#### PE NUMBER: 0604855F PE TITLE: Operationally Responsive Launch

Ex	hibit R-2, I	RDT&E Bu	ıdget Item	Justificat	ion			DATE	- ebruary 2	005
BUDGET ACTIVITY PE NUMBER AND TITLE 04 Advanced Component Development and Prototypes (ACD&P) 0604855F Operationally Responsive Launch								:h		
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	21.544	33.068	23.480	35.504	41.321	74.924	76.327	77.411	Continuing	TBD
A013 Small Launch Vehicle	21.544	33.068	23.480	35.504	41.321	74.924	76.327	77.411	Continuing	TBD

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

The 2002 Operationally Responsive Spacelift (ORS) Mission Needs Statement (MNS) established the requirement for responsive, on-demand access to, through and from space. This requirement encompasses the spacelift missions of delivering payloads to, or from, mission orbit and changing the orbit of existing systems to better satisfy new mission requirements. It also requires on-demand, flexible, and cost effective operations.

In December 2002 the DepSecDef directed the Air Force and the Defense Advanced Research Projects Agency (DARPA) to establish a joint program office to accelerate the Operationally Responsive Space (ORS) effort to meet portions of this requirement. This joint technology development program has been named Falcon and is focused on the development and transition of more mature technologies into a future weapon system capable of delivering and deploying conventional payloads worldwide from and through space such as Joint Warfighting Space satellites. Concept development, risk reduction and technology maturation are the key elements in the ORS program; and demonstrations, modeling and simulations are the critical tools. Although Falcon is a joint program, the Air Force is funding the ORS portion; DARPA is sharing the Hypersonic Technology Vehicle costs with the Air Force.

In July 2004 the Air Force Requirements for Operational Capabilities Council (AFROCC) reviewed the ORS Analysis of Alternatives (AoA), and approved the following recommendations: (1.) Leverage lessons learned from AF-DARPA Falcon demo (2.) Conduct Architecture Studies -- Responsive spacecraft: size and functions study, -- Integration and technology needs (3.) Pursue a Hybrid (part reusable, part expendable) launch vehicle: spiral development approach, Step one: Small scale hybrid integration demonstrator, Step two: Full scale operational hybrid demonstrator, Step three: Vehicle production /operations. The AoA evolutionary approach begins with a starting point Hybrid Demonstrator to reduce risk and uncertainties.

This program is Budget Activity 4, Advanced Component Development and Prototypes (ACDP), because it involves evaluating integrated technologies in as realistic an operating environment as possible to assess the performance or cost reduction potential of advanced technology.

R-1 Shopping List - Item No. 60-2 of 60-8

Exhibit R-2, RDT&E Budget Iter	DATE February 2005			
BUDGET ACTIVITY 4 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0604855F Operationally Re			
U) <u>B. Program Change Summary (\$ in Millions)</u>				
	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 200</u>
U) Previous President's Budget	25.844	35.362	23.354	35.48
J) Current PBR/President's Budget	21.544	33.068	23.480	35.50
() Total Adjustments	-4.300	-2.294		
) Congressional Program Reductions		-5.000		
Congressional Rescissions		-0.294		
Congressional Increases		3.000		
Reprogrammings	-4.300			
SBIR/STTR Transfer           Significant Program Changes:				

R-1 Shopping List - Item No. 60-3 of 60-8

				UNC	LASSIFIED	)					
		Exhibit R-2	a, RDT&E	Project J	ustificatio	n			DATE	February	2005
	GET ACTIVITY Advanced Component Developme	ent and Proto	types (ACD	&P)			anally Respo		ROJECT NUMBE 013 Small La		le
	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
A01	3 Small Launch Vehicle	21.544	33.068	23.480	35.504	41.321	74.924	76.32		Continuing	g TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	(	) 0		
an	A. Mission Description and Budget	Item Justificat	ion								
	from space. This requirement encomp satisfy new mission requirements. It a In December 2002 the DepSecDef dir accelerate the Operationally Responsi and is focused on the development an worldwide from and through space su- the ORS program; and demonstrations DARPA is sharing the Hypersonic Te- In July 2004 the Air Force Requirement following recommendations: (1.) Lev functions study, Integration and tecl Small scale hybrid integration demons approach begins with a starting point h	Ilso requires on- ected the Air Fo ve Space (ORS) d transition of r ch as Joint Wars , modeling and chnology Vehic erage lessons le mology needs strator, Step two Hybrid Demons	demand, flex orce and the D o effort to mee nore mature to fighting Space simulations a le costs with to nal Capabiliti arned from A (3.) Pursue a lo : Full scale o trator to reduc	ible, and cost efense Advan t portions of t echnologies ir e satellites. Core the critical he Air Force. es Council (A F-DARPA Fa Hybrid (part re perational hybre e risk and une	effective oper- ced Research his requirement to a future we oncept develop tools. Althou FROCC) revi- lcon demo (2 eusable, part e orid demonstra certainties.	ations. Projects Ager nt. This joint apon system o oment, risk re gh Falcon is a ewed the ORS .) Conduct Ar xpendable) la ator, Step thre	acy (DARPA) technology de capable of del duction and te joint program S Analysis of A chitecture Stu unch vehicle: e: Vehicle pro	to establish evelopment p ivering and chnology m n, the Air Fo Alternatives dies Resp spiral devel duction /op	a joint program program has be deploying conv aturation are the rce is funding to (AoA), and ap onsive spaceer lopment approa- erations. The A	n office to en named Fa rentional payl e key elemer he ORS porti proved the aft: size and ch, Step one: AOA evolution	lcon oads its in on; nary
	This program is Budget Activity 4, Ac							ating integr	ated technolog	es in as reali	stic
(U)	an operating environment as possible <b>B. Accomplishments/Planned Progr</b> Initiated SLV system definition, syste	<b>am (\$ in Millio</b> ms engineering	ons) and flight tes	t planning for	Phase I		<u>FY 200</u> 3.49	90	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
(U)	Initiate SLV system design and development	opment, system	s engineering	and flight test	planning for	Phase II	8.14	40	22.196	21.000	10.500
(U)	Initiate Phase III flight tests	d loungh /toge f	ailitian1	tion or 1 incom			( )	- 1	5 904		3.020
(U)	Support early demonstration flights an Modified Space Launch Complex-3W			mon and impi	ovement		6.25 1.70		5.804		
(U) (U)	Perform analysis, costing and assess u			sive space co	ncepts/require	ments and	1.70		2.068	2.480	2.947
. ,	Program Management support	• 1	• 1	•							
(U)	Begin Hybrid Launch vehicle develop	oment									19.037
(U)	Blue MAJIC								2.000		
Pro	ect A013			R-1 Shopping L	.ist - Item No. 60	)-4 of 60-8				Exhibit R-2a (	PE 0604855F)

R-1 Shopping List - Item No. 60-4 of 60-8

Exhibit R-2a (PE 0604855F)

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		Exhibi	t R-2a, RD	T&E Projec	t Justific	ation			DATE	February 2	2005
	GET ACTIVITY Advanced Component Develo	pment and I	Prototypes ( <i>I</i>	ACD&P)	060	NUMBER AND TIT 04855F Operat unch		onsive	PROJECT NUMBE A013 Small La	ER AND TITLE	
(U)	Advanced Rocket Components								1.000		
(U)	Total Cost						21.5	544	33.068	23.480	35.504
(U)	C. Other Program Funding Sur	<u>nmary (\$ in N</u>	<u>(fillions)</u>								
		<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	FY 2009	FY 201	0 <u>FY 2011</u>	<u>Cost to</u>	Total Cost
		<u>Actual</u>	Estimate	<b>Estimate</b>	<u>Estimate</u>	<b>Estimate</b>	<b>Estimate</b>	Estima	te <u>Estimate</u>	Complete	<u>101a1 C081</u>
(U)	AF RDT&E, PE 0604856F, CAV (R-61)	17.025	16.464	27.394	32.529	31.651	39.756	92.71	1 94.074	Continuing	TBD
(U)	Defensewide RDT&E, DARPA, PE 0603285E, Falcon	17.500	12.500	40.000						Continuing	TBD
(U)	NASA funding provided to	0.350	2.000								2.350

### (U) <u>D. Acquisition Strategy</u>

Efforts will be executed by the joint AF/DARPA Falcon Program Office. Nine Phase I contracts were awarded in November 2003, Firm Fixed Price (FFP) with a duration of 6 months. An open competition was held for Phase II contracts in August 04, resulting in four awards in September 04 using an Other Transactions contract vehicle. At the completion of Phase II, a third phase will be considered to conduct additional developmental flight testing.

	Exhib	it R-3, RD	T&E Proj	ect Co	st Ana	lysis					DATE		ary 200	)5
BUDGET ACTIVITY 14 Advanced Component Develop	ment and	Prototypes	(ACD&P)		060	NUMBER A 4855F O Inch		nally Res	sponsive			IBER AND T	TITLE	<u> </u>
<ul> <li><u>Cost Categories</u> (Tailor to WBS, or System/Item Requirements)</li> <li>(\$ in Millions)</li> </ul>	<u>Contract</u> <u>Method &amp;</u> <u>Type</u>	Performing Activity & Location	<u>Total</u> <u>Prior to FY</u> <u>2004</u> <u>Cost</u>	<u>FY 2004</u> <u>Cost</u>	FY 2004 Award Date	<u>FY 2005</u> <u>Cost</u>	FY 2005 Award Date	<u>FY 2006</u> <u>Cos</u> t	FY 2006 Award Date	<u>FY 2007</u> <u>Cost</u>	FY 2007 Award Date	<u>Cost to</u> Complete	<u>Total Cost</u>	<u>Tar</u> <u>Value</u> <u>Contr</u>
J) <u>Product Development</u> Nine Phase I contractors Phase II contractors:	FFP	various		3.490	Nov-03	2.000	Sep-05	21.000	Oct-05	10.500	Oct-06	Continuing	3.490 TBD	3.4 T
Air Launch Lockheed Martin	OTA OTA	Reno, NV New Orleans,		4.140	Sep-04 Sep-04	5.573 6.083	Oct-04 Oct-04					Continuing Continuing	TBD TBD	ר ר
Microcosm Space-X TBD Phase III contractors Hybrid Design and Development	OTA OTA TBD TBD	LA El Segundo El Segundo TBD TBD		4.000	Sep-04 Sep-04	4.540 4.000	Oct-04 Oct-04			3.020 19.037	Aug-07 Dec-06	Continuing Continuing Continuing	TBD TBD TBD 19.037	Т Т Т
Subtotal Product Development Remarks: ) Test & Evaluation			0.000	11.630		22.196		21.000		32.557	Dec 00	Continuing	TBD	1
Test Stand 2A Modification	MIPR	Edwards AFB, CA				3.804	Jan-05						3.804	3
Range Services	MIPR	Army-Huntsv ille, AL				2.000	Mar-05					Continuing	TBD	,
Flight Demo Support	MIPR	SMC Det 12/RP/Kirtla nd AFB NM		6.254	Apr-04							Continuing	TBD	
SLC-3W Modification	MIPR	Naval Research Lab/Wash DC		1.700	Jun-04								1.700	1
Blue MAJIC Advanced Rocket Components Subtotal Test & Evaluation	TBD TBD	TBD TBD	0.000	7.954		2.000 1.000 8.804	Mar-05 Mar-05	0.000		0.000		Continuing	2.000 1.000 TBD	2
Remarks: <u>Development Support and Management</u> Perform analysis and assess alternative concepts/requirements & program support	various	various		1.960	Feb-04	2.068	Oct-04	2.480	Oct-05	2.947	Oct-06	Continuing	TBD	,
Subtotal Development Support and Management			0.000	1.960		2.068		2.480		2.947		Continuing	TBD	,
Remarks: Total Cost			0.000	21.544		33.068		23.480		35.504		Continuing	TBD	
				h								<b>P</b> articular de la		0405
Project A013			R-1 S	hopping Li	st - Item N 797	lo. 60-6 of 6	60-8					Exhibi	t R-3 (PE 06	04855

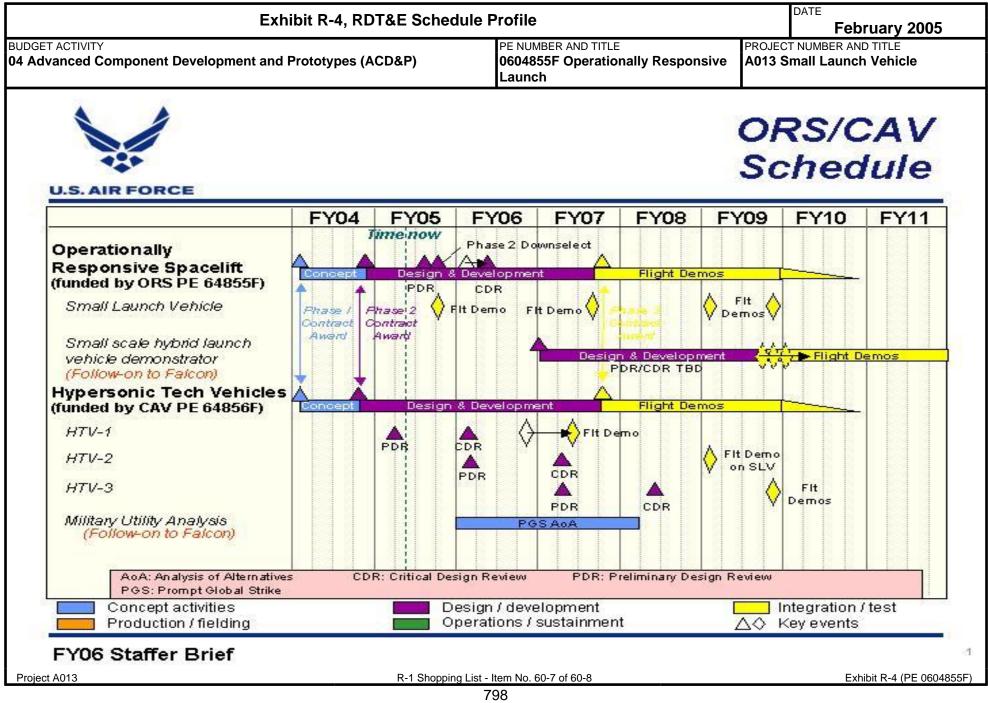


Exhibit R-4a, RDT&E Sche		DATE February 2005				
BUDGET ACTIVITY 04 Advanced Component Development and Prototypes (ACD&P)	PE NUMBER AND TITLE 0604855F Operational Launch	0604855F Operationally Responsive A013 S				
<ul> <li>(U) <u>Schedule Profile</u></li> <li>(U) System Definition (Phase I)</li> <li>(U) Design and Development (Phase II) Contract Award</li> <li>(U) Phase II Preliminary Design Review</li> </ul>	<u>FY 2004</u> 1-4Q 4Q	<u>FY 2005</u> 3Q	<u>FY 2006</u>	FY 2007		
<ul> <li>(U) Phase II Critical Design Review</li> <li>(U) Phase II Test Launch</li> <li>(U) Phase II Contract Complete</li> <li>(U) Flight Demonstrations (Phase III) Contract Award</li> <li>(U) Hybrid Design and Development Contract Award</li> </ul>		4Q	2Q	3Q 4Q 1Q 1Q		

Exhibit R-4a (PE 0604855F)