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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)						Date: February 2005		
APPROPRIATION/BUDGET ACTIVITY RDT&E, Defense Wide/BA 5						R-1 ITEM NOMENCLATURE 0604618D8Z, Man Portable Air Defense Systems (MANPADS) Countermeasures		
COST (<i>In Millions</i>)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total Program Element (PE) Cost	2.871	11.923	13.349	0.936	0.970	0.950	0.968	0.989
MANPADS Countermeasures	2.871	11.923	13.349	0.936	0.970	0.950	0.968	0.989

(U) A. Mission Description and Budget Item Justification**A. (Mission Description and Budget Item Justification:**

(U) Man Portable Air Defense (MANPAD) systems are very widely proliferated, with greater than 500,000 produced and many poorly controlled. These weapons can be easily concealed and transported in a container as small as a suitcase, and can be lethal to a wide range of military and dual use aircraft. MANPAD systems and their launchers are available on the black market for as little as \$15,000. As demonstrated by recent events in Operation Iraqi Freedom, Department of Defense (DOD) and Civil aircraft are attractive terrorist targets.

(U) The process of defeating an IR missile includes two necessary tasks, detecting missile launch, and executing countermeasures to defeat the missile guidance system. Modern IRCM systems rely on sensors mounted on the protected aircraft and either infrared decoys (flares) or directed energy lamp or laser systems. Although various onboard systems have been developed and fielded to counter the IRCM threat, including MANPADS, they remain costly (between \$250,000 and \$5,000,000 per aircraft installation) and their integration is complex and time consuming.

UNCLASSIFIED

R-1 Budget Line – Item No 89

Page 1 of 4

UNCLASSIFIED

(U) Alternatives are needed to reduce the cost and lead time required to protect aircraft from IR missiles in the near-ground urban and expeditionary environment. This program investigates the development of a ground based, networked electro-optical sensor grid that would provide missile launch detection and warning, including examination of commercially available components to lower costs and to reduce the lead-time for system fielding. In conjunction with development of ground based sensor grid, directed energy technologies that could be used to counter ManPADS will be evaluated. By using vehicle mountings and wireless networking, it will be potentially possible make the system readily portable for rapid coverage area reconfiguration. Expeditionary airfields could thus be quickly protected.

(U) A second component of this program explores the development of more affordable countermeasures technologies suitable for use in urban and expeditionary airfield environments.

(U) The objective of this effort is to develop and demonstrate a low-cost, rapidly fieldable IRCM options for the rapid protection of expeditionary airfields and urban areas where comprehensive onboard protection cannot be guaranteed.

B. Program Change Summary: (Show total funding, schedule, and technical changes for the program element that have occurred since the previous President's Budget Submission)

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Previous President's Budget	2.958	14.135	13.674	0.970
Current FY2006 President's Budget	2.871	11.923	13.349	0.936
Total Adjustments	-0.087	-2.212	-0.325	-0.034
Congressional program reductions	-0.087	-2.212		
Congressional rescissions				
Congressional increases				
Reprogrammings				
SBIR/STTR Transfer				
Other			-0.325	-0.034

UNCLASSIFIED

R-1 Budget Line – Item No 89

Page 2 of 4

UNCLASSIFIED

RDT&E Budget Item Justification Sheet (R-2a Exhibit)						Date: February 2005		
Appropriation/Budget Activity RDT&E, Defense Wide/BA-5				R-1 Item Nomenclature Man Portal Air Defense System (MANPADS) Countermeasures PE 0604618D8Z				
Cost (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY2007	FY 2008	FY 2009	FY 2010	FY 2011
MANPADS	2.871	11.923	13.349	0.936	0.970	0.950	0.968	0.989

A. Mission Description and Budget Item Justification

(U) Man Portable Air Defense (MANPAD) systems are very widely proliferated, with greater than 500,000 produced and many poorly controlled. These weapons can be easily concealed and transported in a container as small as a suitcase, and can be lethal to a wide range of military and dual use aircraft. MANPAD systems and their launchers are available on the black market for as little as \$15,000. As demonstrated by recent events in Operation Iraqi Freedom, Department of Defense (DOD) and Civil aircraft are attractive terrorist targets.

(U) The process of defeating an IR missile includes two necessary tasks, detecting missile launch, and executing countermeasures to defeat the missile guidance system. Modern IRCM systems rely on sensors mounted on the protected aircraft and either infrared decoys (flares) or directed energy lamp or laser systems. Although various onboard systems have been developed and fielded to counter the IRCM threat, including MANPADS, they remain costly (between \$250,000 and \$5,000,000 per aircraft installation) and their integration is complex and time consuming.

(U) Alternatives are needed to reduce the cost and lead time required to protect aircraft from IR missiles in the near-ground urban and expeditionary environment. This program investigates the development of a ground based, networked electro-optical sensor grid that would provide missile launch detection and warning. In conjunction with development of ground based sensor grid, ground based directed energy technologies that could be used to counter ManPADS will be evaluated. A second component of this program explores the development of more affordable countermeasures technologies suitable for use in urban and expeditionary airfield environments.

(U) The objective of this effort is to develop and demonstrate a low-cost, rapidly fieldable IRCM option for the protection of expeditionary airfields and urban areas where comprehensive onboard protection cannot be guaranteed.

UNCLASSIFIED

R-1 Budget Line – Item No 89

Page 3 of 4

UNCLASSIFIED

B. Program Plans – FY 2005 Through FY 2006:

	FY 2004	FY 2005	FY 2006	FY2007
ManPADS Defense	2.871	11.923	13.349	0.936

(U) Based upon results from an FY 2003 study, this effort is planned to consist of two demonstration phases. Phase I will consist of a ground-based sensor grid component evaluation, system design, performance evaluation and demonstration. Phase II will consist of reduced cost, ground and/or on aircraft countermeasures.

(U) The initial testing will occur at the Naval Air Warfare Center, Weapons Division (NAWC-WD), China Lake, and will consist of a network of promising ground sensors. Objectives of the test are to show that the sensor and associated computational algorithms can reliably detect a missile launch and provide a declaration in sufficient time to initiate appropriate countermeasures (time is classified).

(U) The ground based sensor grid will consist of an array of sensors that constantly monitor for the presence of a MANPAD launch. Several factors favor this architecture, with much higher detection and lower false alarm rates than current on-aircraft launch detectors. The sensor grid will use commercially available components to reduce cost and the lead-time to field a system. Additionally, it will be possible make the system portable by mounting the sensors on vehicles and using wireless networking between the sensors. Expeditionary airfields and urban areas could be quickly augmented for MANPADS protection.

C. Other Program Funding Summary: N/A

UNCLASSIFIED

R-1 Budget Line – Item No 89

Page 4 of 4