

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

FEBRUARY 2007

APPROPRIATION / BUDGET ACTIVITY
RDT&E, DEFENSE-WIDE / 2

R-1 ITEM NOMENCLATURE / PROJECT NO.

PE 1160401BB Special Operations Technology Development/S100

COST (Dollars in Millions)	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	Cost to Complete	Total Cost
PE1160401BB	26.502	17.730	21.282	23.135	24.895	25.169	28.577	30.903	Cont.	Cont.
S100, SO TECHNOLOGY BASE DEV	26.502	17.730	21.282	23.135	24.895	25.169	28.577	30.903	Cont.	Cont.

A. Mission Description and Budget Item Justification

This program element enables USSOCOM to conduct studies and develop 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>FY06</u>	<u>FY07</u>	<u>FY08</u>	<u>FY09</u>
Previous President's Budget	29.960	12.698	11.382	11.635
Current President's Budget	26.502	17.730	21.282	23.135
Total Adjustments	-3.458	5.032	9.900	11.500
Congressional Program Reductions		-0.069		
Congressional Increases		5.500		
Reprogrammings	-2.782			
Other Program Adjustments			9.900	11.500
SBIR Transfer	-0.676	-0.399		

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Funding:

FY06: Decrease is the result of a 1415-1 Prior Approval Reprogramming (No. FY 06-17 PA) submitted to Congress to support a critical O&M GWOT shortfall (-\$2.782 million) and transfer to the Small Business Innovative Research (SBIR) account (-\$0.676 million).

FY07: Net increase of \$5.032 million is the result of Section 8106 reduction (-\$0.069 million), SBIR transfer (-\$0.399 million), and the following Congressional adds:

- Helios/Global Observer (\$2.250 million)
- Wearable Hyperspectral Imaging System (\$1.000 million)
- Close-In Layered Shield (\$2.250 million)

FY08: Increase of \$9.900 million supports the MK V Special Operations Craft replacement effort (\$1.200 million) and the Tagging, Tracking, and Locating effort (\$8.700 million).

FY09: Increase of \$11.500 million supports the Tagging, Tracking, and Locating effort.

Schedule: None.

Technical: None.

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Special Operations Technology Development/Project S100

Cost (\$ in millions)	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13
SOF Technology Base Development	26.502	17.730	21.282	21.135	24.895	25.169	28.577	38.903
RDT&E Articles Quantity								

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.
- **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/Warrior 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

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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 USSOCOM strategic capability guidance.
- **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.
- **Tagging, Tracking, and Locating (TTL) Technologies** is a key element in the ability of the forces to find, fix, and finish targets in the global War on Terrorism (GWOT). In order to be fully effective, TTL technologies need to be able to work against non-cooperative, unwitting targets and in a manner that does not compromise either the operational personnel or the TTL devices. This effort provides investment in critical science and technology to improve operational capabilities for TTL high value individuals and objects in support of the GWOT. This is a new project created to implement the USSOCOM/Director, Defense Research & Engineering (DDR&E) TTL Science & Technology (S&T) Roadmap and the TTL Quick Look Capabilities Based Assessment. Project conducts applied research into applications of relevant technologies that provide significant reduction in form factor and packaging; detection and identification of objects of interest at long distances, including development of new TTL modalities; Novel techniques for data transmission, sharing and processing; and supporting capabilities required for TTL system integration, reliability, usability and employment.

Additionally, these efforts were added by Congress:

- **Angel Fire for Full Spectrum, Close-in Active Protection System (FCLAS).** Investigate, develop and demonstrate prototype system for FCLAS that will protect SOF assets from Rocket Propelled Grenades (RPGs) using counter munitions.
- **Close In Layered Shield.** Follow on to FY06 Angel Fire for FCLAS project. Analyze and prototype active protection for rotary wing aircraft and vehicles from RPGs and other Man Portable Air Defensive System (MANPAD) type weapon systems.

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- Helios/Global Observer. Research persistent surveillance in denied areas.
- Navigational Technique Enhancements. Research complementary navigational methods to perform in environments where existing navigation systems are denied.
- Technology Infusion Cell for SOF. Research, develop, evaluate, validate and harness the latest emerging technological developments in support of SOF.
- Wearable Hyperspectral Imaging System. Integrate technologies currently under development into low-cost, wearable hyperspectral imaging sensor/display system.

B. Accomplishments/Planned Program

	FY06	FY07	FY08	FY09
SOF Command, Control, Communications, Computers, and Intelligence (C4I) Technologies.	1.172	2.413	2.399	2.654
RDT&E Articles Quantity				

FY06 Continued development of FY05 efforts. Continued Antenna Enhancements project to demonstrate a low cost, conformal, full-duplex, antenna using polyimide Micro-Electro Mechanical Systems (MEMS) technology. Continued Color Night Vision Fusion (Polarimetry) project to use the polarized characteristics of light to enhance SOF reconnaissance and surveillance. Initiated Network Experimentation program to demonstrate capabilities for long range cooperative use of unmanned systems & networks with emphasis on targeting capabilities. Initiated Tactical Language Trainer to develop a pc-based scenario-oriented product to provide the special operations forces operator a usable grasp of culture, gestures & situational language.

FY07 Continue development of FY06 efforts. Complete Antenna Enhancements project and transition to SOST. Complete Color Night Vision Fusion (Polarimetry) project. Continue Network Experimentation program and Tactical Language Trainer. Initiate TTL project to explore nanotechnology applications initiatives to TTL for SOF applications. Initiate C4 technology projects to address identified C4 science and technology capability gaps.

FY08 Continues development of FY07 efforts. Continues Network Experimentation and nanotechnology application programs. Completes Tactical Language Trainer. Initiates C4 technology projects to address identified C4 S&T capability gaps.

FY09 Continues development of FY08 efforts. Completes Network Experimentation program. Initiates C4 technology projects to address identified C4 science and technology capability gaps. Continues to exploit, develop and demonstrate technologies that provide SOF with

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improved situational awareness and communications in all environments, the capability to accurately detect and track threats or targets, provides enhanced sensors and command and control, and continues investigations of science and technology focus areas.

	FY06	FY07	FY08	FY09
SOF Mobility Technologies	4.477	3.866	4.026	2.789
RDT&E Articles Quantity				

FY06 Continued development of FY05 efforts. Initiated studies and analyses of existing technologies needed to replace the Mark V Special Operations Craft (MK V SOC). Continued development of Night Vision Windshield/Distributed Aperture System to provide a full time omnidirectional night viewing capability that significantly increases situational awareness. Continued Enhanced Hostile Detection Capability to exploit promising technologies which can integrate with current systems to enhance the capability to detect and/or discriminate hostile forces in vegetation and riverine environments. Continued Shock Mitigation for High Speed Boats focusing on shock mitigating technologies pertaining to the seat/human interface. Completed Enhanced Situational Awareness for SOF and transitioned to Program Executive Office. Continued Small Versatile Maritime Mobility Craft project.

FY07 Continue development of FY06 efforts. Initiates follow-on studies and analyses and the investigation of new and existing technologies needed to replace the MK V SOC. Continue Enhanced Hostile Detection Capability and Night Vision Windshield/Distributed Aperture System. Continue Shock Mitigation for High Speed Boats. Initiate mobility technology projects to address mobility science and technology capability gaps. Completed Small Versatile Maritime Mobility Craft project and transition to user community.

FY08 Continues development of FY07 efforts. Initiates follow-on studies and Joint Capabilities Integration and Development System (JCIDS) support analyses needed to support a MK V SOC replacement requirements validation. Completes Enhanced Hostile Detection Capability and Night Vision Windshield/Distributed Aperture System. Completes Shock Mitigation for High Speed Boats. Initiates mobility technology projects to address mobility S&T capability gaps.

FY09 Continues development of FY08 efforts. Continues to exploit technologies to improve the performance and survivability, and reduce the detection of SOF mobility assets. Continues to exploit and develops technologies to provide SOF the capability to conduct ground, air, and sea mobility operations in denied areas and continues investigations of science and technology focus areas. Continues to exploit and develop technologies to enhance logistics support, reduce cost and improve the performance of SOF mobility platforms.

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	FY06	FY07	FY08	FY09
SOF Weapons Technologies	0.600	0.900	0.900	0.950
RDT&E Articles Quantity				
<p>FY06 Continued development of FY05 efforts. Terminated Hostile Fire Detection and Defeating System. Continued to exploit technologies to provide SOF with standoff capabilities for targeting and locating personnel and equipment. Exploited technologies to discriminate targets and provide real-time active decision-making capabilities. Exploited technologies that enhance logistics, reduce cost and enhance performance of SOF weapons and munitions. Exploited technologies to provide multipurpose, adaptable weapons applicable to SOF platforms and missions. Continued investigations of science and technology focus areas.</p> <p>FY07 Continue development of FY06 efforts. Initiate weapons technology projects to address weapons science and technology capability gaps.</p> <p>FY08 Continues development of FY07 efforts. Continues investigations of science and technology focus areas. Initiates weapons technology projects to address weapons science and technology capability gaps.</p> <p>FY09 Continues development of FY08 efforts. Continues to exploit technologies to provide SOF with standoff capabilities for targeting and locating personnel and equipment. Exploits technologies that enhance logistics, reduce cost and enhance performance of SOF weapons and munitions. Exploits technologies to provide multipurpose, adaptable weapons applicable to SOF platforms and missions. Continues investigations of science and technology focus areas. Initiates weapons technology projects to address weapons science and technology capability gaps.</p>				
	FY06	FY07	FY08	FY09
SOF Sustainment/Warrior Technologies	1.000	1.565	1.493	1.629
RDT&E Articles Quantity				
<p>FY06 Continued development of FY05 efforts. Continued Advanced Digital Multi-Spectral Night Vision Goggle (ADM-NVG) program to develop a multi-spectral goggle. Continued Special Reconnaissance Simulator to investigate near eye-limiting resolution display systems.</p> <p>FY07 Continues development of FY06 efforts. Continue ADM-NVG project. Complete Special Reconnaissance Simulator. Initiate and complete Portable Laser Communications system (COMCAN).</p> <p>FY08 Continues development of FY07 efforts. Completes ADM-NVG project. Initiates sustainment/warrior technology projects to address sustainment/warrior science and technology capability gaps.</p> <p>FY09 Continues development of FY08 efforts. Continue to exploit technologies to increase SOF's survivability and performance. Continue to exploit technologies to improve the human endurance and sensory performance. Continue investigations of science and technology focus areas. Continue sustainment/warrior technology projects to address sustainment/warrior science and technology capability gaps.</p>				

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		FY06	FY07	FY08	FY09
Concept Exploration Studies		.500	.839	0.743	0.931
RDT&E Articles Quantity					
<p>FY06 Completed the SSGN Seal Delivery Vertical Launch Feasibility Study. Initiated Special Operations Language Training Software Measurement and Effectiveness Study. Initiated Wind Deflector Feasibility Study for A/MH-6M. Initiated studies and analyses of existing technologies needed to replace the MK V SOC.</p> <p>FY07 Initiate Ballistic Protection Required Capabilities Study for MH-47 Aircraft. Initiate follow-on studies and analyses and the investigation of new and existing technologies needed to replace the MK V SOC.</p> <p>FY08 Initiates follow-on studies and JCIDS support analyses needed to support a MK V SOC replacement requirements validation. Continues to conduct concept studies to explore/validate projects that support SOF strategic capability gaps.</p> <p>FY09 Continues to conduct concept studies to explore/validate projects that support SOF strategic capability gaps.</p>					
		FY06	FY07	FY08	FY09
Technology Development Exploitation		.940	.787	0.971	0.582
RDT&E Articles Quantity					
<p>FY06 Continued Technology Roadmaps for focus areas.</p> <p>FY07 Continue Technology Roadmaps for focus areas. Initiate "Athena" TDE project to develop SOF mounted/dismounted direction finding/jamming capabilities.</p> <p>FY08 Continues Technology Roadmaps for focus areas.</p> <p>FY09 Continues Technology Roadmaps for focus areas.</p>					
		FY06	FY07	FY08	FY09
Classified		1.627	2.000	2.050	2.100
RDT&E Articles Quantity					
<p>FY06 Details provided under separate cover.</p> <p>FY07 Details provided under separate cover.</p> <p>FY08 Details provided under separate cover.</p> <p>FY09 Details provided under separate cover.</p>					

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			FY06	FY07
TTL			8.700	11.500
RDT&E Articles Quantity				
<p>FY08 Specific objectives, priorities, and technical approaches are classified. Initiates projects from the USSOCOM/DDR&E TTL project database that exploit TTL relevant technologies (nanotechnology, biotechnology, and chemistry) to provide and demonstrate the maturity for the capabilities enhancements; enable very small packaging, functional elements, and increased endurance; enable very small sensor packages for object detection and identification, enhancement of biometric observables, and increased processing in small devices; and initiates new forms of communications, forward based and embedded processing; enhance long distant TTL; and increase communication range and network agility. Projects will include leveraging and cooperative efforts with DOD, other government agencies, and industry.</p> <p>FY09 Specific objectives, priorities, and technical approaches are classified. Continues projects to exploit nanotechnology, biotechnology, and chemistry for application to TTL systems. Initiates projects identified from the updated USSOCOM/DDR&E Roadmap and supports the Joint Chiefs of Staff TTL Quick Look Capability Assessment.</p>				
			FY06	FY07
Angel Fire for FCLAS			7.707	
RDT&E Articles Quantity				
<p>FY06 This initiative was a Congressional add. Investigated and began development of prototype system for FCLAS that will protect SOF assets from RPGs using counter munitions.</p>				
			FY06	FY07
Close-In Layered Shield			2.193	
RDT&E Articles Quantity				
<p>FY07 This initiative was a Congressional add. Follow-on to FY06 Angel Fire FCLAS project. Analyze and prototype active protection for rotary wing aircraft and vehicles from RPGs and other MANPAD type weapon systems.</p>				

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		FY06	FY07	FY08
Helios/Global Observer		6.551	2.193	
RDT&E Articles Quantity				
<p>FY06 This initiative was a Congressional add. Investigated and evaluated alternative fuel propulsion systems for high altitude long endurance unmanned aerial systems.</p> <p>FY07 This initiative is a Congressional add. Follow on to FY06 to continue investigation and evaluation of alternative fuel propulsion systems for high altitude unmanned aerial systems.</p>				
		FY06	FY07	FY08
Navigational Technique Enhancements		.964		
RDT&E Articles Quantity				
<p>FY06 This initiative was a Congressional add. Researched complementary navigational methods to perform in environments where existing navigation systems are denied.</p>				
		FY06	FY07	FY08
Technology Infusion Cell for SOF		.964		
RDT&E Articles Quantity				
<p>FY06 This initiative was a Congressional add. Researched, developed, evaluated, validated and harnessed the latest emerging technological developments in support of SOF.</p>				
		FY06	FY07	FY08
Wearable Hyperspectral Imaging System			.974	
RDT&E Articles Quantity				
<p>FY07 This initiative was a Congressional add. Minaturize hyperspectral imaging technologies into advanced micro-display for operator-borne applications providing the operator a significant advantage at night or in smoke.</p>				