tactical UAVs and their payloads utilized by the military services for RSTA and combat assessment. TCS has the objective requirement to interface with the Global Hawk High Altitude Endurance (HAE) UAV system and provide connectivity to service designated C4I systems. TCS is being developed in concert with the development of UAV concepts of operations so as to ensure system functionality satisfies operational requirements. The UAV Joint Technology Center and Systems Integration Laboratory (JTC/SIL) supports Concept of Operations (CONOPS) evaluations using the Multiple UAV Simulation Environment (MUSE) in Advanced Warfighting Exercises (AWEs). TCS development and testing is being accomplished via a Government/Industry Team. Software integration/development was initially the responsibility of Naval Surface Warfare Center (NSWC), Dahlgren Division, while systems integration is being accomplished by Raytheon Systems Company. In completing the program's transition to industry, Raytheon Systems Company will assume total system performance responsibility for all software block developments commencing in FY 2000.
- AT ((Applied Technology), formerly Common Systems Development (CSD)): AT pursues RDT&E of technology supporting the advancement in Naval VTOL Tactical and Medium Altitude Endurance (MAE) Unmanned Aerial Vehicles (UAVs). The focus of AT's efforts is the integrated use of UAVs in a Joint Task Force but also emphasizes the needs of any task force. AT is involved in the development of smaller, more capable payloads to enhance the UAV's ability to carry multiple modular mission payloads. AT supports the VTUAV Program and moves promising technologies from development into utility assessment by operational users. AT is leading exploration of Naval MAE concepts. The near term focus is on demonstrating concepts of operation that will better define system requirements and support decisions regarding need for organic Naval MAE UAV. AT supports cooperative R&D arrangements with major allies and NATO, providing day-to-day management and policy oversight regarding UAV export control and foreign military sales case management.
- Multiple-Participant Competitive Demonstration: The Multiple-Participant Competitive Demonstration, known also as the VTOL Demonstration, provides the opportunity to assess the maturity of VTOL UAV technologies, evaluate air vehicle performance, minimize risks in development of VTOL UAVs in the Naval environment and gather lessons learned for future acquisition.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Tactical Control System

(U) COST: (Dollars in thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</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>
A2478 Tactical Control System	31,925*	27,401 **	41,378	18,954	9,245	9,386	9,582	CONT.	CONT.
TOTAL	31,925*	27,401 **	41,378	18,954	9,245	9,386	9,582	CONT.	CONT.

* The FY 99 budget reflects a \$32,144K Congressional add for the Tactical Control System executed under A2669, which has been revised by \$219K for Congressional undistributed adjustments.

** The FY 00 budget reflects a \$3,000K Congressional add for the Tactical Control System executed under A2669, which has been revised by \$152K for a Congressional Across-the-Board rescission.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Tactical Control System (TCS) provides interoperability and commonality for mission planning, command, control, communications, and data dissemination for the current and future family of Tactical and Medium Altitude Endurance (MAE) Unmanned Aerial Vehicles (UAVs). It provides a full range of scaleable UAV capability from passive receipt of air vehicle and payload data to full air vehicle command and control. TCS functionality supports the joint warfighter with the software to receive, process, and disseminate the air vehicle and payload data from two or more different UAV types for reconnaissance, surveillance, and combat assessment. TCS also has an objective requirement to receive and disseminate payload information from the Global Hawk High Altitude endurance UAV. TCS supports seamless integration into the existing Command, Control, Communications Computers and Intelligence (C4I) architecture and interfaces with other manned and unmanned reconnaissance platforms and intelligence systems thereby providing information superiority through cross cueing. TCS maximizes the use of Commercial and Government off-the-shelf (COTs and GOTs) hardware and software whenever possible. TCS software will be interoperable and operate on existing standard service computer platforms and be compliant with the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD(C3I)) Joint Technical Architecture, Distributed Common Ground System (DCGS), Common Imagery Ground/Surface Station (CIGSS), and the United States Imagery Standards, and Defense Information Infrastructure/Common Operating Environment (DII/COE). The Systems Integrator, Raytheon Systems Company supports the assessment of system integration readiness prior to actual flight-testing. The UAV Joint Technology Center and Systems Integration Laboratory (JTC/SIL) supports Concept of Operations (CONOPS) evaluations using the Multiple UAV Simulation Environment (MUSE) in Advanced Warfighting Exercises (AWEs). The NATO Naval Armaments Group, Project 35, has undertaken studies/technical demonstrations to define a common interoperable NATO UAV ground control system architecture. Canada and the United Kingdom have established TCS FMS cases, have procured TCS software/hardware, and are participating in TCS and NATO demonstrations.

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PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Tactical Control System

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 Accomplishments:

- (U) (\$13,251) Matured and refined system design. Conducted critical design review and completed block 0 configuration development. Completed Early Operational Assessment.
- (U) (\$10,110) Initiated transition of system engineering and software development responsibility to Systems Design, Test and Integration (SDTI) contractor.
- (U) (\$3,564) Continued route and payload planning systems integration, continued integration of Common Automatic Recovery System (CARS) into TCS; and supported interoperability tests (i.e. VTOL Technical Demonstration Phase II, TCS/Joint Surveillance Target Attack Radar System (JSTARS) Common Ground Station (CGS) C4I Demonstration).
- (U) (\$5,000) Congressionally directed funding for Multiple UAV Simulation Environment (MUSE) efforts.

2. FY 2000 Plan:

- (U) (\$20,286) Initiate development of TCS Block 1 (TUAV) and Block 2 (VTUAV, Predator Engineering Change Proposal (ECP), Unmanned Aerial Vehicles Common Automatic Recovery System (UCARS) and Tactical Common Data Links (TCDL)) systems
- (U) (\$4,565) Initiate documentation, training and logistics efforts for TCS Block 1 and Block 2 systems
- (U) (\$2,550) Conduct testing of Engineering Development Units (EDUs) #1 and #2 and C4I Certification

3. FY 2001 Plan:

- (U) (\$22,763) Complete development of TCS Block 1 (TUAV) system configuration. Continue development of Block 2 (VTUAV, Predator ECP, UCARS and TC DL) systems
- (U) (\$7,283) Complete documentation, training and logistics efforts for TCS Block 1 configuration. Continue documentation, training, and logistics efforts for Block 2 systems
- (U) (\$9,032) Conduct testing of TCS Block 1 and Block 2 systems
- (U) (2,300) Joint Technology Center/Systems Integration Lab (Multiple UAV Simulation Environment) efforts.

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PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Tactical Control System

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	32,070	24,553	15,724
(U) Appropriated Value:	32,144	24,553	
(U) Adjustments from President's Budget:	-145	+ 2,848	+ 25,654
(U) FY 2001 President's Budget Submit:	31,925	27,401	41,378

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 reflects a \$145 thousand decrease for Inflation savings. FY 2000 reflects a \$3,000 thousand increase from a Congressional add, offset by a \$152 thousand decrease from an Across-the-Board Congressional reduction. FY 2001 reflects a \$25,654 thousand increase which includes a \$2,300 thousand increase for the Joint Technology Center/System Integration Laboratory(JTC/SIL) Simulation Efforts, a \$30 thousand increase for Military and Civilian Pay, a \$103 thousand increase for Navy Working Capital Fund(NWCF) adjustments, a \$23,680 thousand increase for the integration of TCS into the VTUAV and TUAV programs; and is offset by a \$336 thousand decrease for revised economic assumptions, \$14 thousand decrease for Strategic Sourcing Plan Savings and a \$109 thousand decrease for the reprioritization of requirements within the Navy.

(U) Schedule: The TCS schedule has been changed to reflect program realignment with the Army's TUAV and the Navy/Marine Corps VTUAV programs.

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable.

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PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Tactical Control System

(U) D. ACQUISITION STRATEGY:

The TCS initial design and development effort will be completed at the end of Program Definition and Risk Reduction phase (Phase I) in the 2Q of FY00; Engineering and Manufacturing Development (EMD) phase (Phase II) begins in 2Q FY00. A major effort during the EMD phase will be the integration of TCS hardware and software components by a SDTI contractor for four EDUs. The SDTI contract was awarded to Raytheon 1Q FY99. Options for Full Rate Production (Phase III) of additional TCS systems will be included in the basic SDTI contract. The scheduled Initial Operational Capability (IOC) and Full Operational Capability (FOC) of TCS will occur as outlined in the current services Tactical and Medium Altitude Endurance UAV systems programs.

(U) E. SCHEDULE PROFILE

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Program Milestones												
MS II					X							
EMD Start					X							
EDU Delivery								X				
MS III A (Army)											X	
(U) Engineering Milestones												
VTUAV Interoperability	—————→											
MAE/TUAV Interoperability	—————→											

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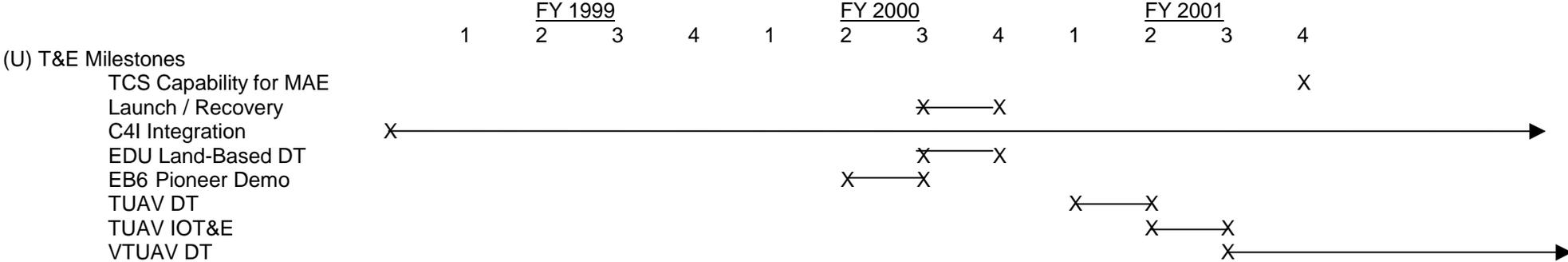
DATE: February 2000

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PROGRAM ELEMENT: 0305204N
PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2478
PROJECT TITLE: Tactical Control System

(U) E. SCHEDULE PROFILE Cont.



(U) Contract Milestones
 VTUAV/TUAV SI Award

X

PROJECT NUMBER: A2768
PROJECT TITLE: VTUAV
 (formerly VTOL UAV)

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT TITLE: Tactical Control System

<u>Cost Categories:</u>	<u>Contract Method</u>	<u>Performing Activity & 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>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
Primary Software Development	WR	NSWC-DD Dahlgren, VA	*	2,600	12/98	1,000	12/99					
Primary Hardware Integration	WR	NSWC-DD Dahlgren, VA	*	1,500	12/98	0						
Systems Engineering	WR	NSWC-DD Dahlgren, VA	*	4,063	12/98	2,740	12/99	3,080	12/00	CONT.	CONT.	
Primary Software Development	CPAF	Raytheon, Falls Church, VA	*	0		7,733	12/99	9,662	12/00	CONT.	CONT.	CONT.
Primary Hardware Integration	CPAF	Raytheon, Falls Church, VA	*	4,000	12/98	800	12/99	1,200	12/00	CONT.	CONT.	CONT.
Systems Engineering	CPAF	Raytheon, Falls Church, VA	*	0		590	12/99	1,085	12/00	CONT.	CONT.	CONT.
Primary Software/ Hardware Integration	MIPR	JTC/SIL, Huntsville, AL	*	**1,000	12/98	1,500		0				
Systems Integration	CPAF	Raytheon, Falls Church, VA	*	3,501	12/98	3,383	12/99	5,535	12/00	CONT.	CONT.	CONT.
Development of the Predator Data Control Module	CPFF	GA-ASI, San Diego, CA	*	1,509	12/98	1,100	12/99	500	12/00	CONT.	CONT.	CONT.
Development of the Outrider Data Control Module	CPFF	Alliant Techsystems, Hopkins MN	*	536	12/98	0		0				536
Human Computer Interface Development	WR	NAWC-AD, Patuxent River, MD	*	240	12/98	300	12/99	300	12/00	CONT.	CONT.	
Subtotal Project Development				18,949		19,146		21,362		CONT.	CONT.	
Remarks:												
• Prior Years funded under PE 0305204D;FY99 contract award fee is 100%.												
Support Organizations												
Configuration Management	WX,RC MIPR	NSWC-DD, Dahlgren, VA	*	813	12/98	140	12/99	280	12/00	CONT.	CONT.	
Configuration Management	CPAF	Raytheon, Falls Church,VA	*	0		985	12/99	1,200	12/00	CONT.	CONT.	CONT.
Training/Logistics	WX,RC	Various	*	2,669	12/98	1,825	12/99	4,610	12/00	CONT.	CONT.	

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2478

PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT TITLE: Tactical Control System

<u>Cost Categories:</u>	<u>Contract Method</u>	<u>Performing Activity &</u>	<u>Total Prior Yrs</u>	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>Support Organizations</u>	<u>& Type</u>	<u>Location</u>	<u>Cost</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Cost</u>	<u>Date</u>	<u>Complete</u>	<u>Cost</u>	<u>Contract</u>
Training/Logistics	CPAF	Raytheon, Falls Church,VA	*	0		1,615	12/99	1,200	12/00	CONT.	CONT.	CONT.
Other/MUSE	MIPR	JTC/SIL Huntsville, AL	*	**4,600	12/98	0	12/99	2,300	12/00	CONT.	CONT.	
Subtotal Support			*	8,082		4,565		9,590		CONT.	CONT.	
Remarks:												
* Prior years funded under PE 0305204D												
** Congressional Adjustment for MUSE support.												
<u>Test and Evaluation</u>												
Test Support	WX,RC	NSWC-DD, Dahlgren, VA	*	562	12/98	420	12/99	520	12/00	CONT.	CONT.	
Test Support	WX	NPS, Monterey, CA	*	422	12/98	650	12/99	1,362	12/00	CONT.	CONT.	
Miscellaneous	WR,RX, MIPR	Various	*	1,117		1,480	12/99	7,150	12/00	CONT.	CONT.	
Subtotal Test & Evaluation:			*	2,101		2,550		9,032		CONT.	CONT.	
Remarks:												
* Prior year funding under PE 0305204D												
<u>Management Support</u>												
Program Management Support	WX,RX MIPR	Various	*	1,888	12/98	420	12/99	401	12/00	CONT.	CONT.	
Travel	WX, MIPR	Various	*	905	12/98	720	12/99	993	12/00	CONT.	CONT.	
Subtotal Management			*	2,793		1,140		1,394		CONT.	CONT.	
Remarks: * Prior year funding under PE 0305204D												
Total Cost			*	31,925		27,401		41,378		CONT.	CONT.	

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BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2479

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

**PROJECT TITLE: Applied Technology (AT)
(Formerly Common Systems Development) (CSD))**

U) COST: (Dollars in Thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</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>
A2479 Applied Technology (AT)	*8,986	9,647	7,832	7,335	7,914	8,084	8,292	CONT.	CONT.
TOTAL	*8,986	9,647	7,832	7,335	7,914	8,084	8,292	CONT.	CONT.

* The FY99 budget reflects a \$5,048K Congressional transfer from the Defense Airborne Reconnaissance Office (DARO) for AT executed under A2668, which has been revised by \$12K for Congressional undistributed adjustments and \$23K for inflation savings. The FY99 budget reflects a \$4,000K Congressional add for the multi-function self aligned gate array technology executed under A2670, which has been revised by \$9K for Congressional undistributed adjustments and \$18K for inflation savings.

** The FY00 budget reflects a \$3,000K Congressional add for the multi-function self, aligned gate array technology will be executed under A2670, which has been revised by \$16K for Congressional undistributed adjustments.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Applied Technology (AT) (formerly Common Systems Development (CSD)) pursues RDT&E of technology supporting advancement in Naval VTOL tactical and medium altitude endurance (MAE) Unmanned Aerial Vehicles (UAVs). Focus of effort is integrated use of UAVs in a Joint Task Force but also emphasizes the needs of any task force including expeditionary units as they are injected into emerging trouble spots. Augments any units ability to develop and maintain an accurate real time tactical situation perspective. Developing smaller, more capable payloads to enhance ability to carry multiple modular mission payloads. There is a stated need for a tactical MAE platform to support maritime operations. AT is leading exploration of Naval MAE concepts. Near term focus on demonstrating concepts of operation that will better define system requirements and support decisions regarding need for organic Naval MAE UAV. Technology focus is on approaches that will evolve to address the needs of unmanned combat systems. In this light, AT provides acquisition lead for the UAV Advanced Technology Review Board (ATRB). Resulting technology roadmap is the basis for a systems approach to incorporating UAVs into the taskforce vision for 2003 and beyond and provides ONR with operator perspective of unified vision of the task force of the future. AT funds technology transition, supports VTUAV Program and moves promising technologies from development into utility assessment by operational units for mission expansion following deployment. AT supports initiatives to evaluate and reduce Total Ownership Cost by improving supportability and incorporating appropriate COTS and NDI applications. AT Balances cost with warfighter needs in effectiveness, availability, interoperability, and capability. AT is actively working initiatives for appropriate use of UAVs in enhanced reconnaissance to the warfighter, Suppression of Enemy Air Defenses, Counter Mine Warfare, Counterproliferation, Personnel Recovery, Military Operations in Urban Terrain, Precision and Real Time Targeting, Riverine Operations, Non-combatant Evacuation Operations, Information Warfare, and Defense Conversion. Emphasis on developing smaller, lighter, cheaper, more capable payloads and air vehicle subsystems supports goal of addressing previously stated warfighter needs and enhancing the potential of small affordable UAVs for special military uses. AT supports cooperative R&D arrangements with major allies and NATO, providing day-to-day management and policy oversight regarding UAV export control and foreign military sales case management. Fabricate Hardware and conduct Bench Tests to demonstrate MLAS simultaneous transmit/receive of multiple signals.

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PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2479

**PROJECT TITLE: Applied Technology (AT)
(Formerly Common Systems Development) (CSD))**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 Accomplishments:

- (U) (\$1,710) Initiated and supported integration, demonstration, and testing of growth payloads
- (U) (\$400) Continued international initiatives and exchange with Allies to improve UAV integration into NATO Task Force Operations
- (U) (\$600) Completed development of UCARS and MIAG for transition to operational user
- (U) (\$200) Investigated alternative UAV automatic launch/recovery technologies
- (U) (\$643) Supported small-drone demonstrations and special payload integration in response to user community requirements
- (U) (\$1,460) Continued common integration, test, logistics and international support efforts
- (U) (\$3,973) Conducted Congressionally-directed research of Multifunction Self-Aligned Gate (MSAG) active array antenna

2. FY 2000 Plan:

- (U) (\$2,400) Initiate and support integration, demonstration, and test of growth payloads
- (U) (\$2,000) Develop Naval MAE UAV concepts of operation and conduct technology assessments
- (U) (\$1,700) Demonstrate operational utility of endorsed UAV ATRB technologies
- (U) (\$600) Continue international initiatives to improve UAV integration into NATO Task Force Operations and common international support efforts
- (U) (\$2,947) Conduct Congressionally-directed research of Multifunction Self-Aligned Gate (MSAG) active array antenna

3. FY 2001 Plan:

- (U) (\$2,839) Initiate and support integration, demonstration, and test of growth payloads
- (U) (\$2,000) Support exercises to demonstrate Naval MAE UAV concepts and military potential
- (U) (\$2,293) Demonstrate operational utility of endorsed UAV ATRB technologies
- (U) (\$700) Continue international initiatives to improve UAV integration into NATO Task Force Operations and common international support efforts

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BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2479

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Applied Technology (AT)

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	9,027	6,700	7,927
(U) Appropriated Value:	9,048		
(U) Adjustments from President's Budget:	-41	2947	-95
(U) FY2001 President's Budget Submit	8,986	9,647	7,832

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY99 decrease of \$41 thousand is for Inflation Savings. The FY 2000 net increase of \$2,947 thousand reflects a \$3,000 thousand increase for the MSAG Program, offset by a \$53 thousand Congressional Across-the-Board Rescission. FY 2001 net decrease of \$95 thousand reflects a \$40 thousand increase for Navy Working Capital Fund(NWCF) adjustments and a \$24 thousand increase for Military and Civilian Pay; and is offset by a \$74 thousand decrease for Strategic Sourcing Plan Savings, a \$64 thousand decrease for revised economic assumptions, and a \$21 thousand decrease for the reprioritization of requirements within the Navy.

(U) Schedule: Schedule changes reflect the program change in emphasis from common systems to more maritime specific requirements.

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable.

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2479

**PROJECT TITLE: Applied Technology (AT)
(Formerly Common Systems Development) (CSD))**

(U) D. ACQUISITION STRATEGY: The key objectives of this program element are to: apply emerging technologies to enhance the value of UAVs in addressing warfighter needs; develop warfighter awareness of UAV capabilities to improve development of concepts of operation and feedback into the development and acquisition processes; develop and demonstrate promising technology to assist in determining military utility; work with the international community to avoid unnecessary and costly duplication and to enhance interoperability; lead the Advanced Technology Review Board to focus basic research on future needs. AT assists in transition of developmental capabilities into operational capability. Effort will emphasize VTUAV mission expansion following system IOC and clarification/development of MAE mission roles and systems requirements. Funds development and demonstration of subsystems believed capable of meeting stated military requirements such as small lightweight Laser designators, communications relays, mine countermeasures, chemical agent detectors, and miniature infrared cameras. Pursues developing a performance specification for a common payload interface and payload performance specifications based on user needs in critical mission areas. Participate in international cooperative agreements to share common interest developments.

(U) E. SCHEDULE PROFILE (CONT.)

	<u>FY1999</u>				<u>FY2000</u>				<u>FY2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
T&E Milestones												
Demo IR Microcam night vision sensor				X								
Comms Relay Demo							X					
Pan-tilt-zoom for IR Microcam							X					
Real-time Precision Targeting Demos					X			X				
Lightweight Laser Designator Subsystem										X		
NATO PG-35 Ship Based Level 5 TCS Demo												X
MAE CONOPS Development Tests								X				X
Payload Validation Tests								X				X

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Contract Milestones

- Precision Targeting
- Pan-tilt-zoom IR Microcam
- Small Lightweight Laser
- Communications Relay
- Advanced Technology Demo
- Lightweight SAR

X		X	X
	X		
	X		
		X	
		X	
			X
			X

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N
PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT NUMBER: A2479
PROJECT TITLE: APPLIED TECHNOLOGY (AT)
(Formerly Common Systems Development)(CSD))

<u>Cost Categories:</u>	<u>Contract Method & Type</u>	<u>Performing Activity & 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>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>	
Primary Hardware Development	CPFF	APL		200	5/99							200	
	WX	NAWC/WD		400	6/99	500	3/00	600	3/01	Cont.	Cont.		
	CPFF	MARCONI		100	7/99							100	
	WX	NAWC/AD		900	1/99	1,000	1/00	1,200	1/01	Cont.	Cont.		
	WX	NSWC/CD		100	1/99	100	1/00	200	1/01	Cont.	Cont.		
	CPFF	North/Grumman		150	5/99							150	
	MP	NRL		157	5/99								
	CPFF	Sierra Nevada Corporation		624	7/99								624
	WX	NSAWC(Fallon)				500	1/00	500	1/01	Cont.	Cont.		
	CPFF	TBD (MAE)				1,000	2/00	1,200	2/01	Cont.	Cont.	Cont.	
	CPFF	TBD (Payload)				1,050	2/00	1,343	2/01	Cont.	Cont.	Cont.	
	Sect. 845	ITT GilFillon		3,795	5/99	2,947	2/00						
Subtotal Product Development			0	6426		7,097		5,043		Cont.	Cont.		

Remarks:

Development Support	IQ/T&M(8A COMP)	H.J. FORD		974	1/99	1,050	12/99	1,350	12/00	Cont.	Cont.	Cont.
		OTHER		627	12/98	500	12/99	500	12/00	Cont.	Cont.	
Subtotal Support				1,601		1,550		1,850		Cont.	Cont.	

Remarks:

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2479

PROGRAM ELEMENT TITLE: TACTICAL UNMANNED AERIAL VEHICLES

PROJECT TITLE: APPLIED TECHNOLOGY (AT)
(Formerly Common Systems Development) (CSD))

Cost Categories:	<u>Contract Method & Type</u>	<u>Performing Activity & 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>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
	Test and Evaluation	Misc.		1,000	1/99	1,000	12/99	1,000	12/00	Cont.	Cont.	
Subtotal Test & Evaluation			0	1,000		1,000		1,000		Cont.	Cont.	

Remarks:

Subtotal Management			0	0		0		0	0	0	0	
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Remarks:

Total Cost			0	8,986		9,647		7,832		Cont.	Cont.	
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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2671

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

**PROJECT TITLE: Multiple-Participant
Competitive Demonstration**

U) COST: (Dollars in Thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</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>
A2671 Multiple-Participant Competitive Demonstration	9,932	0	0	0	0	0	0	0	9,932
TOTAL	9,932	0	0	0	0	0	0	0	9,932

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Multiple-Participant Competitive Demonstration, known also as the VTOL Demonstration, provides the opportunity to assess the maturity of VTOL UAV technologies, evaluate air vehicle performance, minimize risks in development of VTOL UAVs in the Naval environment and gather lessons learned for future acquisition.

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2671

**PROJECT TITLE: Multiple-Participant
Competitive Demonstration**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

Previous Accomplishments under Program Element 0305204D: FY97, FY98 and FY99 Congressional plus-up funds were provided to execute a VTOL UAV demonstration program with three contractors. The purpose of the demonstration program was to evaluate current VTOL UAV air vehicles which demonstrate the potential to meet or exceed defined performance objectives and to evaluate air vehicle technology risks associated with a VTOL UAV system operating in the Naval environment. The contracts for the demonstration program included 50 hours of flight test at a Government range, payload integration and demonstration and a life cycle cost estimate from the contractors. All three contractors concluded the initial phase of the demonstration. The demonstration program continued in FY99 with the integration of the UAV Common Automatic Recovery System (UCARS) which will allow highly accurate autonomous recoveries to shipboard-size landing spots. Efforts have also been conducted to identify feasible equipment to host Tactical Control Systems (TCS) workstations aboard targeted classes of Naval surface ships. Both of these significantly mitigate future risks associated with shipboard integration during the VTUAV Acquisition Program.

1. FY 1999 Accomplishments:

- (U) (\$3,646) Conducted land based UAV Common Automatic Recovery System (UCARS) efforts.
- (U) (\$6,286) Conducted shipboard demonstration efforts to include TCS integration efforts.

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2671

**PROJECT TITLE: Multiple-Participant
Competitive Demonstration**

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) FY 2000 President's Budget:	9,977	0	0
(U) Appropriated Value:	10,000		
(U) Adjustments from President's Budget:	-45	0	0
(U) FY2001 President's Budget Submit	9,932	0	0

CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1999 reflects a \$45 thousand decrease for inflation savings.

(U) Schedule: The schedule for the shipboard demonstration has been updated to reflect the revised schedule for one of the two VTOL Demonstrators.

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY: Not applicable.

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2467

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Multiple Participant Competitive Demonstration

(U) D. ACQUISITION STRATEGY: The Multiple Participant Competitive Demonstration (VTOL UAV Demonstration) was designed as a program to evaluate current VTOL UAV air vehicles which demonstrate the potential to meet or exceed defined performance objectives and to evaluate air vehicle technology risks associated with a system operating in the Naval environment. This demonstration was congressionally directed and congressional plus-up funds were made available. A production representative VTOL UAV System would not be down-selected from the VTOL Demonstration contractors. Any acquisition program for a production VTOL UAV System would be the result of a free and open competition.

(U) E. SCHEDULE PROFILE

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				<u>FY2002</u>				<u>FY2003</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Program Milestones																								
Landbased UCARS																								
Ship Demo																								
(U) Contract Milestones																								
Option Exercise																								
(U) Engineering Milestones																								
Landing System Data																								
Ship Install Data																								
(U) T&E Milestones																								
Test Readiness Review (TRR)																								
TCS Demo																								

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2671

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Mult. Part. Comp. Demo

<u>Cost Categories:</u>	<u>Contract Method & Type</u>	<u>Performing Activity & 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>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>Project Development Organizations</u>												
Project Integration	CPFF	Bell Helicopter		3,301	2/99	0		0		0	3,301	3,301
	CPFF	Bombardier		2,952	1/99	0		0		0	2,952	2,952
Subtotal Project Development				6,253		0		0		0	6,253	6,253
<u>Support Organizations</u>												
DEMO Support	WX	NAWC-AD Patuxent River,MD		1,955	1/99	0		0		0	1,955	
Ship Integration	PD	NAVSEA		305	3/99	0		0		0	305	
Documentation	WX	NSWC, Crane, IN		165	2/99	0		0		0	165	
Training	WX	NAWC Indian Hd.,MD		263	6/99	0		0		0	263	
Subtotal Support				2,818		0		0		0	2,818	
Remarks:												

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2671

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: Mult. Part. Comp. Demo

<u>Cost Categories:</u>	<u>Contract Method & Type</u>	<u>Performing Activity & 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>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>Test & Evaluation Organizations</u>												
Flight Testing	MIPR	USA Yuma Proving Ground, Yuma, AZ		204	6/99	0		0		0	204	0
Subtotal Test & Evaluation				204		0		0		0	204	0
Remarks:												
<u>Management Organizations</u>												
Technical and Management Support	FFP	H. J. FORD		289	3/99	0		0		0	289	0
MISC.	VARIOUS	VARIOUS		498	VARIOUS	0		0		0	498	0
Subtotal Management				787		0		0		0	787	0
Remarks:												
Total Cost				9,932		0		0		0	9,932	6,253

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EXHIBIT R-2a, FY 2001 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2768

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

**PROJECT TITLE: VTUAV
(formerly VTOL UAV)**

U) COST: (Dollars in Thousands)

<u>Project Number & Title</u>	<u>FY 1999 Actual</u>	<u>FY 2000 Budget</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>
A2768 VTUAV (formerly VTOL UAV) Quantity of RDT&E Articles	0	38,277	63,842	48,478	19,422	0	0	0	170,019
			1						
TOTAL	0	38,277	63,842	48,478	19,422	0	0	0	170,019

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: VTUAV will provide users real-time and near-real-time data required to support ISR efforts without the use of manned aircraft or reliance on limited joint theater or national assets. Missions supported under ISR and accomplished by a VTUAV include over-the-horizon classification and targeting, mine countermeasures, battle management, chemical/biological agent reconnaissance and signals intelligence. The VTUAV would be an organic asset of the ship to which it is attached or deployed. The forte of the VTUAV is that it launches and recovers vertically and it can operate from any/all air capable ships as well as confined land based areas. Other capabilities of the VTUAV include: autonomous waypoint navigation; automatic launch and recovery of the vehicle both ashore and afloat; incorporation of a heavy fuel engine and the ability to incorporate modular mission payloads. The data from the VTUAV System would be provided to the user through standard DoD Command, Control, Communications, Computers and Intelligence (C4I) systems, architectures and protocols.

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BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2768

**PROJECT TITLE: VTUAV
(formerly VTOL UAV)**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 1999 Accomplishments: N/A
2. FY2000 Plan:
 - (U) (\$30,655) Initiate system design, fabrication and testing.
 - (U) (\$ 5,154) Government support of VTUAV proposal evaluations leading up to MSII decision and design evaluation.
 - (U) (\$ 2,468) Funds miscellaneous efforts including technical and management support and initial test efforts.
3. FY 2001 Plan:
 - (U) (\$47,083) Continue system design, fabrication and component testing. Procure initial LRIP.
 - (U) (\$10,375) Conduct operational assessment and initiate developmental testing
 - (U) (\$ 6,384) Funds miscellaneous efforts including technical and management support.

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2768

**PROJECT TITLE: VTUAV
(formerly VTOL UAV)**

(U) B. PROGRAM CHANGE SUMMARY

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY2001</u>
(U) FY 2000 President's Budget:	0	38,489	43,407
(U) Appropriated Value:	0	38,489	
(U) Adjustments from President's Budget:	0	-212	20,435
(U) FY2001 President's Budget Submit	0	38,277	63,842

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2000 decrease reflects a \$212 thousand decrease for an Across-the-Board Congressional rescission. FY 2001 net increase of \$20,435 thousand reflects a \$18 thousand increase for Military and Civilian Pay, a \$34 thousand increase for Navy Working Capital Fund(NWCF) adjustments, a \$44,520 thousand increase for Nassau MV-22 Integration; and is offset by a \$23,680 thousand decrease to fund Tactical Control System efforts, a \$91 thousand decrease for Strategic Sourcing Plans Savings, a \$199 thousand decrease for revised economic assumptions, and a \$167 thousand decrease for reprioritization of requirements within the Navy.

(U) Schedule: With the approval of the Direct Down-Select Strategy for the VTUAV program, the following schedule changes occurred: EMD will be initiated with contract award vice a follow on down select. The Critical Design Review (CDR) shifted from 4Q FY2000 to 1Q FY2001. The first Low Rate Initial Production (LRIP) system option shifted from FY2002 to FY2001 and the operational testing has shifted right one quarter.

(U) Technical: N/A

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(U) C. OTHER PROGRAM FUNDING SUMMARY:

<u>Appn</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To</u>	<u>Total</u>
<u>WPN</u>	<u>Budget</u>	<u>Budget</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	<u>Program</u>
						\$39,626	\$56,083	\$62,799	Continuing	Continuing

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT NUMBER: A2768

**PROJECT TITLE: VTUAV
(formerly VTOL UAV)**

(U) D. ACQUISITION STRATEGY: VTUAV program will have a combined Milestone I/Milestone II decision in 2Q FY2000. Development, fabrication and developmental test of the VTUAV system is scheduled to begin in FY 2000 and continue through FY 2001/2002. A low rate initial production decision is planned for FY 2001 with operational testing being conducted in FY 2002. A Milestone III decision is planned for 2Q FY 2003 and the initial operational capability (IOC) would occur during 4Q FY 2003. Initial planning has a VTUAV system defined as: air vehicles (A/Vs), ground control stations (GCSs), modular mission payloads, remote data terminals, and spares. Connectivity into the DOD C4I architecture would be provided by the GCS, which is to be TCS compatible. Although not currently designated as a joint program, the VTUAV program can accommodate Joint Services (Army, Navy and Marine Corps) as well as U.S. Coast Guard requirements into the acquisition planning process. A key objective of the VTUAV program would be to minimize the Total Ownership Cost (TOC) of the system while providing the maximum utility to the user.

(U) E. SCHEDULE PROFILE

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>				<u>FY2002</u>				<u>FY2003</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(U) Program Milestones																								
Program Initiation, MSI/II											X													
EMD											X	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	X		
MSIII																						X		
IOC																							X	
(U) Contract Milestones																								
Direct Down-Select											X													
LRIP 1														X										
(U) Engineering Milestones																								
CDR														X										
PRR																						X		
(U) T&E Milestones																								
Informal OPTEVFOR Eval											X	-----	X											
Developmental Testing													X	-----	-----	-----	-----	-----	-----	-----	-----	-----	X	
Operational Testing																						X	-----	

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EXHIBIT R-3, FY 2001 RDT&E,N COST ANALYSIS

DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2768

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

PROJECT TITLE: VTUAV
(formerly VTOL UAV)

<u>Cost Categories:</u>	<u>Contract Method & Type</u>	<u>Performing Activity & 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>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>Project Development Organizations</u>												
Design/Hardware Development	CPIFAF	TBD		0		30,655	02/00	47,083	03/01	CONT.	CONT.	TBD
Ship Reconfiguration Hardware	PD	NAVSEA Arlington, VA		0				1,564	11/00	CONT.	CONT.	
Subtotal Project Development						30,655		48,647		CONT.	CONT.	
Remarks:												
<u>Support Organizations</u>												
Development Support	WX	NAWC-AD Patuxent River, MD				2,935	11/99	2,484	11/00	CONT.	CONT.	
Logistics Training	WX	NSWC Indian Hd., MD				728	11/99	313	11/00	CONT.	CONT.	
Logistic Support	WX	NAWC Lakehurst, NJ				300	12/99					
Logistic Support	WX	NSWC Crane, IN				200	12/99					
Other						102	11/99	105	11/00	CONT.	CONT.	
Subtotal Support						4,265		2,902		CONT.	CONT.	

Remarks:

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DATE: February 2000

BUDGET ACTIVITY: 7

PROGRAM ELEMENT: 0305204N

PROJECT NUMBER: A2768

PROGRAM ELEMENT TITLE: Tactical Unmanned Aerial Vehicles

**PROJECT TITLE: VTUAV
(formerly VTOL UAV)**

<u>Cost Categories:</u>	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>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>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
<u>Test & Evaluation Organizations</u>												
Developmental Testing	WR	NAWC-AD Patuxent River MD				306	12/99	3,322	11/00	CONT.	CONT.	
Operational Testing	WR	OPTEVFOR Norfolk,VA				0		313	03/01	CONT.	CONT.	
Developmental Testing	TBD	TBD						6,740	03/01			
Subtotal Test & Evaluation						306		10,375		CONT.	CONT.	
Remarks:												
<u>Management Organizations</u>												
Technical and Management Support	FFP	H. J. FORD				1,300	10/99	1,570	10/00	CONT.	CONT.	TBD
Management Support	MP	CECOM/MITRE				390						
MISC.	VARIOUS	VARIOUS				1,361	10/99	348	10/00	CONT.	CONT.	
Subtotal Management						3,051		1,918		CONT.	CONT.	
Remarks:												
Total Cost						38,277		63,842		CONT.	CONT.	

**R-1 Item No. 190
UNCLASSIFIED**