

UNCLASSIFIED

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

Exhibit R-2, RDT&E Budget Item Justification									DATE February 2005																																														
BUDGET ACTIVITY 07 Operational System Development					PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)																																																		
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																																													
Total Program Element (PE) Cost	51.735	86.972	10.158	8.400	1.888	2.032	0.163	0.369	Continuing	TBD																																													
4820 Sensor Development	46.806	84.006	7.149	8.400	1.888	2.032	0.000	0.000	Continuing	TBD																																													
4945 High Altitude Subsystems	4.929	2.966	3.009	0.000	0.000	0.000	0.163	0.369	Continuing	TBD																																													
<p>(U) <u>A. Mission Description and Budget Item Justification</u></p> <p>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 Reconnaissance (ISR) system. The RDT&E portion of this program element funds efforts to develop enhancements and sustain the U-2 Dragon Lady ISR system. In addition to the RDT&E funding, there are procurement funds associated with these developments.</p> <p>This program element will participate in the development, testing, and implementation of international standards (to include NATO standardization agreements) to ensure joint, allied, and coalition interoperability.</p> <p>(U) <u>B. Program Change Summary (\$ in Millions)</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: right;"><u>FY 2004</u></th> <th style="text-align: right;"><u>FY 2005</u></th> <th style="text-align: right;"><u>FY 2006</u></th> <th style="text-align: right;"><u>FY 2007</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget</td> <td style="text-align: right;">46.599</td> <td style="text-align: right;">87.745</td> <td style="text-align: right;">64.567</td> <td style="text-align: right;">9.811</td> </tr> <tr> <td>(U) Current PBR/President's Budget</td> <td style="text-align: right;">51.735</td> <td style="text-align: right;">86.972</td> <td style="text-align: right;">10.158</td> <td style="text-align: right;">8.400</td> </tr> <tr> <td>(U) Total Adjustments</td> <td style="text-align: right;">5.136</td> <td style="text-align: right;">-0.773</td> <td></td> <td></td> </tr> <tr> <td>(U) Congressional Program Reductions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> Congressional Rescissions</td> <td style="text-align: right;">-0.648</td> <td style="text-align: right;">-0.773</td> <td></td> <td></td> </tr> <tr> <td> Congressional Increases</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> Reprogrammings</td> <td style="text-align: right;">5.784</td> <td></td> <td></td> <td></td> </tr> <tr> <td> SBIR/STTR Transfer</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(U) <u>Significant Program Changes:</u></p> <p>FY06</p> <p>A total of \$54.2M in U-2 Airborne Signals Intelligence Program (ASIP) funding was transferred from Project 674820 to the new Airborne SIGINT Enterprise PE 0304260F, distributed between Project 675181 and Project 675183. PE 0305202F no longer funds the ASIP development program.</p> <p>FY07</p> <p>In FY07 U-2 ASIP funding transfers a total of \$1.4M from Project 674820 to the new Airborne SIGINT Enterprise PE 0304260F, between Project 675181 and Project 675183.</p>												<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	(U) Previous President's Budget	46.599	87.745	64.567	9.811	(U) Current PBR/President's Budget	51.735	86.972	10.158	8.400	(U) Total Adjustments	5.136	-0.773			(U) Congressional Program Reductions					Congressional Rescissions	-0.648	-0.773			Congressional Increases					Reprogrammings	5.784				SBIR/STTR Transfer				
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Exhibit R-2a, RDT&E Project Justification

DATE

February 2005

BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT NUMBER AND TITLE		
07 Operational System Development					0305202F Dragon U-2 (JMIP)			4820 Sensor Development		
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
4820 Sensor Development	46.806	84.006	7.149	8.400	1.888	2.032	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

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

This development project supports improvements to the U-2 sensors such as the Advanced Synthetic Aperture Radar System (ASARS-2A), advanced radar technology research such as foliage penetration, concealed target, and counter deception, the SENIOR YEAR Electro-optical Reconnaissance System (SYERS-2) Improvement Program, SIGINT programs, and the ASIP program (through FY05).

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) communications, 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 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 and a second source vendor qualified for the focal planes.

The SIGINT Program develops new sensors such as 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. The program has also examined and may modify current systems to allow them to function on Power/Electromagnetic Interference upgraded U-2s.

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 Global Hawk UAV, project 5144). 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 phase, the three DTUs will be modified to a productionized configuration for operational employment on the U-2. Beginning in FY06, U-2 ASIP funding transferred to the Airborne SIGINT Enterprise PE, 0304260F, Project 675181; \$54.2M in FY06, \$1.4M in FY07.

All U-2 sensors and datalinks are being converted to the Asynchronous Transfer Mode (ATM) standard to address vanishing vendor issues and to optimize signals intelligence bandwidth allocation. Inherent in this transition is the incorporation of suitable security/encryption capabilities.

Budget Activity Justification - This program element is categorized as Budget Activity 7 because it provides for development of technologies and capabilities in

Exhibit R-2a, RDT&E Project Justification

DATE

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BUDGET ACTIVITY				PE NUMBER AND TITLE			PROJECT NUMBER AND TITLE				
07 Operational System Development				0305202F Dragon U-2 (JMIP)			4820 Sensor Development				
support of operational system development for the U-2 intelligence surveillance and reconnaissance (ISR) system.											
(U)	<u>B. Accomplishments/Planned Program (\$ in Millions)</u>						<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	
(U)	Continue ASARS-2A IQI Software/Hardware Development Tasks and System Robustness Improvements						9.979	17.183	6.149	1.500	
(U)	SYERS Focal Planes									6.500	
(U)	Signals Intelligence (SIGINT) Sensor Development/Integration (Airborne Signals Intelligence Payload (ASIP)						34.327	63.413			
(U)	Established SYERS-2 Depot Maintenance Capability						2.500				
(U)	Systems Engineering, Program Management and Flight Test Support							3.410	1.000	0.400	
(U)	Total Cost						46.806	84.006	7.149	8.400	
(U)	<u>C. Other Program Funding Summary (\$ in Millions)</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>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>Estimate</u>	<u>Complete</u>	
	APAF, Manned Recce,										
(U)	0305202F - Sensors	7.300	4.700	1.351	2.130	7.732	7.200	7.900	9.600	Continuing	TBD
	Production										
(U)	RDT&E, 0305205F - ASIP	62.833								0.000	127.005
	Development										
(U)	RDT&E, 0305220F - ASIP		62.767							0.000	116.367
	Development										
(U)	APAF, 0305220F - ASIP			28.400	104.600	60.800	47.400			Continuing	TBD
	Production										
(U)	RDT&E, 0304260F, Airborne			2.000	5.200	5.305	5.424	5.544	5.632	Continuing	TBD
	SIGINT Development - U-2										
(U)	<u>D. Acquisition Strategy</u>										
	Modify existing platform and associated ground control equipment to upgrade and sustain airborne collection capability, while developing and testing new technology line replaceable units (LRUs) for all U-2 sensors.										

Project 4820

R-1 Shopping List - Item No. 196-3 of 196-11

Exhibit R-2a (PE 0305202F)

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Exhibit R-3, RDT&E Project Cost Analysis												DATE February 2005		
BUDGET ACTIVITY 07 Operational System Development					PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)					PROJECT NUMBER AND TITLE 4820 Sensor Development				
(U) Cost Categories (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	<u>Contract Method & Type</u>	<u>Performing Activity & Location</u>	<u>Total Prior to FY 2004 Cost</u>	<u>FY 2004 Cost</u>	<u>FY 2004 Award Date</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>														
ASARS-2A Way Ahead Phase 2	SS/CPIF	Raytheon, El Segundo	0.000	9.979	May-04	17.183	Jan-05	6.149		1.500	Dec-06	Continuing	TBD	TBD
SYERS-2 Depot Testbed	SS/CPFF	BF Goodrich, Boston	0.000	2.500	Jul-04							0.000	2.500	TBD
SYERS Focal Planes	SS/CPIF	BF Goodrich, Boston								6.500	Apr-07	0.000	6.500	TBD
(Collaborative SIGINT Sensor) ASIP	SS/CPAF	Northrop Grumman Los Angeles	5.686	31.238	Mar-04	58.711	Feb-05					Continuing	TBD	TBD
U-2 ASIP Integration	SS/CPIF	LM Aero Palmdale	0.500	0.986	Jun-04	4.101	Feb-05					Continuing	TBD	TBD
U-2 ASIP Integration	SS/CPIF	L3-Comm Garland, TX	0.100	0.045	Jun-04	0.200	Feb-05					Continuing	TBD	TBD
Subtotal Product Development			6.286	44.748		80.195		6.149		8.000		Continuing	TBD	TBD
Remarks:														
(U) <u>Test & Evaluation</u>														
Flight Test				1.573	Apr-04	2.990	Mar-05						4.563	TBD
Subtotal Test & Evaluation			0.000	1.573		2.990		0.000		0.000		0.000	4.563	TBD
Remarks:														
(U) <u>Management</u>														
ASC/RA	C/FFP	Various		0.485	Apr-04	0.821	Jan-05	1.000	Jan-06	0.400	Jan-07		2.706	TBD
Subtotal Management			0.000	0.485		0.821		1.000		0.400		0.000	2.706	TBD
Remarks:														
(U) Total Cost			6.286	46.806		84.006		7.149		8.400		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile

DATE

February 2005

BUDGET ACTIVITY

07 Operational System Development

PE NUMBER AND TITLE

0305202F Dragon U-2 (JMIP)

PROJECT NUMBER AND TITLE

4820 Sensor Development



U.S. AIR FORCE

U-2

OUTYEARS

Nile drive / Quicknotch



ASARS-2A



SYERS-2



SYERS Depot



ASIP



1998 2000 2002 2004 2006 2008 2010 2012

Development

Production



Fielding

Integrity - Service - Excellence

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Exhibit R-4a, RDT&E Schedule Detail			DATE	
			February 2005	
BUDGET ACTIVITY	PE NUMBER AND TITLE		PROJECT NUMBER AND TITLE	
07 Operational System Development	0305202F Dragon U-2 (JMIP)		4820 Sensor Development	
(U) Schedule Profile	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) ASARS-2A- Continue Image Quality Improvement Activities	1Q	1Q	1Q	1Q
(U) ASARS-2A Phase 2 Way Ahead	3Q			
(U) ASARS-2A S/W Interim Delivery		3Q		
(U) ASARS-2A H/W First Article		3Q		
(U) ASARS-2A H/W Last Article			3Q	
(U) ASIP Development				1Q
(U) ASIP Development - CDR		2Q		
(U) ASIP Development - FAT			3Q	
(U) ASIP Development - Capability Delivery				3Q
(U) Quicknotch - Flight Test Complete	1Q			
(U) Quicknotch - Field Test Complete	4Q			
(U) Niledrive - Flight Test Complete	1Q	3Q		
(U) Niledrive - Fielding Complete			3Q	
(U) SYERS-2 Depot Contract Award	4Q			

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Exhibit R-2a, RDT&E Project Justification

DATE

February 2005

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 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
4945 High Altitude Subsystems	4.929	2.966	3.009	0.000	0.000	0.000	0.163	0.369	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(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 communications, navigation, surveillance/air traffic management CNS/ATM 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 encrypt and 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.

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

	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U) ADS	0.100			
(U) LINK-16 Integration for AF/DCGS	0.000	0.000	2.009	
(U) Electro-Optical View Sight (EOVS) development and test	1.239	2.000		
(U) Dual Data Link - II (DDL-II) development and test	0.100			
(U) JP-8 Fuels Conversion	0.016			
(U) Program management, systems engineering, and test	3.474	0.966	1.000	
(U) Total Cost	4.929	2.966	3.009	0.000

Exhibit R-2a, RDT&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

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

	<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>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>Estimate</u>	<u>Complete</u>	
(U) APAF - 0305202F - Data Links	17.877	19.057	17.519	16.602	6.895	10.743			Continuing	TBD
(U) APAF - 0305202F -ViewSight (EOVS)	0.000	0.690	4.780	3.690	1.400	0.000	0.000	0.000	0.000	10.560
(U) APAF - 0305202F -ADS	24.400	8.600	3.300	2.800	10.200	14.565	6.000	29.600	Continuing	TBD

(U) **D. Acquisition Strategy**

Utilize mix of sole source and open competition as appropriate for the U-2 program to sustain, update, and modernize platform sub-systems, in order to enhance operational employment and aircraft survivability.

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Exhibit R-3, RDT&E Project Cost Analysis												DATE February 2005		
BUDGET ACTIVITY 07 Operational System Development						PE NUMBER AND TITLE 0305202F Dragon U-2 (JMIP)					PROJECT NUMBER AND TITLE 4945 High Altitude Subsystems			
(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 2004 Cost</u>	<u>FY 2004 Cost</u>	<u>FY 2004 Award Date</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> ADS Ctr	SS/CPIF	Lockheed, Palmdale and BAE, Nashua NH	16.073	0.100	Apr-04							0.000	16.173	TBD
Fuels Conversion	SS/FFP	Air Force Research Lab, WPAFB OH		0.016	Feb-04							0.000	0.016	TBD
Electro-optical View Sight (EOVS)	SS/FFP	LM Aero, Palmdale, CA	1.061	1.239	Jun-04	1.750			Nov-05			0.000	4.050	TBD
DDL-II Dev and Test	SS/CPIF	L3 Comm, Salt Lake City	4.582	0.100	Jun-04							0.000	4.682	TBD
LINK-16 Integration	SS/CPIF	L3 Comm, Salt Lake City						2.009	Feb-06			0.000	2.009	TBD
Subtotal Product Development Remarks:			21.716	1.455		1.750		2.009		0.000		0.000	26.930	TBD
(U) <u>Test & Evaluation</u> Flight Test				1.035		0.250							1.285	TBD
Subtotal Test & Evaluation Remarks:			0.000	1.035		0.250		0.000		0.000		0.000	1.285	TBD
(U) <u>Management</u> ASC/RA	C/FFP	H.J. Ford WPAFB, OH		2.439	Nov-04	0.966	Dec-04	1.000					4.405	TBD
Subtotal Management Remarks:			0.000	2.439		0.966		1.000		0.000		0.000	4.405	TBD
(U) Total Cost			21.716	4.929		2.966		3.009		0.000		0.000	32.620	TBD

Project 4945

R-1 Shopping List - Item No. 196-9 of 196-11

Exhibit R-3 (PE 0305202F)

Exhibit R-4, RDT&E Schedule Profile

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PE NUMBER AND TITLE

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PROJECT NUMBER AND TITLE

4945 High Altitude Subsystems



U.S. AIR FORCE

U-2

OUTYEARS

Electro-Optical View Sight (EOVS)



Dual Datalink (DDL-II)



Adv Def Sys (AN/ALQ-221)



U-2 Link 16 Demo



1998 2000 2002 2004 2006 2008 2010 2012

Development

Production



Fielding

Integrity - Service - Excellence

2

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Exhibit R-4a, RDT&E Schedule Detail

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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

(U) Schedule ProfileFY 2004FY 2005FY 2006FY 2007

(U) DDL-II DT Testing Complete

1Q

(U) DDL-II First Article Delivery

2Q

(U) DDL-II Full Rate Production Contract Award

2Q

(U) DDL-II P3I Contract Award

3Q

(U) ADS - Fielding Begins

2Q

(U) EOVS - Development Contract Award

3Q

(U) EOVS - Fielding Complete

4Q

(U) Link-16 Incremental Funding Contract Award

2Q