

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE FEBRUARY 2003					
APPROPRIATION / BUDGET ACTIVITY RDT&E, DEFENSE-WIDE / 2			R-1 ITEM NOMENCLATURE / PROJECT NO. PE 1160401BB Special Operations Technology Development							

COST (Dollars in Millions)	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	Cost to Complete	Total Cost
PE1160401BB	19.961	18.006	9.715	13.142	13.749	14.472	15.764	17.471	Cont.	Cont.
S100, SO TECHNOLOGY BASE DEV	19.961	18.006	9.715	13.142	13.749	14.472	15.282	17.471	Cont.	Cont.

**Note: In FY 2002 and 2003 this program element was budgeted for in Budget Activity 7. Beginning in FY 2004, this program element has been moved into Budget Activity 2.**

A. Mission Description and Budget Item Justification:

This program element enables USSOCOM to conduct studies and develops laboratory prototypes for applied research and advanced technology development, as well as leverage other organizations' technology projects that may not otherwise be affordable within MFP-11. Applying small incremental amounts of investments to DOD, other government agencies, and commercial organizations allows the Commander, USSOCOM to influence the direction of technology development or the schedule against which it is being pursued, and to acquire emerging technology for Special Operations Forces. This project provides an investment strategy for USSOCOM to link technology opportunities with USSOCOM capability deficiencies, capability objectives, technology thrust areas, and technology development objectives.

B. Program Change Summary:

	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>
Previous President's Budget	20.506	6.741	7.378	8.488
President's Budget	19.961	18.006	9.715	13.142
Total Adjustments	-0.545	11.265	2.337	4.654
Congressional Program Reductions				
Congressional Rescissions		-0.461		
Congressional Increases		12.200		
Reprogrammings	-0.033			
SBIR/STTR Transfer	-0.512	0.474		

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<p>Funding:</p> <p>FY02 Reprogrammings – Minor changes between programs (-\$0.033)</p> <p>FY03 Reflects \$12.200 million for Congressionally added programs as follows:</p> <ul style="list-style-type: none"> <li>- Night Vision Fusion &amp; Rapid Transmission (\$2.600)</li> <li>- Knowledge Superiority for the Transitional Warfighter (\$1.700)</li> <li>- Large Format Uncooled Infrared Sensors (\$1.000)</li> <li>- Imaging Auto Sensors for Autonomous Vehicles (\$1.700)</li> <li>- Shortwave Infrared Imagers (\$1.700)</li> <li>- SPIKE Urban Warfare System (\$3.500)</li> </ul> <p>FY04 Program increases for the following:</p> <ul style="list-style-type: none"> <li>- C4I Technologies to provide SOF with improved situational awareness and communication (\$.506)</li> <li>- Mobility Technologies to provide SOF the capability to conduct ground, air, and sea operations (\$.500)</li> <li>- Weapons Technologies to provide SOF with standoff capabilities for targeting and locating personnel and equipment (\$.500)</li> <li>- Sustainment Technologies to provide SOF increases in survivability, countermeasures technologies, and performance (\$.642)</li> <li>- Concept Exploration to provide for concepts being continued or initiated in support of desired operational capabilities (\$.188)</li> </ul> <p>Schedule: None.</p> <p>Technical: None.</p>	

<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		Date: FEBRUARY 2003
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Cost (\$ in millions)	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09
SOF Technology Base Development	19.961	18.006	9.715	13.142	13.749	14.472	15.764	17.471
RDT&E Articles Quantity								

***Note: In FY 2002 and 2003 this program element was budgeted for in Budget Activity 7. Beginning in FY 2004, this program element has been moved into Budget Activity 2.***

A. Mission Description and Budget Item Justification: This project conducts studies and develops laboratory prototypes for applied research and advanced technology development, as well as leverages other organizations' technology projects that may not otherwise be affordable within MFP-11. Applying small incremental amounts of investments to DOD, other government agencies, and commercial organizations allows the Commander USSOCOM to influence the direction of technology development or the schedule against which it is being pursued, and to acquire emerging technology for Special Operations Forces (SOF). This project provides an investment strategy for USSOCOM to link technology opportunities with USSOCOM capability deficiencies, capability objectives, technology thrust areas, and technology objectives. Efforts include:

- SOF Command, Control, Communications, Computers, and Intelligence (C4I) Technologies. Exploit technologies that provide SOF with improved situational awareness and communications in all environments. Develop technologies to provide significant improvements to SOF's capability to accurately detect and track threats or targets. Exploit and demonstrate technologies that provide enhanced sensors and command and control. Develop technologies to provide new and improved capabilities in information operations and psychological operations.
- SOF Mobility Technologies. Exploit technologies to improve the performance and survivability, and reduce the detectability of SOF mobility assets. Exploit and develop technologies to provide SOF the capability to conduct ground, air, and sea mobility operations in denied areas. Exploit and develop technologies to enhance logistics support, reduce cost and improve the performance of SOF mobility platforms.

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- **SOF Weapons Technologies.** Exploit technologies to provide SOF with standoff capabilities for targeting, and locating personnel and equipment. Exploit technologies to discriminate targets and provide real-time active decision-making capabilities. Exploit technologies that enhance logistics, reduce cost and enhance performance of SOF weapons and munitions. Exploit technologies to provide multipurpose, adaptable weapons applicable to SOF platform and missions.
- **SOF Sustainment Technologies.** Exploit technologies to increase SOF's survivability and performance. Exploit technologies to improve the human endurance and sensory performance without interfering with normal sensory functions. Exploit and develop technologies to counter the threat of electro-optical devices, devices that detect human presence, and enhance individual operator capabilities.
- **Concept Exploration Studies.** Explore and validate concepts for projects being continued or initiated in support of the USSOCOM desired operational capabilities.
- **Technology Development Exploitation.** Exploit technologies to meet critical SOF capability objectives. Requirements in these areas may be advertised to industry and government research and development agencies via broad area announcements and calls for white papers.

Additionally, these efforts were added by Congress:

- **Dual Band Detector Imaging Technologies.** Congressional add for an integrated multi-spectrum capable system.
- **Lightweight Counter-Mortar Radar System.** Congressional add for a small man-portable radar for the SOF operator.
- **Shoulder Fired Smart Round Urban Warfare System.** Congressional add for a man-portable fire-and-forget rocket for anti-materiel use. Possible maritime platform applications.
- **Wireless Video Links for Special Operations Miniature Remotely Operated Vehicle.** Congressional add to focus tele-operated and tele-supervised (limited autonomy) systems using wireless video technology.

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- Night Vision Fusion & Rapid Transmission. Congressional add to integrate near infrared and long wave infrared sensors coupled to a covert long range communications device.
- Knowledge Superiority. Congressional add for knowledge superiority for transitional warfighter.
- Large Format Uncooled Infrared Sensors. Congressional add for development of larger format arrays to enhance surveillance systems.
- Imaging Auto Sensors For Autonomous Vehicles. Congressional add to incorporate unique microelectronics and opto-electronic processing in low cost micro-sensors.
- Shortwave Infrared Imagers. Congressional add to develop large area focal plane arrays and cameras for unattended sensors and navigation in difficult terrain.

#### B. Accomplishments/Planned Program

	FY02	FY03	FY04	FY05
SOF Command, Control, Communications, Computers, and Intelligence (C4I) Technologies.	1.776	1.082	2.075	3.037
RDT&E Articles Quantity				
<p>FY02 Continued to develop Color Night Vision Fusion through broad-spectrum sensors to include polarimetry and fuse sensors while incorporating SOF size, weight, and human factor requirements; Psychological Operations (PSYOP) Extended-Range Broadcast to increase the range of broadcasts from SOF assets; Reconnaissance Technologies to provide the capability to identify, collect, store, transmit, exploit tactically significant information; Man-Portable Counter Mortar Radar System; and Undersea Master Communications Node for maritime communications devices that transmit across the air water boundary and within each medium. Initiated Enhanced Situational Awareness for SOF Combatant Craft using Joint Surveillance and Target Attack Radar System data. Completed Cassandra.</p> <p>FY03 Continue development of FY02 efforts. Continue Color Night Vision Fusion, PSYOP Extended-Range Broadcast, Reconnaissance Technologies, Man-Portable Counter Mortar System, Undersea Master Communications Node, and Enhanced Situational Awareness.</p> <p>FY04 Continue development of FY03 efforts. Continue to exploit, develop and demonstrate technologies that provide SOF with improved situational awareness and communications in all environments, the capability to accurately detect and track threats or targets, provide enhanced</p>				

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sensors and command and control, and conduct initial investigations of technology thrust areas. Planned projects include: Software Definable Receiver Size Reduction; and Radio Frequency Planning and Assessment Tool for C4I Systems Development.

	FY02	FY03	FY04	FY05
SOF Mobility Technologies	1.481	1.375	2.012	2.776
RDT&E Articles Quantity				

FY02 Continued to develop Night Vision Windshield technologies that permit SOF pilots to view external sensor data on a heads up display allowing the pilot to virtually see through the fuselage and Tactile Sensors to demonstrate tactile sensors on MH-53 pilots to improve pilot situational awareness in brown-out, low visibility conditions. Initiated Conformal Load-Bearing Antenna Structure/Systems for low probability of intercept/low probability of detection antennas on SOF combatant craft, and small versatile maritime craft modeling and scaling to include use of composite material technologies to enhance SOF craft reliability and survivability. Completed Active Noise Cancellation to reduce acoustic signature of SOF propeller craft, Wind Tunnel Integrated Real Time in the Cockpit/Real Time Out of the Cockpit Experiments and Demonstrations to provide capability to interface SOF platforms communications and intelligence systems with new situational awareness; and Special Threat Awareness Receiver/Transmitter for enhanced SOF platform survivability in high threat environments.

FY03 Continue development of FY02 efforts. Continue Night Vision Windshield, Conformal Load-Bearing Antenna, and small versatile maritime craft. Complete Tactile Sensors.

FY04 Continue development of FY03 efforts. Continue to exploit technologies to improve the performance and survivability, and reduce the detectability of SOF mobility assets. Continue to exploit and develop technologies to provide SOF the capability to conduct ground, air, and sea mobility operations in denied areas and conduct initial investigations of technology thrust areas. Continue to exploit and develop technologies to enhance logistics support, reduce cost and improve the performance of SOF mobility platforms. Planned projects include implementation of Hypersteriopsis for Improved Target Identification on AC-130 Gunships.

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	FY02	FY03	FY04	FY05
SOF Weapons Technologies	1.644	1.023	2.066	2.835
RDT&E Articles Quantity				
<p>FY02 Continued Shoulder Fired Smart Round for a man-portable fire-and-forget missile for anti-materiel use and Universal Initiator that is a modular safe and arm device for hand emplaced explosives. Initiated Joint SOF Demolitions Kit Enhancements to enhance accuracy and lethality of advanced demolition technology; and Enhanced Small Arms Technology inquiries to improve fire accuracy and lethality of SOF weapons.</p> <p>FY03 Continue development of FY02 efforts. Continue the development of the SOF Demolitions Kit Enhancements, Enhanced Small Arms Technology, and Universal Initiator.</p> <p>FY04 Continue development of FY03 efforts. Continue to exploit technologies to provide SOF with standoff capabilities for targeting, and locating personnel and equipment. Exploit technologies to discriminate targets and provide real-time active decision-making capabilities. Exploit technologies that enhance logistics, reduce cost and enhance performance of SOF weapons and munitions. Exploit technologies to provide multipurpose, adaptable weapons applicable to SOF platforms and missions. Conduct initial investigations of technology thrust areas.</p>				
	FY02	FY03	FY04	FY05
SOF Sustainment Technologies	1.244	1.397	1.424	1.059
RDT&E Articles Quantity				
<p>FY02 Continued Geological (GEO) Survey Kit to determine if the California bearing ratio for surfaces is safe for aircraft landing and use; Accurate Tactical Navigation System to use in Global Positioning System denied areas; and Phrase Translation System for a handheld system for SOF operators in a tactical environment. Initiated Special Tactics Rappel/Fast Rope to provide an improved and safer rappel and fast rope system.</p> <p>FY03 Continue development of FY02 efforts. Continue Special Tactics Rappel/Fast Rope, and countermeasures technologies, Accurate Tactical Navigation System, and GEO Survey Kit. Complete and transition Phrase Translation System to PE 1160402BB/Project S200.</p> <p>FY04 Continue development of FY03 efforts. Continue to exploit technologies to increase SOF's survivability, countermeasures technologies, and performance. Continue to exploit technologies to improve the human endurance and sensory performance. Conduct initial investigations of technology thrust areas. Planned efforts include Special Reconnaissance Simulator.</p>				

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	FY02	FY03	FY04	FY05
Concept Exploration Studies	.560	.700	.688	.785
RDT&E Articles Quantity				
<p>FY02 Continued to explore/validate concepts for projects being continued or initiated in support of the USSOCOM desired operational capabilities. Continued Maritime Studies to enhance NAVSPECWARCOM operation survivability with special emphasis on the area of shock mitigation.</p> <p>FY03 Continue to explore/validate concepts for projects being continued or initiated in support of the USSOCOM desired operational capabilities. Continue Maritime Studies and initiate Low Cost Autonomous Attack System AC-130 concept to address SOF aircraft using a small UAV for armed reconnaissance.</p> <p>FY04 Continue to explore/validate concepts for projects being continued or initiated in support of the USSOCOM desired operational capabilities.</p>				
	FY02	FY03	FY04	FY05
Technology Development Exploitation	.299	.357	.500	.750
RDT&E Articles Quantity				
<p>FY02 Exploited technologies to meet critical SOF capability objectives. Initiated environmental characterization study of tactical rotary wing aircraft landings in brown out and white out conditions.</p> <p>FY03 Continue to exploit technologies to meet critical SOF capability objectives. Requirements in these areas may be advertised to industry and government research and development agencies via broad area announcements and calls for white papers. Initiated virtual periscope study for algorithm development of above water data collection from below the surface and initiate technology roadmaps for the technology thrust areas.</p> <p>FY04 Continue to exploit technologies to meet critical SOF capability objectives. Requirements in these areas may be advertised to industry and government research and development agencies via broad area announcements and calls for white papers.</p>				

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	FY02	FY03	FY04	FY05
Dual Band Imaging Technologies	4.186			
RDT&E Articles Quantity				
FY02 This initiative was a congressional plus-up. Developed manufacturing technologies for novel, optically coated lens assemblies and systems, demonstrated via custom prototypes, necessary to begin producing night vision systems. This will provide the warfighter with unprecedented nighttime advantage.				
	FY02	FY03	FY04	FY05
Lightweight Counter-Mortar Radar System	2.920			
RDT&E Articles Quantity				
FY02 This initiative was a congressional plus-up. Developed technologies for a man pack (2 man packable) lightweight counter mortar prototype capable of automatically detecting and determining the origin of enemy mortar fire, short-range artillery and rockets with sufficient accuracy to commit counter fire by airborne assets. FY03 Complete and transition Lightweight Counter-Mortar Radar System.				
	FY02	FY03	FY04	FY05
SPIKE Urban Warfare System	3.894	3.327		
RDT&E Articles Quantity				
FY02 This initiative was a congressional plus-up. Funds were used to develop technologies to enhance Shoulder Fired Guided Missiles (SPIKE), and refine the guidance system for more accurate prosecution of hardened targets. FY03. This initiative was a congressional plus-up. Continue to develop technologies to SPIKE, and refine the guidance system for more accurate prosecution of hardened targets. Work continues to refine target tracking sub-system and warhead development.				
	FY02	FY03	FY04	FY05
Wireless Video Links for SOMROV	1.557			
RDT&E Articles Quantity				
FY02 This initiative was a congressional plus-up. Developed technologies for high data rate video links between various unmanned systems. These systems were evaluated during Millenium Challenge 2002.				

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RDT&E BA # 2					
Night Vision Fusion & Rapid Transmission		FY02	FY03	FY04	FY05
RDT&E Articles Quantity			2.473		
FY03 This initiative was a congressional plus-up. Develop novel lens assemblies which are smaller and lighter and prototype night vision systems and assemblies for a variety of warfighter applications including reconnaissance, battlefield imaging, situational awareness, and night sights.					
Knowledge Superiority		FY02	FY03	FY04	FY05
RDT&E Articles Quantity			1.615		
FY03 This initiative was a congressional plus-up. Improve methods and tools used to increase operational efficiency and performance while providing access to tactical data.					
Large Format Uncooled Infrared Sensors		FY02	FY03	FY04	FY05
RDT&E Articles Quantity			.950		
FY03 This initiative was a congressional plus-up. Funds will develop larger format arrays to enhance surveillance systems. Issues to be addressed include uniformity of very thin layers over a large area, deposition and processing of thin micro-support structures, and understanding fundamental issues associated with semi-crystalline and amorphous infrared materials.					
Imaging Auto Sensors For Autonomous Vehicles		FY02	FY03	FY04	FY05
RDT&E Articles Quantity			1.616		
FY03 This initiative was a congressional plus-up. Funds will develop and design miniature sensor packages to incorporate parallel processing which significantly increases processing power that support autonomous vehicles. This development will explore low cost micro-sensors with a focused effort to incorporate unique microelectronics and opto-electronic processing.					

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Shortwave Infrared Imagers		FY02	FY03	FY04
RDT&E Articles Quantity			1.616	
<p>FY03 This initiative was a congressional plus-up. Funds will develop large area Short Wave Infrared focal plane arrays and cameras for unattended sensors and navigation in difficult terrain. Effort will significantly expand the camera's capability by extension of the spectral response to full 1.0 to 2.0 micron spectral region and expansion of the array size to 480 x 640 and 960 x 1280 elements, providing a low cost, large area array for a wide range of systems.</p>				
Classified		FY02	FY03	FY04
RDT&E Articles Quantity		.400	.475	.950
<p>FY02 Provided under separate cover.  FY03 Provided under separate cover.  FY04 Provided under separate cover.</p>				
<p>C. Other Program Funding Summary: None.</p>				