RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE FEBRUARY 2002
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 7	R-1 ITEM NOMENCLATURE PE1160402BB Spec Operations Advanced Technology Development

COST (Dollars in Millions)	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Cost to Complete	Total Cost
PE1160402BB	13.454	10.982	62.276	62.593	42.023	18.322	14.539	Cont.	Cont.
S200 SPECIAL OPERATIONS SPECIAL TECHNOLOGY	13.454	10.982	62.276	62.593	42.023	18.322	14.539	Cont.	Cont.

A. Mission Description and Budget Item Justification

This program element conducts rapid prototyping and advanced technology demonstrations. It provides a means for demonstrating and evaluating emerging/advanced technologies in as realistic an operational environment as possible by Special Operations Forces users. Evaluation results are included in a transition package which assists in the initiation of or insertion into an acquisition program. The program element also addresses projects that are a result of unique joint, special mission, or area-specific needs for which a few-of-a-kind prototypes must be developed on a rapid response basis, or are of sufficient time sensitivity to accelerate the prototyping effort of a normal acquisition program in any phase.

Change Summary Explanation:

Funding:
--This program element received $3 million of FY 2002 Defense Emergency Response Funds for an Unmanned Aerial Vehicle.
--FY 2002 Congressional Actions:
SOF Aircraft Defensive Systems ($2 million)
Electronic Digital Compass System ($1.4 million)

Schedule: None.

Technical: None.

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B. Program Change Summary	FY 2001	FY 2002	FY 2003
Previous President's Budget	13.615	7.582	8.276
Appropriated Value	14.028	10.982	
Adjustments to Appropriated Value / President's Budget	(.574)		54.000
Current Budget Submit	13.454	10.982	62.276

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COST (Dollars in Millions)	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Cost to Complete	Total Cost
S200, Special Operations Special Technology	13.454	10.982	62.276	62.593	42.023	18.322	14.539	Cont.	Cont.

A. Mission Description and Budget Item Justification

This project conducts rapid prototyping and Advanced Technology Demonstrations (ATDs). It provides a means for demonstrating and evaluating the utility of emerging/advanced technologies in as realistic an operational environment as possible by Special Operations Forces (SOF) users. This project integrates efforts with each other and conducts technology demonstrations in conjunction with joint experiments and other assessment events. Evaluation results are included in a transition package, which assists in the initiation of or insertion into an acquisition program. The project also addresses sub-projects that are a result of unique joint, special mission, or area-specific needs for which a few-of-a-kind prototypes must be developed on a rapid response basis, or are of sufficient time sensitivity to accelerate the prototyping effort of a normal acquisition program in any phase. Sub-projects include:

- Advanced Sensors. ATD to provide SOF with an integrated hand-held, multi-sensor reconnaissance capability to observe, locate, and report on targets.
- Advanced Sniper Weapon Fire Control. Full wind vector ballistic solution at extended range (1200 meters).
- Antenna Enhancement. High bandwidth receiver/transmitter conformal antennas for SOF platforms.
- Battery Recharging System. Technologies providing SOF operators capability to recharge batteries or reduce number of batteries required with portable lightweight recharging systems.

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- Burst Comms and Low Probability of Detection (LPD) Antenna. LPD antenna system for maritime platforms permitting multiband Low Probability of Intercept/Detection (LPI/D) communications.
- Integrated Bridge System. A system that enhances maritime craft bridge-console and operator interface through human factor engineering and integration with console design and displays.
- Intrusion Sensor. A miniature, multi-sensor system to detect local threats.
- LPI/D Imagery Forwarding. Demonstrate a short range, self-forming, self-queuing, high data rate, networked communications link for SOF applications.
- Night Vision Electro-Optic Enhancements. Enhance night vision capability in lightweight systems.
- Remote Miniature Weather Station. Man-portable, airdrop capable weather sensors with a transmission system for terrestrial based unattended weather collection operations.
- Penetrating Aircraft Terrain Following/Terrain Avoidance (TF/TA). LPI/D radar technology for SOF penetrating platforms.
- SEAL Delivery Vehicle (SDV) Airdrop. Assess and develop the capability to airdrop an SDV.
- Signals Intelligence (SIGINT). Identification of advanced SIGINT technologies for use in the Joint Threat Warning Systems (JTWS).
- SOF Enhanced Weapons. Weapons and munitions prototypes for increased range, improved accuracy, and improved performance against hardened targets.

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- SOF Robotics. Leverage air, ground, and maritime robotics technology for SOF evaluations to determine operational utility.
- Tactical Personal Computer. Demonstrate advanced wearable computer technology for SOF special reconnaissance and combat control team applications.
- Underwater Adhesives. Demonstrate advanced adhesive technologies for emplacing underwater demolitions.
- SOF Combatant Craft. Fabricate and test a high speed, variable freeboard for the insertion and extraction of SOF.
- Littoral Warfare Craft. Demonstrate a high speed, medium range watercraft that submerges on target, which can perform insertion/extraction missions.
- Vehicle Camouflage System. Easy on/off camouflage system for SOF vehicles providing mission ready advanced camouflage.
- Aircraft Experimentation (AC-X). Develop and explore the emerging technologies for the next generation of the AC-130 gunship.
- SOF Aircraft Defense Systems. Upgrade APR-46 system and replace analog circuits and digital circuits with new cardset.
- Electronic Digital Compass System. Develop an electronic digital compass system.

FY 2001 ACCOMPLISHMENTS:

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- (1.871) SOF Command, Control, Communications, Computers, and Intelligence (C4I) ATDs. Completed development and evaluation of FY00 sub-projects. Continued to exploit emerging technologies to conduct ATDs that provide SOF with a robust C4I capability to ensure uninterrupted information exchange, influence situations to support mission accomplishments, and reduce an adversary's ability to use information. Exploited emerging technology to conduct ATDs that provide SOF with increased sensory performance. Exploited emerging technologies to locate and track targets or items of interest. Sub-projects included: continued night vision enhancements, LPI/D imagery link/forwarding, tactical personal computer, SIGINT technologies, communications suite for robotics and other tactical uses, acoustic sensors and intelligence systems, and the remote weather station. Initiated projects for conformal antennas, burst communications from platforms and other tactical communications. (1QTR01-3QTR01).

- (2.190) SOF Mobility ATDs. Completed development and evaluation of FY00 sub-projects. Continued to exploit emerging technologies to conduct ATDs that provide SOF with survivable mobility operations in high threat areas and with enhanced situational awareness. Exploited emerging technologies to conduct ATDs that provide SOF mobility assets with a reduction in logistic support requirements. Exploited emerging technologies to rapidly deploy and extract SOF personnel and craft. Exploited technologies to allow reconnaissance and conduct direct action in high threat areas using unmanned systems. Sub-projects included: completed penetrating aircraft TF/TA, continued systems and mobility enhancements for robotic platforms. Initiated projects for a SDV airdrop system, SDV periscope, and vehicle camouflage system. (2QTR01-3QTR01).

- (1.063) SOF Weapons ATDs. Completed development and evaluation of FY00 sub-projects. Continued to exploit emerging technologies to conduct ATDs that provide SOF with multi-role/multi-purpose weapons and demolitions with a broader range of potential effects and increased accuracy. Sub-projects included: continued active denial technologies, completed advanced wind sensors for sniper weapons, SOF enhanced weapons. Initiated projects for a 25mm SOF payload rifle. (2QTR01-3QTR01).

- (1.160) SOF Sustainment ATDs. Continued development and evaluation of FY00 sub-projects. Continued to exploit emerging technologies to conduct ATDs that provide SOF with increased survivability and performance. Sub-projects included: continue Naval Special Warfare (NSW) equipment waterproofing, the intrusion sensor system and the battery recharging system. (1QTR01-3QTR01).

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- (0.329) Technology Exploitation Initiative (TEI). Exploit emerging technology to meet critical SOF requirements and encourage industry and government lab participation in identifying enhancements to SOF in critical areas. (3QTR01).

- (0.729) Littoral Warfare Craft. Exploited established technology to demonstrate craft as a conceptual, multi-mission platform. Explored a variety of mission modules and equipment. (2QTR01-3QTR01)

- (5.337) SOF Combatant Craft. Fabricated and tested a semi-submersible, high speed, low signature demonstrator vessel intended for short to medium range insertion/extraction missions. (2QTR01-3QTR01)

- (0.775) Details of this project are provided under separate cover. (1QRT02-2QTR02)

FY 2002 PLAN:

- (2.063) SOF C4I ATDs. Complete development and evaluation of FY01 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with a robust C4I capability to ensure uninterrupted information exchange, influence situations to support mission accomplishment, and reduce an adversary's ability to use information. Exploit emerging technology to conduct ATDs that provide SOF with increased sensory performance. Exploit emerging technologies to locate and track targets or items of interest. Sub-projects include: continue the development of the antenna enhancements, LPI/D imagery forwarding, communications for robotics, burst communications and low probability of detection antenna, and tactical communication/computers technologies projects. Planned projects that will be completed are LPI/D imagery link and tactical personal computer. Planned C4I project starts include: special tactics man-portable integrated global broadcasting system/joint broadcasting system. (1QTR02-3QTR02).

- (2.431) SOF Mobility ATDs. Complete development and evaluation of FY01 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with survivable mobility operations in high threat areas and with enhanced situational awareness. Exploit emerging

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technologies to conduct ATDs that provide SOF mobility assets with a reduction in logistic support requirements. Exploit emerging technologies to rapidly deploy and extract SOF personnel and craft. Exploit technologies to allow reconnaissance and conduct direct action in high threat areas using unmanned systems. Exploit technologies to reduce cost or enhance the performance of existing SOF platforms. Sub-projects include: continue the development of robotics SDV delivery vehicle airdrop, transition of penetrating aircraft TF/TA technologies, vehicle camouflage system and a low observable periscope for maritime platforms. Planned mobility projects: tactical system specific emitter identification technology insertion and portable cradle for the NSW Rigid Inflatable Boat. (2QTR02-3QTR02).

- (0.696) SOF Weapons ATDs. Complete development and evaluation of FY01 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with multi-role/multi-purpose weapons and demolitions with a broader range of potential effects and increased accuracy. Demonstrate capabilities of smart munitions and fire and forget capability. Exploit technologies to increase standoff from threat weapons systems. Decrease cost and logistic support requirements for SOF weapons systems. Sub-projects include: the development of infrared search track technologies and enhanced M203 munitions. Planned projects that will be completed are the advanced sniper weapon fire control system and active denial technology. Planned weapons projects: remote standoff capable/remote operations small arms mount, day/night sniper scope and joint SOF demolitions kit upgrade. (1QTR02-3QTR02)

- (1.292) SOF Sustainment ATDs. Continue development and evaluation of FY01 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with increased survivability and performance. Sub-projects include: continue the development of intrusion sensor system, equipment waterproofing technologies, underwater adhesive technologies and battery recharging. Planned project that will be completed is battery-recharging system. Planned sustainment projects: develop camouflage schemes through paint patterns and coatings for SOF personnel and equipment, prototype advanced navigation system for military free-fall operations utilizing global positioning system and inertial navigation technologies, and develop advanced learning technologies that use web-based, decision-aided tools. (1QTR02-3QTR02)

- (0.500) TEI. Exploit emerging technology to meet critical SOF requirements and encourage industry and government lab participation in identifying enhancements to SOF in critical areas. (3QTR02)

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- (0.600) Details of this project are provided under separate cover. (1QRT02-2QTR02)

- (2.000) SOF Aircraft Defense Systems. Develop an upgrade for the APR-46 microwave receiver which provides long-range threat detection for the MC-130E/H and AC-130H/U aircraft, to include non-recurring engineering.

- (1.400) Electronic Digital Compass System. Develop an electronic digital compass system

DERF PLAN:

- (3.000) Unmanned Aerial Vehicle (UAV). Develop a small UAV that will provide intelligence gathering and dissemination capabilities for urban and complex terrain environments. (1QTR02-4QTR02)

FY 2003 PLAN:

- (1.082) SOF C4I ATDs. Complete development and evaluation of FY02 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with a robust C4I capability to ensure uninterrupted information exchange, influence situations to support mission accomplishment, and reduce an adversary's ability to use information. Exploit emerging technology to conduct ATDs that provide SOF with increased sensory performance. Exploit emerging technologies to locate and track targets or items of interest. Sub-projects include: continue the development of the antenna enhancements, LPI/D imagery forwarding, communications for robotics, burst communications and LPD antenna and tactical communication/computers technologies projects. (1QTR03-3QTR03)

- (1.649) SOF Mobility ATDs. Complete development and evaluation of FY01 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with survivable mobility operations in high threat areas and with enhanced situational awareness. Exploit emerging

technologies to conduct ATDs that provide SOF mobility assets with a reduction in logistic support requirements. Exploit emerging technologies to rapidly deploy and extract SOF personnel and craft. Exploit technologies to allow reconnaissance and conduct direct action in high threat areas using unmanned systems. Exploit technologies to reduce cost or enhance the performance of existing SOF platforms. Sub-projects include: continue the tactical personal computer, SDV airdrop and periscope, robotics and complete vehicle camouflage system. (2QTR03-3QTR03)

- (1.766) SOF Weapons ATDs. Complete development and evaluation of FY01 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with multi-role/multi-purpose weapons and demolitions with a broader range of potential effects and increased accuracy. Demonstrate capabilities of smart munitions and fire and forget capability. Exploit technologies to increase standoff from threat weapons systems. Decrease cost and logistic support requirements for SOF weapons systems Sub-projects include: continue the universal initiator and the anti-material payload rifle. (1QTR03-3QTR03)

- (1.179) SOF Sustainment ATDs. Continue development and evaluation of FY01 sub-projects. Continue to exploit emerging technologies to conduct ATDs that provide SOF with increased survivability and performance. Sub-projects includes: complete the intrusion sensor system, transition equipment waterproofing technologies, projects started in FY02, underwater adhesive technologies and alternative power sources technologies. (1QTR03-3QTR03)

- (0.500) TEI. Exploit emerging technology to meet critical SOF requirements and encourage industry and government lab participation in identifying enhancements to SOF in critical areas. (3QTR03)

- (0.600) Details of this project are provided under separate cover. (1QRT03-2QTR03)

- (55.500) AC-X Gunship Advanced Concept Technology Demonstration (ACTD). This effort will initiate an Advanced Tactical Laser ACTD. The overall intent is to understand the military need, provide preliminary concepts of operation for a directed energy weapon on the battlefield to support

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the warfighter, and assess the military utility based on the ACTD demonstration. These steps will be accomplished by developing and employing a modular, high-energy laser weapon system, capable of conducting ultra-precision strike missions to enhance mission accomplishment of the warfighter.

The steps toward demonstrating the utility of a high-energy laser weapon are:

a. Demonstrate a modular, high-energy laser weapon to conduct ultra-precision strike missions for the warfighter.
   (1) Demonstrate weaponization of the sealed exhaust, Chemical Oxygen Iodine Laser (COIL) in a modular system, capable of deployment on a C-130.
   (2) Demonstrate ability to acquire and engage tactical targets in an air-to-ground system test.
   (3) At the completion of the ACTD, leave behind one fully-operational laser system consisting of the laser and beam director, surveillance and acquisition sensors sufficient to support employment of the laser system, software, an operator workstation and portable ground support equipment. The system will include documentation required to operate and maintain the ATL system.

b. The ATL ACTD is a jointly sponsored effort to demonstrate technology concepts to satisfy the critical mission needs for an ultra-precision strike capability. The demonstration phase for the ACTD will utilize joint/service exercises to the fullest extent possible, focusing on matching the objectives of the ACTD with objectives of the desired exercises and demonstrations. Demonstration of laser utility for both lethal and non-lethal purposes will be provided. To the maximum extent possible, considerations for a logistically supportable system will be integrated in the system design and development.

Management of this ACTD will be monitored by the Overarching Integrated Product Team (OIPT). The OIPT will be chaired by the Deputy Under Secretary of Defense for Advanced Systems and Concepts, DUSD(AS&C). Other members to the OIPT include the Acquisition Executive, USSOCOM; Commander, Air Force Special Operations Command (AFSOC); and Deputy Commandant for Plans, Policy and Operations, U.S. Marine Corps, in the role of the DoD Executive Agent for non-lethal weapons.

USSOCOM is the CINC User Sponsor. USSOCOM has delegated the Operational Manager role to AFSOC. AFSOC is responsible for developing the Concept of Operations (CONOPS), providing the overall utility assessment, and leading the lethal assessment for the ATL ACTD.

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The Joint Non-Lethal Weapons Directorate (JNLWD) will facilitate participation of DoD non-lethal weapons expertise and support the AFSOC's utility assessment for non-lethal target effects.

USSOCOM is the Lead Service and will provide the Technical Manager. Overall technical management will be administered by a Program Integrated Product Team (PIPT). The PIPT will be led by USSOCOM and supported by the U.S. Air Force Research Laboratory and the U.S. Army Space and Missile Defense Command.

USSOCOM is the Transition Manager.

The U.S. Marine Corps will evaluate the ATL for applicability to the MV-22 on a non-interference basis.

The U.S. Army will evaluate the ATL for applicability to the Army Objective Force on a non-interference basis.

The ACTD was approved for a FY01 start. The program will culminate in a Military Utility Assessment in FY06. Based on the results of the utility assessment, the ACTD could transition into an acquisition program.

B. Other Program Funding Summary: None.

C. Acquisition Strategy: None.

D. Schedule Profile: None.