

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>	DATE <b>February 1999</b>
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<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603441F Space Based IR Arch (Dem/Val) (Space)</b>
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COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	213,459	159,008	151,378	113,242	0	0	0	0	0	1,467,591
0007 SBIRS Low	210,703	159,008	151,378	113,242	0	0	0	0	0	1,433,025
0008 Cobra Brass	2,756	0	0	0	0	0	0	0	0	34,566
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

**(U) A. Mission Description**

(U) The Space-Based Infrared System's (SBIRS) primary mission is to provide initial warning of a ballistic missile attack on the US, its deployed forces or its allies. SBIRS will incorporate new technologies to enhance detection; improve reporting of Intercontinental Ballistic Missiles (ICBM), Submarine Launched Ballistic Missiles (SLBM) and tactical ballistic missiles; and provide critical mid-course tracking and discrimination data for national and theater missile defense. This system will provide increased performance in order to meet requirements in US Space Command's Capstone Requirements Document and Operational Requirements Document. SBIRS will consist of satellites in Geosynchronous Orbits (GEO), Highly Elliptical Orbits (HEO) and Low Earth Orbits (LEO) and an integrated centralized ground station serving all SBIRS space elements and the Defense Support Program (DSP) satellites. PE #305911F funds DSP and PE #604441F funds SBIRS High EMD activities. Program Definition Contracts for the operational SBIRS Low system will be awarded in FY99 leading to a Milestone II decision in FY02 and Engineering, Manufacturing and Development (EMD) start in FY02. The Flight Demonstration System (FDS) and Low Altitude Demonstration System (LADS) programs have provided valuable lessons learned and risk reduction. Results of these demonstrations will support the Program Definition efforts for operational requirements trades/allocations and system concept development. This PE, combined with PE #604442F, funds the SBIRS Low Program Risk Reduction (PDRR) activities. SBIRS Low is the LEO component of SBIRS.

(U) On February 5, 1999 subsequent to the formulation of the FY 2000 President's Budget, the flight demonstration contracts were terminated and the program restructured to provide for an expanded PDRR phase. The FY 2000 and FY 2001 funds originally budgeted in this program element to complete the flight demonstration contracts will be required for the expanded PDRR contracts to be funded in PE 64442F.

**(U) B. Budget Activity Justification:**

(U) This program is funded in Budget Activity 4, Demonstration and Validation, because it funds risk reduction and advanced technology demonstrations.

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<b>(U) C. <u>Program Change Summary (\$ in Thousands)</u></b>					
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget FY 1999 PB	202,433	160,262	154,133	115,398	1,432,558
(U) Appropriated Value	217,401	160,262			
(U) Adjustments to Appropriated Value					
a. Cong Gen Reductions	-9,511	-1,254			
b. SBIR	-5,457				
c. Omnibus or Other Above Threshold Reprogram	+7,200				
d. Below Threshold Reprogramming	+3,826				
(U) Adjustments to Budget Years Since FY 1999 PB			-2,755	-2,156	
(U) Current Budget Submit/FY 2000 PB	213,459	159,008	151,378	113,242	1,467,591
<b>(U) Significant Program Changes:</b>					
On 5 Feb 99, the Air Force terminated the SBIRS Low Flight Demonstration Programs. The funding originally intended for these efforts will be used for an expanded Program Definition and Risk Reduction (PDRR) effort.					
Funding: FY99 \$5.261M identified as a source for Small Business Innovative Research (SBIR).					
FY00 and FY01 budget changes due to a required adjustment.					
Schedule: Program was restructured and first SBIRS Low launch delayed from 4QFY04 to 4QFY06.					

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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603441F Space Based IR Arch (Dem/Val) (Space)</b>				PROJECT <b>0007</b>		
COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
0007 SBIRS Low	210,703	159,008	151,378	113,242	0	0	0	0	0	1,433,025
<p><b>(U) A. <u>Mission Description</u></b>            (U) SBIRS Low represents the Low Earth Orbit (LEO) component of the Space Based Infrared System (SBIRS). The objective SBIRS LEO constellation of low-earth orbiting satellites will provide global, below- and above-the-horizon access to strategic and tactical ballistic missiles in boost, post-boost, and midcourse phases of flight, and also track missile targets during reentry. LEO will support the four SBIRS mission areas: Missile Warning, Missile Defense, Technical Intelligence, and Battle Space Characterization.</p> <p><b>(U) <u>FY 1998 (\$ in Thousands):</u></b></p> <ul style="list-style-type: none"> <li>– (U) \$ 114,034 Flight Demonstration System</li> <li>– (U) \$ 63,508 Low Altitude Demonstration System</li> <li>– (U) \$ 13,824 Program office activities.</li> <li>– (U) \$ 7,082 Technologies</li> <li>– (U) \$ 4,631 NMD Targets</li> <li>– (U) \$ 3,000 Long Range Planning</li> <li>– (U) \$ 2,724 FDS and LADS Support—Range support, launch services, TMD Targets</li> <li>– (U) \$ 1,900 Simulation / Discrimination</li> <li>– (U) \$ 210,703 Total</li> </ul> <p><b>(U) <u>FY 1999 (\$ in Thousands):</u></b></p> <ul style="list-style-type: none"> <li>– (U) \$ 75,058 Flight Demonstration System</li> <li>– (U) \$ 37,392 Low Altitude Demonstration System</li> <li>– (U) \$ 15,278 Program office activities.</li> <li>– (U) \$ 5,081 BTR to PE 64442 for an expanded Program Definition and Risk Reduction (PDRR)</li> <li>– (U) \$ 5,261 Identified as a source for Small Business Innovative Research (SBIR)</li> <li>– (U) \$ 5,400 Simulation / Discrimination</li> <li>– (U) \$ 3,438 FDS and LADS Support—Range support, launch services, TMD Targets (includes termination costs)</li> <li>– (U) \$ 4,000 NMD Targets</li> <li>– (U) \$ 4,100 Technologies</li> <li>– (U) \$ 4,000 System of Systems</li> </ul>										
Project 0007			Page 3 of 10 Pages				Exhibit R-2A (PE 0603441F)			

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)</b>		DATE <b>February 1999</b>																				
<b>BUDGET ACTIVITY</b> <b>4 - Demonstration and Validation</b>	<b>PE NUMBER AND TITLE</b> <b>0603441F Space Based IR Arch (Dem/Val) (Space)</b>	<b>PROJECT</b> <b>0007</b>																				
<p>– (U) \$159,008 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> <li>- (U) \$133,478 Risk reduction efforts for an expanded Program Definition and Risk Reduction (PDRR)</li> <li>- (U) \$ 14,800 Program Office Activities</li> <li>- (U) \$ 1,700 Technologies</li> <li>- (U) \$ 1,400 Simulation / Discrimination</li> <li>- (U) \$151,378* Total</li> </ul> <p>*Will request realignment of funds to PE 644442F to fully fund an expanded PDRR phase during Congressional Budget Review</p> <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> <li>- (U) \$112,442 Risk reduction efforts for an expanded Program Definition and Risk Reduction (PDRR)</li> <li>- (U) \$ 800 Simulation / Discrimination</li> <li>- (U) \$113,242* Total</li> </ul> <p>*Funding will be realigned to PE 64442F to fully fund an expanded PDRR phase during FY 2001 DoD budget review.</p> <p><b>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></b></p> <p>(U) Both SBIRS Low Demonstration programs, FDS and LADS, were terminated effective 5 Feb 99.</p> <p><b>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></b></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY1999</u></th> <th style="text-align: center;"><u>FY2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>FY 2004</u></th> <th style="text-align: center;"><u>FY 2005</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>(U) PE #35922F - SBIRS Low Prod</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">33,100</td> <td style="text-align: right;">101,400</td> <td style="text-align: right;">328,390</td> <td style="text-align: right;">3,999,500</td> </tr> </tbody> </table> <p><b><u>Related RDT&amp;E:</u></b></p> <ul style="list-style-type: none"> <li>(U) PE #604441F - SBIRS High EMD</li> <li>(U) PE #305911F - DSP</li> <li>(U) PE #604442F - SBIRS Low EMD</li> </ul>				<u>FY 1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Total Cost</u>	(U) PE #35922F - SBIRS Low Prod						33,100	101,400	328,390	3,999,500
	<u>FY 1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Total Cost</u>													
(U) PE #35922F - SBIRS Low Prod						33,100	101,400	328,390	3,999,500													
Project 0007	Page 4 of 10 Pages	Exhibit R-2A (PE 0603441F)																				

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603441F Space Based IR Arch (Dem/Val) (Space)</b>	PROJECT <b>0007</b>
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**(U) D. Acquisition Strategy:**

(U) Cobra Brass and two SBIRS Low demonstrations provided significant risk reduction for the SBIRS Low program. SBIRS Low Program Definition will be conducted before moving into SBIRS Low EMD. The GEO component of SBIRS now in EMD is a pilot program for acquisition streamlining. The traditional Defense Acquisition Board (DAB) documentation for an ACAT ID program was consolidated into a Single Acquisition and Management Plan (SAMP) for the GEO component. The existing SBIRS SAMP includes the LEO component.

(U) Both the Flight Demonstration System (FDS) and Low Altitude Demonstration System (LADS) were terminated on 5 Feb 99 due to continued cost growth and schedule delays. These efforts managed to mitigate large portions of risk for the objective system, the Air Force decided to apply the remaining funding to other expanded Program Definition and Risk Reduction efforts.

(U) Program Definition (PD) activities will begin in FY99 with up to two Program Definition study contracts. The purpose of Program Definition is to develop specifications and designs for the SBIRS LEO EMD phase. This period will also be used to optimize the SBIRS HEO, GEO, LEO constellations and to revalidate the Air Force Space Command Operational Requirements Document. EMD contract will be competitively awarded in FY02. The same streamlined acquisition approach currently used for the GEO EMD will be used as a baseline for the LEO EMD. Deployment of the operational LEO constellation begins in 4QFY06.

	<u>FY 1998</u>				<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
<b>(U) E. <u>Schedule Profile</u></b>	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Program Definition Contract Award							X									
System Requirement Review													X			

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem/Val) (Space)					PROJECT 0007	
<b>(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u></b>					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Flight Demonstration System					114,034	75,058	0	0			
(U) Low Altitude Demonstration System (LADS)					63,508	37,392	0	0			
(U) Technologies					7,082	4,100	1,700	0			
(U) Targets					4,631	4,000	0	0			
(U) Program office activities					13,824	15,278	14,800	0			
(U) Simulation and Discrimination					1,900	5,400	1,400	800			
(U) Long Range Planning					3,000	0	0	0			
(U) Demo Support					2,724	3,438	0	0			
(U) System of Systems						4,000	0	0			
(U) Identified as a source for SBIR						5,261	0	0			
(U) Realign funds to 64442F for an expanded PDRR						5,081	133,478	112,442			
(U) Total					210,703	159,008	151,378	113,242			
<b>(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u></b>											
<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 1998*	Budget FY 1998	Budget FY 1999	FY 2000	FY 2001	Budget to Complete	Total Program
Identified as a source for SBIR							5,261				
<b><u>Product Development Organizations</u></b>											
FDS - TRW	CPAF	May 95	TBD	686,951	497,859	114,034	75,058	0	0	0	686,951
LADS - Boeing	CPFF	Sep 96	TBD	208,136	107,236	63,508	37,392	0	0	0	208,136
Non-Flyer - RI	CPAF	May 95	130,643	130,643	130,643	0	0	0	0	0	130,643
Expanded PDRR	FFP	Various			0	0	5,081	133,478	112,442		251,001
Misc. Contracts	Various	Various	TBD	TBD	20,214	14,706	16,908	3,100	800	0	55,758
Project 0007					Page 6 of 10 Pages			Exhibit R-3 (PE 0603441F)			

**UNCLASSIFIED**

<b>RDT&amp;E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)</b>										DATE <b>February 1999</b>	
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603441F Space Based IR Arch (Dem/Val) (Space)</b>					PROJECT <b>0007</b>	
<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1998*</u>	<u>Budget FY 1998</u>	<u>Budget FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Support and Management Organizations</u>											
Aerospace SETA/SPO Support	Various	Various	N/A	N/A	24,707	9,200	10,134	10,000	0	0	54,041
	Various	Various	N/A	N/A	18,035	4,624	5,144	4,800	0	0	32,603
<u>Test and Evaluation Organizations</u>											
NMD Targets						4,631	3,000	0	0	0	7,631
<b>Government Furnished Property:</b> Not Applicable.											
Identified as a source for SBIR							5,261	0	0	0	5,261
Subtotal Product Development					755,952	192,248	134,469	136,578	113,242	0	1,332,489
Subtotal Support and Management					42,742	13,824	15,278	14,800	0	0	86,644
Subtotal Test and Evaluation						4,631	4,000	0	0	0	8,631
Total Project					798,694	210,703	159,008	151,378	113,242	0	1,433,025

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603441F Space Based IR Arch (Dem/Val) (Space)</b>				PROJECT <b>0008</b>		
COST (In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
0008 Cobra Brass	2,756	0	0	0	0	0	0	0	0	34,566
<p><b>(U) A. <u>Mission Description</u></b></p> <p>(U) The Cobra Brass (CB) Program was a DIA/CMO (Central MASINT Office) Research and Development program to explore the utility of staring, fast framing, multi-spectral electro-optical sensors. CB was combined with the SBIRS program as a result of the Feb 95 Defense Acquisition Executive review. This approach is a significant departure from the traditional approach of scanning, slow framing, single band sensors previously used for Tactical Warning and Attack Assessment (TW/AA).</p> <p>(U) Previous CB sensors have demonstrated the ability of this technology to contribute to Theater Missile Defense (TMD), Technical Intelligence (TI), and Battlespace Characterization (BSC) missions. Major program emphasis is to increase the timeliness of sensor tasking and reporting. This will allow CB data to be processed in realtime through the existing theater infrastructure. CB will support the development of GEO and HEO component of the SBIRS.</p> <p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> <li>- (U) \$1,634 Ground Station testing</li> <li>- (U) \$1,122 Payload pre-flight testing and checkout integration onto spacecraft</li> <li>- (U) \$2,756 Total</li> </ul> <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> <li>- (U) \$0 Not applicable</li> </ul> <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> <li>- (U) \$0 Not applicable</li> </ul> <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> <li>- (U) \$0 Not applicable</li> </ul> <p><b>(U) B. <u>Project Change Summary - Description of Significant Changes:</u></b></p> <p>None</p>										
Project 0008			Page 8 of 10 Pages				Exhibit R-2A (PE 0603441F)			

UNCLASSIFIED

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)</b>	DATE <b>February 1999</b>
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**(U) C. Other Program Funding Summary (\$ in Thousands):**

	<u>FY 1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	Total
(U) PE #35922F - SBIRS Low Prod						33,100	101,400	328,390	3,999,500

**Related RDT&E:**

- (U) PE #604441F - SBIRS High EMD
- (U) PE #305911F - DSP
- (U) PE #604442F - SBIRS Low EMD

**(U) D. Acquisition Strategy**

(U) The CB was transferred on 1 October 94 to the Air Force from DIA/CMO as part of risk mitigation for the baselined SBIRS program and was included into the SBIRS Low PDRR program element. Sandia National Laboratory (SNL) is the Air Force's executing agent for CB. The Air Force is responsible for funding CB through sensor and ground segment development and integration with the host satellite. Responsibility for funding, sensor operation, and data exploitation will be performed by other government agencies once the satellite is on-orbit.

**(U) E. Schedule Profile**

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
(U) CB Launch	1	2	3	4	1	2	3	4	1	2	3	4
	*											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603441F Space Based IR Arch (Dem/Val) (Space)</b>				PROJECT <b>0008</b>			
<b>(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u></b>											
					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>			
(U) Payload					0	0	0	0			
(U) Ground Station Build					0	0	0	0			
(U) Satellite Integration and Checkout					0	0	0	0			
(U) Ground Station Testing					1,634	0	0	0			
(U) MIPR to National Air Intelligence Center					1,122	0	0	0			
(U) Total					2,756	0	0	0			
<b>(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u></b>											
<b>Performing Organizations:</b>											
Contractor or	Contract										
Government	Method/Type	Award or	Performing	Project	Total						
Performing	or Funding	Obligation	Activity	Office	Prior to	Budget	Budget			Budget to	Total
<u>Activity</u>	<u>Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>	<u>FY 1998</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Organizations</u>											
Sandia Nat'l Labs	Various	Various			31,810	2,756	0	0	0	0	34,566
<u>Support and Management Organizations</u>											
Not Applicable											
<u>Test and Evaluation Organizations</u>											
Not Applicable											
<b>Government Furnished Property:</b> Not Applicable											
Subtotal Product Development					31,810	2,756	0	0	0	0	34,566
Subtotal Support and Management											
Subtotal Test and Evaluation											
Project Total					31,810	2,756	0	0	0	0	34,566
Project 0008					Page 10 of 10 Pages				Exhibit R-3 (PE 0603441F)		