CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification								DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7**						R-1 ITEM NOMENCLATURE 0305204N Tactical Unmanned Aerial Vehicles					
COST ($ in Millions)	Prior Years 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		**75.029**	**121.753**	**66.349**							
A2478 Tactical Control System		* **30.094**	**** **40.576**	**15.801**							
A2479 Applied Technology		** **10.109**	*** **14.749**								
A2768 VTUAV		**34.826**	**66.428**	**48.248**							
A2910 Joint Tactical Center/System Integration Lab				**2.300**							
Quantity of RDT&E Articles			**3**								

* The FY00 budget reflects a $3.000M Congressional add for the Tactical Control System executed under A2669; which, has been decreased by $.017M for Congressional undistributed reductions.

**The FY00 budget for PU A2479 reflects a $3.000M Congressional add for the Multi-function Self-Aligned Gate (MSAG) Array Technology executed under A2670; that has been decreased by $.017M for Congressional undistributed reductions.

*** The FY01 budget for PU A2479 reflects a $7.000M Congressional add for the MSAG Array Technology for Applied Technology; that will be executed under A2670.

**** The FY01 budget for PU A2478 reflects a $3.000M Congressional add for the Joint Forces Command Operational TestBed for TCS; that will be executed under A2669.

(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. Specificall

TCS: Efforts are underway to develop a Tactical Control System (TCS) to provide an interoperablity for command and control of the present and future Tactical and Medium Altitude Endurance (MAE) UAVs and their payloads utilized by the military services for RSTA and combat assessment. TCS has the requirement to provide connectivity to service designated C4I systems and the objective requirement to interface with Global Hawk High Altitude Endurance (HAE) UAV system. TCS is being developed in concert with the development of UAV concept of operations so as to ensure system functionality satisfies operational requirements. TCS development and testing is being accomplished via a Government/Industry team. In FY2000 Raytheon assumed total system performance responsibility for all software block developments.

Applied Technology(AT): AT supports the advancement of systems on the Naval UAV Roadmap/Long Range Plan, including P3I of currently fielded or EMD programs, requirements definition efforts, support to CONOPS development efforts, and technology transition from science and technology efforts, leading to the next generation of Naval UAVs. Current AT efforts include the UAV Advanced Technology Review Board(ATRB), the Multi-Role Endurance (MRE) UAV requirements definition effort, small UAVs and miniaturized payloads and UAVs in Network Centric Warfare. AT also 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.

R-1 SHOPPING LIST - Item No. 209

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification	DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY BA-7**	R-1 ITEM NOMENCLATURE 0305204N Tactical Unmanned Aerial Vehicles

VTUAV: 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 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.

JTC/SIL: The Joint Tactical Center/System Integration Laboratory provides a test- bed for UAV technology assessment, insertion, demonstration, and transfer, as well as simulation and excerise support.

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

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EXHIBIT R-2a, RDT&E Project Justification								DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0305204N Tactical Unmanned Aerial Vehicles					PROJECT NUMBER AND NAME A2478 Tactical Control System					
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		* **30.094**	** **40.576**	**15.801**							
RDT&E Articles Qty (EDU)		**2**									

* The FY00 budget reflects a $3.000 M Congressional add for the Tactical Control System executed under A2669; which, has been decreased by $.017 M for Congressional undistributed reductions.
** FY01 budget reflects a $3.000M Congressional add for the Joint Forces Command Operational Testbed; which will be executed under A2669.

(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 capabilities 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 wherever 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, supports the assessment of system integration readiness prior to actual flight-testing. 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.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:

- (U) ($ 2.443) Completed testing of Engineering Development Units (EDU's) #1 and #2 and C4I certification.
- (U) ($23.086) Initiated development of TCS Block 1 (TUAV EDU #3) and Block 2 (VTUAV, MAE back-fit ECP, EDU #4).
- (U) ($ 4.565) Initiated development of training systems for TCS Blocks 1 and 2.

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-7	0305204N Tactical Unmanned Aerial Vehicles	A2478 Tactical Control System

(U) PROGRAM ACCOMPLISHMENTS AND PLANS: (continued)

2. FY 2001 PLANS:

- (U) ($ 1.284) Completed software development and Developmental Testing (DT) of TCS Block 0 (EDU #2).
- (U) ($30.775) Continue development of TCS Block 1 (TUAV), conduct DT through Laboratory System Integration Test (LSIT) with EDU #3, and continue development of TCS Block 2 (VTUAV), MAE back-fit ECP, EDU #4 *.
- (U) ($ 3.244) Continue development of training systems for TCS Block 2.
- (U) ($ 2.300) Continue Joint Technology Center/Systems Integration Lab (JTC/SIL) Multiple UAV Simulation Environment (MUSE) efforts.
- (U) ($ 2.973) Support Joint Operational Test Bed System testing & experimentation support, system upgrades and risk reduction operations.

3. FY 2002 PLANS:

- (U) ($14.601) Complete development of TCS Block 1 (TUAV) and DT with EDU #3, and continue development of TCS Block 2 (VTUAV).
- (U) ($ 0.500) Continue General Test Support for Multiple Link Atenna System/Multi-function Self-Aligned Gate Array Technolgoy (MLAS/MSAG).
- (U) ($ 0.700) C4I Testing/Certification Assessments.

* This line does not represent a programmatic change. Block 1 and Block 2 are being developed concurrently by Raytheon under a single contract.

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-7	0305204N Tactical Unmanned Aerial Vehicles	A2478 Tactical Control System

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	27.401	41.378	18.954
(U) Adjustments from the President's Budget:	2.693	-0.802	-3.153
(U) FY 2002 President's Budget Submit:	30.094	40.576	15.801

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2000 net increase of $2.693 million consists of a $2.800 million internal reprograming effort from project unit A2768 for accelerated TCS hardware buy to realign schedule with Navy/Marine Corps VTUAV program and a decrease of $0.107 million for a Congressional Recission. The FY 2001 net decrease of $0.802 million consists of a $3.300 million decrease for an internal reprogramming effort to project unit A2768 for FY 01 VTUAV requirements, a $0.058 million decrease for reprioritization of requirements within the Navy, a $0.339 million decrease for a Congressional Reduction, a $3.000 million Congressional add for Joint Operational Testbed System, and a $0.105 million decrease for a Congressional Recission. The FY 2002 net decrease of $3.153 million consists of a $0.125 million decrease for reprioritization of requirements within the Navy, a $3.000 million decrease for Joint Operational Test Bed reprioritization, and a $0.032 million decrease for economic assumptions.

(U) Schedule:

The TCS schedule has been updated to reflect program realignment with the Army's TUAV and the Navy/Marine Corps VTUAV programs. In addition, program, engineering, test & evaluation, and contract milestone terminologies have been updated to reflect standard nomenclature and a more accurate description of terminology used in the current contract.

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY: N/A

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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-7	0305204N Tactical Unmanned Aerial Vehicles	A2478 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 System Design Test and Integration 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 Milestone III, 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:

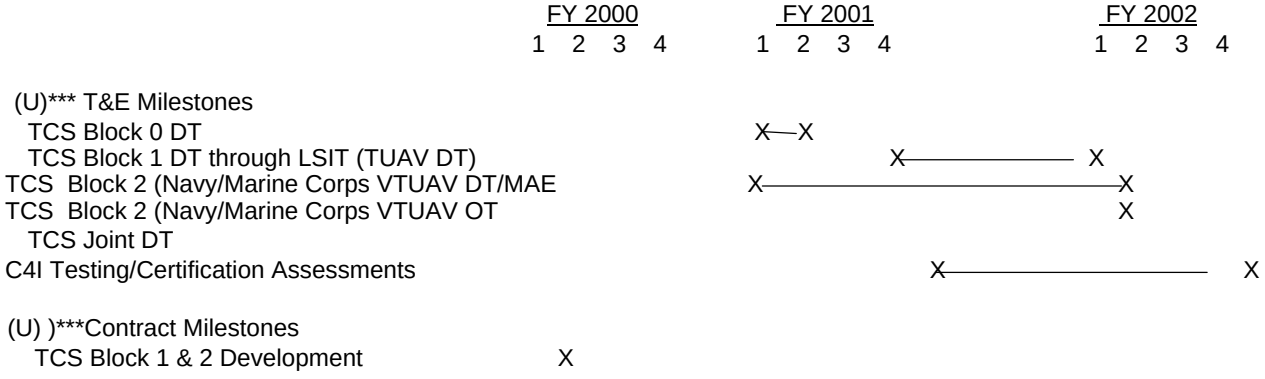
	FY 2000	FY 2001	FY 2002
	1 2 3 4	1 2 3 4	1 2 3 4
*** (U) Program Milestones			
TCS MS II	X		
Army TUAV MS III			X
Navy Marine Corps VTUAV MS III			
Air Force MAE BACKFIT ECP			X
(U) Engineering Milestones			
Engineering Design Unit (EDU) Deliveries	X	X X	X

*** Note: EDU Delivery on previous budget submission was move from Program Milestones to Engineering Milestones to replace VTUAV and MAE/TUAV interoperability. Each EDU delivery represents their respective interoperabiity (i.e VTUAV or MAE/TUAV). EMD Start was removed from Program Milestones due to redundancy with TCS MS II.

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-7	0305204N Tactical Unmanned Aerial Vehicles	A2478 Tactical Control System

(U) E. SCHEDULE PROFILE: Continuation.



***Note: The following T&E milestones from the previous budget submission have been changed: Launch and Recovery is now incorporated into TCS Block 0 DT. C4I integration is included in each event. EDU Land-Based DT is incorporated into TVS Block 2; EB6 Pioneer Demo was removed from the program due to no future integration planned; TUAV IOT&E is incorporated into TCS Block 1 OT. In Contract Milestones, TCS Block 1 & 2 Development is a more accurate description than previously submitted terminology (VTUAV/TUAV SI Award).

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)											DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2478 Tactical Control System							
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
Tactical Control System Development	C/CPAF	Raytheon, Falls Church, VA	17.406	22.420	02/01	10.659	11/01					
Joint Operational TestBed System	WX	USJFCOM, Norfolk, VA	0.000	2.973	05/01	0.000						
TUAV System	MIPR	TUAV, Redstone, Al		0.808	11/00	0.000						
Award Fees	C/CPAF	Raytheon, Falls Church,VA		0.921	09/01	0.658	09/02					
Subtotal Product Development			17.406	27.122		11.317						
Remarks: Raytheon contract includes: Primary Software Development, Hardware Engineering, Systems Engineering, and Systems Integration												
Systems Engineering	WX	NSWC-Dalhgren, VA	2.740	1.704	11/00	0.782	12/01					
Systems Engineering	WX	NAWCAD, Pax River, MD	1.125	1.200	12/00	0.558	12/01					
MUSE	MIPR	JTC/SIL, Huntsville, AL	1.500	2.300	11/00	0.000						
Logistics Support	WX	Various	1.100	0.360	12/00	0.342	12/01					
Training	WX	NSWC-IH, Indian Head, MD	2.340	3.244	12/00	0.166	12/01					
Technical Engineering Services	WX	NAWCAD, Pax River, MD/Other	0.000	1.531	12/00	1.088	12/01					
Human Computer Interface Develop	WX	NAWCAD, Pax River, MD	0.300	0.200	10/00	0.000	12/01					
Subtotal Support			9.105	10.539		2.936						
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)						DATE: **June 2001**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2478 Tactical Control System						
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	MIPR	JITC, FT Huachuca, AZ	0.000	0.749	10/00	0.700	12/01					
Developmental Test & Evaluation	WX	Various	1.070	0.984	02/01	0.000						
Operational Test & Evaluation	WX, MIPR	Various	1.480	0.000		0.000						
General Test Support	WX	NSWC-Dalgren, VA	0.000	0.500	03/01	0.500	12/01					
Subtotal T&E			2.550	2.233		1.200						
Remarks:												
Contractor Engineering Support	C/FFP	Summit, Waldorf, MD	0.100	0.000		0.000						
Government Engineering Support	WX	NAWCAD, Pax River, MD	0.300	0.000		0.000						
Program Management Support	WX	Various	0.313	0.334	04/01	0.214	12/01					
Travel/Misc.	WX, MIPR	Various	0.320	0.348	10/00	0.134	12/01					
Subtotal Management			1.033	0.682		0.348						
Remarks:												
Total Cost			30.094	40.576		15.801						
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification								DATE: June 2001			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0305204N Tactical Unmanned Aerial Vehicles					PROJECT NUMBER AND NAME A2479 Applied Technology (AT)					
COST ($ in Millions)	Prior Years Cost	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Program
Project Cost		* **10.109**	** **14.749**								
RDT&E Articles Qty											

*The FY00 budget reflects a $3.000 M Congressional add for the Multi-function Self Aligned Gate Array Technology (A2479) executed under A2670; which, has been decreased by $.017 M for Congressional undistributed reductions.

**The FY01 budget reflects a $7.000 M Congressional add for the Multi-function Self-Aligned Gate (MSAG) Array Technology for the Applied Technology (A2479); which will be executed under A2670.

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

Applied Technology (AT) supports the advancement of systems on the Naval UAV Roadmap/Long Range Plan, including P3I of currently fielded or EMD programs, requirements definition efforts, support to CONOPS development efforts, and technology transition from science and technology efforts, leading to the next generation of Naval UAVs. Current AT efforts include the UAV Advanced Technology Review Board (ATRB), the Multi-Role Endurance (MRE) UAV requirements definition effort, small UAVs and miniaturized payloads, and UAVs in Network Centric Warfare. AT is leading exploration of MRE concepts to better define system requirements. These defined requirements will then enable technology pull to draw industry into this growth area. Similar efforts are underway to develop mission definition and analysis for the Small and Micro UAVs. AT's technology focus also encourages approaches that are expected to address needs of Unmanned Combat Air Vehicle Systems. AT is the acquisition lead for the Naval UAV Advanced Technology Review Board (ATRB). The ATRB effort supports development of requirements definition and technology transition into existing and future Naval UAV programs. AT is also the focal point for working international initiatives to improve UAV integration into NATO Task Force Operations.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:
   - (U) ($ 1.920) Initiated and supported requirements definition, integration, demonstration, and test of growth payloads/small UAVs.
   - (U) ($ 2.583) Developed Naval MRE UAV concepts of operation. Awarded multi contracts for MRE risk assessments. Completed Phase I of contract, Mission Area Analysis and Missions Need Analysis.
   - (U) ($ 2.070) Demonstrated operational utility of key technologies endorsed by the UAV ATRB.
   - (U) ($ 0.553) Continued international initiatives to improve UAV integration into NATO Task Force Operation and common international support efforts.
   - (U) ($ 2.983) Conducted Congressionally-directed research of Multi-Link Antenna System (MLAS) active array antenna using MSAG technology. MLAS approved as ACTD New Start
2. FY 2001 PLANS:
   - (U) ($2.642) Complete requirements definition, integration, demonstration, and test of small UAV for USMC Interim Small Unit Remote Scouting System (I-SURSS) effort.
   - (U) ($2.462) Complete Phase II, System Design and Definition and Phase III, Systems Analysis and Risk Assessment of the MRE contracts.
   - (U) ($2.437) Complete demonstration of operational utility of key technologies endorsed by the UAV ATRB, including Touch Down Predictability (TDP) Landing Aid, and Plug and Play Modular Mission Payload (MMP) contracts.
   - (U) ($0.208) Support international initiatives to improve UAV integration into NATO Task Force Operations and common international support efforts.
   - (U) ($7.000) Continue to execute design, engineer and manufacture components using MSAG Technology for MLAS Demonstration.

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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-7	0305204N Tactical Unmanned Aerial Vehicles	A2479 Applied Technology (AT)

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	9.647	7.832	7.335
(U) Adjustments from the President's Budget:	0.462	6.917	-7.335
(U) FY 2002 President's Budget Submit:	10.109	14.749	0.000

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2000 net increase of $0.462 million consists of a $0.500 million for the Multi-role Endurance UAV effort, offset by a decrease of $0.038 million for a Congressional Rescission. The FY 2001 net increase of $6.917 million consists of a $7.000 million increase for a Congressional add for Multi-function Self Aligned Gate Array Technology offset by a $0.055 million decrease for a Congressional Reduction, a decrease of $0.017 for a Congressional Rescission, and a $0.011 million decrease for reprioritization of requirements within the Navy. The FY 2002 net decrease consist of $7.335 million for reprioritization of requirements within the Navy.

(U) C. OTHER PROGRAM FUNDING SUMMARY: N/A

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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-7	0305204N Tactical Unmanned Aerial Vehicles	A2479 Applied Technology (AT)

(U) D. ACQUISITION STRATEGY:The key objectives of this program element are: Technology transition and insertion of emerging technologies to Naval UAV programs to address warfighter needs; Requirements definition and roadmapping in support of the Naval UAV Roadmap/Long Range Plan, including CONOPS development efforts and feedback into the development and acquisition process; Development of Naval UAV Network Centric Warfare Concepts; International cooperation to avoid unnecessary and costly duplication and enhance interoperability; And focusing basic research on future needs through the ATRB process. AT supports the ATRB, the MRE requirements definition effort, small UAVs and miniaturized payloads, and UAVs in Network Centric Warfare, including P3I of currently fielded or EMD programs, requirements definition efforts, and technology transition from science and technology efforts, leading to the next generation of Naval UAVs. Participates in international cooperative agreements to share common interest developments.

(U) E. SCHEDULE PROFILE:

	FY 2000				FY 2001			
	1	2	3	4	1	2	3	4
T&E Milestones								
Comms Relay Demo			X					
Pan-tilt-zoom for IR Microcam			X					
Real-time Precision Targeting Demos	X			X				
Small UAV Rqmts Def and CONOPS Dev/Tests (I-SURSS)						X		
Ship Based UCARS TDP Landing Aid Dev/Tests							X	
MMP Plug and Play Dev/Tests							X	
See and Avoid Validation efforts			X				X	
Contracts Milestones								
New technology demos					X			
Pan-tilt-zoom for IR Microcam				X				
Real-time Precision Targeting Demos				X				
Comms Relay Demo			X					
MRE Risk Assessment			X	X	X			

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA7**			PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2479 Applied Technology (AT)						
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
Product Development	Sect 845	Boeing, Long Beach, CA	0.781	0.246	01/01							
	Sect 845	Lockheed, Ft. Worth, TX	0.660	0.221	01/01							
	Sect 845	GDIS, Bloomington, MN	0.446	0.231	01/01							
	Sect 845	Northrop, Pico Rivera,CA	0.700	0.201	01/01							
	C/FFP	Aeroteam, Petach Israel	0.220									
	Sect 845	ITT Gilfillan, Nuys, CA	2.089									
	Sect 845	Battlespace, Arlington, VA	0.435									
	C/FFP	Sierra Nevada, Sparks, NV	0.250	0.250	12/00							
	WX	NSWC Indian Head, MD	0.234	0.250	12/00							
	PD	NAVSEA,Washington DC	0.370	0.750	12/00							
	MIPR	Joint Spectrum Center, MD		0.300	04/01							
	WX	NAWCAD, Pax River, MD		0.700	04/01							
MSAG	WX/RX	NSWC DD Dahlgren, VA		7.000	12/00							
Subtotal Product Development			6.185	10.149		0.000						

Remarks:

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)											DATE: **June 2001**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2479 Applied Technology (AT)						
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
Technical & Engineering Support	WX	NAWCWD, China Lake, CA	0.650	0.155	12/00							
Technical & Engineering Support	WX	NAWCAD, Pax Riv., Md	0.665	1.704	12/00							
Technical & Engineering Support	WX	NSWC Crane, IN.	0.150									
Technical & Engineering Support	WX	NSWC, Dahlgren, VA.	0.570									
Subtotal Support			2.035	1.859		0.000						

Remarks:

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Exhibit R-3 Cost Analysis (page 2)						DATE: **June 2001**						
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2479 Applied Technology (AT)						
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
Demonstration/Exercises	WX	NAWCAD, Pax Riv	0.950	0.890	12/00							
Demonstration/Exercises	WX	NAWCWD, China Lake, CA		0.600	12/00							
Demonstration/Exercises	WX	NSWC Crane, IN		0.100	12/00							
Subtotal T&E			0.950	1.590		0.000						
Remarks:												
Program Management Support	WX,RX	Various/Pax Riv, Md	0.839	0.750	04/01							
Travel	WX	NAWCAD, Pax Riv, Md	0.100	0.100	12/00							
Miscellaneous	WX	Various		0.301	12/00							
Subtotal Management			0.939	1.151		0.000						
Remarks:												
Total Cost			10.109	14.749		0.000						
Remarks:												

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CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification									DATE: June 2001		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0305204N Tactical Unmanned Aerial Vehicles					PROJECT NUMBER AND NAME A2768 Vertical Take-off Landing UAV					
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		**34.826**	**66.428***	**48.248**							
RDT&E Articles Qty		2	3								

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: 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. The quantities above represent the air vehicle and payload hardware sets procured in EMD and LRIP 1.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2000 ACCOMPLISHMENTS:
   - (U) ($28.053) Awarded EMD contract for system design, fabrication and testing
   - (U) ($ 4.551) Continued Government support of VTUAV proposal evaluations leading up to MSII decision, design evaluation, test and engieering support and logistics support. Initiated integration support.
   - (U) ($ 2.222) Funded miscellaneous EMD efforts including technical and management support and initial test efforts

2. FY 2001 PLANS:
   - (U) ($54.067) Continue contractor EMD system design, fabrication and component testing. Procure initial LRIP
   - (U) ($ 5.630) Continue test & engineering, logistics and integration support
   - (U) ($ 2.453) Conduct operational assessment and initiate developmental testing
   - (U) ($ 4.278) Continue contractor engineering management, program technical management and management support

3. FY 2002 PLANS:
   - (U) ($34.014) Continue contractor EMD design, fabrication and testing
   - (U) ($ 7.616) Continue test & engineering, logistics and integration support
   - (U) ($ 2.727) Complete developmental testing and initiate operational test and evaluation
   - (U) ($ 3.891) Continue contractor engineering management, program technical management and management support

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-7	0305204N Tactical Unmanned Aerial Vehicles	A2768 Vertical Take-off Landing UAV

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:	38.277	63.842	48.478
(U) Adjustments from the President's Budget:	-3.451	2.586	-0.230
(U) FY 2002 President's Budget Submit:	34.826	66.428	48.248

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2000 net decrease of $3.451 million consists of a $3.300 million decrease for an internal reprogramming effort to project units A2478 and A2768, and a $0.151 million decrease for a Congressional recission. FY2001 net increase of $2.586 million consists of a $3.300 million increase for an internal re-programming effort from project unit A2478 for FY 2001 VTUAV requirements offset by a $0.145 million decrease for a Congressional Rescission, $0.101 decrease for reprioritization of requirements within the Navy, and a $0.468 million decrease for Congressional Reductions. The FY 2002 net decrease of $0.230 million consists of a $0.202 million decrease for reprioritization of requirements within the Navy and a $0.038 million decrease for economic assumptions.

(U) Schedule: LRIP 1 has shifted to 3rd Qtr FY 2001. IDR and FDR were previously submitted as CDR and PRR, respectively. These are the same reviews but the titles have been changed so that contract and program terminology agrees. The operational assessment will start in 1Q for FY01 vice 3Q FY 00.

(U) Technical: Not Applicable

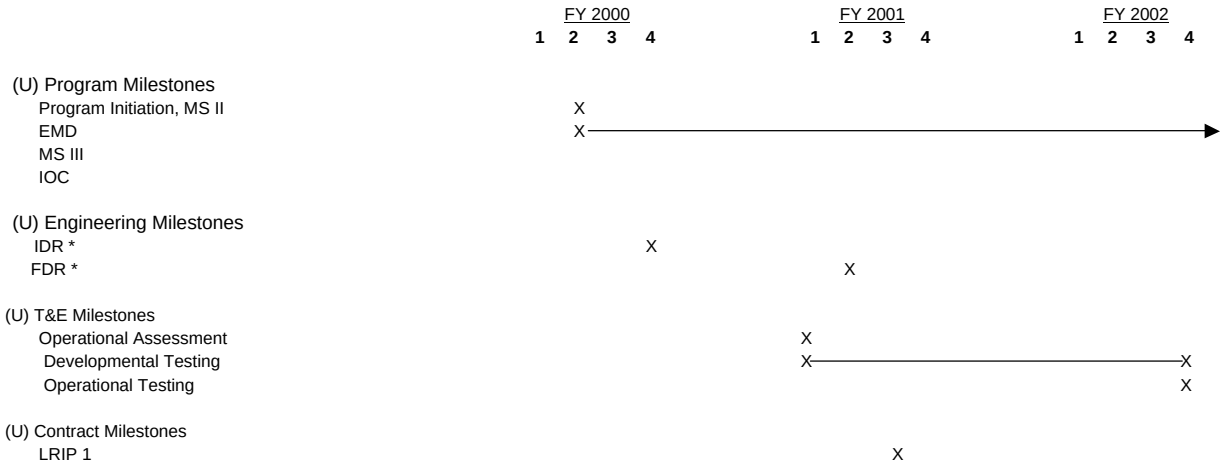
(U) C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable

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-7	0305204N Tactical Unmanned Aerial Vehicles	A2768 Vertical Take-off Landing UAV

(U) D. ACQUISITION STRATEGY: VTUAV program had 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 providin the maximum utility to the user.

(U) E. SCHEDULE PROFILE:



* IDR and FDR was previously submitted as CDR and PRR, respectively, these are the same reviews but the titles have been changed so that contract and program terminology agrees. In addition, the term Operational Assessment, which is the correct effort, replaces the Informal OPTEVFOR Eval.

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)								DATE: **June 2001**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2768 Vertical Take-off Landing UAV						
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
Design/Hardware Development	C/CPIFAF	NGC-Ryan, San Diego, CA	27.081	53.598	04/01	30.999	02/02					
Award Fees	C/CPIFAF	NGC-Ryan, San Diego,CA	0.972	0.469	12/01	3.015	04/02					
Subtotal Product Development			28.053	54.067		34.014						
Remarks:												
Test & Engineering Support	WX	NAWC-AD, Pax River, MD	2.533	2.260	11/01	2.595	11/02					
Logistics -Training Development	WX	NSWC, Indian Head, MD	0.395	0.615	11/01	1.413	11/02					
Logistics - Technical Data	WX	NSWC, Crane, IN	0.300	0.300	11/01	0.300	11/02					
Logistics Technical Support	WX	NAWC-WD, Lakehurst, NJ	0.280	0.560	11/01	0.605	11/02					
Logistics Technical Support	WX	NAWC-AD, Pax River, MD	0.290	0.945	11/01	0.787	11/02					
Ship Integration Support	PD	NAVSEA, Arlington, VA	0.600	0.950	12/01	1.916	11/02					
Ship Integration Support	WX	NSWC, Indian Head, MD	0.153									
Subtotal Support			4.551	5.630		7.616						
Remarks:												

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CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)											DATE: **June 2001**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**		PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles				PROJECT NUMBER AND NAME A2768 Vertical Take-off Landing UAV						
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	WR	NAWC-AD, Pax River, MD	0.306	1.608	12/00	1.198	12/01					
Operational Test & Evaluation	MIPR	VARIOUS	0.097	0.455	03/01	1.139	03/02					
Range Testing	WX	China Lake, CA		0.390	10/00	0.390	11/00					
Subtotal T&E			0.403	2.453		2.727						
Remarks: Operational Test & Evaluation performing activities include OPTEVFOR and MCOTEA.												
Contractor Engineering Management	C/FFP	H.J. Ford, Lexington Park, MD	1.297	1.400	11/00	1.300	11/01					
Program Technical Management	WX	NAWC-AD, Pax River, MD		1.050	11/00	1.120	11/01					
Program Management	MIPR	CECOM/MITRE	0.390	0.205	11/00	0.175	11/01					
Travel	WX	NAWC-AD, Pax River, MD	0.132	0.105	11/00	0.105	11/01					
Miscellaneous	Various	Various		1.518	11/00	1.191	11/01					
Subtotal Management			1.819	4.278		3.891						
Remarks:												
Total Cost			34.826	66.428		48.248						
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification								DATE: **June 2001**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0305204N Tactical Unmanned Aerial Vehicles					PROJECT NUMBER AND NAME A2910 Joint Tactical Center/System Integration Lab					
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		*	*	**2.300**							
RDT&E Articles Qty (EDU)											

* The FY 02 - FY 07 budget reflects an OSD adjustment per PBD 220C which will be executed under A2910. These efforts were previously executed under PU A2478, Tactical Control System.

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

The JTC/SIL is the center of technical excellence for the DoD family of UAVs including tactical, medium altitude, high altitude endurance, and future UAVs. This joint facility provides a cost-effective test-bed for UAV technology assessment, insertion, demonstration, and transfer, as well as simulation and exercise support.

A primary product being developed by the JTC/SIL is the Multiple Unified Simulation Environment (MUSE) which is a system that provides a real-time, interoperable hardware, and operator-in-the-loop simulation environment of multiple intelligence systems that is integrated with larger force on force simulations. It creates a realistic operational environment which supports: an embedded training capability for multiple Program Managers; tools to minimize acquisition and life cycle costs and schedule impacts; a mechanism for the assessment of military utility; architecture, CONOPS, and TTP development and refinement; the ability to conduct emerging concepts experimentation, future systems exploration, systems integration, and technology insertion; applications for Joint and Service specific warfighting exercises; and C4I Optimization. Canada and the United Kingdom have established TCS FMS cases have procured MUSE software/hardware.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2002 PLAN:
   - (U) ($0.367) Laboratory sustainment
   - (U) ($1.033) MUSE/AFSERS development
   - (U) ($0.900) Maintenance, licenses, and equipment purchases

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-7	0305204N Tactical Unmanned Aerial Vehicles	A2910 Joint Tactical Center/System Integration Lab

(U) B. PROGRAM CHANGE SUMMARY:

	FY2000	FY2001	FY2002
(U) FY 2001 President's Budget:			0.000
(U) Adjustments from the President's Budget:			2.300
(U) FY 2002 President's Budget Submit:			2.300

CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 2002 net increase of $2.300 million is for Joint Tactical Center/System Integration Lab (JTC/SIL).

(U) Schedule: The JTC/SIL schedule is determined by a MUSE User's Working Group which meets semi-annually to determine recommended development priorities and is approved by a Council of Colonels with representation from each Service and JFCOM with oversight by OASD C3I and USD AT&L.

(U) Technical: N/A

(U) C. OTHER PROGRAM FUNDING SUMMARY: N/A

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-7	0305204N Tactical Unmanned Aerial Vehicles	A2910 Joint Tactical Center/System Integration Lab

(U) D. ACQUISITION STRATEGY:
The JTC/SIL assists ISR system Program Managers with expertise in systems engineering, prototyping, training, and warfighter support.
This joint facility provides a cost-effective test-bed for UAV and ISR technology assessment, insertion, demonstration, and transfer, as well as simulation and exercise support. It creates a realistic operational environment which supports: an embedded training capability for multiple Program Managers; tools to minimize acquisition and life cycle costs and schedule impacts; a mechanism for the assessment of military utility; architecture, CONOPS, and TTP development and refinement; the ability to conduct emerging concepts experimentation, future systems exploration, systems integration, and technology insertion; applications for Joint and Service specific warfighting exercises; and C4I Optimization.

	FY 2000	FY 2001	FY 2002
	1 2 3 4	1 2 3 4	1 2 3 4
***(U) Program Milestones			
User's Working Group			X X
Council of Colonels			X X
(U) Engineering Milestones			
AVSI TCS BL I Update			X
AVSI TCS BL II Update			X
Devlopment Advanced Tactical Aerial Reconnaissance System simulation			X
P3 Flight Model			X
VTUAV Flight Model			X
Integrate JSIPS-N			X
National Space Assets Enhancements			X

EXHIBIT R-2a, RDT&E Project Justification		DATE: **June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME 0305204N Tactical Unmanned Aerial Vehicles	PROJECT NUMBER AND NAME A2910 Joint Tactical Center/System Integration Lab

(U) E. SCHEDULE PROFILE: Continuation.

TO COMPLETE

(U) T&E Milestones N/A

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: **June 2001**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**		PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2910 Joint Tactical Center/System Integration Lab							
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
MUSE Development	C/CPFF	Redstone Arsenal, AL				1.033	11/01					
Award Fees												
Subtotal Product Development						1.033						
Remarks:												
Development equipment purchases	C/FFP	Redstone Arsenal, AL				0.900	11/01					
Subtotal Support						0.900						
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE:		**June 2001**
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT 0305204N Tactical Unmanned Aerial Vehicles			PROJECT NUMBER AND NAME A2910 Joint Tactical Center/System Integration Lab						
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
Subtotal T&E												
Remarks:												
Laboratory Sustainment	C/FFP	Redstone Arsenal, AL				0.367	11/01					
Subtotal Management						0.367						
Remarks:												
Total Cost						2.300				Continuing	Continuing	
Remarks:												

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