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<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>									DATE <b>February 1995</b>	
BUDGET ACTIVITY <b>4 - DEMONSTRATION AND VALIDATION</b>				PE NUMBER AND TITLE <b>0603319F Airborne Laser Demonstrator</b>						
COST (In Thousands)	FY 1994 Actual	FY 1995 Estimate	FY 1996 Estimate	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	1881	19303	19954	19954	0	0	0	0	0	61853
0 4269	1881	19303	19954	19954	0	0	0	0	0	61853

(U) A. Mission Description and Budget Item Justification  
 (U) The Airborne Laser (ABL) program will demonstrate all necessary technologies required for acquiring, tracking, and killing Theater Ballistic Missiles in the boost phase. The Air Force approved program is a two-phased effort. Phase I involves award of two competing concept design contracts (FY 1994-1997) which were awarded in May 1994. The program will down-select to a single contractor in FY 1997 who will build and test the winning ABL Demonstrator design (Phase II). Phase II will be performed in two parts: Phase IIA is a one-year effort beginning in January 1997 and continuing through the Preliminary Design Review (PDR) in January 1998; Phase IIB begins after the completion of Phase IIA in January 1998 and culminates in FY 2001 with lethality demonstrations against boosting Theater Ballistic Missiles. The Phase II effort must demonstrate all key technologies for a fully operational system, allowing the Air Force to advance to EMD/Production in the FY 2001 time frame should the Air Force decide to proceed with an operational fleet of ABLs. Phase II will begin only if results of Phase I allow the program to pass exit criteria dealing with physics and engineering-related issues. During Phase I, the ABL leverages off laser and imaging technologies in PE 0603605F as well as the High Altitude Balloon Experiment (currently BMDO funded), which is to validate key fire control and tracking technologies. Deliveries from Phase I are: full operational capability ABL designs; scalable/traceable ABL Demonstrator designs; contractor risk mitigation demonstrations to decrease Phase II engineering/aircraft integration risk; simulations in the Air Combat Command's (ACC) Theater Air Command and Control Simulation Facility (TACCSF); and ABL adjunct mission studies for (a) cruise missile defense, (b) protection of high value assets, (c) defensive counter-air, (d) BMC<sup>4</sup>I, (e) suppression of enemy air defenses, and (f) surveillance.

(U) Acquisition Strategy  
 (U) Phase I competing contracts include: (1) Boeing, Seattle WA (prime); Lockheed, Sunnyvale CA; TRW, Redondo Beach CA; and ITEK, Lexington MA (subcontractors), and (2) Rockwell, Canoga Park CA (prime); Hughes, Los Angeles CA; United Technologies Optical Systems, West Palm Beach FL; North American Aircraft, El Segundo CA; Strategic Defense Centers, Seal Beach CA; E-Systems, Greenville TX; IBM, Boulder CO and Gaithersburg MD; Unisys, Salt Lake City UT and Eagan MN; and Parsons, Pasadena CA (subcontractors). Government Integrated Product Teams include Phillips Laboratory ABL SPO, Lasers and Imaging Directorate, and Advanced Weapons and Survivability Directorate; Air Force Electronics Systems Center; Wright Laboratories; Air Combat Command; and US Army White Sands Missile Range.

(U) Project Justification Narrative  
 (U) FY 1994: Awarded dual 33 month competing ABL Concept Design contracts in May 1994.  
 - (U) Initiated design of airframe modifications, as well as the related hardware and software necessary to install and support the high energy laser and

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<b>4 - DEMONSTRATION AND VALIDATION</b>	<b>0603319F Airborne Laser Demonstrator</b>	
related	subsystems into an existing 747 aircraft platform. (\$87)	
	- (U) Initiated design of a high power laser including fuel handling or power generation subsystem and resonator optical benches/components. (\$248)	
	- (U) Initiated design of a laser beam control subsystem to irradiate target with lethal energy density. (\$197)	
	- (U) Initiated design of avionics, battle management, and fire control components. (\$40K)	
	- (U) Initiated development of analytical models/computer codes to predict the performance of the ABL to include the aircraft, weapons, and command and control elements. (\$205)	
and	- (U) Provided government participation in government/contractor Integrated Product Teams to accomplish Integrated Product Development of tasks described above. (\$599)	
described	- (U) Provided ACC/Air Staff technical support for continued ABL requirements, operational concept, and COEA development. (\$425)	
	- (U) Continued maturing of theater integration and ABL adjunct mission capabilities through active defense and BMC <sup>4</sup> I Integrated Product Teams and government modeling/simulation efforts such as the Theater Air Command and Control Simulation Facility (TACCSF). (\$60)	
	- (U) Began government Phase II environmental impact studies. (\$20)	
(U)	<u>FY 1995:</u> Continue all efforts under Concept Design contracts begun in FY 1994 plus initiate additional tasks described below:	
	- (U) Initiate contractor hardware/software demonstration to reduce engineering/aircraft integration risk for Phase II of the program. Results factor into Phase II downselect decision in FY 1997. (\$4400)	
	- (U) Begin contractor modeling of their ABL design in TACCSF. Results factor into Phase II downselect decision in FY 1997. (\$200)	
	- (U) Begin ABL adjunct mission studies described above. (\$180)	
	- (U) Conduct Operational Concept and Preliminary Requirement Reviews with government. (\$6800)	
	- (U) Continue design and conduct first incremental Demonstrator Concept Design Reviews with government. (\$3403)	
	- (U) Begin government Phase II environmental impact studies. (\$475)	
	- (U) Begin government Phase II test planning. (\$675)	
	- (U) Support ACC/SMC/Air Staff in boost phase intercept COEA study development and requirements definition. (\$470)	
	- (U) Provide government participation in contractors' Integrated Product Teams for Integrated Product Development of all contract tasks. (\$2400)	
	- (U) Provide government system security engineering and facility utilization planning support to contractors. (\$380)	
(U)	<u>FY 1996:</u> Continue all efforts begun under Concept Design contracts in FY 1994/1995 and deliver preliminary ABL Demonstrator specifications. Complete those Concept Design deliverables summarized below.	
	- (U) Continue hardware/software risk mitigation demonstrations for Phase II downselection decision. (\$6500)	
	- (U) Continue initial contractor simulation modeling efforts in TACCSF for downselection decision. (\$200)	
	- (U) Deliver final Demonstrator specifications for downselection evaluation. (\$3200)	
	- (U) Prepare for final concept design review in FY 1997. (\$4500)	

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<b>BUDGET ACTIVITY</b> <b>4 - DEMONSTRATION AND VALIDATION</b>	<b>PE NUMBER AND TITLE</b> <b>0603319F Airborne Laser Demonstrator</b>			<b>PROJECT</b>	
<ul style="list-style-type: none"> <li>- (U) Complete majority of ABL adjunct mission studies supporting COEA/study decision. (\$200)</li> <li>- (U) Government continues with detailed test planning for Phase II. (\$700)</li> <li>- (U) Government continues environmental impact study for Phase II. (\$1000)</li> <li>- (U) Government completes facility utilization planning for Phase II. (\$200)</li> <li>- (U) Government participates in IPTs with contractors to accomplish all tasks described above. (\$3454)</li> </ul> <p>(U) <u>FY 1997</u>: Phase I of program completes in FY 1997 when all contract tasks begun in FY 1994/1995/1996 are completed.</p> <ul style="list-style-type: none"> <li>- (U) Completion and delivery of final designs. (\$6600)</li> <li>- (U) Conduct of final Concept Design Reviews. (\$2000)</li> <li>- (U) Completion of all remaining contractor risk-mitigation demonstrations. (\$3300)</li> <li>- (U) Completion of ABL adjunct mission studies. (\$100)</li> <li>- (U) Government completes environmental impact study for Phase II. (\$50)</li> <li>- (U) Completion of evaluation of all simulation and modeling efforts in TACCSF with government. (\$350)</li> <li>- (U) Government completes detailed test planning for Phase II. (\$250)</li> <li>- (U) Government participates in IPTs with contractors to accomplish all tasks. (\$4000)</li> <li>- (U) Government completes evaluation of competing Phase II proposals and completes active tracking experiments for concept design effort. (\$2854)</li> </ul> <p>(U) B. <u>Program Change Summary</u></p>					
<b>\$ IN THOUSANDS</b>					
	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>Total Cost</u>
(U) Previous President's Budget	1945	20000	20000	20000	61954
(U) Appropriated Value	1945	20000	20000		
(U) Adjustments to Appropriated Value					
a. (U) Small Business Innovative Research	-27	-374			
b. (U) Below Threshold Reprogramming	-26				
c. (U) Congressional Reduction	-11				
d. (U) General Reduction		-323			
(U) Adjustment To Budget Years Since FY95 PB			-46	-46	
(U) Current Budget Submit/President's Budget	1881	19303	19954	19954	61092
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE February 1995			
BUDGET ACTIVITY 4 - DEMONSTRATION AND VALIDATION				PE NUMBER AND TITLE 0603319F Airborne Laser Demonstrator					PROJECT 0			
COST (In Thousands)	FY 1994 Actual	FY 1995 Estimate	FY 1996 Estimate	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	Cost to Complete	Total Cost		
0 4269	1881	19303	19954	19954	0	0	0	0	0	61853		
<u>(U) C. Other Program Funding Summary</u>												
	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>To Compl</u>	<u>Total Cost</u>		
(U) PE 0603605F Advanced Weapons Technology	15950	12388	8300	11750						48400		
(U) PE 0603217C BMD Advanced Development	8100	7800	7300							23200		
<u>(U) D. Schedule Profile</u>												
	<u>FY 1994</u>			<u>FY 1995</u>			<u>FY 1996</u>			<u>FY 1997</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Airborne Laser Concept Design Contract Awards			*									
(U) Preliminary Requirements Review (PRR)				*								
(U) Conceptual Design Review 1						X						
(U) Demonstrator Request for Purchase (RFP) Release							X					
(U) Conceptual Design Review 2								X				
(U) Downselect winning Concept Design contractor for Demonstrator (Phase II)									X			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1995	
BUDGET ACTIVITY 4 - DEMONSTRATION AND VALIDATION				PE NUMBER AND TITLE 0603319F Airborne Laser Demonstrator						PROJECT 0	
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
					<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>			
(U) Major Contracts					800	14983	14600	12000			
(U) Support Contracts					360	1620	2525	2160			
(U) In-House/Miscellaneous Support					785	2780	2829	5794			
Total					1945	19303	19954	19954			
(U) B. <u>Budget Acquisition History and Planning Information</u>											
<b>Performing Organizations</b>											
Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1994	FY 1994	FY 1995	FY 1996	FY 1997	Budget to Complete	Total Program
Product Development Organizations											
Rockwell Int Conoga Park, CA	CPFF	9 May 94	61945	61945		400	7700	7300	6000	0	21400
Boeing Defense & Space Group Seattle, WA	CPFF	9 May 94	61945	61945		400	7700	7300	6000		21400
Support and Management Organizations											
Support Contracts						360	1700	2525	2160		6745
In House/Misc Sup						785	2900	2829	5794		9437
<i>Page 5 of 6 Pages</i>						Exhibit R-3					

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1995		
BUDGET ACTIVITY 4 - DEMONSTRATION AND VALIDATION				PE NUMBER AND TITLE 0603319F Airborne Laser Demonstrator				PROJECT 0		
Government Furnished Property		NOT APPLICABLE								
Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 1994	FY 1994	FY 1995	FY 1996	FY 1997	Budget to Complete	Total Program
Product Development Property										
Support and Management Property										
Test and Evaluation Property										
				Total Prior to FY 1994	FY 1994	FY 1995	FY 1996	FY 1997	Budget to Complete	Total Program
Subtotal Product Development										
Subtotal Support and Management										
Subtotal Test and Evaluation										
Total Project										

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