

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development					
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	19490	38266	32574	33984	24179	19355	18879	Continuing	Continuing
DL69 Horizontal Technology Integration Second Generation FLIR Engineering Development	0	11847	11949	13674	6633	0	0	0	127127
DL70 Night Vision Devices Engineering Development	9915	21229	14335	16309	16604	18167	17642	Continuing	Continuing
DL74 Long Range Advanced Scout Surveillance System (LRAS3)	9575	0	1490	793	0	0	0	0	37333
DL75 Profiler	0	5190	4800	2345	0	0	0	0	12335
DL76 Lightweight Laser Designator Rangefinder Upgrades	0	0	0	863	942	1188	1237	0	4230

A. Mission Description and Budget Item Justification: This program element provides night vision technologies required for U.S. defense forces to engage enemy forces twenty-four hours a day under conditions with degraded visibility due to darkness, adverse weather and battlefield obscurants. These developments and improvements to high performance night vision electro-optics, radar, laser, and thermal systems and integration of related multi-sensor suites will enable near to long range target acquisition identification and engagement to include significant fratricide reduction, which will improve battlefield command and control in “around the clock” combat operations. Project DL69 is focuses on inserting key Horizontal Technology Integration Second Generation and beyond FLIR (HTI SGF) thermal sensor technology into common battle groups. Project DL70 focuses on night vision electro-optical, laser, and other target identification and location equipment for use by individual soldiers and a variety of platforms. In addition to the Lightweight Laser Designator Rangefinder (a Warfighter Rapid Acquisition Program) this project includes both mounted and dismounted HTI laser evaluation and assessment, and integrates individual sensors into a common architecture. It also funds development and qualification of critical upgrades (e.g. dual wavelength target acquisition capabilities) for Thermal Weapons Sight and Drivers Vision Enhancer production programs, and funds activities associated with image and sensor fusion capabilities (e.g. I2 and thermal). Project DL74 focuses on a long-range multi-sensor system utilizing HTI SGF thermal sensor and other technologies, for use by US Army scouts at extended ranges beyond the Abrams and Bradley capabilities. The LRAS3 will provide the scouts with their first reconnaissance and surveillance system with a twenty-four hour, all weather capability that is mounted or man-portable. Project DL75 focuses on development of the Profiler upgrade of the capabilities of the current AN/TMQ-41 Meteorological Measuring Set. Profiler will employ remote and local sensing of the atmosphere, mesoscale modeling and enhanced computing capabilities to provide target area and more accurate meteorological data. These enhancements and new capabilities will increase the lethality of field artillery systems such as Crusader, Multiple Launched Rocket Systems (MLRS) and towed and self-propelled cannons. Project DL76 focuses on LLDR Upgrades that will increase the operational capability and survivability of Combat Observation Lasing (COLT) and Fire Support (FIST) teams, thereby yielding greater lethality for precision and area munitions through precise target location and designation. Upgrades developed under this Project will be inserted either through ongoing production

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development
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contracts or a Mod in Service line.

B. Program Change Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 2000/2001 PB)	21167	30644	31270
Appropriated Value	21311	38644	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-144		
b. SBIR / STTR	-545		
c. Omnibus or Other Above Threshold Reductions		-155	
d. Below Threshold Reprogramming	-1046		
e. Rescissions	-86	-223	
Adjustments to Budget Years Since <u>FY 2000/2001</u> PB			+1304
Current Budget Submit (FY 2001 PB)	19490	38266	32574

Change Summary Explanation: Funding – FY 1999: Reprogrammed below threshold (-1046) to PE 0604817/D902 to support redesign of Combat ID Dismounted Soldier (CIDDS) helmet electronics and weight reduction effort. FY 2001: Funding increase (+1500) due to the LRAS3 initiative that will provide for the design and development of the capability to interface with the Future Battlefield Command, Brigade and Below (FBCB2) hardware and software on the host platform and automatically provide target location information.

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
--	------------------------------

BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL69
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COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DL69 Horizontal Technology Integration Second Generation FLIR Engineering Development	0	11847	11949	13674	6633	0	0	0	127127

A. Mission Description and Justification- Horizontal Technology Integration Second Generation FLIR (HTI SGF) will enable the Army to insert key thermal sensor technology into the highest priority forces [the M2A3/M3A3 Bradley Fighting Vehicle System (BFVS), the Long Range Advanced Scout Surveillance System (LRAS3), the M1A2 System Enhancement Package (SEP) Abrams, and the AH-64 Apache Helicopter]. The HTI SGF will allow all vehicles in a common battle group to see the same thermal image. The HTI SGF development is in two parts, an "A" kit, which is specific to the host platform, and includes integration and installation, and a "B" kit, which includes the common FLIR sensor and display. Funds in this project will develop the "B" kit for all weapon systems employing the HTI SGF.

FY 1999 Accomplishments: Project not funded in FY 1999.

FY 2000 Planned Program:

- 100 Milestone I/II Approval for HTI Aviation Second Generation FLIR (SGF)
 - 760 Initiate design and development for high performance detectors for Aviation SGF
 - 10668 Initiate design and development of Aviation SGF
 - 319 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 11847

FY 2001 Planned Program:

- 5042 Continue development of Aviation SGF
 - 1466 Initiate manufacturing of high performance detectors for Aviation SGF (six test unit sets)
 - 5441 Initiate prototype manufacturing of B kit for Aviation SGF (six test unit sets)
- Total 11949

B. <u>Other Program Funding Summary</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>To Compl</u>	<u>Total Cost</u>
6.4 RDTE 0604710A, "A" Kit LRAS3 (DL74)	9575	0	1490	793	0	0	0	0	37333
6.7 RDTE 0203735A, "A" Kit Bradley (D371)	57787	24777	0	0	0	9419	24503	Continue	Continue

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL69
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B. Other Program Funding Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Compl	Total Cost
OPA2 K38300 LRAS3 "A" & "B" Kit	0	42030	46156	44361	49809	51140	51085	Continue	Continue
WTCV G80717 M2A3/M3A3 Bradley "B" Kit	39617	45276	59904	61679	49850	52914	55887	Continue	Continue
WTCV GA0750 Abrams Upgrade "A" and "B" Kit	91631	65196	54210	52122	33590	7648	0	0	388697
WTCV GA0730 M1A2 SEP "A" & "B" Kit	0	0	16652	28895	40518	41109	41105	Continue	Continue
ACFT AA6607 Longbow Apache Mods	0	0	0	0	0	64897	85027	Continue	Continue
6.7 RDTE 0203774A, "A" Kit Apache (D508)	0	37144	17434	38388	41168	0	0		

The funds identified above reflect only the portion of funding in the platform funding lines related to DL 69 efforts.

C. Acquisition Strategy: The Aviation Second Generation FLIR "B" Kit will be developed and fabricated using competitively awarded cost plus award fee contracts.

D. Schedule Profile	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Conduct Initial Operational Test & Evaluation (IOT&E) for SGF on Ground Vehicles *	3-4Q						
MS III Decision for SGF on Ground Vehicles **		1Q					
MS I/II Decision for Aviation HTI SGF EMD Pgm		3Q					
Conduct EMD Pgm for Aviation HTI SGF		3-4Q	1-4Q	1-4Q	1-4Q		
IOT&E for Aviation HTI SGF EMD Program					3-4Q		
MS III Decision for Aviation HTI SGF					4Q		

* All operational tests are funded by the host platforms.

** The HTI SGF program is currently in LRIP and is procurement funded through M/S III.

UNCLASSIFIED

ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000		
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development						PROJECT DL69		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Producibility Contracts	Various	Various	3876							0	3876	3876
b. EMD Contract	C/CPAF	Texas Instruments, McKinney, TX	62100							0	62100	62100
c. SADA II	C/FP	SBRC, Santa Barbara, CA	2116							0	2116	2116
d. T&M	SS/T&M	Hughes, El Segundo, CA	3556							0	3556	3556
e. LRAS3 "B" Kits	C/CPAF	Texas Instruments, McKinney, TX Hughes, El Segundo, CA	477							0	477	477
f. Trade Studies (3)	C/CP	Various	900							0	900	900
g. Aviation EMD Contract	C/CPAF	To Be Selected				10568	2Q	10982	1Q	18177	39727	79454
h. SBIR/STTR						319					319	
Subtotal Product Development:			73025			10887		10982		18177	113071	152479
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. ASARC Support	MIPR	CECOM, NVESD	250							0	250	
b. Matrix Support	MIPR	CECOM, NVESD	7958			672	2Q	677	1Q	1550	10857	
Subtotal Support Costs:			8208			672		677		1550	11107	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DT/OT												
Subtotal Test and Evaluation:												

UNCLASSIFIED

ARMY RDT&E COST ANALYSIS (R-3)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL69
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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Program Management		PM, NV/RSTA	1791			288	2Q	290	1Q	580	2949	
Subtotal Management Services:			1791			288		290		580	2949	
Project Total Cost:			83024			11847		11949		20307	127127	

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL70
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COST <i>(In Thousands)</i>	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DL70 Night Vision Devices Engineering Development	9915	21229	14335	16309	16604	18167	17642	Continuing	Continuing

A. Mission Description and Justification: This project develops and improves high performance night vision electro-optics, thermal and laser systems, and systems integration of related multi-sensor suites to enable near to long range target acquisition and engagement as well as improve battlefield command and control in “around-the-clock” combat operations. The Lightweight Laser Designator Rangefinder (LLDR) and entered a thirty month Engineering and Manufacturing Development Phase in FY 1997. LLDR is a day/night manportable modular target location and laser designator system. The target location system combines a thermal imager, a day camera, eyesafe laser rangefinder, compass, global positioning system (GPS) and digital data and image export capability. The laser designator provides pinpoint targeting for all laser-guided munitions. LLDR gives the artillery light forces the capability to observe, locate and designate targets for direct and indirect fire missions. Improvements to the Thermal Weapon Sight (TWS) and the Driver’s Vision Enhancer (DVE) are also developed under this project. TWS improvements are focused on the integration of target location and digital data transfer capabilities. DVE improvements focus on achieving a dual wavelength capability, leading to image fusion. Sensor fusion activities are planned for both vehicle mounted systems, such as DVE, and soldier carried systems, such as TWS. Both TWS and DVE will benefit from MANTECH improvements to focal plane array and optics. The DVE dual wavelength capabilities will be developed, evaluated and inserted incrementally into ongoing production efforts. The architecture for interoperability of sensors [Mini Eye-Safe Laser Infrared Observation Set (MELIOS), LLDR, Lightweight Video Reconnaissance System (LVRS), TWS, DVE, Long Range Advanced Scout Surveillance System (LRAS3), Synthetic Aperture Radar (SAR), Infrared Line Scanner (IRLS), Forward Looking Infrared (FLIR), visible imagers, hyperspectral cameras and Moving Target Indicator (MTI) radars] on the digital battlefield will be developed through an integrated sensor suite program. This will facilitate the merging of existing sensor data for digital distribution within the Joint Technical Architecture-Army. Sensor data distribution activities include the development and promulgation of a common device architecture, and a computer-based system which will verify and validate the flow of data from the sensor, through a variety of computing devices and then out over the communications network. Efforts include Image Intensified photo cathode development in support of an eye-safe laser system, and evaluation of the suitability and technology supporting a common, HTI, laser system that could be used in a variety of ground and air platforms. Manufacturing technology activities in optics and focal plane arrays are also being supported. Targeting aid development will upgrade the AN/TMQ-41 Meteorological Measuring Set by integrating radar and microwave satellite technology to provide “on demand” trajectory and target area weather conditions. This will increase the ability of artillery/rocket forces to project accurately lethal munitions further into the battlespace. The Enhanced NVG program will develop enhancements and improvements to be incorporated into the Night Vision Goggle system.

FY 1999 Accomplishments:

- 5708 Continued development of ten LLDR EMD models for test/evaluation.
- 1062 Conducted integration and technical tests of the sensor architecture on various platforms [USMC Target Location Designation and Hand-Off System (TLDHS), Bradley FIST, Striker, FBCB2] including Ft. Bragg demonstration.

UNCLASSIFIED

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL70
FY 1999 Accomplishments: (continued)		
<ul style="list-style-type: none"> • 426 • 1969 • 750 Total 9915 	<ul style="list-style-type: none"> Continued development and integration of prototype HTI tactical laser onto Army platforms, such as FSCS, Apache, Kiowa Warrior, LLDR and LRAS3; focus was on laser performance specifications and interface-to-platform requirements supporting modular laser design. Conducted preliminary hardware evaluation and demonstration of Thermal Upgrade activities (TWS Target Location, DVE Dual Wavelength and MANTECH improvements covering both systems). Conducted evaluation of upgrade alternatives for the AN/TMQ-41 (MMS) to include program/technical requirements definition. 	
FY 2000 Planned Program:		
<ul style="list-style-type: none"> • 2486 • 5568 • 2148 • 2472 • 3000 • 1000 • 1000 • 3000 • 555 Total 21229 	<ul style="list-style-type: none"> Complete LLDR EMD activities, to include technical and operational testing, reports and equipment refurbishment for transition of the program into production. Fabricate prototypes and evaluate Thermal Upgrade activities (TWS Target Location and displays (eight test units), DVE Dual Wavelength (six test units) and MANTECH improvements covering both systems). Continue integration and technical tests of the sensor architecture for FBCB2 and a variety of platforms such as TLDS, Striker, including efforts leading to participation in the Joint Contingency Forces (JCF) Army Warfighting Experiment (AWE). Conduct modeling and simulation efforts in support of modular laser design for systems such as: FSCS, Apache, Kiowa Warrior, TUAV, LLDR and LRAS3; initiate dismounted multifunction application for the HTI tactical laser (i.e. reduced cost, size, weight and power consumption), to include initial prototype development for systems such as the M-4/M-16, MK-19 and TWS. Conduct analysis and preliminary detail design effort for LLDR Long Range Striker Vehicle application Design and fabricate internal digital interface (MELIOS Digital RSTA, 4 test units) to support battlefield data dissemination Conduct analyses and preliminary design effort for Enhanced NVG to make lighter, smaller and increase individual movement techniques. Combustion Eyesafe Laser was funded in this Program Element (PE) in error; Reprogramming to PE 0602709A, Project DH95, Night Vision & EO Tech has been requested. Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs 	
FY 2001 Planned Program:		
<ul style="list-style-type: none"> • 2639 • 3595 • 3388 • 4713 Total 14335 	<ul style="list-style-type: none"> Continue Thermal Upgrade activities (prototype test and evaluation) to enhance combat effectiveness of TWS and DVE. Continue integration and technical tests of the sensor architecture, including implementing results from the JCF AWE. Continue dismounted HTI laser activity to reduce cost, size, and weight and power consumption. Initiate Image Fusion of Image Intensification and Thermal technologies to enhance the effectiveness of combat and combat service support platforms such as: the individual soldier and vehicles using the DVE (Bradley, Smoke Generators, etc). 	
Project DL70	Page 8 of 19 Pages	Exhibit R-2A (PE 0604710A)

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL70
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B. <u>Other Program Funding Summary</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Compl	Total Cost
Night Vision AN/PVS-7 Aid K36400 OPA2	43505	44810	32203	24939	26880	31724	42152	Continue	Continue
Night Vision TWS K22900 OPA2	37891	37215	35348	34997	36766	36461	39660	Continue	Continue
Night Vision DVE K31300 OPA2	0	3484	1943	1935	1930	4940	4935	Continue	Continue
Night Vision LLDR K31100 OPA2	0	6234	7093	7032	7204	9824	9814	Continue	Continue

C. Acquisition Strategy: The development programs in this project are currently all based on competitive awards and under cost reimbursement type contract. A dual source/approach will be pursued for the DVE image fusion effort scheduled for FY 2001.

D. <u>Schedule Profile</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
HTI laser prototype design, modeling and simulation	1-4Q	1-3Q					
Develop Prototype Multifunction Tactical HTI Laser for Dismounted Application		2-4Q	1Q				
HTI Laser Demo on Dismounted Platform			2-3Q				
LLDR Vehicle Integration effort conducted	1-4Q						
LLDR Technical Test		2-3Q					
LLDR IOT&E		4Q	1Q				
LLDR MS III Decision			2Q				
LLDR Long Range Striker Vehicle Variant		2-4Q					
Digital MELIOS Design & Fabrication		2-4Q					
Enhanced NVG		2-4Q					
Sensor Architecture Platform Demonstration and Evaluation	2-4Q	1-3Q					
Sensor Architecture Validation/Test (LLDR)	3Q						
Sensor Architecture demonstration for JCF AWE		4Q					
Sensor Architecture integration based on AWE results			1-4Q				
AN/TMQ-41 Upgrade Alternatives Evaluation and Requirements Definition	2-4Q						

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)						DATE February 2000	
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development			PROJECT DL70
D. Schedule Profile	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Thermal Upgrade MANTECH for Focal Plane Array and optics	1-4Q	1-3Q					
Thermal Upgrade target location and display capability demonstration and evaluation for TWS	2-4Q	1-4Q	1Q				
Thermal Upgrade dual wavelength capability demonstration and evaluation for DVE	3-4Q	1-4Q	1Q				
Image Fusion Activities for DVE			1-4Q	1-4Q			
Image Fusion Activities for soldier carried systems				1-4Q	1-4Q		
Sensor Fusion Activities for Driving and soldier carried systems					1-4Q	1-4Q	1-4Q

UNCLASSIFIED

ARMY RDT&E COST ANALYSIS (R-3)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL70
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DVE Development	C/CPIF	Various	21831	0		0		0		0	21831	21831
b. Various Prototypes and Studies	C/CPIF	Various	2947	0		0		0		0	2947	2947
c. LLDR Advanced Demonstration System	C/CP	Litton Laser, Apopka, FL	2556	0		0		0		0	2556	2556
d. LLDR WRAP	C/CP	Various	4253	0		0		0		0	4253	4253
e. LLDR EMD	C/CP	Litton Lasers, Apopka FL	10600	5208	1Q	1799	1Q	0		0	17607	17607
f. Sensor Architecture and integration	C/CPIF & C/CP	Various	5492	992	1-2Q	2074	1Q-2Q	2948	1Q	Continue	Continue	Continue
g. HTI Laser Trade Studies	C/CP	Various	1020	0		0		0		0	1020	1020
h. HTI Laser MFS3 design and prototype activities	C/CPIF	Raytheon, Dallas, TX	270	295	1Q	0		0		0	565	565
i. Modular HTI Multifunction Laser Activities	C/CP	Various	0	0		2245	2Q	2973	1Q	Continue	Continue	Continue
j. AN/TMQ-41 Trade Studies and related activities	C/CP	Various	600	632	1-2Q	0		0		0	1232	1232
k. MANTECH Focal Plane Array and optics	C/CP	Raytheon, Dallas, TX	0	1000	1Q	500	1Q			0	1500	1500
l. Thermal Upgrades for TWS (target location)	C/CP, MIPR	Raytheon, El Segundo, CA, Various	0	439	2Q	2575	1Q	1312	1Q	0	4326	4326
m. Thermal Upgrades for DVE (Dual wavelength)	C/CP	Kaiser Electric San Diego, CA	0	135	3Q	1780	1Q-2Q	850	1Q	0	2765	2765
n. Image Fusion for DVE	C/CP	To Be Selected	0	0		0		2500	2Q	Continue	Continue	Continue
o. Image Fusion for Soldier Carried System	C/CP	To Be Selected	0	0		0		2150	2Q	Continue	Continue	Continue
p. LLDR Long Range Striker Vehicle application	C/CP	Litton Laser, Apopka, FL Various	0	0		3000	2Q				3000	

UNCLASSIFIED

UNCLASSIFIED

ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000		
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
q. Digital MELIOS Design & Fabrication	C/CP	To Be Selected	0	0		1000	2Q				1000	
r. Enhanced NVG Analysis & Design	C/CP	To Be Selected	0	0		1000	2Q				1000	
s. Combustion Eyesafe Laser		To Be reprogrammed				3000					3000	
t. SBIR/STTR						555					555	
Subtotal Product Development:			49569	8701		19528		12733		Continue	Continue	Continue
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Matrix Support	MIPR	Various	9718	481	1Q	753	1Q-4Q	786	1Q	Continue	Continue	
Subtotal Support Costs:			9718	481		753		786		Continue	Continue	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DT/IOT&E	MIPR	ATEC	6048	383	2Q	365	2Q	247	2Q	Continue	Continue	
b. Other Test Support	MIPR	Various	2636	125	2Q	245	2Q	187	2Q	Continue	Continue	
Subtotal Test and Evaluation:			8684	508		610		434		Continue	Continue	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Project Management		PM, NV/RSTA	3180	225	1Q	338	1Q-4Q	382	1Q	Continue	Continue	
Subtotal Management Services:			3180	225		338		382		Continue	Continue	
Project Total Cost:			71151	9915		21229		14335		Continue	Continue	

UNCLASSIFIED

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000			
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<i>COST (In Thousands)</i>	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost	
DL74 Long Range Advanced Scout Surveillance System (LRAS3)	9575	0	1490	793	0	0	0	0	37333	
<p>A. <u>Mission Description and Justification</u> - Long Range Advanced Scout Surveillance System (LRAS3): This project will develop the Long Range Advanced Scout Surveillance System (LRAS3), a long range multi-sensor system for US Army scouts which will provide the capability to detect, recognize, identify, range and determine the location of potential targets. Currently, US Army scouts do not have the necessary equipment to perform these functions "around the clock." LRAS3 will utilize the Horizontal Technology Integration Second Generation FLIR (HTI SGF) thermal sensor and will enable scouts to function "around the clock" in adverse weather and penetrate battlefield obscurants.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 7045 Completed EMD contract and Fabrication (six systems), integration and test of LRAS3. • 618 Conducted and completed Developmental Tests. • 926 Conducted and completed Operational Test. • 986 Completion of enhanced Built In Test (BIT) development. <p>Total 9575</p> <p>FY 2000 Planned Program: Project not funded in FY 2000.</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 778 Initiate LRAS3 software modifications to develop required interface with FBCB2 • 637 Initiate LRAS3 hardware redesign to incorporate required interface with FBCB2 • 75 Initiate LRAS3 fabrication of prototype hardware to support software and hardware redesign (2 test units) <p>Total 1490</p>										
Project DL74			<i>Page 13 of 19 Pages</i>			Exhibit R-2A (PE 0604710A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL74
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B. Other Program Funding Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Compl	Total Cost
6.3 RDTE, PE 0603774A, Project 131	2240	3164	10968	12698	11677	5373	5339	Continue	Continue
6.3 RDTE, PE 0604710A, Project L69 (B Kit) *	0	11847	11949	13674	6633	0	0	0	127127
OPA2, SSN K38300 (LRAS3 Production)	0	42030	46156	44361	49809	51140	51085	Continue	Continue
RDTE, PE 0203759, Project 120 (FBCB2)	29154	12179	56328	65176	63601	37699	0	0	264137

* Note Only the Ground portion of the DL69 (prior to FY 99) funding line is related to LRAS3. Aviation SGF funding in FY00-03 is not related to LRAS3

C. Acquisition Strategy: This project was awarded via competitive acquisition utilizing oral presentations and Cost as An Independent Variable (CAIV) for the Engineering and Manufacturing Development contract. The current objective for the production contract is to competitively award on a fixed price basis utilizing CAIV.

D. Schedule Profile	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Fabrication, integration and test of LRAS3	1-2Q						
Conduct Development Test **	1-2Q, 4Q						
Conduct Operational Test ***	3Q						
MS III Production Decision		2Q					
Award Production Contract		2Q					
Award FBCB2 Interface Contract			1Q				
S/W, H/W Devel and Fabrication			1-4Q	1Q			
Qualification Test				2Q			

** Development test in 4QFY99 is for destructive testing.
 *** OPTEC (ATEC) is directly funded for the majority of costs for IOT&E.

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000		
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development						PROJECT DL74		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. LRAS3 EMD	C/CPAF	Raytheon Systems (TI)	11939	4576	1Q						16515	
b. LRAS3 EMD	C/CPAF	DRS (Hughes)	12958	3755	1Q						16713	
c. LRAS3 Modifications	C/CPAF	TBS						1415	1Q	753	2168	
d. LRAS3 Design Study	C/CPFF	Litton		275	3Q						275	
Subtotal Product Development:			24897	8606				1415		753	35671	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Matrix Support	MIPR	CECOM NVESD	376	219	1Q			50	1Q	30	675	
Subtotal Support Costs:			376	219				50		30	675	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999</u> Cost	<u>FY 1999</u> Award Date	<u>FY 2000</u> Cost	<u>FY 2000</u> Award Date	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. DT	MIPR	TEXCOM		538	3Q						538	
b. OT	MIPR	National Guard		100	3Q						100	
Subtotal Test and Evaluation:				638							638	

UNCLASSIFIED

ARMY RDT&E COST ANALYSIS (R-3)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL74
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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Project Management		PM, NV/RSTA	202	112	1Q-4Q			25	1Q-4Q	10	349	
Subtotal Management Services:			202	112				25		10	349	

Project Total Cost:			25475	9575				1490		793	37333	
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Project DL74												
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 2000			
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development				PROJECT DL75		
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost	
DL75 Profiler	0	5190	4800	2345	0	0	0	0	12335	
<p>A. <u>Mission Description and Budget Item Justification:</u> Profiler is an upgrade of the capabilities of the current AN/TMQ-41 Meteorological Measuring Set (MMS). Profiler will employ remote and local sensing of the atmosphere, Mesoscale modeling and enhanced computing capabilities to provide target area and more timely meteorological data. By providing more accurate MET messages, Profiler will enable supported cannon and rocket systems to decrease miss distances, which will increase predicted fire effectiveness. These enhancements and new capabilities will increase the lethality of field artillery systems such as Multiple Launch Rocket Systems (MLRS) and towed and self-propelled cannons. A further enhancement that would remove the balloon radiosonde from the system should reduce the objective crew size from six to four personnel. This Engineering and Manufacturing Development (EMD) effort will increase the accuracy of a wide range of deep fire weapons and munitions, and ultimately reduce total cost of ownership to the Army.</p> <p>FY 1999 Accomplishments: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4816 Initiate MMS Profiler (MMS-P) EMD development effort, including hardware for four prototype units for both technical tests and operational evaluation and conduct design reviews. • 162 Studies and simulations to support mesoscale model requirements and enhancements. • 72 Planning and preparation for development and operational testing • 140 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 5190</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 4498 Continue MMS-P EMD development effort. • 99 Ballistics and meteorology simulations to support accuracy requirements. • 203 Conduct developmental testing and prepare for operational testing. <p>Total 4800</p>										
Project DL75			Page 17 of 19 Pages				Exhibit R-2A (PE 0604710A)			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development	PROJECT DL75
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B. Other Program Funding Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To Compl	Total Cost
6.4 RDTE, Night Vision Devices Engineering Development 0604710A, (DL70) *	9915	21229	14335	16309	16604	18167	17642	Continue	Continue
Profiler K27900 OPA2	0	0	0	11031	15546	17916	17896	Continue	Continue

* DL 70 of the same SSN as Profiler is identified, since prior years' efforts were funded in that project line.

C. Acquisition Strategy: The MMS Profiler development and production IDIQ contract will be awarded competitively. The EMD phase contract type will be Cost Plus Award Fee (CPAF) and the production option will be Firm Fixed Price. The formal solicitation will include requirements for oral presentations and cost as an independent variable (CAIV).

D. Schedule Profile	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
MS I/II Decision		2Q					
Award EMD Contract		3Q					
Begin System Fabrication		3Q					
Conduct Developmental Testing			4Q	1Q			
Conduct Operational Test				2Q			
MS III Decision				3Q			
Award Production Contract				3Q			
First Unit Equipped (FUE)					3Q		
Initial Operational Capability (IOC)						1Q	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 2000		
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604710A Night Vision Systems - Engineering Development					PROJECT DL75		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. EMD Contract	C/CPAF	To Be Selected				4000	3Q	3719	1Q	1546	9265	9265
b. Studies and Simulations	MIPR	ARL, NOAA				162	2Q	99	1Q	0	261	261
c. SBIR/STTR						140					140	
Subtotal Product Development:						4302		3818		1546	9666	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Matrix Support	MIPR	CECOM I2WD, Other				778	2Q	730	1Q	220	1728	
Subtotal Support Costs:						778		730		220	1728	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Test Planning and Preparation	MIPR	ATEC				72					72	
b. DT/OT	MIPR	ATEC						203	2Q	534	737	
Subtotal Test and Evaluation:						72		203		534	809	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Project Management		PM, NV/RSTA				38		49		45	132	
Subtotal Management Services:						38		49		45	132	
Project Total Cost:						5190		4800		2345	12335	