

<b>ARMY RDT&amp;E BUDGET ITEM JUSTIFICATION (R2 Exhibit)</b>							<b>February 2005</b>				
BUDGET ACTIVITY <b>5 - System Development and Demonstration</b>				PE NUMBER AND TITLE <b>0604 20A - RADAR DEVELOPMENT</b>				PROJECT <b>E10</b>			
COST (In Thousands)		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
E10	SENTINEL	0	5851	5080	2547	2647	0	0	0	0	Continuing

**A. Mission Description and Budget Item Justification:** The Short Range Air Defense (SHORAD) Project Office merged with the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) Project Office on January 11, 2005 to become the Cruise Missile Defense System (CMDS) Project Office. On January 13, 2005, the Program Executive Office (PEO) for Air, Space and Missile Defense (PEO ASMD) which CMDS is assigned to merged with the PEO for Tactical Missiles (PEO TM) to become the PEO for Missiles and Space (PEO MS).

The Sentinel Modernization Program is part of the Missiles and Space System of Systems (SoS). This enables the Cruise Missile Defense Systems (CMDS) weapons to engage these targets at maximum effective range. Sentinel supports Missiles and Space (MS) SoS through efforts which are initiated in FY05. These are Surface Launched Advance Medium Range Air-to-Air Missile (SLAMRAAM) Integration (SI), Mode V (MV), Joint ID (JID) and Composite Sensor Net (CSN).

SLAMRAAM Integration modifies Sentinel to interface with the SLAMRAAM MS Common Software communications network and adds specific SLAMRAAM engagement support capabilities. Current budgeted funds for the Sentinel Program will accomplish initial Sentinel modification. The integration development effort is partially funded.

Mode 5 is a replacement for Mode 4. Mode 5 provides improvements over Mode 4 in Crypto sensitivity, range performance, probability of identification, Friend from Friend identification, lethal interrogation capability and reduced interference with Civil Air Traffic Control Systems.

Joint Identification leverages off of fielded Air Force and Navy Electronic Support Measures (ESM) Technology, to optimize the affordability and effectiveness to address Cruise and Unmanned Aerial Vehicles (UAV) threats. Cutting edge specific emitter identification technology and cruise missile emitter detection will be integrated with Sentinel to provide passive and semi-active target acquisition along with jointly accepted identification capability. Signal processing will be tailored to reduce ESM processing cost by 40 – 50% versus airborne ESM systems by multiplexing processing across emitter bands. This capability improves survivability, effectiveness against air breathing Weapons of Mass Destruction (WMD) delivery systems, and fully supports multi-service SoS sensor and joint identification capability

Composite Sensor Netting is a software and communications link that allows target data to be shared among sensors and the Command, Control, Communications, Computers and Intelligence (C4I) structure to support both hostile identification and sensor resource management. This software and communication link allows a Sentinel radar communication net to effectively exchange target acquisition, tracking and classification information with other Sentinel radars on the battlefield. It improves the ability to cue weapon systems to destroy fixed wing, rotary wing, unmanned aerial vehicles and cruise missiles. When integrated with SLAMARRAM system it improves the accuracy of the missile by providing 3 times the update rate of commands to the missile versus the current system.

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## Accomplishments/Planned Program

	FY 2004	FY 2005	FY 2006	FY 2007
Initiate ASMD SoS Integration Development (SLAMRAAM/Sentinel SW Integration, Joint ID, Composite Sensor Netting, Mode 5)	0	5851	5080	2547
Totals	0	5851	5080	2547

## B. Program Change Summary

	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005)	6107	6393	2503
Current Budget (FY 2006/2007 PB)	5851	5080	2547
Total Adjustments	-256	-1313	44
Net of Program/Database Changes			
Congressional Program Reductions	-88		
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer	-168		
Adjustments to Budget Years		-1313	44

Funds realigned FY06 -\$1.313 Million to higher priority requirements and budget realignments.

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<b>C. Other Program Funding Summary</b>	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Compl	Total Cost
PE 643869, MEADS	236823	251414	0	0	0	0	0	0	0	488237
PE654869M06, Patriot/MEADS CAP	0	0	288785	326352	454511	510672	510389	490441	0	2581150
PE 273801, PATRIOT PIP	45587	32082	16188	10607	10884	11119	12029	12520	0	151016
PE 654865, PAC-3	151318	61482	0	0	0	0	0	0	0	212800
PE C49100, PATRIOT	616942	487364	489700	494754	466004	471770	0	0	0	3026534
PE C50001, PATRIOT/MEADS CAP	0	0	0	0	88425	64338	423209	663557	0	1239529
SSN C53201, PATRIOT/MEADS GSE	0	0	0	0	56048	62482	97555	230684	0	446769
PE 172419, JLENS	57803	79316	106420	256893	471997	332428	0	0	0	1304857
PE BZ0525, JLENS PRODUCTION	0	0	0	0	0	29153	549707	397776	0	976636
PE 654802, SLAMRAAM	36103	63111	36102	29200	0	0	0	0	0	164516
PE C81001, SLAMRAAM	7397	2440	19315	21970	59273	13124	0	0	0	123519
PE WK 5057, Sentinel Production	20646	7337	8393	15373	25074	31572	34473	32552	0	175420
PE 643327, Integrated Fire Control AMD	40275	0	24961	42736	48894	50930	0	0	0	207796

**C. Other Program Funding Summary:** This PE is an integral part of the Air, Space and Missile Defense System of Systems (SoS) including Integrated Fire Control, JLENS, Patriot/MEADS Combined Aggregate Program (CAP), SLAMRAAM, JTAGS, SENTINEL, and on-going initiatives to achieve Single Integrated Air Picture (SIAP).

**D. Acquisition Strategy:** In FY 1998 a Sole Source Cost Plus Award Fee (CPAF) contract was awarded to the Sentinel radar developer/manufacturer for the system design, development (SDD) of an upgraded transmitter.

In FY 2000, a second Sole Source Cost Plus Fixed Fee (CPFF) under the Sentinel Modernization Program was awarded to the Sentinel developer/manufacturer for the SDD of the Enhanced Target, Range, and Classification (ETRAC) kits. The ETRAC SDD contract was executed in three phases taking advantage of already developed items and certain off-the-shelf technologies to minimize risk while ensuring cost, schedule and performance goals are achieved.

In FY 2005, a modification to the current SLAMRAAM System Development and Demonstration contract will be awarded for the Sentinel integration into

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<p>SLAMRAAM. Sentinel funded a part of the integration effort starting in FY 05. The balance will be funded from other sources. The System Design, Development and Production of Mode 5, Joint Identification and Composite Sensor Netting hardware and will be funded from several contract and government sources.</p> <p>. In FY 2002, an initial Sole Source Firm Fixed Price (FFP) procurement contract was awarded to Thales Raytheon Systems (TRS) for procurement of Transmitter Mod Kits for installation into the Sentinel Fleet.</p> <p>In FY 2003, an initial Sole Source Firm Fixed Price (FFP) procurement contract was awarded to TRS to procure and install the ETRAC Mod Kits and the Transmitter Mod kits (procured under a separate contract ) into fielded Sentinel fleet.</p> <p>IN FY 2004, a Sole Source FFP modification to the FY 2003 ETRAC production contract was issued for procurement of an additional twenty-two (22) Kits and installation of twenty (20) kits into the Sentinel fleet</p> <p>Several Sole Source FFP procurement contracts are planned for award in TRS in FY 05 through FY 13 to procure and install ETRAC System Kits (integration of an upgraded Transmitter Mod Kit and an ETRAC Mod Kit into a single Mod kit) into the remaining Sentinel fleet.</p>		

ARMY RDT&E COST ANALYSIS(R3)									February 2005			
BUDGET ACTIVITY <b>5 - System Development and Demonstration</b>					PE NUMBER AND TITLE <b>0604 20A - RADAR DEVELOPMENT</b>					PROJECT <b>E10</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . ETRAC System Development	SS/CFFP	Raytheon, CA, Sentinel PM/AMCOM, AL	102729	0		0		0		0	102729	79192
b . Initiate MS SoS Integration Development (SI, JID, MV, CSN)	SS/CPFF	Raytheon, CA Sentinel PM/AMCOM, AL	0	5191	2Q	4329		2128		0	11648	11648
Subtotal:			102729	5191		4329		2128		0	114377	90840
II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . ETRAC Product Support Services	MIPR/1095	AMCOM, Redstone Arsenal, AL	16930	0		0		0		0	16930	0
Subtotal:			16930	0		0		0		0	16930	0

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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . ETRAC IOT&E, KPP Demonstration & other T&E Activities	MIPR/1095	OPTEC, VA; Redstone Technical Test Ctr, redstone Arsenal AI	34599	0		0		0		0	34599	0
Subtotal:			34599	0		0		0		0	34599	0
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . ETRAC Product Manager support	CPFF; MIPR/1095	Raytheon, MA; PM Sentinel/AMCOM, AL ; Vista Tech, AL; O2K Contractor, AL	11398	0		0		0		0	11398	0
b . Initiate MS SoS Integration Development (SI, JID, MV, CSN)	CPFF; MIPR/1095	Sentinel PM, AMCOM, AL; Various SETA Contractors, AL	0	660		751		419		0	1830	1051
Subtotal:			11398	660		751		419		0	13228	1051
Project Total Cost:			165656	5851		5080		2547		0	179134	91891

Schedule Profile (R4 Exhibit)																								February 2005									
BUDGET ACTIVITY 5 - System Development and Demonstration												PE NUMBER AND TITLE 0604□20A - RADAR DEVELOPMENT																PROJECT E10					
Event Name		FY 04				FY 05				FY 06				FY 07				FY 08				FY 09				FY 10				FY 11			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Sentinel SoS Integration:																																	
SLAMRAAM Integration																																	
Mode V Development/Production																																	
Joint ID Development/Production																																	
Composite Sensor Netting Development																																	

## Schedule Detail (R4a Exhibit)

February 2005

BUDGET ACTIVITY

**5 - System Development and Demonstration**

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<u>Schedule Detail</u>	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
SLAMRAAM Integration		3-4Q	1-4Q	1-4Q	1-4Q	1-4Q		
Mode V Development/Production			2-4Q	1-4Q	1-4Q	1-4Q	1-4Q	
Joint ID Development/Production			3-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Composite Sensor Netting Development		3-4Q	1-4Q	1-4Q	1-4Q	1-4Q		

ETRAC = Enhanced Target Range and Classification