

**UNCLASSIFIED**

PE NUMBER: 0305202F  
 PE TITLE: Dragon U-2 (JMIP)

<b>Exhibit R-2, RDT&amp;E Budget Item Justification</b>	DATE <b>February 2004</b>
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<b>BUDGET ACTIVITY</b> <b>07 Operational System Development</b>	<b>PE NUMBER AND TITLE</b> <b>0305202F Dragon U-2 (JMIP)</b>
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Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	24.101	46.599	87.745	64.567	9.811	9.966	10.123	Continuing	TBD
4820 Sensor Development	17.241	41.624	84.753	61.575	9.811	9.966	10.123	Continuing	TBD
4945 High Altitude Subsystems	6.860	4.975	2.992	2.992	0.000	0.000	0.000	Continuing	TBD

1. The FY04 appropriations bill added \$2.5M for Senior Year Electro-Optical Reconnaissance System (SYERS) focal plane depot capability and cut \$8M from the Airborne Signals Intelligence Payload (ASIP) program.

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

The RDT&E portion of this program element funds efforts required to enhance and sustain the U-2 Dragon Lady Intelligence Surveillance Reconnaissance (ISR) system. In addition to the RDT&E funding there are procurement funds associated with these developments. This program element is categorized as Budget Activity 7 because it provides for development of technologies and capabilities in support of operational system development for the U-2 ISR system.

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

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Previous President's Budget	23.586	52.518	59.975
(U) Current PBR/President's Budget	24.101	46.599	87.745
(U) Total Adjustments	0.515	-5.919	
(U) Congressional Program Reductions	-7.000	-5.500	
Congressional Rescissions	-0.253	-0.419	
Congressional Increases			
Reprogrammings	7.768		
SBIR/STTR Transfer			

**(U) Significant Program Changes:**

The FY04 appropriations bill added \$2.5M for SYERS focal plane depot capability and cut \$8M from the U-2 ASIP. The Air Force will request authority from Congress to apply the \$2.5M toward a SYERS test bed capability.

**FY05**

- \$8M of procurement funds were reprogrammed into RDT&E funds to correctly align with the ASIP acquisition strategy.
- \$3M of procurement is realigned into RDT&E for further Link 16 development for the U-2.
- the U-2 program received \$17M to address ASARS-2A image quality problems noted during acceptance tests.

**FY06**

- \$25.4M of procurement funds were reprogrammed into RDT&E funds to correctly align with the ASIP acquisition strategy.

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- another \$3M of procurement is realigned into RDT&E for further U-2 Link 16 development.
- the U-2 program received \$6M to address ASARS-2A image quality problems

## Exhibit R-2a, RDT&amp;E Project Justification

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BUDGET ACTIVITY 07 Operational System Development				PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)			PROJECT NUMBER AND TITLE 4820 Sensor Development		
Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
4820 Sensor Development	17.241	41.624	84.753	61.575	9.811	9.966	10.123	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

Budget Activity Justification - This program element is categorized as Budget Activity 7 because it provides for development of technologies and capabilities in support of operational system development for the U-2 intelligence surveillance and reconnaissance (ISR) system.

1. The FY04 appropriations bill added \$2.5M for SYERS focal plane depot capability and cut \$8M from the Airborne Signals Intelligence Payload (ASIP) program.

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

This development project supports high payoff improvements to the U-2 sensors such as the Advanced Synthetic Aperture Radar System (ASARS-2A), the SENIOR YEAR Electro-optical Reconnaissance System (SYERS) 2 Improvement Program, SIGINT programs, and the ASIP program.

The ASARS-2A Program improves area search, precision geolocation, and image quality to support precision guided munitions targeting. The system produces complex imagery, enabling enhanced exploitation methods. ASARS-2A introduces Asynchronous Transfer Mode (ATM) datalink formats to the ISR community and supports National Imagery Transmission Format (NITF) standards. Requirements include ASARS-2A reliability improvements and exploitation tools for the user (for example, system robustness, Dual Data Link (DDL), Beyond Line of Sight (BLOS), image quality, Ground Moving Target Indication (GMTI), geolocation and targeting, sensor position data, Receiver Exciter Controller (REC) upgrades and software upgrades). The ongoing ASARS-2A Image Quality Improvement Program (IQIP) addresses system robustness and image quality performance identified during initial system fielding.

The SYERS-2 Improvement Program includes upgrades such as multi-spectral collection and processing, polarization collection and processing, possible hyperspectral collection and processing, and the associated exploitation tools for the user. SYERS-2 also includes reliability and maintainability upgrades that incorporate next generation technology to maintain and enhance system supportability. SYERS Polarimetric Improvement (SYERS P4I) investigates the potential for using polarimetric collection data to find man-made objects on the battlefield. A depot for the repair and refurbishing of SYERS sensors will be established.

The SIGINT Program develops new sensors (ASIP) and maintains present capability by developing replacements for current components affected by diminishing manufacturing sources as well as enhancing capability to exploit evolving signals of interest including Quick Reaction Capabilities (QRCs) to meet emerging operational requirements. Also, we are examining the possibility of modifying current systems to allow them to function on Power/Electromagnetic Interference upgraded U-2s.

All of the sensors are being converted to the ATM standard to address vanishing vendor issues and to optimize signals intelligence bandwidth allocation.

The ASIP Program will design, develop, and build a common/scalable modernized SIGINT system with a low-band subsystem integrated with a High Band Sub-System (HBSS). The ASIP will be fielded on the U-2 and Global Hawk (PE 0305220F Endurance Unmanned Aerial Vehicles, project 4799). Three ASIP prototype Developmental Test Units (DTUs) will be delivered in FY07 for system integration and testing on the U-2 and Global Hawk. Following the developmental flight test

## Exhibit R-2a, RDT&amp;E Project Justification

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BUDGET ACTIVITY <b>07 Operational System Development</b>	PE NUMBER AND TITLE <b>0305202F Dragon U-2 (JMIP)</b>	PROJECT NUMBER AND TITLE <b>4820 Sensor Development</b>
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phase, the three DTUs will be modified to a productionized configuration for operational employment on the U-2.

(U) <b><u>B. Accomplishments/Planned Program (\$ in Millions)</u></b>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Accomplishments/Planned Program	0.000	0.000	
(U) Continue ASARS-2A IQI Software/Hardware Development Tasks and System Robustness Improvements	4.241	4.173	19.253
(U) SIGINT Enhancements	4.152		
(U) Signals Intelligence (SIGINT) Sensor Development/Integration (Airborne Signals Intelligence Payload, (ASIP)	6.500	35.327	65.413
(U) Establish SYERS-2 Depot Maintenance Capability		2.124	
(U) Systems Engineering, Program Management and Flt Test Support	2.348		0.087
(U) Total Cost	17.241	41.624	84.753

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

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</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) APAF, Manned Recce, 0305202F - Sensors Production	23.032	13.671	12.596	9.927	11.849	14.160	13.226	Continuing	TBD
(U) RDT&E, 0305205F - ASIP Development	58.331	68.674						0.000	127.005
(U) RDT&E, 0305220F - ASIP Development			62.767	26.955	26.645			0.000	116.367
(U) APAF, 0305220F - ASIP Production				28.400	104.600	60.800	47.400	Continuing	TBD
(U) RDT&E, 0305206F, SYERS-2	1.976								1.976

(U) **D. Acquisition Strategy**

For airborne collection capability upgrades, modify existing platform and associated ground control equipment via Engineering Change Proposals (ECPs)/Task Orders to existing USAF contracts. Develop and test new technology line replaceable units (LRUs) for all U-2 sensors. There is associated procurement funding tied to this development activity.

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**Exhibit R-3, RDT&E Project Cost Analysis**

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BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT NUMBER AND TITLE				
<b>07 Operational System Development</b>				<b>0305202F Dragon U-2 (JMIP)</b>				<b>4820 Sensor Development</b>				
(U) <u>Cost Categories</u>	<u>Contract Method</u>	<u>Performing Activity &amp;</u>	<u>Total</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>FY</u>	<u>Cost to</u>	<u>Total</u>	<u>Target</u>
(Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>&amp; Type</u>	<u>Location</u>	<u>Prior to FY</u>	<u>2003</u>	<u>2003</u>	<u>2004</u>	<u>2004</u>	<u>2005</u>	<u>2005</u>	<u>Complete</u>	<u>Cost</u>	<u>Value of</u>
			<u>2003</u>	<u>Cost</u>	<u>Award</u>	<u>Cost</u>	<u>Award</u>	<u>Cost</u>	<u>Award</u>			<u>Contract</u>
			<u>Cost</u>		<u>Date</u>		<u>Date</u>		<u>Date</u>			
(U) <u>Product Development</u>												
ASARS-2A	SS/CPIF	Raytheon, Los Angeles	105.767	4.241	Feb-03	4.173	Dec-03	19.253	Feb-05	Continuing	TBD	
SYERS	SS/CPFF	BF Goodrich, Boston	4.954	0.000		2.124	Apr-04	0.000		0.000	7.078	
SIGINT	SS/CPIF	Raytheon, Los Angeles	0.000	4.152	Nov-02	0.640	Jun-04	0.000		0.000	4.792	
(Collaborative SIGINT Sensor) ASIP	SS/CPAF	Northrop Grumman Los Angeles	0.000	6.500	Apr-03	32.269	Feb-04	63.012	Feb-05	Continuing	TBD	
Subtotal Product Development			110.721	14.893		39.206		82.265		Continuing	TBD	0.000
Remarks:												
(U) <u>Support</u>												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) <u>Test &amp; Evaluation</u>												
Flight Test	SS/CPFF	Lockheed Palmdale		1.877	Dec-02	1.933	Mar-04	1.990	Mar-05	Continuing	TBD	
Subtotal Test & Evaluation			0.000	1.877		1.933		1.990		Continuing	TBD	0.000
Remarks:												
(U) <u>Management</u>												
ASC/RA	C/FFP	H.J. Ford WPAFB OH		0.471	Dec-02	0.485	Dec-03	0.498	Dec-04		1.454	
Subtotal Management			0.000	0.471		0.485		0.498		0.000	1.454	0.000
Remarks:												
(U) Total Cost			110.721	17.241		41.624		84.753		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile

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BUDGET ACTIVITY  
07 Operational System Development

PE NUMBER AND TITLE  
0305202F Dragon U-2 (JMIP)

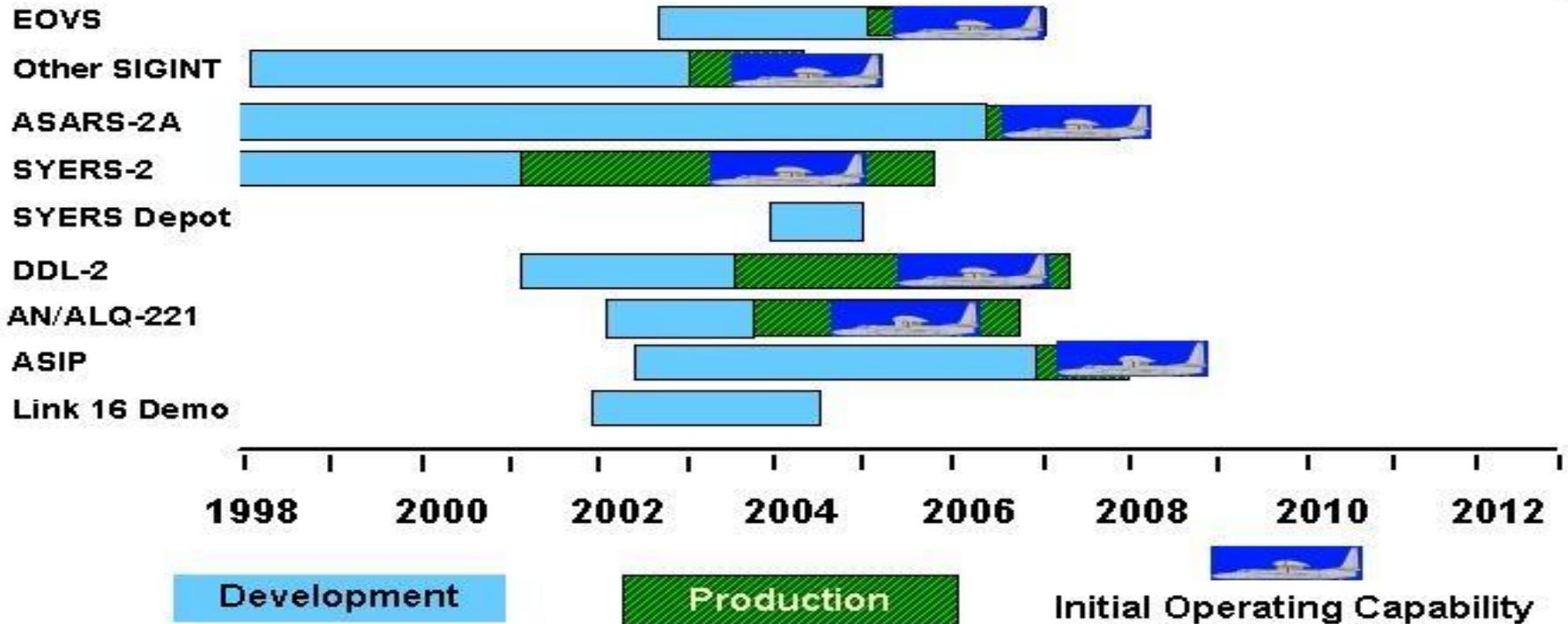
PROJECT NUMBER AND TITLE  
4820 Sensor Development



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**Exhibit R-4a, RDT&E Schedule Detail**

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**07 Operational System Development**

PE NUMBER AND TITLE

**0305202F Dragon U-2 (JMIP)**

PROJECT NUMBER AND TITLE

**4820 Sensor Development**

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) <b><u>Schedule Profile</u></b>			
(U) ASARS-2A Program	1Q		
(U) - Continue IQI Activities	1Q	1Q	1Q
(U) SYERS-2 Depot		2Q	
(U) Other SIGINT	3Q	1Q	
(U) ASIP Development	1Q		
(U) - Award Contract	3Q		
(U) - Preliminary Design Review		4Q	
(U) - Critical Design Review			1Q

## Exhibit R-2a, RDT&amp;E Project Justification

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BUDGET ACTIVITY 07 Operational System Development				PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)			PROJECT NUMBER AND TITLE 4945 High Altitude Subsystems		
Cost (\$ in Millions)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total
4945 High Altitude Subsystems	6.860	4.975	2.992	2.992	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0		

Budget Activity Justification - This program is categorized as Budget Activity 7 because it provides for development of technologies and capabilities in support of operational system development for the U-2 aircraft.

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

This project supports development and integration of subsystems on the U-2 (e.g., Advanced Defensive System (ADS or AN/ALQ-221) development, and cockpit upgrades that include a glass cockpit with Electro-Optical View Sight (EOVS), Direct Threat Warning, navigator upgrades, datalinks) and compliance with Global Air Navigation Systems and Global Air Traffic Management (GATM) requirements.

EOVS replaces the legacy optical drift sight that was removed in the U-2 Block 20 upgrade. The image from the EOVS camera will be displayed in the cockpit.

The U-2 ADS (AN/ALQ-221) development provides a new Wide Band Radar Warning Receiver (RWR)/Jammer for Search, Track and Launch Detection capability and Track and Launch Jamming capability. The new RWR/Jammer will integrate with the legacy 29E Low Band Receiver/Jammer, 29F Radar Warning Receiver, and portions of the System 29 Band Aid System.

The Fuels Conversion Program is an Air Force Research Laboratory research program attempting to develop a low temperature additive for JP-8 to substitute the current JPTS U-2 fuel. The additive will lower fuel costs and decrease the U-2's logistical footprint.

The Dual Data Link (DDL)-II Program provides the capability to transmit ISR data via dual, simultaneous, independent wideband datalinks.

The Link-16, Direct Threat Warning (DTW) data and voice links, and an upgraded electrical generator will be developed, demonstrated, and integrated on to the U-2 aircraft.

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

	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) Accomplishments/Planned Program	0.000	0.000	
(U) Complete ADS development. Includes hardware/software development program and test program.	2.631	0.000	0.000
(U) LINK-16 Integration for AF/DCGS	0.000	0.892	2.992
(U) Electro-Optical View Sight (EOVS) development and test	1.080	3.047	0.000
(U) Dual Data Link - II (DDL-II) development and test	2.229	0.100	0.000
(U) JP-8 Fuels Conversion	0.000	0.016	0.000
(U) Program management, systems engineering, and test	0.920	0.920	0.000
(U) Total Cost	6.860	4.975	2.992

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PROJECT NUMBER AND TITLE

4945 High Altitude Subsystems

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

Funds are for the engineering, manufacturing and development for the U-2 Advanced Defensive System (ADS). A sole source contract has been awarded to a prime contractor which will be responsible for delivering a total system. For DDL-2, develop, factory test, and flight test the dual data link systems, and continue integration of ABIT P3I into datalink design. Link 16, EOVS, and DDL-2 utilizes existing CPIF contracts.

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**Exhibit R-3, RDT&E Project Cost Analysis**

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BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT NUMBER AND TITLE				
<b>07 Operational System Development</b>				<b>0305202F Dragon U-2 (JMIP)</b>				<b>4945 High Altitude Subsystems</b>				
(U) <u>Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method &amp; Type</u>	<u>Performing Activity &amp; Location</u>	<u>Total</u> Prior to FY 2003 Cost	<u>FY</u> 2003 Cost	<u>FY</u> 2003 Award Date	<u>FY</u> 2004 Cost	<u>FY</u> 2004 Award Date	<u>FY</u> 2005 Cost	<u>FY</u> 2005 Award Date	<u>Cost to Complete</u>	<u>Total</u> Cost	<u>Target</u> Value of Contract
(U) <u>Product Development</u>												
ADS Ctr	SS/CPIF	Lockheed, Palmdale and BAE, Nashua NH	40.442	2.631	May-03					0.000	43.073	
Fuels Conversion	SS/FFP	Air Force Research Lab, WPAFB OH	1.141	0.000		0.016	Nov-03			Continuing	TBD	
Electro-optical View Sight (EOVS)	SS/CPIF	Lockheed, Palmdale and Goodrich, Boston	0.209	0.462	Mar-03	3.047	Mar-04			Continuing	TBD	
DDL-II Dev and Test	SS/CPIF	L3 Comm, Salt Lake City	4.000	2.647	Jun-03	0.100	Mar-04		Feb-05	0.000	6.747	
LINK-16 Integration	SS/CPIF	L3 Comm, Salt Lake City	0.000	0.115	Feb-03	0.892	Mar-04	2.072	Feb-05	0.000	3.079	
Subtotal Product Development			45.792	5.855		4.055		2.072		Continuing	TBD	0.000
Remarks:												
(U) <u>Support</u>												0.000
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
(U) <u>Test &amp; Evaluation</u>												
Flight Test	SS/CPFF	Lockheed Eglin AFB and Edwards AFB		0.534	Feb-03	0.435	Feb-04	0.422	Feb-05	0.000	1.391	
Subtotal Test & Evaluation			0.000	0.534		0.435		0.422		0.000	1.391	0.000
Remarks:												
(U) <u>Management</u>												
ASC/RA	C/FFP	H.J. Ford WPAFB, OH		0.471	Dec-02	0.485	Dec-03	0.498	Dec-04		1.454	
Subtotal Management			0.000	0.471		0.485		0.498		0.000	1.454	0.000
Remarks:												
(U) Total Cost			45.792	6.860		4.975		2.992		Continuing	TBD	0.000

Exhibit R-4, RDT&E Schedule Profile

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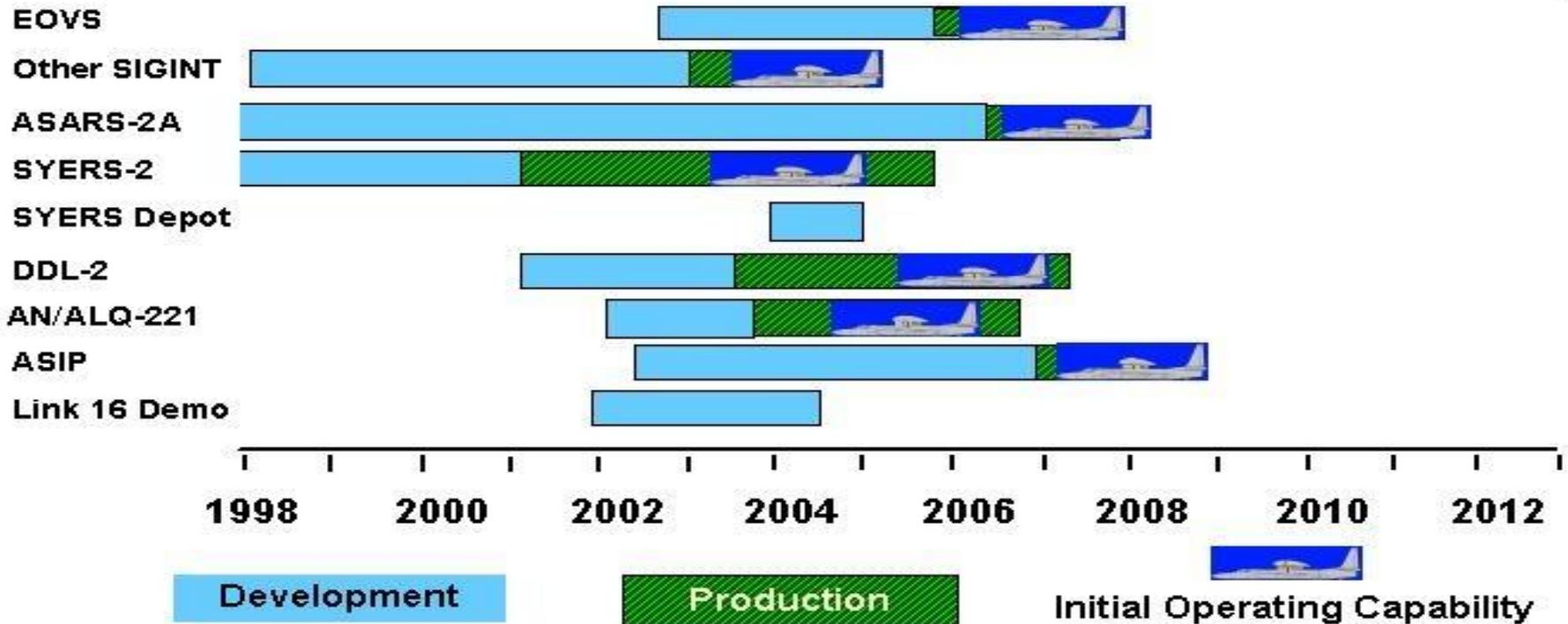
PROJECT NUMBER AND TITLE  
4945 High Altitude Subsystems



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<b>Exhibit R-4a, RDT&amp;E Schedule Detail</b>	DATE <b>February 2004</b>
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BUDGET ACTIVITY <b>07 Operational System Development</b>	PE NUMBER AND TITLE <b>0305202F Dragon U-2 (JMIP)</b>	PROJECT NUMBER AND TITLE <b>4945 High Altitude Subsystems</b>
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	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
(U) <b><u>Schedule Profile</u></b>			
(U) Complete ADS Flight Tests	2Q		
(U) First ADS Delivery		1Q	
(U) DDL-II Development & Integration Contract Award	2Q		
(U) DDL-II DT Testing Complete	3Q		
(U) DDL-II SIL Testing	3Q		
(U) First DDL-II Delivery		1Q	
(U) View Sight Development and Test	4Q	1Q	1Q
(U) Complete View Sight Development			4Q
(U) Link 16 Development		2Q	2Q