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Exhibit R-2, RDT&E Budget Item Justification								Date: February 2000	
APPROPRIATION/BUDGET ACTIVITY			R-1 ITEM NOMENCLATURE						
ENGINEERING AND MANUFACTURING DEVELOPMENT, DEFENSE-WIDE, BUDGET ACTIVITY 5			JOINT ROBOTICS PROGRAM PE 0604709D8Z						
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost	14.708	14.660	11.553	13.123	13.590	13.853	14.121	Continuing	Continuing
SRS	9.700	10.000	3.000	0.000	0.000	0.000	0.000	0.000	22.700
RCSS	1.900	3.000	6.053	7.123	7.590	0.000	0.000	0.000	10.953
MDARS-I	3.108	1.660	1.500	0.000	0.000	0.000	0.000	0.000	6.268
MDARS-E	0.000	0.000	1.000	6.000	6.000	0.000	0.000	0.000	13.000
FTUV						13.853	14.121	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification. This program is a budget activity level 5 based on the successful transition of robotic technologies from Program Definition and Risk Reduction (PDRR) activities to Engineering, Manufacturing and Development (EMD) as part of an Evolutionary Strategy. This PE was established in response to Office of the Secretary of Defense (OSD) and Service agreement at the April 1997 Joint Robotics Program General Officer Steering Committee (GOSC). The agreement was to have OSD retain oversight of DoD robotics programs through EMD. Individual Services are responsible for requirements generation and procurement funding. Within the JRP, emphasis is on the development of robotic technologies that: are usable in multi-service missions; provide capability in hazardous environments; provide improved battlefield efficiency using supervised autonomous operational capability; reduce or enhance force manpower and sustainability; and are affordable. Success has been achieved in four programs to justify EMD at this time. This PE establishes the consolidated DoD robotics program for unmanned ground vehicles (UGV) and advances UGV concepts into EMD for (1) the Standardized Robotic System (SRS) - a generic, modular set of kits that can be used to retrofit several different types of currently fielded vehicles to allow remote obstacle breaching operations (minefields, earthworks, bunkers, etc.), and have supported operations in Bosnia and Kosovo; (2) the Robotic Combat Support System (RCSS) - a three phase block upgrade program to the "Block 0" Product Improved Mini-Flail for anti-personnel (AP) landmine/scattermine and unexploded ordnance (UXO) proofing for the light, rapid deployment forces; (3) the Mobile Detection Assessment Response System, Interior (MDARS-I) - which will provide physical security inside warehouses of fixed installations and large storage facilities, protection of critical inventory items and track movement of items in warehouses and ammunition storage facilities; and (4) the Mobile Detection Assessment Response System, Exterior (MDARS-E)- that are intended to provide unmanned roving security patrols among the buildings and around the perimeter of large fixed installations.</p>									

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Exhibit R-2, RDT&E Budget Item Justification				Date:
				February 2000
B. <u>Program Change Summary</u> (\$ million)				
	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>Total</u>
Previous President's Budget	15.115	12.004	11.742	<u>Cost</u>
Appropriated Value		15.004		Continuing
Adjustments to Appropriated Value				
a. Congressionally Directed				
Appropriation Reduction				
b. Congressionally Directed				
Undistributed Reduction				
c. Below threshold reprogramming,				
inflation savings, government-wide rescission	(0.407)	(0.344)	(0.189)	
Current Budget Submit/President's Budget	14.708	14.660	11.553	Continuing
Change Summary Explanation:				
Funding:	FY 2000-2001 inflationary savings; FY 2000 government-wide rescission			
Schedule:	N/A			
Technical:	N/A			
C. <u>Other Program Funding Summary</u>				
D. <u>Acquisition Strategy</u>				
E. <u>Schedule Profile</u>				
Fiscal Year actual and planned events:				
	FY 1999	FY2000	FY2001	
<b>Acquisition Milestones</b>				
SRS			MS III	
MDARS-I			MS III	
RCSS-Block 1		MS I		
MDARS-E		MS I/II		
<b>Engineering Milestones</b>				
<b>T&amp;E Milestones</b>				
<b>Contract Milestones</b>				

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Exhibit R-2a, RDT&E Project Justification								Date: February 2000	
APPROPRIATION/BUDGET ACTIVITY EMD, DEFENSE WIDE, BUDGET ACTIVITY 5		PROGRAM ELEMENT PE 0604709D8Z			PROJECT NAME AND NUMBER STANDARDIZED ROBOTIC SYSTEM (SRS)				
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY2005	Cost to Complete	Total Cost
SRS	9.700	10.000	3.000	0.000	0.000	0.000	0.000	0.000	22.700
<p>A. <u>Mission Description and Budget Item Justification</u> The Standardized Robotic System (SRS) program is a generic, modular set of kits that can be used to retrofit several different types of currently fielded engineer vehicles to allow remote obstacle breaching operations (minefields, earthworks, bunkers, etc.) Prototypes have been used in support of operations in Bosnia and Kosovo. The US Army has an approved Operational Requirements Document (ORD).</p> <p>(U) <u>FY 1999 Accomplishments</u></p> <ul style="list-style-type: none"> <li>Executed SRS EMD contract effort for the design, manufacture and delivery of engineering prototype kits (D7G, M9 Armored Combat Excavator [ACE], T3 Dozer, DEUCE) for Developmental Testing (DT) and Operational Testing (OT)</li> <li>Conducted engineering and program management support for the SRS kit development</li> <li>Developed of an SRS kit for the Interim Vehicle Mounted Mine Detector (IVMMD) program and Interim T-3 bulldozer kits for engineering school evaluation</li> </ul> <p>(U) <u>FY 2000 Plans</u></p> <ul style="list-style-type: none"> <li>Continue SRS EMD effort for the design, manufacture and delivery of engineering prototypes</li> <li>Complete DT and OT of the IVMMD (Meerkat) robotic kit</li> <li>Engineering and program management support for the SRS kit development</li> </ul> <p>(U) <u>FY 2001 PLANS</u></p> <ul style="list-style-type: none"> <li>Continue SRS EMD effort for the design, manufacture, and delivery of engineering prototypes</li> <li>Complete DT and OT for the D7G</li> <li>Complete design for the M9 ACE, T3, and DUECE SRS kit application</li> <li>Engineering and program management support for the SRS kit development</li> <li>Obtain MSIII Decision for the D7G</li> </ul>									

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**Exhibit R-2a, RDT&E Project Justification**

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B. Other Program Funding Summary

C. Acquisition Strategy

The SRS kit development effort is contracted under a Small Business Innovative Research (SBIR) effort. The EMD contract was awarded 4<sup>th</sup> Quarter FY 1998 to Omnitech Robotics Incorporated. The contract is incrementally funded beginning FY 1999 through FY 2001. The SRS Milestone III production decision is scheduled for 4<sup>th</sup> Quarter FY 2001, based on the D7G kit development.

D. Schedule Profile

Fiscal Year actual and planned events:

FY1999	FY2000	FY2001
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**Acquisition Milestones**

SRS (D7G) (M9 ACE/DEUCE) (T3)		MSIII
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**Engineering Milestones**

**T&E Milestones**

SRS (D7G) (M9 ACE/DEUCE) (T3)		DT/OT
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**Contract Milestones**

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Exhibit R-3 Cost Analysis (page 1)								Date: February 2000				
EMD, DEFENSE-WIDE BUDGET ACTIVITY 5,			PROGRAM ELEMENT PE 0604709D8Z					STANDARDIZED ROBOTIC SYSTEM (SRS)				
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPIF	Omnitech		7.900		5.804		1.000			Cont.	Cont.
Ancillary Hardware Development	CPIF	Omnitech		1.000		1.000						
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development				8.900		6.804		1.000			Cont.	Cont.
Remarks: Omnitech Robotics, Inc., Englewood, CO												
Development Support												
Software Development						0.496		0.444				
Training Development												
Integrated Logistics Support				0.125		0.300		0.050				
Configuration Management				0.100		0.200		0.050				
Technical Data												
GFE												
Subtotal Support				0.225		0.996		0.544			CONT	CONT
Remarks												

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Exhibit R-3 Cost Analysis (page 2)										Date: February 2000			
EMD, DEFENSE-WIDE, BUDGET ACTIVITY 5			PROGRAM ELEMENT PE 0604709D8Z							STANDARDIZED ROBOTIC SYSTEM (SRS)			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
Developmental Test D7G	MIPR	APG, MD				0.550		0.200					
IOT&E D7G	MIPR	T&E CMD				0.550							
DT M9 ACE	MIPR	APG, MD						0.306					
IOT&E M9 ACE	MIPR	T&E CMD						0.450					
DT DEUCE	MIPR	APG, MD											
IOT&E DEUCE	MIPR	T&E CMD											
DT T3	MIPR	APG, MD				0.175							
IOT&E T3	MIPR	T&E CMD				0.300							
Subtotal T&E						1.575		0.956		CONT	CONT		
Remarks DT - Developmental Test IOT&E - Initial Operational Test & Evaluation APG, MD - Aberdeen Proving Ground, Maryland T&E CMD - Test and Evaluation Command													
Contractor Engineering Support													
Government Engineering Support						0.075							
Program Management Support		US AMCOM		0.500		0.500		0.500					
Program Management Personnel													
Travel				0.075		0.050							
Labor (Research Personnel)													
Miscellaneous													
Subtotal Management				0.575		0.625		0.500		CONT	CONT		
Remarks													
Total Cost				9.700		10.000		3.000					
Remarks													

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Exhibit R-2a, RDT&E Project Justification								Date February 2000	
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT			PROJECT NAME AND NUMBER				
EMD, DEFENSE WIDE, BUDGET ACTIVITY 5		PE 0604709D8Z			ROBOTIC COMBAT SUPPORT SYSTEM (RCSS)				
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY2005	Cost to Complete	Total Cost
RCSS	1.900	3.000	6.053	0.000	0.000	0.000	0.000	0.000	10.953
<p>A. <u>Mission Description and Budget Item Justification.</u> The Robotic Combat Support System (RCSS) Program utilizes a 3 phase "Block" upgrade approach. "Block 0" is the Product Improved Mini-Flail (PIMF) which is an RCSS with the anti-personnel mine proofing and clearing payload. The PIMF has proven effective in Bosnia and Kosovo as a contingency asset. "Block 1" will be an anti-personnel obstacle clearing and neutralization system and will replace the PIMF, providing improved off-route stability, increased anti-personnel (AP) landmine neutralization speed, improved reliability, and improved human-machine interface. "Block 2" will add AP wire obstacle clearing, advanced controls, remotely deployed smoke and obscurants, and remotely delivered special munitions to support dismounted operations. "Block 3" will add the capability to carry soldier loads and provide hands-free control and dismounted soldier leader-follower technology. Mechanical devices will be added to "Block 2" that will be used to emplace demolitions and special breaching systems. A Mission Need Statement (MNS) has been developed and an Operational Requirements Document (ORD) is waiting final approval at Army Training and Doctrine Command (TRADOC).</p> <p>(U) <u>FY 1999 Accomplishments</u></p> <ul style="list-style-type: none"> <li>• Designed, developed, and tested non-explosive breaching system for RCSS-Light</li> <li>• Produced four lightweight contingency systems for operations in Bosnia and Kosovo</li> </ul> <p>(U) <u>FY 2000 Plans</u></p> <ul style="list-style-type: none"> <li>• Engineering and program management support for the RCSS-Block 1 development</li> <li>• Start RCSS-Block 1 Program Definition and Risk Reduction (PDRR) effort for the design, manufacture and delivery of engineering prototypes</li> </ul> <p>(U) <u>FY 2001 Plans</u></p> <ul style="list-style-type: none"> <li>• Engineering and program management support for the RCSS-Block 1 development</li> <li>• Conduct initial verification testing</li> </ul> <p>B. Other Program Funding Summary</p> <p>C. Acquisition Strategy</p>									

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<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		Date February 2000		
The RCSS-Block 1 contract will be awarded under full and open competition in FY 2000.				
D. Schedule Profile				
Fiscal Year actual and planned events:				
	FY1999	FY2000	FY2001	
<b>Acquisition Milestones</b>				
RCSS-Block 1		MSI		
<b>Engineering Milestones</b>				
<b>T&amp;E Milestones</b>				
RCSS-Block 1			IVT	
<b>Contract Milestones</b>				
			PDRR	

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Exhibit R-3 Cost Analysis (page 1)										Date: February 2000		
EMD, DEFENSE-WIDE, BUDGET ACTIVITY 5			PROGRAM ELEMENT PE 0604709D8Z							Robotic Combat Support System (RCSS)		
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPIF	OST		0.950				3.953				
Ancillary Hardware Development												
Systems Engineering				0.650		2.000		0.800				
Licenses				0.200								
Tooling								0.100				
GFE		TACOM		0.100								
Award Fees												
Subtotal Product Development				1.900		2.000		4.853		CONT	CONT	
Remarks:												
Development Support								0.100				
Software Development						0.500		0.100				
Training Development								0.100				
Integrated Logistics Support								0.100				
Configuration Management								0.100				
Technical Data												
GFE												
Subtotal Support						0.500		0.500		CONT	CONT	
Remarks												

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Exhibit R-3 Cost Analysis (page 2)										Date: February 2000			
EMD, DEFENSE-WIDE, BUDGET ACTIVITY 5			PROGRAM ELEMENT PE 0604709D8Z							Robotic Combat Support System (RCSS)			
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
DT								0.300					
IOT&E													
DT													
IOT&E													
Subtotal T&E								0.300		CONT	CONT		
Remarks													
Contractor Engineering Support								0.100					
Government Engineering Support						0.500		0.100					
Program Management Support								0.200					
Program Management Personnel													
Travel													
Labor (Research Personnel)													
Miscellaneous													
Subtotal Management						0.500		0.400		CONT	CONT		
Remarks													
Total Cost				1.900		3.000		6.053					
Remarks													

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Exhibit R-2a, RDT&E Project Justification								Date: February 2000	
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER					
EMD, DEFENSE WIDE, BUDGET ACTIVITY 5		PE 0604709D8Z		MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM - INTERIOR (MDARS-I)					
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY2005	Cost to Complete	Total Cost
MDARS-I	3.108	1.660	1.500	0.000	0.000	0.000	0.000	0.000	6.268
<p>A. <u>Mission Description and Budget Item Justification.</u> The Mobile Detection Assessment Response System - Interior (MDARS-I) will provide unmanned physical security inside the warehouses of fixed installations and large storage facilities. In addition to security, the system will also support inventories and track movement or disturbance of critical inventory items.</p> <p>(U) <u>FY 1999 Accomplishments</u></p> <ul style="list-style-type: none"> <li>• Awarded Engineering Manufacturing Development (EMD) contract</li> <li>• Designed/fabricated pre-production prototype system</li> </ul> <p>(U) <u>FY 2000 Plans</u></p> <ul style="list-style-type: none"> <li>• Conduct Developmental and Operational Tests (DT/OT)</li> <li>• Prepare/Coordinate MSIII IPR package</li> <li>• Prepare material change package</li> </ul> <p>(U) <u>FY 2001 Plans</u></p> <ul style="list-style-type: none"> <li>• Initiate Pre-Planned Product Improvement effort</li> <li>• Obtain materials change decision</li> <li>• Obtain MSIII decision</li> </ul> <p>B. Other Program Funding Summary</p> <p>C. Acquisition Strategy</p> <p>D. Schedule Profile</p>									

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<b>Exhibit R-2a, RDT&amp;E Project Justification</b>		Date:		
		February 2000		
Fiscal Year actual and planned events:				
	FY1999	FY2000	FY2001	
<b>Acquisition Milestones</b>				
MDARS-I				MSIII
<b>Engineering Milestones</b>				
<b>T&amp;E Milestones</b>				
MDARS-I			DT/OT	
<b>Contract Milestones</b>				
	EMD			

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Exhibit R-3 Cost Analysis (page 1)								Date: February 2000				
EMD, DEFENSE-WIDE, BUDGET ACTIVITY 5			PROGRAM ELEMENT PE 0604709D8Z					MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM - INTERIOR (MDARS-I)				
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPIF	TBD		1.750		1.000		1.000				
Ancillary Hardware Development												
Systems Engineering				0.200		0.150		0.150				
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development				1.950		1.150		1.150		CONT	CONT	
Remarks:												
Development Support												
Software Development				0.500		0.150		0.150				
Training Development				0.200								
Integrated Logistics Support						0.100		0.100				
Configuration Management				0.100								
Technical Data												
GFE												
Subtotal Support				0.800		0.250		0.250		CONT	CONT	
Remarks												

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Exhibit R-3 Cost Analysis (page 2)										Date: February 2000			
EMD, DEFENSE-WIDE, BUDGET ACTIVITY 5			PROGRAM ELEMENT PE 0604709D8Z				MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM - INTERIOR (MDARS-I)						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract	
Developmental Test				0.158		0.260							
Operational Test													
Tooling													
GFE													
Award Fees													
Subtotal T&E				0.158		0.260				CONT	CONT		
Remarks													
Contractor Engineering Support													
Government Engineering Support													
Program Management Support				0.200				0.100					
Program Management Personnel													
Travel													
Labor (Research Personnel)													
Miscellaneous													
Subtotal Management				0.200				0.100		CONT	CONT		
Remarks													
Total Cost				3.108		1.660		1.500					
Remarks													

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Exhibit R-2a, RDT&E Project Justification								Date: February 2000	
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT		PROJECT NAME AND NUMBER					
EMD, DEFENSE WIDE, BUDGET ACTIVITY 5		PE 0604709D8Z		MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM - EXTERIOR (MDARS-E)					
Cost (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY2005	Cost to Complete	Total Cost
MDARS-E			1.000	6.000	6.000	0.000	0.000	0.000	13.000
<p>A. <u>Mission Description and Budget Item Justification.</u> The Mobile Detection Assessment Response System - Exterior (MDARS-E) will provide unmanned roving security patrols among the buildings and around the perimeter of large fixed installations including warehouses, large storage facilities and ammunition facilities. In addition to security, the system will also support inventories and track movement or disturbance of critical inventory items.</p> <p>(U) <u>FY 1999 Accomplishments</u></p> <ul style="list-style-type: none"> <li>No EMD funding during this fiscal year</li> </ul> <p>(U) <u>FY 2000 Plans</u></p> <ul style="list-style-type: none"> <li>No EMD funding during this fiscal year</li> </ul> <p>(U) <u>FY 2001 Plans</u></p> <ul style="list-style-type: none"> <li>Prepare/release EMD Request for Proposal (RFP)</li> <li>Conduct EMD Source Selection</li> <li>Prepare/award EMD contract</li> </ul> <p>B. Other Program Funding Summary</p> <p>C. Acquisition Strategy</p>									

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<b>Exhibit R-2a, RDT&amp;E Project Justification</b>				Date:
D. Schedule Profile:				February 2000
Fiscal Year actual and planned events:				
	FY1999	FY2000	FY2001	
<b>Acquisition Milestones</b>				
MDARS-E		MSI/II		
<b>Engineering Milestones</b>				
<b>T&amp;E Milestones</b>				
<b>Contract Milestones</b>				

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Exhibit R-3 Cost Analysis (page 1)										Date: February 2000		
RDT&E, DEFENSE-WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0604709D8Z				MOBILE DETECTION ASSESSMENT RESPONSE SYS - EXTERIOR (MDARS-E)					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development								0.600				
Ancillary Hardware Development												
Systems Engineering								0.200				
Licenses												
Tooling												
GFE												
Award Fees												
Subtotal Product Development								0.800		CONT	CONT	
Remarks:												
Development Support								0.200				
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support								0.200		CONT	CONT	
Remarks												

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RDT&E, DEFENSE-WIDE, BUDGET ACTIVITY 4			PROGRAM ELEMENT PE 0604709D8Z							MOBILE DETECTION ASSESSMENT RESPONSE SYSTEM - EXTERIOR (MDARS-E)		
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total 1998 Cost	1999 Cost	1999 Award Date	2000 Cost	2000 Award Date	2001 Cost	2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation												
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E										CONT	CONT	
Remarks												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Program Management Personnel												
Travel												
Labor (Research Personnel)												
Miscellaneous												
Subtotal Management										CONT	CONT	
Remarks												
Total Cost								1.000				
Remarks												

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