Exhibit R-2a, RDT&E Project Justification

DATE: February 2005

BUDGET ACTIVITY: 03 Advanced Technology Development (ATD)

PE NUMBER AND TITLE: 0603444F MAUI SPACE SURVEILLANCE SYSTEM

PROJECT NUMBER AND TITLE: 4868 Maui Space Surveillance System

Cost ($ in Millions)		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
4868	Maui Space Surveillance System	50.208	58.189	5.848	6.005	6.082	6.596	6.735	6.860	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

This program funds space situational awareness technology development and demonstration at the Maui Space Surveillance System (MSSS) in Hawaii, as well as the operation and upgrade of the facility. Note: In FY 2005, Congress added $33.9 million for the MSSS, $8.5 million for High Accuracy Network Determination System, and $10.0 million for Panoramic Survey Telescope And Rapid Response System (Pan-STARRS).

This program is in Budget Activity 3, Advanced Technology Development, since it enables and demonstrates technologies for existing system upgrades and/or new system developments that have military utility and address warfighter needs.

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007
(U) MAJOR THRUST/CONGRESSIONAL ADD: Develop and demonstrate space situational awareness technology at the MSSS in Hawaii, as well as operate and upgrade the facility.	32.142	39.852	5.848	6.005

(U) In FY 2004: Enhanced MSSS utility by dedicating specific areas to operate at higher classification levels, continuing the upgrade of heavy lift elevator, providing support to resolve electromagnetic interference at site, enhancing reliability and maintainability by upgrading network servers at various classification levels, improving connectivity between sites, and procuring critical state-of-the-art spares. Provided automatic frame selection for daylight imagery that is post-processed using advanced algorithms for increased timeliness. Implemented data dissemination architecture with secure, near-real-time, web-based connectivity for release of MSSS sensor information. Conducted technology development efforts using active laser illumination including high precision range rate data collection and demonstrated high precision laser pointing to increase measurement accuracy. Characterized and upgraded the adaptive optics system by implementing a tracker upgrade to improve sensitivity and implement diagnostic software capabilities improving resolution. Refurbished MSSS sensors such as the radiometer, long-wave imager, spectrograph, and daylight acquisition sensor for increased sensitivity and resolution. Conducted lost satellite search and non-imaging space object identification to detect and characterize smaller/fainter objects including near-Earth asteroid tracking.

(U) In FY 2005: Enhance MSSS utility by procuring critical sensor and telescope spares, refurbishing the control rooms and upgrading computers for increased personnel efficiency, and maintaining requirements for safety and security in accordance with Air Force regulations. Research current and new, advanced technologies for improving active track of satellite and missile tests. Refine active imaging technology along with adaptive optics and image post-processing algorithms as well as techniques to assess when further processing is no longer productive. Pursue non-imaging space object identification techniques to

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	determine how shape and size information can be extracted from non-imaging signature information.				
(U)	In FY 2006: Continue MSSS operations, research, and development supporting various operational customers and experimenters. Procure additional critical sensor and telescope spares, continue to refurbish the control rooms and upgrade computers for increased efficiency, while maintaining requirements for safety and security in accordance with Air Force regulations.				
(U)	In FY 2007: Continue MSSS operations, research, and development supporting various operational customers and experimenters. Continue refurbishing and upgrading MSSS, and maintaining requirements for safety and security in accordance with Air Force regulations.				
(U)					
(U)	CONGRESSIONAL ADD: Panoramic Survey Telescope And Rapid Response System (Pan-STARRS)	9.854	9.912	0.000	0.000
(U)	In FY 2004: Completed preliminary design review and began development for telescope system to include: advanced charged coupled devices to detect very dim space objects of the 24th magnitude; a telescope system that uses the charged coupled device detectors; and the hardware/procedures to collect and display the data. Designed and developed data archiving to support future data collection.				
(U)	In FY 2005: Perform site selection and ground-breaking activities. Fabricate and assemble first PanSTARRS telescope which will be located on Haleakala, HI. Investigate satellite streak issue for dim object detections. Evaluate the PanSTARRS system for its military utility and complete development of focal plane arrays for use in the 4-telescope system.				
(U)	In FY 2006: Not Applicable.				
(U)	In FY 2007: Not Applicable.				
(U)					
(U)	CONGRESSIONAL ADD: High Accuracy Network Determination System (HANDS).	8.212	8.425	0.000	0.000
(U)	In FY 2004: Deployed additional HANDS sensors in areas of high interest in the Space Surveillance Network and studied use of system for detecting and tracking objects in low-earth orbit. Developed large field of view acquisition telescope.				
(U)	In FY 2005: Deploy additional HANDS sensors, both narrow field of view and wide field of view, to expand global coverage of the geosynchronous earth orbit belt, advancing state-of-the-art space situation awareness technology. Continue development in the areas of improving satellite metrics accuracy, low earth orbit sensors, and meter-class sensors.				
(U)	In FY 2006: Not Applicable.				
(U)	In FY 2007: Not Applicable.				
(U)	Total Cost	50.208	58.189	5.848	6.005

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(U) C. Other Program Funding Summary ($ in Millions)

	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
(U) Related Activities:										
(U) PE 0602605F, Directed Energy Technology.										
(U) PE 0603605F, Advanced Weapons Technology.										
(U) PE 0602500F, Multi-Disciplinary Space Technology.										
(U) PE 0603500F, Multi-Disciplinary Advanced Development Space Technology.										
(U) PE 0603883C, Ballistic Missile Defense Boost Phase Segment.										
(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.										

(U) D. Acquisition Strategy

Not Applicable.