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PE NUMBER: 0604425F

PE TITLE: Space Situation Awareness Systems

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2006
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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604425F Space Situation Awareness Systems
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Cost (\$ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	0.000	0.000	121.157	216.972	285.475	407.838	294.509	Continuing	TBD
A006 Space Based Space Surveillance	0.000	0.000	110.558	194.119	202.342	293.515	206.305	Continuing	TBD
A008 Space Situation Awareness Initiatives	0.000	0.000	10.599	8.943	7.407	7.793	7.866	Continuing	TBD
A009 Space Fence	0.000	0.000	0.000	13.910	75.726	106.530	80.338	Continuing	TBD

In FY 2007 this is a new PE. These projects transferred from PE 0305910F, Spacetrack, to reflect evolution of space surveillance to the Space Situation Awareness construct.

(U) A. Mission Description and Budget Item Justification

Space Situation Awareness (SSA) is knowledge of all aspects of space related to operations. The foundation for space control, it encompasses intelligence on adversary space operations; surveillance of all space objects and activities; detailed reconnaissance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities. This program element develops new Air Force sensors for the SSA network and improves information integration across it; companion program element 0305940F, Space Situation Awareness Operations, fields, upgrades, operates, and sustains sensors within that network. Development activities are necessary to deploy new, advanced sensors capable of finding, fixing, tracking, and reconnoitering the expanding number of debris objects on orbit as well as the increasing number of satellites launched by other nations, many of them smaller and more capable than previous spacecraft. They are also required to better integrate the disparate elements of SSA into a single informational picture enabling rapid, responsive space operations.

(U) B. Program Change Summary (\$ in Millions)

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Previous President's Budget	0.000	0.000	0.000
(U) Current PBR/President's Budget	0.000	0.000	121.157
(U) Total Adjustments	0.000	0.000	
(U) Congressional Program Reductions			
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer			

(U) Significant Program Changes:

FY 2007: Funding transferred from PE 0305910F

Exhibit R-2a, RDT&E Project Justification

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Cost (\$ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
A006 Space Based Space Surveillance	0.000	0.000	110.558	194.119	202.342	293.515	206.305	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

In FY 2007 this effort transferred from Project 674930, Space-Based Space Surveillance, in PE 0305910F, Spacetrack, to reflect the evolution of space surveillance to the Space Situation Awareness construct. The full FY 2005 - FY 2011 schedule for it is included here for clarity, but refer to the RDT&E Budget Item Justification for that PE for further information on funding and activities prior to FY 2007.

(U) A. Mission Description and Budget Item Justification

Building upon the success of the Space-Based Visible technology demonstration, which proved the utility of surveilling orbiting objects from space, the Space-Based Space Surveillance (SBSS) project develops a constellation of optical sensing satellites to find, fix, and track objects in Earth orbit. It will accomplish this via collecting and processing space object identification and satellite metric data, then communicating it to command and control nodes. Migrating surveillance capabilities to space augments existing ground sensors with advanced 24-hour, all-weather object search capabilities that allow detection of smaller targets with greater timeliness, improve orbit characterization accuracy by an order of magnitude, and vastly improve capacity for tracking multiple objects simultaneously. In conjunction with information from other SSA network sensors, the resulting data will enable near-continuous detection and tracking of space objects.

This effort is in Budget Activity 5, System Development and Demonstration, because it is developing a new spacecraft system.

(U) B. Accomplishments/Planned Program (\$ in Millions)

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Block 10 design, development, and risk reduction	0.000	0.000	83.075
(U) Block 10 launch vehicle integration	0.000	0.000	6.860
(U) Block 20 design, development, and risk reduction	0.000	0.000	9.096
(U) Program operations	0.000	0.000	11.527
(U) Total Cost	0.000	0.000	110.558

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

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) RDT&E, Air Force (PE 0305190F, Spacetrack)	76.424	91.913	0.000	0.000	0.000	0.000	0.000	0.000	236.940
(U) Missile Procurement, Air Force (PE 0305940F, Space Situation Awareness Operations)	0.000	0.000	0.000	0.000	0.000	0.000	31.406	Continuing	TBD

(U) D. Acquisition Strategy

This system is being acquired via a two-phased approach. Block 10 will develop and field a single pathfinder satellite to replace the capability of the aging

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Space-Based Visible sensor on the orbiting Midcourse Space Experiment research & development spacecraft. Block 20 will deploy a robust constellation of four satellites incorporating more advanced technologies for worldwide space surveillance. Lessons learned from the former effort will guide development of the latter. Block 10 began as an option on the existing Mission Area Prime Integrating Contract for the space control mission area to expedite fielding but was transformed into its own contract when a competitive award was held for the Block 10 subcontract. The contract for Block 20 will be awarded following a full and open competition.

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Exhibit R-3, RDT&E Project Cost Analysis

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<u>(U) Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>Total Prior to FY 2005 Cost</u>	<u>FY 2005 Cost</u>	<u>FY 2005 Award Date</u>	<u>FY 2006 Cost</u>	<u>FY 2006 Award Date</u>	<u>FY 2007 Cost</u>	<u>FY 2007 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
(U) <u>Product Development</u> Block 10 design and development	C/CPAF	Northrop Grumman, Redondo Beach, CA	0.000	0.000		0.000		83.075	Nov-06	Continuing	TBD	
Technical risk reduction	SS/CPFF	MIT Lincoln Laboratory, Lexington, MA	0.000	0.000		0.000		0.500	Jan-07	Continuing	TBD	
Launch vehicle integration	MIPR	Space and Missile Systems Center Det. 12, Kirtland AFB, NM	0.000	0.000		0.000		6.860	Nov-06	Continuing	TBD	
Block 20 design and development	TBD	TBD	0.000	0.000		0.000		9.096	Nov-06	Continuing	TBD	
Subtotal Product Development			0.000	0.000		0.000		99.531		Continuing	TBD	0.000
Remarks:												
(U) <u>Support</u> Program operations	Various	Space and Missile Systems Center, Los Angeles AFB, CA	0.000	0.000		0.000		11.027	Oct-06	Continuing	TBD	
Subtotal Support			0.000	0.000		0.000		11.027		Continuing	TBD	0.000
Remarks:												
(U) <u>Test & Evaluation</u> Not applicable											0.000	
Subtotal Test & Evaluation			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) <u>Management</u> Not applicable											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Total Cost			0.000	0.000		0.000		110.558		Continuing	TBD	0.000

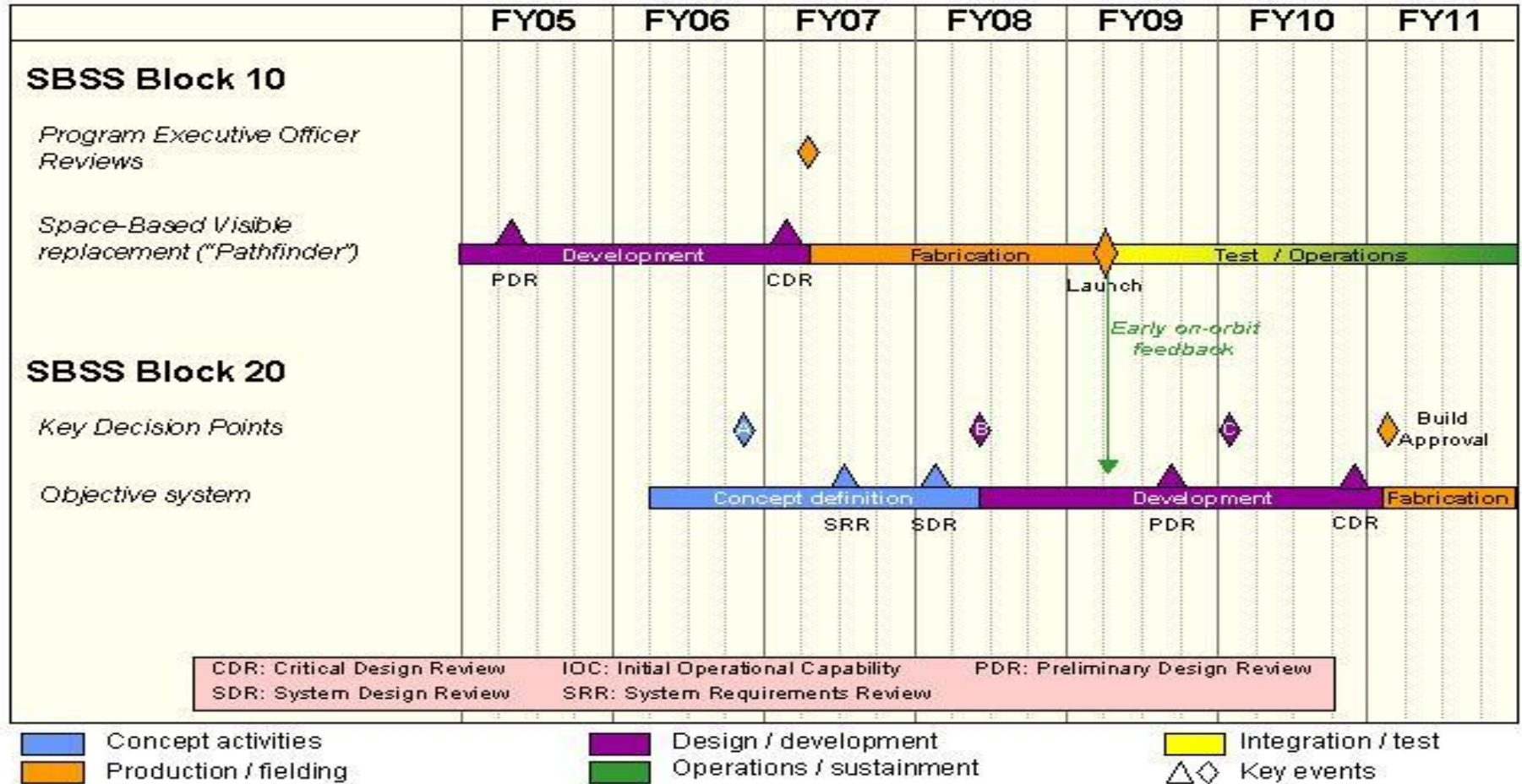
Exhibit R-4, RDT&E Schedule Profile

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BUDGET ACTIVITY
05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE
0604425F Space Situation Awareness Systems

PROJECT NUMBER AND TITLE
A006 Space Based Space Surveillance



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Exhibit R-4a, RDT&E Schedule Detail		DATE February 2006
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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604425F Space Situation Awareness Systems	PROJECT NUMBER AND TITLE A006 Space Based Space Surveillance
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(U) <u>Schedule Profile</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Block 10 Critical Design Review			1Q
(U) Block 10 Program Executive Officer Review			2Q
(U) Block 20 System Requirements Review			3Q

Exhibit R-2a, RDT&E Project Justification

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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)				PE NUMBER AND TITLE 0604425F Space Situation Awareness Systems			PROJECT NUMBER AND TITLE A008 Space Situation Awareness Initiatives		
Cost (\$ in Millions)	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
A008 Space Situation Awareness Initiatives	0.000	0.000	10.599	8.943	7.407	7.793	7.866	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

In FY 2007 these efforts transferred from Project 675011, Space Situational Awareness Initiatives, in PE 0305910F, Spacetrack, to reflect the evolution of space surveillance to the Space Situation Awareness construct. The full FY 2005 - FY 2011 schedule for them is included here for clarity, but refer to the RDT&E Budget Item Justification for that PE for further information on funding and activities prior to FY 2007.

(U) A. Mission Description and Budget Item Justification

Space Situation Awareness Initiatives improve the integration of the disparate information components of SSA into a single informational picture to better support space command, control, operations, and planning activities with timely data.

The main project initiative, Space Situation Awareness Command and Control (SSA C2), develops software applications to collect, process, fuse, and disseminate intelligence, surveillance, reconnaissance, and environmental data; combines tools developed in these four areas into integrated capabilities for delivery; conducts operational utility evaluations of these using the SSA data fusion testbed; refines and integrates them into space command & control applications; and upgrades the testbed to ensure its ability to evaluate the utility of future applications under operationally-representative conditions. A related Extended Space Sensors Architecture Advanced Concept Technology Demonstration will also develop, test, and demonstrate SSA data fusion capabilities. Successive delivery of SSA C2 capability spirals progressively improves space command and control via more effective correlation and distribution of data collected by the SSA network's various sensors.

This project also encompasses the architecture development and computer modeling efforts of Air Force Space Command's Space Situation Awareness Integration Office (SSAIO), the lead service/system integrator and executive agent for the nation's SSA activities. SSAIO captures SSA capability needs; develops short- and mid-term enterprise architectures; and evaluates satisfaction of capabilities to guide Department of Defense and intelligence community budget formulation, systems integration, and requirements allocation toward improved fulfillment of U.S. SSA needs via greater collaboration and leveraging of community assets.

These initiatives are in Budget Activity 5, System Development and Demonstration, because they develop and demonstrate tools for better fusion and distribution of SSA data or develop architectures guiding associated technical and budgetary planning.

(U) B. Accomplishments/Planned Program (\$ in Millions)

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) Intelligence data integration and applications	0.000	0.000	1.515
(U) Surveillance & reconnaissance data integration and applications	0.000	0.000	1.278
(U) Space environmental data integration and applications	0.000	0.000	1.212
(U) Fusion tool development, assessments, requirements development, and technical support	0.000	0.000	3.420
(U) Extended Space Sensors Architecture Advanced Concept Technology Demonstration (ESSA ACTD)	0.000	0.000	1.500
(U) SSA architecture development and modeling activities	0.000	0.000	1.674
(U) Total Cost	0.000	0.000	10.599

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BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604425F Space Situation Awareness Systems	PROJECT NUMBER AND TITLE A008 Space Situation Awareness Initiatives
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(U) **C. Other Program Funding Summary (\$ in Millions)**

	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) RDT&E, Air Force (PE 0305910F, Spacetrack)	10.645	16.076	0.000	0.000	0.000	0.000	0.000	0.000	51.733

(U) **D. Acquisition Strategy**

SSA initiatives utilize existing engineering and study contracts awarded and maintained by space planning and development organizations throughout the Department of Defense in order to accomplish required development activities and to obtain infrastructure and technical support. Most activities develop, test, and deliver capabilities or provide products in successive spirals. Operational needs drive the prioritization and selection of particular applications and architecture products for development.

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(U) <u>Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>Total Prior to FY 2005 Cost</u>	<u>FY 2005 Cost</u>	<u>FY 2005 Award Date</u>	<u>FY 2006 Cost</u>	<u>FY 2006 Award Date</u>	<u>FY 2007 Cost</u>	<u>FY 2007 Award Date</u>	<u>Cost to Complete</u>	<u>Total Cost</u>	<u>Target Value of Contract</u>
(U) <u>Product Development</u>												
Intelligence data applications	Various	Various	0.000	0.000		0.000		1.515	Dec-06	Continuing	TBD	
Surveillance & reconnaissance data applications	Various	Various	0.000	0.000		0.000		1.278	Dec-06	Continuing	TBD	
Space environmental data applications	MIPR	Space and Missile Systems Center Det. 11, Peterson AFB, CO	0.000	0.000		0.000		1.212	Nov-06	Continuing	TBD	
ESSA ACTD	SS/CPFF	MIT Lincoln Laboratory, Lexington, MA	0.000	0.000		0.000		1.500	Dec-06	Continuing	TBD	
SSA architecture development	Various	Various	0.000	0.000		0.000		1.674	Dec-06	Continuing	TBD	
Subtotal Product Development			0.000	0.000		0.000		7.179		Continuing	TBD	0.000
Remarks:												
(U) <u>Support</u>												
Fusion tool development, requirements, and technical support	Various	Electronic Systems Center Det., Peterson AFB, CO	0.000	0.000		0.000		3.420	Dec-06	Continuing	TBD	
Subtotal Support			0.000	0.000		0.000		3.420		Continuing	TBD	0.000
Remarks:												
(U) <u>Test & Evaluation</u>												
Not applicable											0.000	
Subtotal Test & Evaluation			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) <u>Management</u>												
Not applicable											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) Total Cost			0.000	0.000		0.000		10.599		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile

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BUDGET ACTIVITY
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PE NUMBER AND TITLE
0604425F Space Situation Awareness Systems

PROJECT NUMBER AND TITLE
A008 Space Situation Awareness Initiatives

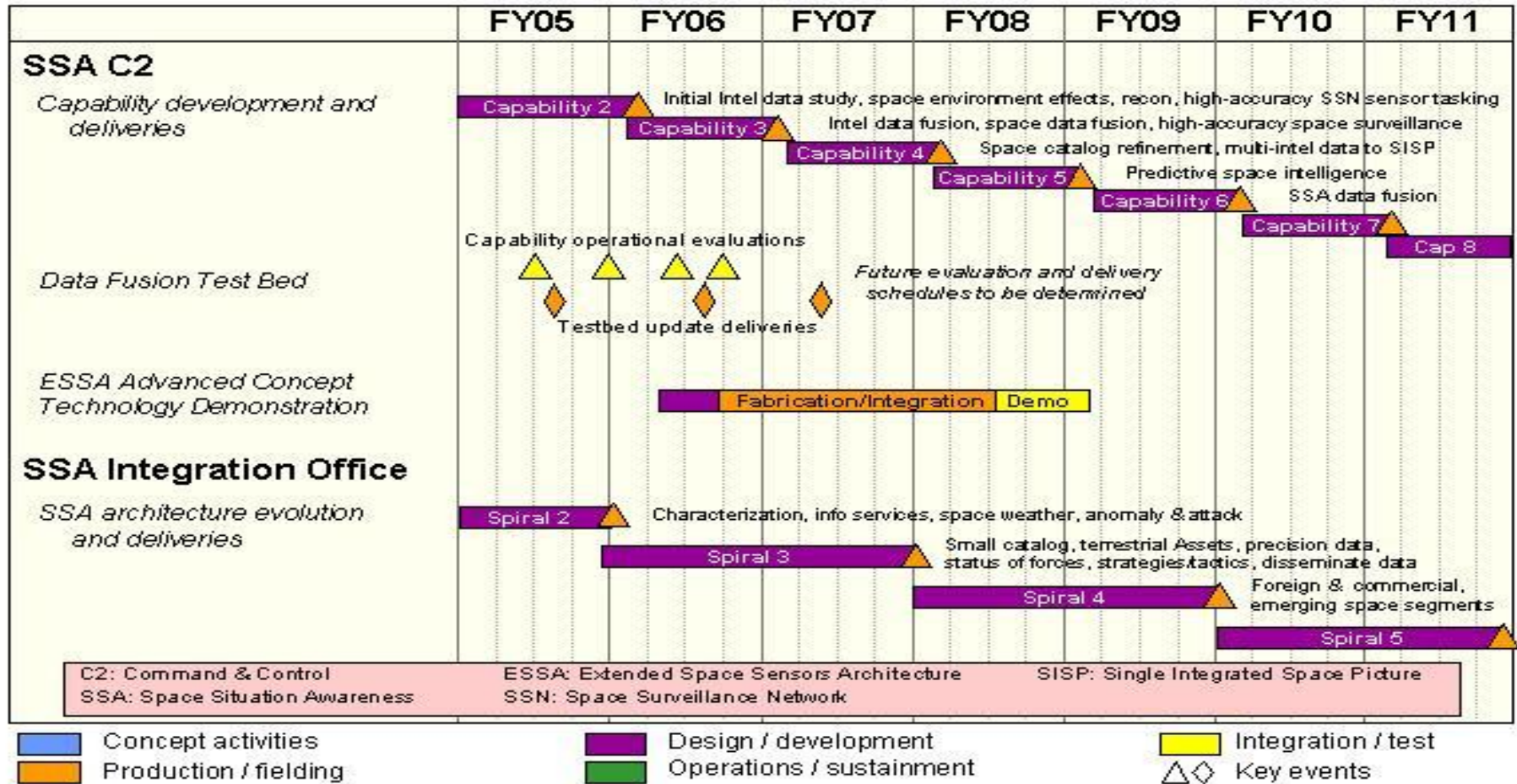


Exhibit R-4a, RDT&E Schedule Detail	DATE February 2006
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	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) <u>Schedule Profile</u>			
(U) SSA command & control capability spiral delivery			1Q
(U) Data fusion testbed update			2Q