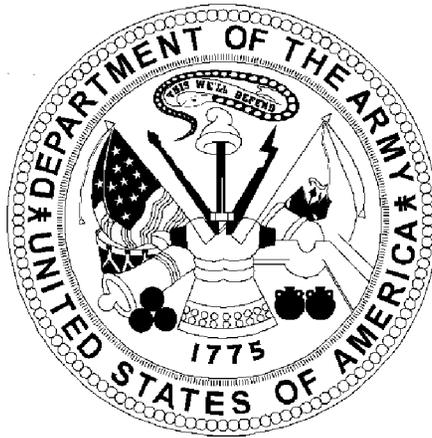


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Supporting Data FY 2000/2001 Biennial Budget Estimate
Submitted to Congress - February 1999

DESCRIPTIVE SUMMARIES OF THE



**RESEARCH, DEVELOPMENT, TEST AND EVALUATION
Army Appropriation, Budget Activities 6 and 7**

Department of the Army
Office of the Secretary of the Army (Financial Management and Comptroller)

"READINESS THROUGH MODERNIZATION"

VOLUME III

UNCLASSIFIED

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**DESCRIPTIVE SUMMARIES FOR PROGRAM ELEMENTS
OF THE
RESEARCH, DEVELOPMENT, TEST AND
EVALUATION, ARMY
FY 2000/2001
FEBRUARY 1999**

**VOLUME III
Budget Activities 6 and 7**

**Department of the Army
Office of the Assistant Secretary of the Army (Financial Management and Comptroller)**

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FY 2000/2001 RDT&E, ARMY
PROGRAM ELEMENT DESCRIPTIVE SUMMARIES

INTRODUCTION AND EXPLANATION OF CONTENTS

1. General. This section has been prepared for the purpose of providing information concerning the Army Research, Development, Test and Evaluation program. The Descriptive Summaries are comprised of R-2 (Army RDT&E Budget Item Justification – Program Element level), R-2A (Army RDT&E Budget Item Justification – project level) and R-3 (Army RDT&E Cost Analysis) Exhibits which provide narrative information on all RDT&E program elements and projects for the FY 1998, 1999, 2000 and 2001 time period.

2. Relationship of the FY 2000 Budget Submission to the FY 1999 Budget submitted to Congress. This paragraph provides a list of program elements restructured, transitioned, or established to provide specific program identification.

A. Program Element Restructures. Explanations for these changes can be found in the narrative sections of the Program Element R-2/R-3 Exhibits.

OLD		NEW
<u>PE/PROJECT</u>	<u>NEW PROJECT TITLE</u>	<u>PE/PROJECT</u>
0203761A/399	Striker (Force XXI Initiative)	0203762A/008
0203761A/414	Radio Frequency Tags (RF Tags – Force XXI Initiative)	0203763A/007
0602618A/H81	Armor Exploratory Development	0602601A/C05
0603005A/C62	Combat Vehicle Survivability	0603005A/221
0603710A/K87	Night Vision Advanced Technology	0603710A/K70
0602710A/K87	Night Vision, ABN	0603710AK86
0603713A/370	Joint Tactical Radio System – Ground Domain Integration	0604805A/615
0604824A/112	COSSI	0708045A/E32
0604280A/152 (BA 3)	Joint Tactical Radio System	0604280A/162 (BA 5)

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B. FY 2000 Developmental Transitions.

FROM		TO
<u>PE/PROJECT</u>	<u>PROJECT TITLE</u>	<u>PE/PROJECT</u>
0602303A/214	Advanced Missile Demos	0603313A/704
0602720A/896	Environmental Compliance Technology	0603728A/002
0603640A/B91 & 0603854A/C68	Crusader – Advanced Development	0603854A/505
0603804A/266/428 & 0604804A/279/429	Soldier Support Equipment – Advanced Development	0603747A/C09
0603805A/246	Tactical Communications System – Engineering Development	0604805A/629

C. Establishment of New FY 2000 Program Elements/Projects. There are no major system new starts. Minor new initiatives for FY 2000, in addition to Congressionally directed initiatives for FY 1999, are shown below with asterisks. The remaining programs listed are outyear initiatives or restructures beyond FY 1999 or were previously funded from other Defense appropriations.

<u>TITLE</u>	<u>PE/PROJECT</u>
Emergency Preparedness Training	0203610A/E33
Striker (Force XXI Initiative)	0203762A/008
Radio Frequency Tags (RF Tags - Force XXI Initiative)	0203763A/007
Tactical Reconnaissance Sensors	0305206A/K98
Common Imagery Ground/Support Systems (CIGSS) Development	0305208A/956
Photonics Research	0602308A/D01
Sustaining Green Manufacturing	0602720A/947
Electronic Equipment Demanufacture*	0602720A/946
Army Research Office Chemical/Hazardous Material Disposal	0602720A/F27
Multimedia Tactical Adapter*	0602782A/J06
University Partnering for Operational Support	0602784A/T49
Enhanced Geographic Synthetic Aperture Radar (GeoSAR)*	0602784A/T50
Portable Cardiopulmonary Bypass	0602787A/948
Advanced Cancer Detection	0602787A/949

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C. Establishment of New FY 2000 Program Elements/Projects - continued

<u>TITLE</u>	<u>PE/PROJECT</u>
Teleradiology	0602787A/950
Diagnostics and Surgical Breast Imaging	0602787A/951
Musculoskeletal Injuries*	0602787A/952
Disaster Relief and Emergency Medical Services (DREAMS)	0602787A/953
Telemedicine Testbed	0603002A/800
Digital X-Ray	0603002A/954
Assistive Technology	0603002A/955
Robotic Ground Systems	0603005A/515
Global Broadcast System (GBS) Information Management	0603006A/617
Tactical Simulation Interface Unit (TSIU)	0603308A/979
Range Upgrades	0603308A/988
Anti-Personnel Landmine Alternatives	0603606A/683
Millimeter Wave Technology	0603710A/K89
Joint Tactical Radio System – BA 5	0604280A/162
Trailer Development	0604622A/E50
Forward Repair System – Heavy	0604622A/E51
Digital Topographic Support System – WRAP	0604716A/653
Air and Missile Defense Planning and Control Support (PCS) – WRAP*	0604741A/169
Joint Tactical Radio Systems – Ground Domain Integration	0604805A/615
Tactical Communications System – Engineering Development	0604805A/629
Digital Information Technology Testbed	0605326A/309

D. FY 2000 programs for which funding was shown in the FY 1999 President's Budget Submit (February 1998), but which are no longer funded.

<u>PE/PROJECT</u>	<u>TITLE</u>	<u>BRIEF EXPLANATION</u>
0602308A/636	Army After Next (AAN) Applied Research	Program terminated
0602618A/H81	Armor/Anti-Armor Technology	Program restructured to 0602601A/C05
0602720A/895	Pollution Prevention	Program terminated
0603710A/K87	Night Vision, Combat Vehicle	Program restructured to 0603710A/K70/K86
0603780A/852	SERDP/Environmental Security Technology	Program transferred back to OSD

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D. FY 2000 programs for which funding was shown in the FY 1999 President's Budget Submit (February 1998), but which are no longer funded - Continued

<u>PE/PROJECT</u>	<u>TITLE</u>	<u>BRIEF EXPLANATION</u>
0603313A/496	Enhanced Fiber Optic Guided Missil (EFOG-M)	ATD Completed
0603645A/Q19	Future Combat System	Program terminated
0604325A/E18	Follow-On to TOW	Program terminated by Congress
0604768A/686	ATACMS Block II	Program restructured to the outyears.
0604804A/H02	Bridge Site Mobility	Program terminated
0605853A	Environmental Conservation	Program transferred to OMA PE 0408853
0605854A	Pollution Prevention	Program transferred to OMA PE 0408854
0605856A	Environmental Complianc	Program transferred to OMA PE 0408856
0605876A	Minor Construction – RPM	Program transferred to OMA PE 0409876
0605878A	Maintenance and Repair – RPM	Program transferred to OMA PE 0409878
0605879A	Real Property (RPS)	Program transferred to OMA PE 0408879
0605896A	Base Operations – RDTE	Program transferred to OMA PE 0408896
0203735A/718	Ground Combat Vehicle HTI	Program terminated

3. Classification. This document contains no classified data. Classified/Special Access Programs which are submitted offline are listed below.

0203735A/DC64	0603005A/DC62/DC66	0603851A
0203808A	0603009A	0603854A/DC68
0301359A	0603020A	0604649A/DG15
0602104A	0603017A	0604328A
0602122A	0603018A	
0602712A/AC61	0603122A	
0602786A/AC60	0603322A	
0603003A/D391	0603710A/DC63/DC65/ DC67	

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Department of the Army
 FY 2000/2001 RDT&E Program

Exhibit R-1

Summary	Date: Feb 1999			
	Thousands of Dollars			
	FY 1998	FY 1999	FY 2000	FY 2001
<u>Summary Recap of Budget Activities</u>				
Basic Research	177,269	183,727	186,872	191,101
Applied Research	663,035	628,091	555,258	563,386
Advanced Technology Development	677,814	653,024	524,925	494,101
Demonstration and Validation	536,628	497,598	405,723	281,322
Engineering and Manufacturing Development	1,130,519	1,267,285	1,495,741	1,893,978
RDT&E Management Support	1,216,038	1,136,691	665,304	739,807
Operational Systems Development	<u>622,010</u>	<u>665,782</u>	<u>592,371</u>	<u>586,883</u>
Total Research Development Test & Eval Army	5,023,313	5,032,198	4,426,194	4,750,578

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Department of the Army
FY 2000/2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 1999

Line	Element	Program	Item	Act	Thousands of Dollars			
					FY 1998	FY 1999	FY 2000	FY 2001
No	Number							
1	0601101A	IN-HOUSE LABORATORY INDEPENDENT RESEARCH		1	13,325	13,574	14,193	14,499
2	0601102A	DEFENSE RESEARCH SCIENCES		1	120,211	125,314	125,613	128,578
3	0601104A	UNIVERSITY AND INDUSTRY RESEARCH CENTERS		1	<u>43,733</u>	<u>44,839</u>	<u>47,066</u>	<u>48,024</u>
		Basic Research			177,269	183,727	186,872	191,101
4	0602104A	TRACTOR ROSE		2	0	0	6,766	6,667
5	0602105A	MATERIALS TECHNOLOGY		2	12,319	13,012	13,849	13,825
6	0602120A	SENSORS AND ELECTRONIC SURVIVABILITY		2	25,545	16,614	22,978	23,723
7	0602122A	TRACTOR HIP		2	6,872	11,603	9,298	7,191
8	0602211A	AVIATION TECHNOLOGY		2	22,698	24,943	30,165	31,184
9	0602270A	EW TECHNOLOGY		2	15,927	16,116	17,487	18,082
10	0602303A	MISSILE TECHNOLOGY		2	22,199	30,130	32,892	31,469
11	0602308A	ADVANCED CONCEPTS AND SIMULATION		2	19,660	21,494	24,955	24,799
12	0602601A	COMBAT VEHICLE AND AUTOMOTIVE TECHNOLOGY		2	62,141	39,208	39,749	41,625
13	0602618A	BALLISTICS TECHNOLOGY		2	36,678	27,229	36,287	37,687
14	0602622A	CHEMICAL, SMOKE AND EQUIP DEFEATING TECHNOLOG		2	3,500	5,078	3,996	4,042
15	0602623A	JOINT SERVICE SMALL ARMS PROGRAM		2	8,714	5,188	5,187	5,428
16	0602624A	WEAPONS AND MUNITIONS TECHNOLOGY		2	27,962	28,913	34,687	37,487
17	0602705A	ELECTRONICS AND ELECTRONIC DEVICES		2	23,974	25,238	25,796	27,719
18	0602709A	NIGHT VISION TECHNOLOGY		2	16,563	19,008	20,111	20,966
19	0602712A	COUNTERMINE SYSTEMS DEVELOPMENT		2	9,928	10,547	10,321	10,453
20	0602716A	HUMAN FACTORS ENGINEERING TECHNOLOGY		2	16,577	16,473	16,392	16,270
21	0602720A	ENVIRONMENTAL QUALITY TECHNOLOGY		2	58,711	64,386	12,758	14,041
22	0602782A	COMMAND, CONTROL, COMMUNICATIONS TECHNOLOGY		2	16,197	22,359	19,613	21,010
23	0602783A	COMPUTER AND SOFTWARE TECHNOLOGY		2	658	2,170	5,210	4,012
24	0602784A	MILITARY ENGINEERING TECHNOLOGY		2	55,978	52,074	41,085	42,820
25	0602785A	MANPOWER/PERSONNEL/TRAINING TECHNOLOGY		2	10,736	8,533	12,071	11,904
26	0602786A	WARFIGHTER TECHNOLOGY		2	17,372	18,420	23,971	23,405
27	0602787A	MEDICAL TECHNOLOGY		2	171,362	138,264	70,136	68,014
28	0602789A	ARMY ARTIFICIAL INTELLIGENCE TECHNOLOGY		2	764	1,156	1,276	1,346
29	0602805A	DUAL USE APPLICATIONS PROGRAM		2	<u>0</u>	<u>9,935</u>	<u>18,222</u>	<u>18,217</u>
		Applied Research			663,035	628,091	555,258	563,386

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Department of the Army
FY 2000/2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 1999

Line	Element	Program	Act	Thousands of Dollars			
				FY 1998	FY 1999	FY 2000	FY 2001
No	Number	Item					
30	0603001A	WARFIGHTER ADVANCED TECHNOLOGY	3	33,126	30,430	31,287	16,337
31	0603002A	MEDICAL ADVANCED TECHNOLOGY	3	202,504	229,325	10,539	12,591
32	0603003A	AVIATION ADVANCED TECHNOLOGY	3	85,778	44,834	34,167	38,585
33	0603004A	WEAPONS AND MUNITIONS ADVANCED TECHNOLOGY	3	23,694	24,858	39,893	38,686
34	0603005A	COMBAT VEHICLE AND AUTOMATIVE ADVANCED TECH	3	38,694	61,300	90,941	97,200
35	0603006A	COMMAND, CONTROL, COMM ADVANCED TECHNOLOGY	3	24,884	23,747	20,883	21,508
36	0603007A	MANPOWER, PERSONNEL AND TRAINING ADV TECH	3	3,913	2,949	3,030	3,074
37	0603009A	TRACTOR HIKE	3	13,901	9,807	12,553	13,537
38	0603013A	TRACTOR DIRT	3	3,178	48	0	0
39	0603017A	TRACTOR RED	3	5,190	4,559	4,582	2,830
40	0603020A	TRACTOR ROSE	3	10,379	2,001	11,151	10,950
41	0603105A	MILITARY HIV RESEARCH	3	17,541	5,672	5,976	5,926
42	0603122A	TRACTOR HIP	3	0	0	2,432	986
43	0603238A	AIR DEFENSE/PRECISION STRIKE TECHNOLOGY	3	12,174	9,907	24,618	21,434
44	0603270A	EW TECHNOLOGY	3	7,672	11,425	16,169	17,008
45	0603313A	MISSILE AND ROCKET ADVANCED TECHNOLOGY	3	91,280	71,394	43,639	24,011
46	0603322A	TRACTOR GEM	3	5,758	4,377	2,665	3,083
47	0603606A	LANDMINE WARFARE AND BARRIER ADV TECHNOLOGY	3	30,529	23,777	47,456	44,935
48	0603607A	JOINT SERVICE SMALL ARMS PROGRAM	3	8,784	9,608	4,869	5,468
49	0603654A	LINE-OF-SIGHT TECHNOLOGY DEMO	3	4,683	11,920	41,619	52,940
50	0603710A	NIGHT VISION ADVANCED TECHNOLOGY	3	17,628	27,273	36,628	37,035
51	0603728A	ENVIRONMENTAL QUALITY TECHNOLOGY DEVELOPMENT	3	0	0	1,337	1,626
52	0603734A	MILITARY ENGINEERING ADVANCED TECHNOLOGY	3	18,922	15,523	15,881	5,240
53	0603772A	ADV TACTICAL COMPUTER SCIENCE & SENSOR TECH	3	17,602	18,257	22,610	19,111
54	0604280A	JOINT TACTICAL RADIO SYSTEM	3	0	10,033	0	0
		Advanced Technology Development		677,814	653,024	524,925	494,101
55	0603308A	ARMY MISSILE DEFENSE SYSTEMS INTEGRATION	4	72,009	38,957	12,353	12,580
56	0603619A	LANDMINE WARFARE AND BARRIER - ADV DEV	4	14,845	6,707	4,099	19,832
57	0603639A	ARMAMENT ENHANCEMENT INITIATIVE	4	36,036	35,784	36,937	42,511
58	0603640A	ARTILLERY PROPELLANT DEVELOPMENT	4	7,983	0	0	0
59	0603645A	ARMORED SYSTEMS MODERNIZATION-ADVANCED DEVEL	4	1,130	0	0	0
60	0603653A	ADVANCED TANK ARMAMENT SYSTEM	4	8,485	8,867	1,937	8,870
61	0603713A	ARMY DATA DISTRIBUTION SYSTEM	4	19,785	15,162	10	17

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Department of the Army
FY 2000/2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 1999

Line	Element	Program	Item	Act	Thousands of Dollars			
					FY 1998	FY 1999	FY 2000	FY 2001
No	Number							
			x					
62	0603747A		SOLDIER SUPPORT AND SURVIVABILITY	4	6,196	7,522	12,804	13,642
63	0603766A		TAC EXPLOIT OF NAT CAP (TENCAP)-DEM/VAL TIARA	4	18,957	0	0	0
64	0603774A		NIGHT VISION SYSTEMS ADVANCED DEVELOPMENT	4	2,152	2,664	3,188	4,036
65	0603790A		NATO RESEARCH AND DEVELOPMENT (H)	4	7,885	4,132	1,872	1,971
66	0603801A		AVIATION - ADV DEV	4	14,869	11,404	5,746	5,870
67	0603802A		WEAPONS AND MUNITIONS - ADV DEV	4	0	0	1,751	2,810
68	0603804A		LOGISTICS AND ENGINEER EQUIPMENT - ADV DEV	4	6,570	18,845	6,514	6,265
69	0603805A		CBT SERVICE SUPPORT CONTROL SYS EVAL & ANALYS	4	7,037	14,056	11,062	8,839
70	0603807A		MEDICAL SYSTEMS - ADV DEV	4	9,181	11,329	12,723	12,235
71	0603851A		TRACTOR EARL	4	1,779	960	1,087	985
72	0603854A		ARTILLERY SYSTEMS DEMONSTRATION/VALIDATION	4	301,160	313,526	282,937	120,457
73	0603856A		SCAMP BLOCK II (SPACE)	4	<u>569</u>	<u>7,683</u>	<u>10,703</u>	<u>20,402</u>
			Demonstration and Validation		536,628	497,598	405,723	281,322
74	0604201A		AIRCRAFT AVIONICS	5	32,504	14,780	6,372	2,990
75	0604223A		COMANCHE	5	262,601	364,784	427,069	565,800
76	0604270A		EW DEVELOPMENT	5	84,106	86,258	78,603	81,037
77	0604280A		JOINT TACTICAL RADIO SYSTEM	5	0	0	36,797	68,296
78	0604321A		ALL SOURCE ANALYSIS SYSTEM	5	25,275	33,776	49,684	46,399
79	0604325A		FOLLOW-ON TO TOW	5	9,002	0	0	0
80	0604328A		TRACTOR EARL	5	11	1,777	2,848	2,934
81	0604601A		INFANTRY SUPPORT WEAPONS	5	0	0	0	1,747
82	0604604A		MEDIUM TACTICAL VEHICLES	5	2,917	0	1,973	1,971
83	0604609A		SMOKE, OBSCURANT AND TARGET DEFEATING SYS-ED	5	0	701	918	2,480
84	0604611A		JAVELIN (AWWS-M)	5	7,512	5,242	493	493
85	0604619A		LANDMINE WARFARE	5	21,448	23,036	13,318	0
86	0604622A		FAMILY OF HEAVY TACTICAL VEHICLES	5	4,683	8,244	0	0
87	0604633A		AIR TRAFFIC CONTROL	5	6,750	1,724	1,981	2,035
88	0604640A		ADVANCED COMMAND AND CONTROL VEHICLE	5	9,382	0	0	0
89	0604641A		TACTICAL UNMANNED GROUND VEHICLE	5	2,397	2,452	0	0
90	0604642A		LIGHT TACTICLE WHEELED VEHICLE	5	0	0	7,498	9,954
91	0604645A		ARMORED SYSTEMS MODERNIZATION (ASM)-ENG DEV	5	0	4,470	2,899	6,064
92	0604649A		ENGINEER MOBILITY EQUIPMENT DEVELOPMENT	5	52,388	70,590	58,321	37,741

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Department of the Army
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Exhibit R-1

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Line	Program Element No Number	Item	Act	Thousands of Dollars			
				FY 1998	FY 1999	FY 2000	FY 2001
93	0604710A	NIGHT VISION SYSTEMS - ENG DEV	5	33,338	21,167	30,644	31,270
		xi					
94	0604713A	COMBAT FEEDING, CLOTHING, AND EQUIPMENT	5	58,579	67,674	110,829	136,899
95	0604715A	NON-SYSTEM TRAINING DEVICES - ENG DEV	5	75,977	63,778	71,034	51,925
96	0604716A	TERRAIN INFORMATION - ENG DEV	5	2,831	6,157	5,348	6,120
97	0604726A	INTEGRATED METEOROLOGICAL SUPPORT SYSTEM	5	1,823	1,777	2,318	1,782
98	0604739A	JTT/CIBS-M (TIARA)	5	4,215	4,400	4,552	6,096
99	0604741A	AIR DEFENSE C2I - ENG DEV	5	20,591	11,458	7,995	8,942
100	0604746A	AUTOMATIC TEST EQUIPMENT DEVELOPMENT	5	7,925	9,962	10,252	12,632
101	0604760A	DISTRIBUTIVE INTERACTIVE SIMULATIONS ENG DEV	5	19,572	2,727	7,657	20,646
102	0604766A	TAC EXPLOIT NAT CAP (TENCAP)-EMD (TIARA)	5	17,221	43,950	70,940	57,008
103	0604768A	BRILLIANT ANTI-ARMOR SUBMUNITION(BAT)	5	225,241	128,521	128,026	112,149
104	0604770A	JOINT SURVEILLANCE/TARGET ATTACK RADAR SYSTEM	5	6,464	5,463	11,535	26,871
105	0604778A	POSITIONING SYS DEVEL (SPACE)	5	405	377	443	435
106	0604780A	COMBINED ARMS TACTICAL TRAINER (CATT)	5	14,950	7,472	19,925	18,627
107	0604801A	AVIATION - ENG DEV	5	5,402	11,519	6,312	9,264
108	0604802A	WEAPONS AND MUNITIONS - ENG DEV	5	18,114	35,566	54,943	55,077
109	0604804A	LOGISTICS & ENGINEER EQUIPMENT - ENG DEV	5	21,591	25,820	22,996	16,074
110	0604805A	COMMAND, CONTROL, COMMUNICATIONS SYSTEMS - ED	5	14,352	16,280	23,987	23,842
111	0604807A	MEDICAL MATERIEL/MED BIO DEFENSE EQUIPMENT ED	5	4,200	5,299	9,705	9,448
112	0604808A	LANDMINE WARFARE/BARRIER - ENG DEV	5	4,040	52,680	40,916	39,187
113	0604814A	SENSE AND DESTROY ARMOR - ENG DEV	5	10,485	31,602	19,366	9,775
114	0604817A	COMBAT IDENTIFICATION	5	19,227	13,379	8,658	2,395
115	0604818A	ARMY TACTICAL COMM & CONT HARDWARE & SOFTWARE	5	20,600	32,548	35,299	33,620
116	0604820A	RADAR DEVELOPMENT	5	0	6,742	5,128	8,481
117	0604823A	FIREFINDER	5	2,400	20,583	32,353	37,589
118	0604824A	COSSI	5	0	21,457	0	0
119	0604854A	ARTILLERY SYSTEMS - ENGINEERING DEVELOPMENT	5	<u>0</u>	<u>1,093</u>	<u>65,806</u>	<u>327,883</u>
		Engineering and Manufacturing Development		1,130,519	1,267,285	1,495,741	1,893,978
120	0604256A	THREAT SIMULATOR DEVELOPMENT	6	15,501	12,837	13,680	13,791
121	0604258A	TARGET SYSTEMS DEVELOPMENT	6	11,149	13,038	13,397	14,423
122	0604759A	MAJOR TEST & EVALUATION INVESTMENT	6	40,256	37,030	39,380	40,190
123	0605103A	RAND ARROYO CENTER	6	15,983	16,685	17,656	17,995

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Department of the Army
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Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 1999

Line	Program Element No	Item Number	Act	Thousands of Dollars			
				FY 1998	FY 1999	FY 2000	FY 2001
124	0605301A	ARMY KWAJALEIN ATOLL	6	117,096	133,027	140,344	140,958
125	0605326A	CONCEPTS EXPERIMENTATION	6	0	13,948	16,990	73,006
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126	0605502A	SMALL BUS INV RSCH/SMALL BUS TECH PILOT PROG	6	106,048	0	0	0
127	0605601A	ARMY TEST RANGES AND FACILITIES	6	114,970	118,571	137,193	134,335
128	0605602A	ARMY TECHNOLOGY & SUSTAINING INSTRUMENTATION	6	30,518	43,638	30,470	33,332
129	0605604A	SURVIVABILITY/LETHALITY ANALYSIS	6	30,263	34,131	30,138	33,916
130	0605605A	DOD HIGH ENERGY LASER SYS TEST FAC (HELSTF)	6	28,048	23,848	14,230	14,260
131	0605606A	AIRCRAFT CERTIFICATION	6	2,734	2,893	3,021	3,169
132	0605702A	METEOROLOGICAL SUPPORT TO RDT&E ACTIVITIES	6	6,235	6,628	6,843	6,952
133	0605706A	MATERIEL SYSTEMS ANALYSIS	6	27,120	9,617	8,796	8,718
134	0605709A	EXPLOITATION OF FOREIGN ITEMS	6	7,277	4,004	4,143	3,605
135	0605712A	SUPPORT OF OPERATIONAL TESTING	6	74,656	65,460	68,946	69,038
136	0605716A	ARMY EVALUATION CENTER	6	0	25,313	24,255	26,362
137	0605801A	PROGRAMWIDE ACTIVITIES	6	79,128	64,047	64,121	73,259
138	0605803A	TECHNICAL INFORMATION ACTIVITIES	6	15,795	16,006	15,973	16,330
139	0605805A	MUNITIONS STANDARDZION EFFECTIVENESS & SAFETY	6	10,707	10,422	10,537	10,814
140	0605853A	ENVIRONMENTAL CONSERVATION	6	2,435	3,174	0	0
141	0605854A	POLLUTION PREVENTION	6	4,773	10,624	0	0
142	0605856A	ENVIRONMENTAL COMPLIANCE-RDT&E	6	55,058	48,986	0	0
143	0605876A	MINOR CONSTUCTION (RPM) - RDTE	6	4,003	4,177	0	0
144	0605878A	MAINTENANCE AND REPAIR (RPM) - RDTE	6	79,639	80,059	0	0
145	0605879A	REAL PROPERTY SERVICES (RPS)	6	84,756	86,441	0	0
146	0605896A	BASE OPERATIONS-RDT&E	6	224,968	229,573	0	0
147	0605898A	MANAGEMENT HEADQUARTERS (RSCH & DEVELOPMENT)	6	24,361	22,514	5,191	5,354
148	0909999A	CLOSED ACCOUNT ADJUSTMENT	6	<u>2,561</u>	<u>0</u>	<u>0</u>	<u>0</u>
		RDT&E Management Support		1,216,038	1,136,691	665,304	739,807
149	0603778A	MLRS PRODUCT IMPROVEMENT PROGRAM	7	33,022	25,159	36,540	58,591
150	0102419A	JOINT LAND ATTACK CRUISE MISSILE DEFENSE (JLENS)	7	29,910	14,572	24,903	25,141
151	0203610A	EMERGENCY PREPAREDNESS TRAINING	7	0	15,000	0	0
152	0203726A	ADV FIELD ARTILLERY TACTICAL DATA SYSTEM	7	36,225	34,646	36,222	34,528
153	0203735A	COMBAT VEHICLE IMPROVEMENT PROGRAMS	7	151,520	104,000	29,544	23,938
154	0203740A	MANEUVER CONTROL SYSTEM	7	23,712	28,623	45,125	25,682

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Department of the Army
FY 2000/2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 1999

Line	Element	Program	Act	Thousands of Dollars			
				FY 1998	FY 1999	FY 2000	FY 2001
No	Number	Item					
155	0203744A	AIRCRAFT MODIFICATIONS/PRODUCT IMPROV PROGRAM	7	21,847	26,628	51,644	61,033
156	0203752A	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	7	2,756	6,901	2,900	2,946
157	0203758A	DIGITIZATION	7	91,248	46,240	28,180	26,830
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158	0203759A	FORCE XXI BATTLE CMD, BRIGADE & BELOW	7	0	52,121	44,225	28,876
159	0203761A	FORCE XXI WARFIGHTING RAPID ACQUISITION PGM	7	8,686	26,942	55,921	66,058
160	0203762A	STRIKER (WRAP)	7	3,654	0	0	0
161	0203763A	RADIO FREQUENCY TECHNOLOGY	7	1,592	0	0	0
162	0203801A	MISSILE/AIR DEFENSE PRODUCT IMPRV PROGRAM	7	29,471	15,151	29,985	28,649
163	0203802A	OTHER MISSILE PRODUCT IMPROVEMENT PROGRAMS	7	1,613	1,239	9,914	14,817
164	0203806A	TRACTOR RUT	7	1,967	0	0	0
165	0203808A	TRACTOR CARD	7	6,146	3,967	3,898	3,861
166	0208010A	JOINT TACTICAL COMMUNICATIONS PROG (TRI-TAC)	7	20,815	35,664	18,432	19,666
167	0208053A	JOINT TACTICAL GRD STATION (TIARA)	7	4,835	12,148	28,061	6,306
168	0301359A	SPECIAL ARMY PROGRAM	7	10,543	9,704	6,584	5,471
169	0303140A	INFORMATION SYSTEMS SECURITY PROGRAM	7	11,406	11,338	9,426	8,178
170	0303142A	SATCOM GROUND ENVIRO (SPACE)	7	45,679	52,447	36,230	47,743
171	0303150A	ARMY GLOBAL C2 SYS	7	14,094	17,339	11,606	14,295
172	0305114A	TRAFFIC CNTL/APPROACH/LANDING SYS (JPALS)	7	610	0	0	788
173	0305128A	SECURITY AND INTELLIGENCE ACTIVITIES	7	468	944	0	0
174	0305204A	TACTICAL UNMANNED AERIAL VEHICLE	7	0	53,224	3,866	4,309
175	0305206A	AIRBORNE RECONNAISSANCE ADVANCED DEVELOPMENT	7	0	7,451	4,932	4,928
176	0305208A	DISTRIBUTED COMMON GROUND SYSTEMS	7	0	8,853	8,066	7,943
177	0708045A	MANUFACTURING TECHNOLOGY	7	60,044	52,501	66,167	66,306
178	1001018A	NATO JSTARS - TIARA	7	<u>10,147</u>	<u>2,980</u>	<u>0</u>	<u>0</u>
		Operational Systems Development		622,010	665,782	592,371	586,883
Total Research Development Test & Eval Army				5,023,313	5,032,198	4,426,194	4,750,578

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104	0604770A Joint Surveillance/Target Attack Radar Syste	1007
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107	0604801A Aviation - Engineering Development	1025
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0604256A Threat Simulator Development				PROJECT D976		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D976 Army Threat Simulator Program	15501	12837	13680	13791	16024	16022	20691	21367	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: This program finances the design, development, integration and fielding of realistic mobile threat simulators and realistic threat simulation products utilized in Army training, developmental tests and operational tests. Army Threat Simulator and Threat Simulation products are utilized to populate test battlefields for US Army Operational Test and Evaluation Command (OPTEC)-conducted operational tests, to support OPTEC oversight developmental testing, and PEO required user testing in System Integration Laboratories and hardware/simulation in the loop facilities. Army threat simulator and threat simulation products developed or fielded under this program support Army wide requirements defined in the AMC chartered Threat Simulator and Simulation Program Plan (TSPP) and identified as nonsystem specific threat product requirements. Each capability is pursued in concert and coordination with existing Army and tri-service capabilities to eliminate duplication of products and services while providing the proper mix of resources needed to support Army testing and training. These battlefield simulators represent systems (e.g. missile systems; command, control and communications systems; electronic warfare systems; helicopters; etc.) that are used to portray a realistic threat environment during testing of U.S. weapon systems. Simulator development is responsive to Office of the Secretary of Defense and General Accounting Office concerns that the Army conduct operational testing in a realistic threat environment. Initially created to develop simulators of Soviet equipment, the changing world order has expanded the scope of this program to address rest of world (ROW) threats. Actual threat equipment is acquired when appropriate in lieu of development. Total package fielding will still be required (i.e., instrumentation, operations and maintenance, manuals, new equipment training, etc.). Threat simulator development is accomplished under the auspices of the Project Manager for Instrumentation, Targets, and Threat Simulators (PM ITTS), and CROSSBOW, which is administered by the Director for Test, Systems Engineering and Evaluation, Office of the Under Secretary of Defense (Acquisition and Technology). These affiliations eliminate any duplication within the U.S. Army or Department of Defense (DoD).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1759 Completed development of XM15S Air Defense System. • 1767 Instrumented XM43A Air Defense System. • 1856 Completed development of Proof of Principle breadboard XM17S short-to-medium range SAM Air Defense System receiver processor chain. • 1702 Continued development of XMDEWS Advanced Land Combat System. • 3276 Completed main command center development of XMC3S. • 1451 Initiated development of Advanced Distributed Electronic Warfare Simulation (XMADEWS). • 3690 Developed and fielded Distributed Compatible Interactive Simulation Radar (Congressional plus-up). <p>Total 15501</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2433 Continue development of regimental elements of XMC3S for the Battle Management Network. • 1782 Continue development of XMDEWS Advanced Land Combat Systems. 										
Project D976	Page 1 of 3 Pages					Exhibit R-2 (PE 0604256A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256A Threat Simulator Development	PROJECT D976
FY 1999 Planned Program: (continued)		
•	1000 Develop Jamming Simulator for US Army Battle Laboratory (Congressional Plus-up).	
•	2754 Instrument the XM15A Air Defense System.	
•	1856 Instrument the second XM43A Air Defense System.	
•	2754 Continue development of Advanced Distributed Electronic Warfare Simulation (XMADEWS).	
•	258 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs	
Total	12837	
FY 2000 Planned Program:		
•	1974 Develop Global Positioning System (XMGPS) receiver jammer.	
•	2904 Continue development of XMDEWS Advanced Land Combat System.	
•	2354 Initiate development of XM70A threat system.	
•	2877 Continue development of regimental elements of XMC3S for the Battle Management Network	
•	2454 Develop Preplanned Product Improvements for the XM15S Air Defense System.	
•	1117 Continue development of Advanced Distributed Electronic Warfare Simulation (XMADEWS).	
Total	13680	
FY 2001 Planned Program:		
•	2811 Complete development and fielding of XMGPS receiver jammer.	
•	1872 Complete development of XMDEWS Advanced Land Combat System.	
•	1317 Continue development and fielding of XM70A threat system.	
•	1572 Continue development of regimental elements of XMC3S for the Battle Management Network.	
•	3691 Initiate development of threat helicopter program.	
•	2528 Initiate development of XMAPS threat system.	
Total	13791	
<p>THREAT SIMULATOR Test Programs Supported: Aircraft (MH-47E) Follow On Operational Test II, MH-60K Aircraft, Aircraft (MH-60K) Follow On Operational Test II, RAH-66 Comanche EUTE, RAH-66 Comanche FDTE I, Suite of Integrated Radio Countermeasures (SIRFCM), Suite of Integrated Radio Countermeasures (SIIRCM), Unmanned Aerial Vehicle (UAV) - Payload, Force XXI Battle Command Brigade and Below, Army Airborne Command and Control, Army TACMS Block II/BAT, Bradley Fighting Vehicle-A3, Crusader FDTE, Extended Range MLRS, FAAD Block III, GPS in Joint Battle Space Environment, Guardrail/Common Sensor System II, Handheld Standoff Mine Field Detection System, IEW Tactical Proficiency Trainer, Joint Close Air Support HT&E, Joint Suppression of Enemy Air Defense (JSEAD), Land Warrior, Long Range Advanced Scout Surveillance System, Navigational Warfare Global Positioning System, OH-58D Kiowa Warrior, Patriot Advanced Capabilities PAC-3 Config-3, UH-60Q, Theater High Altitude Area Defense System.</p>		
Project D976	Page 2 of 3 Pages	Exhibit R-2 (PE 0604256A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256A Threat Simulator Development	PROJECT D976
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	16480	11935	14009	14309
Appropriated Value	17004	12935		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-524	-98		
b. SBIR / STTR	-346			
c. Omnibus or Other Above Threshold Reduction	-114			
d. Below Threshold Reprogramming	-519			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-329	-518
Current Budget Submit (FY 2000/2001 PB)	15501	12837	13680	13791

Change Summary Explanation: Funding – FY 1999 – Congressional add (+1000) for a jamming simulator for the Army Battle Lab.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258A Target Systems Development
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	11149	13038	13397	14423	16213	14756	21754	21645	Continuing	Continuing
D238 Aerial Targets	6307	5557	6465	6949	7373	7088	10196	9584	Continuing	Continuing
D459 Ground Targets	4842	7481	6932	7474	8840	7668	11558	12061	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program funds aerial and ground target hardware and software development, maintenance and upgrade. The overall objective is to allow validation of weapon system accuracy and reliability by developing aerial and ground targets essential for Test and Evaluation (T&E). These targets are economical and expendable, remote controlled or stationary, and often destroyed in use. The Army is the Tri-Service lead under Reliance for providing rotary wing, mobile ground and assigned legacy targets for test and evaluation. The Army executes development of some Service-peculiar target requirements in support of quality assurance, lot acceptance and training; and continues development of Service-peculiar and previously begun target materiel to maintain continuity.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u> PB)	11328	13127	12934	14178
Appropriated Value	11688	13127		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-360	-89		
b. SBIR / STTR	-277			
c. Omnibus or Other Above Threshold Reductions	-92			
d. Below Threshold Reprogramming	+190			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			+463	+245
Current Budget Submit (<u>FY 2000/2001</u> PB)	11149	13038	13397	14423

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258A Target Systems Development	PROJECT D238
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COST (<i>In Thousands</i>)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D238 Aerial Targets	6307	5557	6465	6949	7373	7088	10196	9584	Continuing	Continuing

Mission Description and Justification: Provides for development, acquisition, operation, storage, update, and maintenance of realistic surrogate or acquired threat high-performance, multi-spectral aerial targets that can fully stress the latest air defense and air-to-air weapons. Modern weapons require test, evaluation, and training using threat representative aerial targets to assess their effectiveness on the battlefield. This program encompasses a family of rotary and fixed-wing targets, full-scale, miniature and subscale targets, tactical ballistic targets, ancillary devices, and remote control systems. To stress systems under test, aerial targets must have flight characteristics, signatures, and other performance factors, which emulate the modern threat. This tasking includes long-range planning to determine future target needs and development of coordinated requirement documents; the management of target research, development, test and evaluation process; execution of the validation process to ensure that surrogate targets adequately represent the threat; development and acquisition of surrogate and acquired targets; and continuing maintenance, storage, and development/enhancements/update via engineering services of the developed and acquired threat targets to ensure availability for the Test and Evaluation (T&E) customer. The US Army is the Reliance lead for rotary wing targets and the Tri-Service lead for procurement and enhancement of the MQM-107 Fixed Wing Target.

FY 1998 Accomplishments:

- 2799 Continued development of HOKUM-X Rotary Wing (Canadian Cooperative Program).
 - 951 Continued enhancement of the MQM-107 Target System, including updating of obsolete parts and improved airframe maneuverability.
 - 1007 Completed development of Universal Drone Control System (UDCS).
 - 583 Conducted requirements analysis for redesign of the Target Tracking and Control System (TTCS), to allow use of system beyond year 2000.
 - 853 Continued development, enhancement, maintenance, and storage for all RDT&E aerial targets, towed targets and ancillary devices.
 - 114 Continued development of aerial virtual targets, including models of HOKUM-X and AH-1 variants.
- Total 6307

FY 1999 Planned Program:

- 1255 Complete baseline configuration and initiate update for HOKUM-X Rotary Wing Target (Canadian Cooperative Program) to include developmental integration work of UDCS Drone kits into the first aircraft.
- 1313 Continue enhancement of the MQM-107 Target system, including updating of obsolete parts to maintain producibility and supportability; manage fabrication; and improved airframe maneuverability to meet the aerodynamic performance and payload capability needed by the Army and the other services (Army assigned Tri-Service lead for MQM-107).
- 633 Integrate and install into additional targets the Universal Drone Control System (UDCS) (i.e. AH-1, HOKUM-X).
- 1085 Redesign Target Tracking and Control System (TTCS), with state of the art computer processors, and datalink to replace obsolete system that allows system use beyond year 2000 and continue to support current TTCS to maintain operations until re-designed systems are available.
- 701 Continue development, enhancement, maintenance, and storage for all RDT&E aerial targets, towed targets and ancillary devices.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258A Target Systems Development	PROJECT D238
FY 1999 Planned Program: (continued)		
•	428	Begin development of UAV-S Target.
•	142	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	5557	
FY 2000 Planned Program:		
•	760	Continue enhancement, maintenance, fabrication and storage of HOKUM-X Rotary Wing Target (Canadian Cooperative Program) includes updates for obsolescence, maintenance, and safety to support T&E programs such as Stinger and MEADS.
•	1385	Continue enhancement of the MQM-107 Target system, including updating obsolete parts to maintain producibility and supportability, manage fabrication and improved airframe maneuverability to meet the aerodynamic performance and payload capability needed by the Army, Tri-Service and customers.
•	515	Continue integration of Universal Drone Control System (UDCS) into additional targets and update system for obsolescence, maintenance and safety.
•	1227	Continue redesign and begin testing of redesigned Target Tracking and Control System (TTCS). Continue to support current TTCS to maintain operations until upgraded systems are available.
•	675	Continue development, enhancement, maintenance and storage for all RDT&E aerial targets, towed targets and ancillary devices.
•	515	Continue development of aerial virtual targets, including models of HOKUM-X, and AH-1 variants.
•	1388	Continue development and testing of UAV-S Target.
Total	6465	
FY 2001 Planned Program:		
•	480	Continue enhancement, maintenance, fabrication and storage of HOKUM-X Rotary Wing Target (Canadian Cooperative Program) includes updates for obsolescence, maintenance, and safety to support T&E programs such as Stinger and MEADS.
•	1427	Continue enhancement of the MQM-107 Target system, including updating obsolete parts to maintain producibility and supportability, manage fabrication, and improved airframe maneuverability to meet the aerodynamic performance and payload capability needed by the Army, Tri-Service and customers.
•	536	Continue integration of Universal Drone Control System (UDCS) into additional targets, and update system for obsolescence, maintenance and safety.
•	1472	Complete testing of redesigned Target Tracking and Control System (TTCS) and begin fabrication/installation of TTCS upgrade kits into RDT&E units. Continue to support current TTCS to maintain operations until all TTCSs are upgraded.
•	710	Continue development, enhancement, maintenance, and storage for all RDT&E aerial targets, towed targets and ancillary devices.
•	359	Continue development of aerial virtual targets, including models of Towed targets.
•	1965	Continue development of additional UAV-S variants, and begin fabrication and deployment of UAV-S Targets into the operational fleet in time to support Stinger and MEADS T&E.
Total	6949	
Project D238	<i>Page 3 of 7 Pages</i>	Exhibit R-2A (PE 0604258A)

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
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BUDGET ACTIVITY
6 - Management and Support

PE NUMBER AND TITLE
0604258A Target Systems Development

PROJECT
D238

AERIAL TARGETS Test Programs Supported: Forward Area Air Defense (FAAD) Missile Systems (Stinger, Avenger, Bradley-Stinger), Patriot, Medium Extended Air Defense System (MEADS), Comanche and, under Reliance, Air Force, Navy and defense technology programs which demand accurate threat representation in their aerial targets.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258A Target Systems Development	PROJECT D459
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D459 Ground Targets	4842	7481	6932	7474	8840	7668	11558	12061	Continuing	Continuing

Mission Description and Justification: This program funds Army efforts to support Test and Evaluation (T&E) of advanced weapon systems by developing surrogates and acquiring foreign equipment, and developing virtual target computer models of ground vehicle targets. These computer models are compatible with Distributed Interactive Simulation (DIS) and will be Higher Level Architecture (HLA) compliant. These products are required to adequately stress weapons systems undergoing test and evaluation. This tasking includes long-range planning to determine future target needs and development of coordinated requirement documents; the centralized management of the ground target research, development, test and evaluation process; execution of the validation process; acquisition of foreign equipment; and continuing maintenance, storage, and development/enhancement/update via engineering services of the developed and acquired targets to ensure availability for test and evaluation customers. Project also manages use of current assets and operates centralized spare parts program. The US Army is the Tri-Service lead for providing ground targets for test and evaluation. Increased funding in FY 1999 provided the ground target surrogate vehicles required to support Comanche and BAT testing in the FY00-FY02 timeframe. These up-to-date threat representative ground targets are acquired at a greatly reduced unit cost over buying the authentic foreign vehicles.

FY 1998 Accomplishments:

- 2001 Managed and provided oversight for Primary Operating Centers operation, storage, maintenance, and configuration management of repair of Ground Target assets including acquisition of new material and spare parts.
- 139 Continued validation, accreditation, and certification and configuration controls/studies of ground targets and development/execution of safety and environmental plans.
- 1312 Continued development of virtual ground targets to support T&E. Developed two new virtual target models of a classified target and the BMP3-Surrogate target for use by developers and testers. Continued development and initiated implementation of configuration control plan for virtual targets. These target models will be utilized in Virtual Proving Ground activities and other weapon systems T&E and M&S activities.
- 851 Continued requirements definition of the Next Mobile Ground Target Surrogate.
- 539 Continued development of BMP3-S with building of second prototype at Rock Island Industrial Operations Command facility.
- Total 4842

FY 1999 Planned Program:

- 1934 Manage and provide oversight for Primary Operating Centers operation, storage, maintenance, and configuration management of repair of Ground Targets assets including acquisition of new material and spare parts.
- 1774 Continue development of virtual ground targets to support test and evaluation (ex. SCUD-B, SA8, SA6, and TZM). Implement configuration control and initiate validation efforts. Target models will be utilized in Virtual Proving Ground and other weapon systems T&E and M&S activities.
- 1169 Complete requirements definition of the Next Mobile Ground Target Surrogate.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258A Target Systems Development	
FY 1999 Planned Program: (continued)		
•	2409	Complete testing of BMP3-S and begin fabrication of 10 BMP3-S Ground Target Surrogates, for deployment into the operational fleet, to maintain up-to-date threat representative targets which are required to support Comanche and BAT T&E in the FY00 and FY02 timeframe.
•	195	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	7481	
FY 2000 Planned Program:		
•	1950	Manage and provide oversight for Primary Operating Centers operation, storage, maintenance, and configuration management of repair of Ground Targets assets including acquisition of new material and spare parts.
•	1878	Develop additional virtual ground targets (e.g., BTR-60, Straight Flush, HMMWV, BMP-1) to support test and evaluation. Update current models to add/improve IR characteristics and improve visual representation. Target models will be utilized in Virtual Proving Ground and other weapon systems T&E and M&S activities.
•	1139	Begin prototyping and testing of the Next Mobile Ground Target Surrogate.
•	1965	Complete fabrication and begin deployment into the operational fleet, of the first ten (10) BMP3-S Ground Target Surrogates, and continue fabrication of ten (10) additional BMP3-S Surrogates for deployment into the fleet to maintain up-to-date threat representative targets that are required to support Comanche and BAT T&E in the FY00 and FY02 timeframe.
Total	6932	
FY 2001 Planned Program:		
•	2267	Manage and provide oversight for Primary Operating Centers operation, storage, maintenance, and configuration management of repair of Ground Targets assets including acquisition of new material and spare parts.
•	200	Update Ground Control equipment for Ground targets to overcome obsolescence and to maintain usefulness.
•	2117	Develop additional virtual ground targets (e.g., 2S-3M, BDRM-2, T-80, TEL) to support test and evaluation. Update current models, add/improve IR characteristics and improve visual representation. Target models will be utilized in Virtual Proving Ground and other weapon systems T&E and M&S activities
•	2106	Complete prototyping and testing of the Next Mobile Ground Target Surrogate and begin fabrication of units for deployment into the operational fleet to maintain up-to-date threat representative targets to support T&E testing.
•	784	Complete fabrication and deployment into the operational fleet of BMP3-S and update system configuration to maintain up-to-date threat representative targets that are required to support Comanche and BAT T&E in the FY02 timeframe.
Total	7474	
Project D459	Page 6 of 7 Pages	Exhibit R-2A (PE 0604258A)

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
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BUDGET ACTIVITY
6 - Management and Support

PE NUMBER AND TITLE
0604258A Target Systems Development

PROJECT
D459

GROUND TARGETS Test Programs Supported: Ground Targets efforts are investments which enable Department of Defense (DoD) customers to conduct appropriate developmental and operational testing, evaluation and training in the future. Weapon systems for which these developments are required include: Comanche, Longbow, Close Combat Anti-Armor Weapon System (CCAWS), Wide Area Munitions (WAM), Line-Of-Sight Antitank (LOSAT), Army Tactical Missile System (Army TACMS), Brilliant Anti-Armor Submunition (BAT), Unmanned Aerial Vehicle, (UAV-SR), Short Range Anti-Armor Weapon System (SRAW), Javelin, Sense and Destroy Armor (SADARM).

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	40256	37030	39380	40190	46661	61572	54722	63817	Continuing	Continuing
D983 Major Test & Evaluation - USAKA	3577	4115	7493	4447	4480	7920	5114	6690	Continuing	Continuing
D984 Major Technical Test Instrumentation	32374	30356	27205	29163	33861	39345	39198	44919	Continuing	Continuing
D986 Major User Test Instrumentation	4305	2559	4682	6580	8320	14307	10410	12208	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program funds development and acquisition of major developmental test instrumentation for the U.S. Army Test and Evaluation Command (TECOM) test activities: White Sands Missile Range (WSMR), NM; Yuma Proving Ground, (YPG), AZ; Aberdeen Test Center (ATC), MD; Dugway Proving Ground (DPG), UT; Redstone Technical Test Center (RTTC), AL; and Aviation Technical Test Center (ATTC), AL; and for the US Army Kwajalein Atoll (USAKA), which is managed by the U.S. Army Space and Missile Defense Command. Program also funds development and acquisition of major field instrumentation for U. S. Army Operational Test and Evaluation Command (OPTEC) test organizations. Requirements for instrumentation are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs required for these systems. Army testing facilities are also surveyed to determine major testing capability shortfalls.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	39200	40284	40265	41961
Appropriated Value	40449	37284		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1249	-254		
b. SBIR / STTR	-936			
c. Omnibus or Other Above Threshold Reductions	-308			
d. Below Threshold Reprogramming	+2300			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-885	-1771
Current Budget Submit (FY 2000/2001 PB)	40256	37030	39380	40190

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment				PROJECT D983		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D983 Major Test & Evaluation - USAKA	3577	4115	7493	4447	4480	7920	5114	6690	Continuing	Continuing
<p>Mission Description and Justification: This project funds the purchase of major Improvement and Modernization (I&M) equipment at the US Army Kwajalein Atoll/Kwajalein missile Range (USAKA/KMR) in the Marshall Islands. USAKA/KMR is a national test range supporting Army, Ballistic Missile Defense Organization (BMDO), US Air Force, National Aeronautics and Space Administration (NASA), and other customers. Upgrades to telemetry, optics, command/control and other equipment are required to maintain USAKA as a national test range. FY 2000 increase supports the Kwajalein Missile Range (KMR) Modernization and Remoting (KMAR) project, which is a concurrent, range-wide modernization effort to maximize the use of common, standardized Commercial Off-The-Shelf (COTS) technology to replace obsolete components; implement common hardware/software architectures and automation; and “remote” the operation of range sensors and instrumentation to the island of Kwajalein. This effort will upgrade range capabilities that are critical to the success of upcoming Theater Missile Defense (TMD) and National Missile Defense (NMD) test missions as well as reduce USAKA/KMR annual operating costs by \$17.7M per year. These savings are already reflected in PE 0605301A, Army Kwajalein Atoll.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 3577 KMR Modernization and Remoting (KMAR) – Completed three major design reviews, Radar design completed, material purchases generated for 2 of 5 radars, robust network architecture design completed. Gellinam Island deactivated, Optics computer upgrades completed at 2 sites. <p>Total 3577</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 4006 Continue KMR Modernization and Remoting (KMAR) – Complete purchase of Advanced Research Project Agency (ARPA) Lincoln C-band Observable Radar (ALCOR) and Millimeter Wave (MMW) radar material. Begin installation of ALCOR equipment. Complete remoting of Gagan Island telemetry. Complete optics computer upgrades. • 109 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 4115</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 7493 Continue KMR Modernization and Remoting (KMAR) – Complete ALCOR radar modernization. Complete network upgrades to allow full automation of Kiernan Re-entry Measurement Site radar complex at Roi-Namur as each radar system completes modernization. Complete Telemetry Center to allow for relocation of telemetry receive and recording equipment to Kwajalein Island from Carlos Island. Complete mission planning workstation and simulation capabilities to allow for automated mission planning. <p>Total 7493</p>										
Project D983			Page 2 of 7 Pages				Exhibit R-2A (PE 0604759A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment					PROJECT D984	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D984 Major Technical Test Instrumentation	32374	30356	27205	29163	33861	39345	39198	44919	Continuing	Continuing
<p>Mission Description and Justification: This project develops and acquires major test instrumentation to perform developmental testing of weapon systems at U. S. Army Test and Evaluation Command (TECOM) activities which include: Yuma Proving Ground (YPG), AZ; Aberdeen Test Center (ATC), MD; Dugway Proving Ground (DPG), UT; White Sands Missile Range (WSMR), NM; Redstone Technical Test Center (RTTC), AL; and Aviation Technical Test Center (ATTC), AL. Major instrumentation is defined as having one or more of the following attributes: joint-service requirements, multiple command use, high visibility, large dollar value, produces a new capability or requires intensive management during acquisition. The Test Support Network (TSN) at WSMR will provide complete secure coverage of voice, data and video in a single integrated, transport system. TSN will provide advanced encryption capabilities and remote control of switching capabilities for test configuration and total network data arrangement control. The Land Combat Instrumentation (LCI) provides for upgrade and expansion for ATC's suite of instrumentation required for performance testing of combat and tactical vehicles, advanced armor, and advanced munitions. The Fiber Optic Network (FON) provides ATC instrumented test areas with high-speed communication links to other test and central data processing/evaluation facilities. The Frequency Surveillance System (FSS) will provide remote capabilities to daily operations of radio frequency spectrum surveillance at WSMR in support of all Service and non-DoD agency tests. The Dynamic Infrared Scene Projector (DIRSP) will conduct performance testing of night vision sensors and Infrared (IR) imaging seekers at RTTC, and will provide the capability to fully simulate and synthesize present and future battlefields with a mix of real and simulated objects. The Hardened Subminiature Telemetry and Sensor System (HSTSS) is developing, miniaturizing, and hardening an instrumentation/telemetry package at YPG that will provide continuous direct measurement of internal functioning and flight data for cannon-launched munitions, smart submunitions, and small missiles/rockets. The Range Digital Transmission System (RDTS) will improve test operations and will reduce test costs allowing for efficient data collection and remote operations at YPG. The Mobile Infrared Scene Projector (MIRSP) project will conduct performance testing of infrared IMAGING and FLIR sensors while installed on the weapon system under test at ATTC.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1375 Completed installation of fiber optic data link for FON at ATC. Also completed securing of the FON. • 12405 Completed installation and acceptance testing for the first subnet of the WSMR TSN and initiated the system integration and testing (software qualification) which will support the Initial Operating Capability (IOC) of the WSMR TSN. Completed installation of Phase I of the Eastern Fiber Optic Network backbone. • 2172 Continued installation of Automotive Communication Network at ATC Churchville test area. Continued LCI range instrumentation and started Direct Fire Imager development. • 10438 Continued installing, integrating, testing and performing site acceptance of FSS network communication equipment located at the control center and three remote sites at WSMR. • 3453 Started fabrication of full up system, started system integration, and subsystem testing for the DIRSP project at RTTC. • 2106 Awarded EMD transmitter Development Contract for HSTSS instrumentation. Released request for proposal for Data Acquisition Chipset (DAC). 										
Project D984			Page 4 of 7 Pages				Exhibit R-2A (PE 0604759A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0604759A Major Test and Evaluation Investment	D984
FY 1998 Accomplishments: (continued)		
•	372 Started MIRSP Phase I tradeoff analysis and design.	
•	53 Completed development of the statement of work and system specification for the RDTS at YPG.	
Total	32374	
FY 1999 Planned Program:		
•	10727 Complete WSMR TSN Phase I to include installation and acceptance testing to support IOC. Install breakout and feeder sites to support WSMR TSN Phase II. Achieve Milestone II decision approval.	
•	1938 Continue installation of Automotive Communication Network at ATC Churchville test area. Complete LCI range instrumentation and Direct Fire Imager.	
•	6020 Install, integrate, test and perform site acceptance of WSMR FSS at the Holloman control center and Higbie and Sacramento Peak remote sites. Purchase, integrate, and test FSS equipment for Ft Bliss, TX and Kirtland AFB, NM remote sites.	
•	3275 Complete DIRSP system integration and testing to meet IOC and field system to RTTC.	
•	5651 Continue development of HSTSS instrumentation for YPG and start acceptance testing of key components.	
•	856 Complete RDTS acquisition strategy; institute Engineering Design Plan to include engineering drawings and site survey report.	
•	1108 Complete MIRSP Phase I preliminary and final designs.	
•	781 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs	
Total	30356	
FY 2000 Planned Program:		
•	15086 Continue WSMR TSN Phase II to include fiber optic service extension and additional network/subnetwork capability.	
•	6181 Continue development and acceptance testing of HSTSS components.	
•	2922 Complete YPG RDTS telecommunications installation plan and the telecommunications systems engineering plan. Award RDTS integration contract. Initiate installation of digital fiber optic cable to support Phase I of RDTS for the YPG West Kofa test ranges.	
•	3016 Complete MIRSP Phase I system fabrication, integration and testing at ATTC.	
Total	27205	
FY 2001 Planned Program:		
•	18888 Complete WSMR TSN Phase II system integration. Initiate Phase III to include extension of fiber optic service to additional WSMR test sites.	
•	3168 Complete HSTSS development and achieve Milestone III decision for HSTSS production.	
•	5772 Continue installation of digital fiber optic cable to support YPG RDTS Phase I.	
Project D984		
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BUDGET ACTIVITY
6 - Management and Support

PE NUMBER AND TITLE
0604759A Major Test and Evaluation Investment

- 1335 Complete verification, validation, accreditation and fielding to ATTC of MIRSP Phase I (prototype). Initiate development of MIRSP Phase II, (the fullup system).
- Total 29163

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment					PROJECT D986		
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D986	Major User Test Instrumentation	4305	2559	4682	6580	8320	14307	10410	12208	Continuing	Continuing
<p>Mission Description and Justification: This project finances the development of major field instrumentation for Operational Testing (OT), Force Development Testing and Experimentation (FDTE), and Army Warfighting Experiments (AWE) for the U.S Army Operational Test and Evaluation Command (OPTEC) which includes test directorates at Fort Hood, TX, Fort Bragg, NC, Fort Sill, OK, Fort Bliss, TX and Fort Huachucha, AZ. Each initiative set forth in this program is directly tied to tactical systems that support each of the five Army Modernization Objectives: Project and Sustain; Protect The Force; Win Information War; Conduct Precision Strikes; and Dominate The Maneuver Battle. Cornerstone of this effort is the Mobile Automated Instrumentation Suite (MAIS) which provides users a high fidelity, realistic, real-time capability to measure the performance of hardware and personnel under tactical conditions for large-scale operations (up to 1830 players). The MAIS will instrument combat systems in the operational forces to provide encrypted Real Time Casualty Assessment (RTCA) and Time, Space, and Positioning Information (TSPI) data. The MAIS system and its data are the tools that will enable objective assessments for new materiel acquisition, force structuring, doctrine and tactics modification, and, through the High Level Architecture (HLA)/Distributed Interactive Simulation (DIS) Protocol Data Unit (PDU) format, provide data to validate the future DoD warfighting models and simulations, bridge the test analysis centers, and link multi-Service test and training exercises. The MAIS, an ACAT III program, was approved for Milestone III in February 1998. Current program (one control center and 131 player units) achieved Initial Operational Capability (IOC) in December 1997. One additional control center and 469 player units are programmed in Other Procurement, Army. A MAIS Pre-Planned Product Improvement (P3I) program was initiated in FY 98 to provide MAIS interfaces with new and existing weapons systems such as the Longbow Apache helicopter, Comanche, Crusader, Bradley Stinger, Javelin/Surrogate Weapon Interface, Precision Guided Mortar Munition, and the Objective Individual Combat Weapon. MAIS P3I provides insertion of enhancements to the RTCA algorithms; simulation of Opposing Force (OPFOR) weapon systems and player units for newly acquired weapon systems; and development of player units for new weapon systems. These core system enhancements are required as part of the basic program enabling the operational test community to effectively emulate current and future battlefield weapons in a high fidelity environment. Weapon system unique MAIS components are funded by the weapon system program. The P3I program will develop and integrate additional weapon system interfaces and capabilities to improve the fidelity and robustness of the MAIS system.</p> <p>FY 1998 Planned Program:</p> <ul style="list-style-type: none"> • 3755 Completed system Developmental and Operational Testing for MAIS and achieved Milestone III. Continued MAIS product refurbishment to eliminate component obsolescence for production. Designed, developed, and implemented the MAIS P3I program, specifically Dismounted Troop miniaturization and the Digital M1A2 and M2A3 system interfaces, critical to conducting realistic weapon system operational testing and force development testing. • 550 Completed the Mobile Integrated Non-Intrusive Command, Control and Communications Instrumentation (MINI C3I) which provides audio, video, and digital information required for credible testing of C3I systems. <p>Total 4305</p>											
Project D986			Page 6 of 7 Pages				Exhibit R-2A (PE 0604759A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment	
		PROJECT D986
FY 1999 Planned Program:		
<ul style="list-style-type: none"> • 2512 	Complete the Dismounted Troop miniaturization design, development and testing in preparation for production. Design, develop and prepare for the Production of the MAIS Weapons Performance Module (WPM) which miniaturizes the remaining MAIS functionality and secures cost savings resulting from decreased production and life-cycle support costs. Initiate development of a reconfigurable interface/controller that allows MAIS to use the training community's surrogate weapons. Complete the design, development, and implementation of a MAIS-MILES interoperability capability.	
<ul style="list-style-type: none"> • 47 	Small Business Innovation Research/Small Business Technical Transfer (SBIR/STTR) Research.	
Total	2559	
FY 2000 Planned Program:		
<ul style="list-style-type: none"> • 4682 	Continue to execute the MAIS P3I program, specifically to initiate the development of core system algorithms and interfaces for existing and emerging weapon systems. Initiate the development of Chemical Detection Alarms, Weapon System Software Upgrades, After Action Review capability, and a Test Officer's Training Station. Implement Weapon System Software Compatibility Upgrades and an Automated Indirect Fire Execution capability. Complete development of the MAIS reconfigurable interface/controller.	
Total	4682	
FY 2001 Planned Program:		
<ul style="list-style-type: none"> • 6580 	Continue MAIS P3I core weapon system interface development for the existing and emerging weapon systems. Complete development of Chemical Detection Alarm, After Action Review, and Test Officer's Training Station. Continue development of the Weapon System Software Compatibility Upgrade. Initiate design and development of the MAIS P3I Wearable Computer.	
Total	6580	
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605103A Rand Arroyo Center	PROJECT D732
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COST (<i>In Thousands</i>)	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
D732 Arroyo Center Support	15983	16685	17656	17995	18340	18747	19786	20188	Continuing	Continuing

A. Mission Description and Budget Item Justification This program funds the RAND Arroyo Center, the Department of the Army's Federally Funded Research and Development Center (FFRDC) for studies and analysis, which has operated at RAND since FY 1985. The Arroyo Center draws its researchers from RAND's staff of approximately 600 professionals trained in a broad range of disciplines. About 90 percent of RAND's staff are located at the corporate headquarters in Santa Monica, California; the remainder is based at RAND's Washington D.C. office. The RAND Arroyo Center provides for continuing analytical research across a broad spectrum of issues and concerns, which are grouped in four major research areas: Strategy, Doctrine, and Resources; Military Logistics; Manpower and Training; and Force Development and Technology. The RAND Arroyo Center research agenda is primarily focused on mid/long-term concerns. Results and analytical findings directly impact senior leadership deliberations on major issues. Arroyo Center research is sponsored by the Chief of Staff, Vice Chief, and Assistant Vice Chief of the Army; the Deputy Chiefs of Staff of the Army; the Assistant Army Secretaries; and most of the Army's major commands. The Arroyo Center is provided guidance from the Army through the Arroyo Center Policy Committee (ACPC), which is co-chaired by the Vice Chief of Staff of the Army and the Assistant Secretary of the Army (Research, Development, and Acquisition). The ACPC reviews, monitors, and approves the annual Arroyo Center research plan as well as all individual research projects. Each project requires General Officer (or SES equivalent) sponsorship and involvement on a continuing basis. RAND Arroyo provides the Army with a unique multidisciplinary capability for independent analysis. Although the Arroyo Center staff work with analysts in the Army's internal study program, the Arroyo Center is an independent organization that provides analysis for both the Army and the broader national security community. Work in this program element is consistent with the resource constrained Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and Project Reliance.

FY 1998 Accomplishments:

- 1405 Research addressing the Army in national strategy, including identifying unique and significant Army contributions to the execution of future national military strategy; identifying the strength of the case for a stronger land-force emphasis in future U.S. engagement operations; conducting a parametric assessment of how costs affect Army expandability issues; and understanding the processes by which states translate sustained economic growth into military power.
- 1012 Research addressing improving the Army PPBE System, including developing and extending strategies for streamlining the processes; extending assumption-based planning; developing strategic concepts and planning processes to revitalize long-range strategic planning; developing new analytic tools to support the development of strategic resource alternatives; assessing the appropriateness of the current programming structure used by DoD; and providing and integrating operational and institutional guidance for the programming phase of Army PPBS.
- 3147 Research addressing Force XXI and Army After Next, including assisting the senior Army leadership in informing and influencing thinking in the broader defense community on operational concepts and technological applications for future forces; assisting in the design of the AAN winter and summer wargames; examining potential tactical and technological counters to the rapid force projection initiative system-of-systems concept; providing assistance in developing Army guidance leading to an improved level of joint and NATO interoperability; and developing concepts to explore U.S. military capabilities to conduct joint operations other than war (OOTW) and wartime operations on urban terrain.

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605103A Rand Arroyo Center	PROJECT D732
FY 1998 Accomplishments: (continued)		
• 1326	Research addressing the Army and its Title X responsibilities, including identifying near-term resourcing and management actions to sustain recruiting and reduce the force, and conducting a meta-analysis of existing and developing visions and strategic plans for logistics in 2005-2015 and beyond.	
• 3822	Research addressing shaping and staffing the force, including designing and testing new systems of training CSS command and control, focusing on improved use of simulations and exercises; enhancing training of heavy combat units by developing more effective ways to use simulations; developing an objective, longitudinal system as a tool for assessing proficiency on collection and individual tasks performed at CTCs; strengthening and modernizing the system for developing and educating NCOs; testing and evaluating alternative ROTC staff programs; and maintaining training effectiveness and readiness of Army units in the face of varying levels of OPTEMPO and PERSTEMPO.	
• 1563	Research addressing exploration of future force and technology alternatives, including maintaining science and technology capability necessary to meet AAN mission needs in period of reducing R&D funding; identify opportunities for exploiting information technologies by Army forces and reducing vulnerabilities to an adversary's use of information warfare; investigating current staff responsibilities for the management of the C2 Protect program; and improving the Army's ability to model, simulate, and analyze issues regarding the knowledge-based Army.	
• 3708	Research addressing reshaping support functions and infrastructure, including adjustments to the Army's price and credit policies to support logistics initiatives; identifying types of savings that can be accrued from implementing improvements; improving the quality and usability of financial information needed for logistics decision making; improving the Army's CONUS and OCONUS order and ship processes; sizing and configuring stocks at all echelons to meet operational requirements responsively with lowest dollar investment; developing and implementing specific process improvements to sustain continuous process improvement; and increasing effectiveness and efficiency of logistics deployment capabilities.	
Total	15983	
FY 1999 Planned Program:		
• 5434	Research addressing the national security debate, including assisting senior Army leadership in informing and influencing defense community thinking on operational concepts and technological applications for future forces; helping the leadership evaluate how to best develop and demonstrate capabilities to support domestic authorities in peace and war; evaluating the effects of continuing deployments on the ability to maintain wartime readiness requirements; assisting Army leadership to prepare for high-level strategy, force structure, and resource reviews; applying a new methodology for measuring state power in the post-industrial age; examining how the Asian economic crisis will affect the security environment; developing and analyzing strategic resource alternatives for the Army Strategic Resource Planning Process (ASRPP); evaluating the effects of continuing deployments on ability to maintain wartime readiness requirements; informing Army thinking on multinational force compatibility; explore U.S. military capabilities to conduct operations in urban environments; assisting the Army in evaluating candidate AAN capabilities and operational concepts through system-of-system/force-on-force analysis; helping determine how the Crusader might best integrate into the Army's vision of the future; improving joint interoperability by evaluating prioritization approaches for coupling Army's C4I operational and system architectures in a constrained resource environment; improving analytical tools to support the next Quadrennial Defense Review QDR; assessing how science and technology should be conducted to meet AAN mission objectives; and analyzing the benefits of improved effectiveness of precision munitions and the impact of modern weapon systems on war planning in terms of in-theater logistics footprint and deployability and logistics force structure.	
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605103A Rand Arroyo Center	PROJECT D732
FY 1999 Planned Program: (continued)		
• 1263	Research addressing the Army's preparation for the upcoming transitions of top U.S. and Army leadership, including analyzing visions and strategic plans for logistics in 2005-2015 and beyond; assisting the Army in developing alternative long-term modernization plans; assisting efforts to improve and institutionalize the Army Strategic Planning Process; and providing analyses that will assist with the development, operation, and interpretation of major AAN wargames to help understand information generated during AAN gaming and turn it into usable information for the Army leadership.	
• 4577	Research addressing shaping and staffing the force, including assessing long-term changes in personnel requirements and their implication for future personnel structure and resources; testing and evaluating alternative ROTC staffing programs that could reduce demands for active personnel; evaluating costs and effects of alternative peacetime training strategies for National Guard enhanced brigades; identifying and analyzing personnel policy issues that will arise as the Army implements distance learning throughout the active and reserve component training system; developing an objective, longitudinal system to provide a tool for assessing proficiency on collective and individual tasks performed at combat training centers; and determining the extent and sources of personnel turbulence and characterizing the effects on operational experience levels of current and future Army leaders.	
• 4362	Research addressing reshaping support functions by helping the Army to dramatically improve its order and ship processes; improving the size and configuration of inventories at all echelons to responsively meet operational requirements while reducing the dollar investment in inventory and associated operating costs; improving the quality and usability of financial information needed for logistics decision making and evaluating alternatives to reduce the burden of financial management; recommending adjustments to Army's price and credit policies; and achieving better performance in the critical logistics processes by identifying and correcting the sources of poor quality to reduce the wastage incurred by multiple orders, serviceable returns, etc.	
• 1049	Research addressing technology alternatives, including identifying acquisition reform initiatives that can be implemented to improve the Army's acquisition system; and evaluating how the Army can leverage the experiences of commercial firms to improve operational and acquisition efficiencies.	
Total	16685	
FY 2000 Planned Program:		
• 5826	Research addressing the national security debate.	
• 5297	Research addressing shaping and staffing the force.	
• 1766	Research addressing exploring technology alternatives.	
• 4767	Research addressing reshaping support functions and infrastructure.	
Total	17656	
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605103A Rand Arroyo Center	PROJECT D732
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FY 2001 Planned Program:

- 6298 Research addressing the national security debate.
 - 5219 Research addressing shaping and staffing the force.
 - 1080 Research addressing exploring technology alternatives.
 - 5398 Research addressing reshaping support functions and infrastructure.
- Total 17995

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	16534	16718	16868	17017
Appropriated Value	17576	16718		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1042	-33		
b. SBIR / STTR	-414			
c. Omnibus or Other Above Threshold Reductions	-137			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+788	+978
Current Budget Submit (FY 2000 / 2001 PB)	15983	16685	17656	17995

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605301A Army Kwajalein Atoll				PROJECT D614		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D614 US Army Kwajalein Atoll	117096	133027	140344	140958	121470	124197	135778	139768	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: U.S. Army Kwajalein Atoll/Kwajalein Missile Range (USAKA/KMR) is a remote (located in the Republic of the Marshall Islands), secure activity of the Major Range and Test Facility Base as constituted by DoD Directive 3200.11. Its function is to support test and evaluation of major Army and DoD missile systems, Army Space surveillance and object identification, and National Aeronautics and Space Administration (NASA) scientific and space programs. Programs supported include Army missile defense, Ballistic Missile Defense Organization (BMDO) demonstration/validation tests, Air Force Intercontinental Ballistic Missile (ICBM) development and operational tests, U.S. Space Surveillance Network, and NASA Space Transportation System (Shuttle) and orbital debris experiments. USAKA/KMR supports the Missile Defense Act of 1991 to put in place a Ground Based Defense System by 2006 or earliest date possible. The technical element of USAKA/KMR is the Kwajalein Missile Range which consists of a number of sophisticated, one-of-a-kind, radar, optical, telemetry, command/control/communications, and data reduction systems. These systems include the four unique radars of the Kiernan Reentry Measurement Site (KREMS); super Recording Automatic Digital Optical Tracker (RADOT) long range video-metric tracking systems, high density data recorders for high data-rate telemetry, and underwater acoustic impact location system data analysis and reduction hardware and software. USAKA/KMR is contractor operated and is therefore totally dependent upon its associated support contractors. Program also provides funds for the contractors to accomplish installation operation and maintenance (O&M). Funding levels programmed for FY 2000 and FY 2001 are required to maintain minimal O&M support, while accepting moderate risk of continued degradation of USAKA/KMR infrastructure (housing, offices, facilities), higher future repair costs, and reduced logistical support capability, as well as continuation of the KMR Modernization and Remoting (KMAR) Program. The KMAR program is a concurrent, range-wide modernization effort to maximize the use of common, standardized Commercial Off-The-Shelf (COTS) technology to replace obsolete components; implement common hardware/software architectures and automation; and "remote" the operation of range sensors and instrumentation to the island of Kwajalein. This effort will upgrade range capabilities that are critical to the success of upcoming Theater Missile Defense (TMD) and National Missile Defense (NMD) test missions as well as reduce USAKA/KMR annual operating costs by \$18M per year beginning in FY 2003 as reflected in FY 2003-2005 funding levels above. Due to congressional reductions in FY 1998 and FY 1999 and shortfalls in outside investment in FY 1998, KMAR has been restructured to focus on automating and remoting the KREMS radars to Kwajalein. The savings of \$18M already reflected in funding shown for FY 2002 will need to be restored due to the delay in completion of the radar automation. The Army, Air Force, Navy and BMDO have programs planned, which have significant test and data gathering requirements at USAKA/KMR. Air Force programs require firing at full range with complete data collection during late mid course and terminal trajectory. BMDO programs require range sensors to collect technical data in support of National Missile and Theater Missile Defense programs being conducted at USAKA/KMR. These test data cannot be obtained except through the use of technical facilities available on and in the vicinity of USAKA/KMR. Data collection on objects in space remains significant because the Defense Advanced Research Project Agency (DARPA) Long-Range Tracking and Instrumentation Radar (ALTAIR), located at USAKA/KMR, is one of only three sensors world-wide that has deep-space tracking capability. Programs supported include Air Force programs Peacekeeper, Minuteman III, and Delta; Army/BMDO's Strategic Target System (STARS), Multi-Service Launch System (MSLS), Midcourse Space Experiment (MSX), Missile Defense Critical Measurements Program, Theater High Altitude Air Defense (THAAD), Patriot, and ground-based radar; NASA's Space</p>										
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605301A Army Kwajalein Atoll	PROJECT D614
<p>Transportation System (STS), Orbital Debris Measurement Program, Small Expendable Deployer System and Orbital Debris Radar Calibration Spheres, along with the Air Force Space and Missile Center's associated programs.</p>		
<p>FY 1998 Accomplishments:</p>		
<ul style="list-style-type: none"> • 6560 Provided management support (salaries, training, travel, SMDC matrix support, etc.). • 2395 Accomplished maintenance and repair projects. • 16180 Procured POL and MILSTRIP. • 2308 Procured other mission operating supplies, equipment, and services. • 6422 Provided air and sea transportation (cargo to and from continental United States). • 32101 Continued to support Army, BMDO, NASA, and Air Force developmental and operational missile testing. Continued integration of range technical support contract effort. Completed design phase of KMR Modernization and Remoting (KMAR) program and begin fabrication and software coding. • 51130 Provided logistical support to self contained islands of USAKA. <p>Total 117096</p>		
<p>FY 1999 Planned Program:</p>		
<ul style="list-style-type: none"> • 8082 Provide management support (salaries, training, travel, SMDC matrix, etc.). • 500 Accomplish maintenance and repair projects. • 14626 Procure POL and MILSTRIP. • 2889 Procure other mission operating supplies, equipment, and services. • 6103 Provide air and sea transportation (cargo to and from continental United States). • 35212 Continue to support Army, BMDO, NASA, and Air Force developmental and operational missile testing. Continue integration of range technical support contract effort. Continue support to KMAR program). • 60481 Provide logistical support to self contained islands of USAKA. • 5134 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 133027</p>		
<p>FY 2000 Planned Program:</p>		
<ul style="list-style-type: none"> • 8252 Provide management support (salaries, training, travel, SMDC matrix, etc). • 1583 Accomplish maintenance and repair projects. 		
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605301A Army Kwajalein Atoll	PROJECT D614
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- 14933 Procure POL and MILSTRIP.
- 2950 Procure other mission operating supplies, equipment, and services.

FY 2000 Planned Program: (continued)

- 6231 Provide air and sea transportation (cargo to and from continental United States).
 - 37951 Continue to support Army, BMDO, NASA and Air Force development and operational missile testing. Continue integration of range technical support contract effort. Continue support to KMR Modernization and Remoting (KMAR).
 - 68444 Provide logistical support to self contained islands of USAKA.
- Total 140344

FY 2001 Planned Program:

- 8425 Provide management support (salaries, training, travel, SMDC matrix, etc.).
 - 2317 Accomplish maintenance repair projects.
 - 15247 Procure POL and MILSTRIP.
 - 3012 Procure other mission operating supplies, equipment, and services.
 - 6362 Provide air and sea transportation (cargo to and from continental United States).
 - 37726 Continue to support Army, BMDO, NASA and Air Force development and operational missile testing. Continue integration of range technical support contract effort. Continue support to KMR Modernization and Remoting (KMAR).
 - 67869 Provide logistical support to self contained islands of USAKA.
- Total 140958

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	120918	142710	142509	133693
Appropriated Value	124769	134710		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-3851	-1683		
b. SBIR / STTR	-2874			
c. Omnibus or Other Above Threshold Reduction	-948			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-2165	7265
Current Budget Submit (FY 2000/2001 PB)	117096	133027	140344	140958

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605326A Concept Experimentation Program
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	0	13948	16990	73006	92647	60815	67787	54758	Continuing	Continuing
D308 Concept Experimentation Program	0	10471	16990	73006	92647	60815	67787	54758	Continuing	Continuing
D309 Digital Information Technology Testbed	0	3477	0	0	0	0	0	0	0	3477

A. Mission Description and Budget Item Justification: The Concept Experimentation Program (project 308) enables the U.S. Army Training and Doctrine Command (TRADOC) battle labs and schools to evaluate emerging technologies and other equipment to help define Army mission needs and operational requirements. Projects selected for funding are relatively low cost conceptual evaluations, with high potential for warfighting return on investment. The program provides direct support to Battle Lab Warfighting Experiments (BLWE). The program is also a first look at emerging technologies that have the potential to support the Army's Force XXI design needs. The Digital Information Technology Testbed (project 309), a Congressional special interest project, is a functional test bed and model for the DOD and Federal Government to test and integrate new digital technologies for collecting, disseminating and managing information globally. It is also operational multimedia records (management and archives) that enable DOD to meet its Title 10 responsibilities under the Goldwater-Nichols Act through collecting, managing and disseminating information worldwide to achieve knowledge dominance.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	0	17441	17580	17697
Appropriated Value		14041		
Adjustments to Appropriated Value				
a. Congressional General Reductions		-93		
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-590	+55309
Current Budget Submit (FY 2000 / 2001 BES/PB)	0	13948	16990	73006

Change Summary Explanation: Funding – FY 1999 Congressional adjustments included a reduction to project 308 (-6900) for undefined experiments and a Congressional add for project 309 (+3500).
 FY 2001 – Additional funding provided by DOD for Force XXI/AWEs to enhance Army's readiness posture.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605326A Concept Experimentation Program				PROJECT D308		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D308 Concept Experimentation Program	0	10471	16990	73006	92647	60815	67787	54758	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: The Concept Experimentation Program (CEP) is a key innovative tool which provides TRADOC battle labs and schools the ability to capitalize on emerging technologies, emerging warfighting concepts, and new materiel initiatives. Program growth reflects increased emphasis on Force XXI initiatives and accelerated acquisition methods. Funds are used to acquire, lease or fabricate equipment to conduct experiments to determine military utility or potential to satisfy Army Doctrine, Training, Leader Development, Organization, Materiel and Soldiers (DTLOMS) needs. TRADOC battle labs build on initiatives with greatest potential payoff. Program is also used as a first look at emerging technologies and emerging warfighting concepts that have the potential to support the Army's Force XXI design needs. As the Army moves toward Force XXI, the critical task of designing the force around information requires major investment in information-age capabilities. Constructive, virtual, and live simulations are used to examine warfighting concepts across DTLOMS domains. They cover all aspects of command and control, lethality, survivability, and tempo and are essential to technology insertion in future Army systems and force structure. Beginning in FY1999 funding was restructured from PE 0605712, Project D985.</p> <p>FY 1998 Accomplishments: Program funded in PE 0605712A</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 132 Warfighter Information Network (WIN) Space Based Tactical Data Collection and Reporting • 491 Beyond Line of Sight Communication Support for Aviation and Maneuver Support • 225 Semi-Autonomous Reconnaissance Operations II for Mounted Maneuver • 437 Weather/Terrain Assessment Tool • 200 Rotorcraft Pilots Associate Integration into Army After Next Platforms • 350 Designing the Army After Next Battalion Field Artillery Tactical Operations Center • 136 Own the Night Technologies • 129 Dismounted Real Time Tactical Video Link • 235 Space Technology to Enhance Information Dominance on the Move • 97 Helmet Mounted Sniper Detection System • 56 Configured Load Unit Building • 178 Battle Command Vehicle (BCV) • 7277 Force XXI Experimentation / Advanced Warfighting Experiments per the Army Experimentation Campaign Plan (AECPP). • 250 Army Experiment 6 • 278 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 10471</p>										
Project D308			Page 2 of 4 Pages				Exhibit R-2A (PE 0605326A)			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605326A Concept Experimentation Program	PROJECT D308
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FY 2000 Planned Program:

- 10044 Concept experimentation to be determined by Sep 99 CEP Schedule and Review Committee.
 - 6946 Force XXI Experimentation / Advanced Warfighting Experiments per the Army Experimentation Campaign Plan (AECF).
- Total 16990

FY 2001 Planned Program:

- 9881 Concept experimentation to be determined by Sep 00 CEP Schedule and Review Committee.
 - 63125 Force XXI Experimentation / Advanced Warfighting Experiments per the Army Experimentation Campaign Plan (AECF).
- Total 73006

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605326A Concept Experimentation Program	PROJECT D309
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D309 Digital Information Technology Testbed	0	3477	0	0	0	0	0	0	0	3477

Mission Description and Justification: The DoD Information Technology Testbed (DITT) prototype is a functional test bed and system to conduct concept exploration, operational prototyping and full requirements definition for multimedia research libraries (multimedia national and tactical imagery) in support of technology-assisted learning, intelligence analysis, C2, and decision-making in both an institutional and battlefield setting. It will establish the pilot test bed and core capabilities for the DITT, and the Joint and Army Virtual Research Library. The DITT prototype will be fielded at Ft. Leavenworth, KS. The contractor shall identify and register each system level component of the DITT in the DITT System Database, design the DITT System to interface with various networks for data ingest and user interface, design the Systems Administration Function, and ensure system and data security using best commercial practices. This project is a Congressional add, and is fully funded by the FY 1999 program.

FY 1998 Accomplishments: Project not funded in FY 1998

FY 1999 Planned Program:

- 190 Multimedia Research Library System – System Test
 - 225 Multimedia Research Library System – Video Prototype
 - 3062 Multimedia Research Library System – Baseline Operational System
- Total 3477

FY 2000 Planned Program: Project not funded in FY 2000

FY 2001 Planned Program: Project not funded in FY 2001

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities
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<i>COST (In Thousands)</i>	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	114970	118571	137193	134335	132680	135692	154984	176946	Continuing	Continuing
DF30 Army Test Ranges & Facilities	112750	118571	137193	134335	132680	135692	154984	176946	Continuing	Continuing
D699 Non-Major Sys Test Design and Evaluation	2220	0	0	0	0	0	0	0	0	2220

A. Mission Description and Budget Item Justification: This Program Element sustains an objective test capability for developmental testing and integrated developmental/operational testing of DoD materiel, weapons and weapons systems from concept through production within the acquisition cycle at three Major Range and Test Facility Bases: Yuma Proving Ground, AZ (to include management of Army environmental testing); Aberdeen Test Center, Aberdeen Proving Ground, MD; and White Sands Missile Range, NM. This program also sustains an objective developmental test capability at: Aviation Technical Test Center, Fort Rucker AL; Redstone Technical Test Center, Redstone Arsenal, AL; Electronic Proving Ground, Fort Huachuca, AZ; Cold Regions Test Center, Forts Greely and Wainwright, AK; and a capability to provide for integrated test planning plus safety assessment/verification. Developmental test capabilities at each test range have been uniquely established, are in place to support independent test and evaluation (T&E) requirements of funded weapons programs, and are required to assure technical performance, adherence to safety requirements, reliability, logistics supportability, and quality of materiel in development and in production. Program funding includes efforts toward leveraging technologies to include procurement of essential equipment, personnel training and facility modernization to support the warfighter's testing requirements. It also provides for leverage, integration and use of virtual and synthetic test tools/capabilities for reduction of test costs and program acquisition costs. Current testing capabilities are not duplicated within DoD and they represent baseline requirements to assure acceptable risk to the soldier as new technologies emerge into fielded weapons systems. As part of the DoD RELIANCE initiative, the Army (via this program) has committed at the highest senior service levels to be the lead agency for ground vehicles, gun munitions, electric guns, and surface-to-air missiles. This initiative is currently supported by the Services' Vice Chiefs of Staff in their role as the T&E Board of Directors. This program finances indirect test operating costs not billable to test customers, replacement of test equipment and test facility modernization projects to maintain current testing capabilities and improvements to safety, environmental protection, efficiency of test operations, and technological advances. This program does not finance reimbursable costs directly identified to a user of these ranges. These direct costs are borne by materiel developers and project/product managers in accordance with DoD Directive 7000.14R. It also supports integrated Army evaluation for decision makers at milestone reviews, includes the development of test design, evaluation plans, and subsequent independent evaluations at all acquisition milestones to include recommendations for type classification and materiel release of non-major systems. Evaluation results will be incorporated into a single Army evaluation and presented at all acquisition milestones.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u> PB)	118327	119553	119882	121679
Appropriated Value	122117	119553		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-3790	-982		
b. SBIR / STTR	-2967			
c. Omnibus or Other Above Threshold Reductions	-979			
d. Below Threshold Reprogramming	+589			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			17311	12656
Current Budget Submit (<u>FY 2000/2001</u> President's Budget Submission)	114970	118571	137193	134335

Change Summary Explanation: FY00/01 plus-ups of 17311/12656 increase the level of contractor labor supporting known test program/schedule requirements. The increased funding is necessary to keep Army major acquisition programs from being delayed, to keep Army from moving programs into operational testing (OT) before problems are thoroughly identified, and from fielding items that might not work in the hands of soldiers. It also provides funding to offset the most critical and severe test facility deterioration essential to preserve critical test capabilities and assets at Aberdeen Test Center, MD; White Sands Missile Range, NM; Yuma Proving Ground, AZ; Redstone Technical Test Center, AL; and Aviation Technical Test Center, AL.

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities	PROJECT DF30
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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
DF30 Army Test Ranges & Facilities	112750	118571	137193	134335	132680	135692	154984	176946	Continuing	Continuing

A. Mission Description and Justification: Sustains an objective test capability for developmental testing and support to operational testing of DoD materiel, weapons and weapons systems from concept through production within the acquisition cycle at three Major Range and Test Facility Bases: Yuma Proving Ground, AZ (to include management of Army environmental testing); Aberdeen Test Center, Aberdeen Proving Ground, MD; and White Sands Missile Range, NM. This program also sustains an objective developmental test capability at: Aviation Technical Test Center, Fort Rucker AL; Redstone Technical Test Center, Redstone Arsenal, AL; Electronic Proving Ground, Fort Huachuca, AZ; Cold Regions Test Center, Forts Greely and Wainwright, AK; and a capability to provide for integrated test planning plus safety assessment/verification. Developmental test capabilities at each test range have been uniquely established, are in place to support independent test and evaluation (T&E) requirements of funded weapons programs, and are required to assure technical performance, adherence to safety requirements, reliability, logistics supportability, and quality of materiel in development and in production. Program funding includes efforts toward leveraging technologies to include procurement of essential equipment, personnel training and facility modernization to support the warfighter's testing requirements. It also provides for leverage, integration and use of virtual and synthetic test tools/capabilities for reduction of test costs and program acquisition costs. Current testing capabilities are not duplicated within DoD and they represent baseline requirements to assure acceptable risk to the soldier as new technologies emerge into fielded weapons systems. As part of the DoD RELIANCE initiative, the Army (via this program) has committed at the highest senior service levels to be the lead agency for ground vehicles, gun munitions, electric guns, and surface-to-air missiles. This initiative is currently supported by the Services' Vice Chiefs of Staff in their role as the T&E Board of Directors. This program finances indirect test operating costs not billable to test customers, replacement of test equipment and test facility modernization projects to maintain current testing capabilities and improvements to safety, environmental protection, efficiency of test operations, and technological advances. This program does not finance reimbursable costs directly identified to a user of these ranges. These direct costs are borne by materiel developers and project/product managers in accordance with DoD Directive 7000.14R.

FY 1998 Accomplishments:

- 112310 Command-wide test management including test planning, safety assessment/verification and conduct of test operations. Involvement in over 760 Integrated Product Team efforts and issuance of over 350 safety releases and over 100 safety confirmations were conducted on both major and non-major acquisition programs/experiments. No range modernization was affordable. Some of the major systems tested include:

Wide Area Mine (HORNET)	Naval ship structures programs/experiments
Artillery Systems (CRUSADER)	LONGBOW HELLFIRE
COMANCHE Helicopter Subsystems	JAVELIN Block II
Light/Medium Tactical Vehicles (4X4)	Army Tactical Missile System (ATACMS) Block II
Theater Missile Defense (TMD)	Theater High Altitude Area Defense (THAAD)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities	
FY 1998 Accomplishments: (continued)		
	Brilliant Anti-Armor Submunition (BAT) Enhanced Fiber Optic Guided Missile (EFOG) Aircraft Survivability Equipment Airborne Avionics Air Reconnaissance Low M915A2 Line Haul Truck M1 Breacher LAND WARRIOR Heavy Utility Truck	Multiple Launch Rocket System (MLRS) Improved Target Acquisition System/TOW (Tube Lanch'd, Opti. Tracked, Wire Guided) Heavy Assault Bridge Forward Area Air Defense Ground Based Sensor EH-60 QUICKFIX Advanced Field Artillery Tactical Data System (AFATDS) Advanced Tank Armaments Close Combat Tactical Trainer (CCTT) Ground Combat Identification
<ul style="list-style-type: none"> • 440 Total	Airborne Engineering Evaluation Support Activity (AEESA), Fort Monmouth, NJ 112750	
FY 1999 Planned Program:		
<ul style="list-style-type: none"> • 116455 	Command-wide test management including test planning, safety assessment/verification and conduct of test operations. Involvement in significant numbers of Integrated Product Team efforts and issuance of safety releases and safety confirmations will be conducted on both major and non-major acquisition programs/experiments. No range modernization is affordable. Some of the major systems to be tested include: Close Combat Tactical Trainer (CCTT) Naval Ship Structures Programs/Experiments LONGBOW HELLFIRE Light/Medium Tactical Vehicles (4X4) Theater Missile Defense (TMD) Brilliant Anti-Armor Submunition (BAT) Enhanced Fiber Optic Guided Missile (EFOG) Aircraft Survivability Equipment Airborne Avionics JAVELIN Block II Mine Neutralization M1 Breacher LAND WARRIOR High Mobility Multi-Purpose Wheeled Vehicle Prototype Artillery Systems (CRUSADER) COMANCHE Helicopter Subsystems Army Tactical Missile System (ATACMS) Block II Theater High Altitude Area Defense (THAAD) Multiple Launch Rocket System (MLRS) Improved Target Acquisition System/TOW Heavy Assault Bridge Forward Area Air Defense Ground Based Sensor EH-60 QUICKFIX Advanced Field Artillery Tactical Data System (AFATDS) Navy Standard & Rolling Airframe Missiles Secure Mobile Anti-Jam Reliable Tactical – Terminal (SMART-T)	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities	
FY 1999 Planned Program: (continued)		
	Improved Recovery Vehicle	Improved Cargo Helicopter
	10 Ton Recovery Truck	2-1/2 T, 5 T, & High Mobility Multi-Purpose Whl Veh (HMMWV) Ext Svc Life Program
	Multipurpose Individual Munitions	
•	479 Airborne Engineering Evaluation Support Activity (AEESA)	
•	1637 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs	
Total	118571	
FY 2000 Planned Program:		
•	136631 Command-wide test management including test planning, safety assessment/verification and conduct of test operations. Involvement in significant numbers of Integrated Product Team efforts and issuance of safety releases and safety confirmations will be conducted on both major and non-major acquisition programs/experiments. Only limited range modernization is affordable. Some of the major systems to be tested include:	
	FIREFINDER P3I	Naval ship structures programs/experiments
	Artillery Systems (CRUSADER)	LONGBOW HELLFIRE
	COMANCHE Helicopter Subsystems	Multipurpose Individual Munition
	STINGER RMP PIP	Army Tactical Missile System (ATACMS) Block IIA
	Theater Missile Defense (TMD)	Theater High Altitude Area Defense (THAAD)
	Brilliant Anti-Armor Submunition (BAT)	Multiple Launch Rocket System (MLRS)
	Sngl Chan Anti-Jam Man Prtbl (SCAMP) Blk III	Aircrew Integrated Systems
	Mine Neutralization/Detection	GUARDRAIL Common Sensor
	Improved Cargo Helicopter	High Mobility Multi-Purpose Wheeled Veh (HMMWV) Prototype
	SMART-T	Army Joint Standoff Target Attack Radar System (JSTARS)
	Maneuver Control System (MCS)	Advanced Field Artillery Tactical Data System (AFATDS)
	M1 Breacher	Advanced Tank Armaments
	LAND WARRIOR	SENTINEL
•	562 Airborne Engineering Evaluation Support Activity (AEESA)	
Total	137193	
FY 2001 Planned Program:		
•	133784 Command-wide test management including test planning, safety assessment/verification and conduct of test operations. Involvement in significant numbers of Integrated Product Team efforts and issuance of safety releases and safety confirmations will be conducted on both major and non-major acquisition programs/experiments. Only limited range modernization is affordable. Some of the major systems to be tested include:	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities	
PROJECT DF30		
FY 2001 Planned Program: (continued)		
<ul style="list-style-type: none"> • 551 Total 134335 	<ul style="list-style-type: none"> Wide Area Mine (HORNET) Artillery Systems Dem/Val (CRUSADER) COMANCHE Helicopter Subsystems Improved Cargo Helicopter Theater Missile Defense (TMD) Brilliant Anti-Armor Submunition (BAT) STINGER RMP PIP Multipurpose Individual Munition SMART-T Soldier Enhancement Program SCAMP Block II M1 Breacher LAND WARRIOR Aircrew Integrated Systems Airborne Engineering Evaluation Support Activity (AEESA) 	<ul style="list-style-type: none"> Naval ship structures programs/experiments FIREFINDER P3I Maneuver Control System (MCS) Army Tactical Missile System (ATACMS) Block II Theater High Altitude Area Defense (THAAD) Guided Multiple Launch Rocket System (MLRS) Tube Launched, Optically Tracked, Wire Guided (TOW) Missile PIP Mine Neutralization/Detection Forward Area Air Defense Command and Control Objective Individual Combat Weapon Advanced Field Artillery Tactical Data System (AFATDS) Fire Support Team Vehicle Integration Ground Combat Identification
Project DF30	Page 6 of 7 Pages	Exhibit R-2A (PE 0605601A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities	PROJECT D699
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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
D699 Non-Major Sys Test Design and Evaluation	2220	0	0	0	0	0	0	0	0	2220

Mission Description and Justification: Project D699 provides independent evaluations of all Army non-major systems. This project supports integrated Army evaluations for decision makers at milestone reviews, development of test designs, evaluation plans, and subsequent independent evaluations of all acquisition milestones to include recommendations for type classification and materiel release of non-major systems. Evaluation results are incorporated into single Army evaluations and presented at all acquisition milestones. Starting in FY 1999, funding for Project 699 has been restructured to PE 0605716A, Army Evaluation Center, established under US Army Operational Test and Evaluation Command (OPTEC) to perform the Army's consolidated developmental and operational evaluation function

FY 1998 Accomplishments:

- 2220 Funded 35 civilian authorizations required to continue test design and evaluation (TD&E) programs, addressing new developments, production, and materiel changes. TD&E programs included:

– Non-Lethal Ammo Family	Suite of Integrated Radio Frequency Countermeasures
– TRAILBLAZER	Sorbent Decontamination System
– Air Warrior	Mounted Warrior
– Modular Body Armor	Armored Security Vehicle
– Joint Biological Detector	Counter Proliferation Long Range Biological Standoff Detector
– Close Combat Tactical Trainer	Force XXI Battle Command Brigade and Below
– Ground Based Command Sensor - Light	Joint Service Lightweight Integrated Suit Technology
- Total 2220

FY 1999 Planned Program: Program restructured to PE 0605716A

FY 2000 Planned Program: Program restructured to PE 0605716A

FY 2001 Planned Program: Program restructured to PE 0605716A

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation	PROJECT D628
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D628 Test Technology & Sustaining Instrumentation	30518	43638	30470	33332	34925	39537	41734	41913	Continuing	Continuing

A. Mission Description and Budget Item Justification: Test technology provides critical front-end investments for development of new test methodologies, test standards, advanced test technology concepts for long range requirements, future test capabilities, and advanced instrumentation prototypes for US Army Test and Evaluation Command (TECOM), which includes: Yuma Proving Ground (YPG), AZ; Aberdeen Test Center (ATC), MD; Dugway Proving Ground (DPG), UT; White Sands Missile Range (WSMR), NM; Redstone Technical Test Center (RTTC), AL; and Aviation Technical Test Center (ATTC), AL. Within this element, a major initiative called Virtual Proving Ground (VPG) is directed towards integrating Modeling, Simulation, and Internetting technologies into the Test and Evaluation process to support acquisition streamlining and to offset significant downsizing and budget reductions. Sustaining instrumentation maintains existing technical testing capabilities at TECOM test facilities by replacing unreliable, uneconomical and irreparable instrumentation, as well as incremental upgrades of instrumentation and software, to assure adequate test data collection capabilities. This data supports acquisition milestone decisions for projects such as Patriot Advanced Capability Phase 3 (PAC 3), M1A2 Main Battle Tank, Joint Service Lightweight Integrated Suit Technology (JSLIST), Crusader, Theater High Altitude Area Defense (THAAD), Comanche and Javelin. VPG, an innovative Acquisition Streamlining Initiative in testing, will significantly improve the ability of the Army to provide early influence on system design, reduce test costs and time, and extend the envelope of information to reduce risk and reduce acquisition costs. This initiative is critical to achieving long term efficiencies not only within the T&E mission to offset funding and manpower reductions, but also within the acquisition process at large by conforming to the Simulation Based Acquisition Process. Test instrumentation and equipment affected by the Year 2000 (Y2K) phenomena will be compliant to maintain data integrity and test site safety.

FY 1998 Accomplishments:

- 15021 Continued support of TECOM Virtual Proving Ground (VPG):
 - ATC: Continued development of databases, detailed models and system interfaces to support virtual testing of ground vehicle systems. Completed development of the Distributed Simulation Architecture and test procedures needed to link high fidelity system models with synthetic test stimuli and virtual instrumentation to conduct simulation testing of automotive and combat vehicles. Continued funding the cooperative Technology Program Annexes (TPA) with the Army Research Lab (ARL) to develop capabilities and implementation of VPG. Created a High Level Architecture (HLA) Engineering Federation to integrate the ARL reconfigurable fire control model with the ATC terrain model, virtual instrumentation, and automated test procedures.
 - ATTC: Continued development of a totally virtual test range to integrate various system models (such as the Comanche aircraft model), virtual terrain, and threat models to conduct virtual flight visualization testing. Continued development of a physics-based helicopter simulation to conduct test and evaluation of the potential flight hazards associated with integration of new components into the aircraft.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation	PROJECT D628
<p>FY 1998 Accomplishments: (continued)</p> <p>DPG: Continued development of a software model to conduct virtual chemical, biological, and aerosol testing. Accomplished Verification, Validation and Accreditation (VV&A) of the Four-Dimensional Weather System (4DWX) software model. The 4DWX provides the world's leading developmental/operational test support MET capability. The 4DWX performs micro/meso-scale weather analyses and forecasts which provide increased range efficiencies, enhanced range safety, and significantly upgraded project support, i.e., test windows (acceptable weather conditions) and reduced setup/teardown times for instrumentation.</p> <p>RTTC: Continued to acquire the capability to support virtual component/subsystem tests for small missile systems with open loop and closed loop non-destructive testing of imaging IR/MMW Seekers, and all-up-round missiles. Continued development of ground truth databases. Completed development of a Dynamic 3-Dimensional IR Scene Generation System for the Electro-Optical Sensor Flight Evaluation Laboratory (EOSFEL) which will provide the capability to accept 3-D Virtual Range databases. Procured and installed fiber optic interface equipment. Provided support to Project Constellation, a distributed virtual test capability across multiple TECOM test centers (WSMR, EPG, EPG/Ft Lewis, ATTC and RTTC) using standard architectures, networks, and validation/accreditation procedures. Continued acquisition of hardware and software to support development of a small missile Modeling and Simulation (M&S) testbed.</p> <p>WSMR: Continued development of virtual reality mission planning for large missile systems. Continued development of an M&S testbed by acquiring the hardware and software required to conduct virtual large missile testing. Continued development of C4I and Electronic Warfare (EW) simulation testing capabilities that replace expensive airborne jammers with simulators which inject actual threat waveforms into the test items that will significantly reduce test costs, test time, and provide test repeatability. Developed test range and laboratory fiber-optic interconnectivity. Completed development of Distributed Interactive Simulation (DIS) interfaces to link together models used at various test centers. Initiated development of an Airblast Survivability Model for Comanche. Developed an Electromagnetic Model for Breacher (minefield-clearing system on M1 chassis). Completed development of software to merge video, Global Positioning System, radar, and Time/Space/Position/Information (TSPI) data acquisition during actual missile flight-tests to conduct post mission analyses. Continued development of software tools to simulate battlefield electromagnetic characteristics and C4I systems.</p> <p>YPG: Developed a comprehensive virtual tropic database that incorporates digital mapping data, soil characteristics, and terrain characteristics. Continued development of aviation fire control and line of sight models to characterize turreted weapon systems in an Air-to-Air firing environment. Completed development of requirements for integrated air delivery modeling and simulation.</p> <p>HQ TECOM: Continued VPG program coordination and integration.</p> <ul style="list-style-type: none"> • 9877 Continued development, acquisition and sustainment of critical test instrumentation and equipment. <ul style="list-style-type: none"> ATC: Continued development of test site integration which consists of electronically linking test site instrumentation with a control facility to conduct test control, monitoring and real-time data analysis and review. Continued to acquire high-speed analysis and processing equipment. Completed acquisition of range and system safety instrumentation. Continued development of autonomous vehicle control and test range traffic. 		
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<p>FY 1998 Accomplishments: (continued)</p> <p>monitoring systems. Continued development of a combined Developmental Test (DT)/Operational Test (OT) vehicle instrumentation package. Continued development of vehicle endurance/performance test data analyzers</p> <p>ATTC: Acquired Rotary-wing Flight Test Cockpit Indicators. Acquired wireless rotor measurement equipment, data management hardware and software and test analysis workstations to streamline data acquisition and reduction time. Developed software to integrate GPS equipment with a ground control station.</p> <p>DPG: Completed acquisition of agent hood ventilation system filters and chemical/biological laboratory analysis instrumentation for the Combined Chemical Test Facility to sustain the Nuclear, Biological, Chemical (NBC) Defense mission. Completed acquisition of fiber optic network equipment to interconnect the large-scale test grid for outdoor bio-testing.</p> <p>RTTC: Continued development of a flight test capability to produce dynamically accurate missile flights necessary to reduce the number of costly missile test flights. Continued upgrade to the laser tracker hardware and software to provide accurate and reliable TSPI data. Completed acquisition of solid state power amplifiers. Initiated acquisition of electromagnetic radiation equipment used in physical environments testing.</p> <p>WSMR: Continued modification of the Command Destruct system for remote control capability IAW personnel downsizing and safety assurance initiatives. Continued upgrade of a single station laser tracker. Initiated development of an instrumentation platform to remotely collect, analyze, transmit and log C4I message traffic. Upgraded a suite of optical tracking instrumentation with high-resolution video cameras. Continued upgrades to the Drone Formation Control System to control the QF-4 target drone. Modified/replaced test instrumentation and equipment affected by the Year 2000 (Y2K) phenomena to be compliant and maintain data integrity and test site safety.</p> <p>YPG: Acquired mobile, portable, and base station trunked land radio units. Initiated development of a scoring sensor suite for turreted gun systems on rotary wing aircraft (munitions from .50 caliber to 30mm) and a gun pointing vector instrumentation package.</p> <ul style="list-style-type: none"> • 906 Provided quick reaction capability to respond to failed instrumentation and replacement needs. Provided support for technical committees forging future instrumentation technology developments. Maintained/improved existing capability by replacing and upgrading worn out, obsolete or unserviceable equipment/instrumentation (such as the portable data acquisition system) at Army technical test ranges. Developed prototype instrumentation (e.g. a program designed to eliminate the need to use chlorofluorocarbon (CFC) refrigerants) and performed advanced concept studies for development of new technologies. Continued development of Test Operations Procedures (TOPs) and International Test Operations Procedures (ITOPs) to ensure quality and consistency of test results throughout Army and for international cooperative applications. • 4714 HQ TECOM: Provided technical support costs to include salaries and benefits, travel, training and developmental assignments for Directorate for Technical Mission personnel, who manage requirements development, project prioritization, and execution of investment accounts for Small 		
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<p>Business Innovative Research, Production Base Support, Army Test Technology and Sustaining Instrumentation, Major Test and Evaluation Investment, and the Central Test and Evaluation Investment Program. Management and support costs also provided for direct interface with the T&E Executive Agent, managing needs and solutions calls for T&E Reliance oversight, and supporting the Army TERIB co-chair as well as the Army principal on the T&E Board of Operating Directors. Provided administrative support for the Local Area Network and Test and Evaluation Community</p> <p>FY 1998 Accomplishments: (continued) Network (TECNET), contracts, patents, symposia and conferences, exhibits and printing. Continued funding support to the Joint Program Office (JPO) for Test and Evaluation under the tri-service Executive Agent for Test and Evaluation.</p> <p>Total 30518</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 16040 Continue support of TECOM Virtual Proving Ground (VPG): <ul style="list-style-type: none"> ATC: Initiate development of a Modeling & Simulation (M&S) Testbed to integrate High Level Architecture-compliant models and simulations with ground truth data. Continue development of databases, detailed models and system interfaces to support virtual testing of ground vehicle systems. Continue funding the cooperative Technology Program Annexes (TPA) with the Army Research Lab in developing capabilities and implementation of VPG. Initiate development of a bridge simulator to perform bridge durability testing by simulating heavy vehicle crossings using computer models of combat vehicles in a synthetic environment. ATTC: Initiate development of an M&S Testbed to develop and integrate high-fidelity Aviation models and simulations required to conduct virtual testing. Complete development of a virtual test range to integrate various system models (such as the Comanche aircraft model), virtual terrain, and threat models to conduct virtual flight visualization testing. Continue development of a physics-based helicopter simulation, in cooperation with the Comanche program, to conduct test and evaluation of the potential flight hazards associated with integration of new components into the aircraft. DPG: Initiate procurement of hardware and software to develop an M&S Testbed. Develop a smoke/obscurant model in the visible spectrum to predict dispersion characteristics under various live test conditions. Complete development of a software model to conduct virtual chemical, biological, and aerosol testing. 		
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<p>RTTC: Continue acquisition of virtual component/subsystem test capability for small missile systems with open loop and closed loop non-destructive testing of imaging IR/MMW Seekers, and all-up-round missiles. Complete development of small missile ground truth databases. Develop a 3-D smoke and obscurant model in the IR spectrum to generate and inject scenes for the EOSFEL. Continue to provide support to Project Constellation, a distributed virtual test capability across multiple TECOM test centers using standard architectures, networks, and validation/accreditation procedures. Develop an electromagnetic model to measure the susceptibility parameters of various anti-tank and Non-line-of-sight missiles. Continue acquisition of hardware and software to develop a small missile M&S tested.</p> <p>WSMR: Continue development of virtual reality mission planning for large missile systems. Develop an M&S testbed by acquiring the hardware and software required to conduct virtual large missile and C4I testing. Continue development of C4I and EW simulation testing capabilities that replace expensive airborne jammers with simulators that inject actual threat waveforms into the test items which will significantly reduce test costs, test time, and provides test repeatability. Develop test range and laboratory fiber-optic interconnectivity. Continue development of an Airblast Survivability Model for Comanche. Support Project Constellation, a distributed virtual test capability across multiple TECOM test centers using</p> <p>FY 1999 Planned Program: (continued)</p> <p>standard architectures, networks, and validation/accreditation procedures. Acquire software to reconfigure the High Performance Computing (HPC) mainframe computer to servers that will provide real-time control of test resources. Initiate development of terrain and ground truth databases. Complete development of software tools to simulate C4I systems. Complete development of software tools to simulate battlefield electromagnetic characteristics.</p> <p>YPG: Develop a comprehensive virtual desert terrain database that incorporates digital mapping data, soil characteristics, and terrain characteristics. Complete development of aviation fire control and line of sight models to characterize turreted weapon systems in an Air-to-Air firing environment. Develop an enhanced virtual range to support and incorporate multi-weapon test scenarios. Initiate development of an M&S Testbed to integrate the simulations, models and databases. Develop software models to conduct virtual shock and vibration testing of howitzers.</p> <p>HQ TECOM: Continue VPG design and integration.</p> <ul style="list-style-type: none"> • 21034 Continue development, acquisition and sustainment of critical test instrumentation and equipment. <ul style="list-style-type: none"> ATC: Continue development of test site integration which consists of electronically linking test site instrumentation with a control facility to conduct test control, monitoring and real-time data analysis and review. Continue development of autonomous vehicle control and test range traffic monitoring systems. Continue acquisition of high-speed analysis and processing equipment. Continue development of a combined Developmental Test (DT)/Operational Test (OT) vehicle instrumentation package. Continue development of vehicle endurance/performance test data analyzers. ATTC: Acquire inertial measurement units to measure aircraft altitude, angular rates and acceleration rates. Acquire airborne recorders to simultaneously record and reproduce multiple aircraft data channels. 		
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<p>DPG: Acquire gas chromatograph workstations, mini-cams and software to conduct real-time monitoring and detection of chemical agents. RTTC: Complete development of a test capability to produce dynamically accurate missile flights necessary to reduce the number of costly missile test flights. Complete upgrade of the laser tracker hardware and software to provide accurate and reliable Time Space Position Information (TSPI) data. Continue acquisition of electromagnetic radiation equipment used in physical environments testing. WSMR: Complete upgrade of a single station laser tracker. Continue development of an instrumentation platform to remotely collect, analyze, transmit and log C4I message traffic. Continue upgrade of the Drone Formation Control System to control the QF-4 target drone. Initiate acquisition of telemetry, range timing, operations control, data display, communications and video relay equipment and instrumentation to provide a smooth transition of range control from the Range Control Center to the new National Range Control Center. Upgrade a suite of optical tracking instrumentation with high-resolution video cameras. Upgrade the Command Destruct System for remote control capability IAW personnel downsizing and safety assurance initiatives. Procure two spare cables, a spare target trolley, and instrumentation to replace damaged equipment at the Aerial Cable Range. Upgrade core radar and telemetry instrumentation to improve missile tracking accuracy and reliability. Upgrade an existing Small Business Innovative Research project which predicts missile debris dispersion and analyzes the impact to commercial aircraft traversing the range. YPG: Continue acquisition of mobile, portable, and base station trunked land radio units. Develop of a scoring sensor suite for turreted gun systems on rotary wing aircraft (munitions from .50 caliber to 30mm) and a gun pointing vector instrumentation package.</p> <p>FY 1999 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 815 Provide quick reaction capability to respond to failed instrumentation and replacement needs, provide support for technical committees forging future instrumentation technology developments, and maintain/improve existing capability by replacement and limited upgrade of worn out, obsolete or unserviceable equipment/instrumentation at Army technical test ranges. Develop prototype instrumentation and perform advanced concept studies for development of new technologies. Continue to develop Test Operations Procedures (TOPs) and International Test Operations Procedures (ITOPs) to ensure quality and consistency of test results throughout Army and for international cooperative applications. • 4658 HQ TECOM: Provide technical support costs to include salaries and benefits, travel, training and developmental assignments for Directorate for Technical Mission personnel, who manage requirements development, project prioritization, and execution of investment accounts for Small Business Innovative Research, Production Base Support, Army Test Technology and Sustaining Instrumentation, Major Test and Evaluation Investment, and the Central Test and Evaluation Investment Program. Continue to provide management and support costs for direct interface with the T&E Executive Agent, management of needs and solutions calls for T&E Reliance oversight, and support to the Army TERIB co-chair and the Army principal on the T&E Board of Operating Directors. Provide administrative support for the Local Area Network and TECNET, contracts, patents, symposia and conferences, exhibits and printing. Continue funding support to the Joint Program Office (JPO) for Test and Evaluation under the tri-service Executive Agent for Test and Evaluation. • 1091 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 43638</p>		
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation	PROJECT D628
<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> 11924 Continue support of TECOM Virtual Proving Ground (VPG): <ul style="list-style-type: none"> ATC: Continue development of a Modeling & Simulation (M&S) Test Bed to integrate High Level Architecture-compliant models and simulations with ground truth data. Continue development of databases, detailed models and system interfaces to support virtual testing of ground vehicle systems. Continue funding the cooperative Technology Program Annexes (TPA) with the Army Research Lab in developing capabilities and implementation of VPG. Complete development of a bridge simulator to perform bridge durability testing by simulating heavy vehicle crossings in a virtual environment. Continue development of an engineering model to support tri-service development and evaluation of the Joint Modeling and Simulation System (J-MASS). ATTC: Continue development of an M&S Testbed to develop and integrate high-fidelity aviation models and simulations required to conduct virtual testing. Continue development of a physics-based helicopter simulation to conduct test and evaluation of the potential flight hazards associated with integration of new components into the aircraft. Initiate development of a database management system to store, access, aggregate, and manipulate aircraft performance data. <p>FY 2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> DPG: Continue acquisition and integration of hardware and software to develop a M&S Testbed. Initiate development of a database management system to store, access, aggregate, and manipulate chemical/biological performance data. Conduct verification, validation and accreditation of the 4D Weather System at ATC to perform micro/meso-scale weather analyses and forecasts which provide increased range efficiencies, enhanced range safety, and significantly upgraded project support, i.e., test windows (acceptable weather conditions) and reduced setup/teardown times for instrumentation. Initiate development of validated model to replicate a chemical/biological point detection system. RTTC: Continue to acquire the capability to support virtual component/subsystem tests for small missile systems with open loop and closed loop non-destructive testing of imaging IR/MMW Seekers, and all-up-round missiles. Continue to provide support to Project Constellation, a distributed virtual test capability across multiple TECOM test centers using standard architectures, networks, and validation/accreditation procedures. Continue acquisition of hardware and software to develop a small missile M&S testbed. Initiate development of a standardization process to integrate various software components (synthetic environments, databases, data repositories, models, and interfaces) to support virtual testing. Continue development of a 3-D smoke and obscurant model to generate IR scenes for the EOSFEL. 		
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6 - Management and Support

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WSMR: Continue development of virtual reality mission planning for large missile systems. Continue development of C4I and EW testing capabilities to replace expensive airborne jammers with simulators that inject actual threat waveforms into the test items which significantly reduce test costs, test time, and provide test repeatability. Continue development of terrain and ground truth databases. Continue development of software tools to simulate C4I systems. Continue development of an Airblast Survivability Model for Comanche. Initiate development of an architecture to rehost existing C4I legacy test tools to support DT, OT and training exercises.

YPG: Continue development of a M&S Testbed to integrate simulations, models and databases. Initiate development of a test instrumentation suite to merge real-time test data with simulation models and databases.

HQ TECOM: Continue VPG program coordination and integration.

- 12412 Initiate/continue development, acquisition and sustainment of critical test instrumentation and equipment.

ATC: Continue development of test site integration which consists of electronically linking test site instrumentation with a control facility to conduct test control, monitoring and real-time data analysis and review. Continue development of autonomous vehicle control and test range traffic monitoring systems. Continue acquisition of high-speed analysis and processing equipment. Continue development of a combined Developmental Test (DT)/Operational Test (OT) vehicle instrumentation package. Continue development of vehicle endurance/performance test data analyzers. Initiate development of a soldier-system instrumentation suite to measure and record field test data. Initiate development of a laser target scoring system to measure supersonic/subsonic projectiles. Acquire a high-speed digital camera to reduce costly environmental hazardous waste. Initiate development of a gun chamber pressure system. Initiate development of a ballistic measurement system to measure shock levels generated by munitions on combat vehicles. Upgrade the real-time x-ray system to maximize detection of defects in materials, ammunition, and ammunition components.

FY 2000 Planned Program: (continued)

ATTC: Complete acquisition of airborne recorders to simultaneously record and reproduce multiple aircraft data channels. Initiate upgrade of the helicopter icing spray system to ensure spray level characteristics are identical to natural clouds. Initiate acquisition of pre-flight instrumentation checkout equipment.

DPG: Complete acquisition of gas chromatograph workstations, mini-cams and software to conduct real-time monitoring and detection of chemical agents. Acquire aerodynamic particle sizers that are used to measure aerosol clouds that are produced during all field tests of biological agent detectors. Acquire biological aerosol detectors to support chamber and outdoor testing.

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation	PROJECT D628
<p>RTTC: Continue acquisition of electromagnetic radiation equipment used in physical environments testing. Initiate procurement of automated matrix switching devices and programmable conditioning equipment to allow insertion of flight test data into hardware-in-the-loop and six degree-of-freedom simulators. Continue procurement and installation of fiber optic interface equipment. Initiate development of signal conditioning units and transducers to upgrade data acquisition instrumentation. Initiate acquisition of digital data recorders and receivers to receive, record, and display missile flight performance data. Acquire inertia measurement system to measure missile system physical characteristics. Initiate development of a six degree of freedom motion simulator to perform non-destructive testing of small missiles.</p> <p>WSMR: Continue development of an instrumentation platform to remotely collect, analyze, transmit and log C4I message traffic. Continue upgrade of the Drone Formation Control System to control the QF-4 target drone. Continue acquisition of telemetry, range timing, operations control, data display, and video relay equipment and instrumentation to provide a smooth transition of range control from the Range Control Center to the new National Range Control Center. Initiate development of a high speed/high capacity wireless data communication network to support data collection, analysis and reduction of C4I test data. Initiate upgrade of optical tracking platforms to single station laser trackers. Upgrade a suite of optical tracking instrumentation with high-resolution video cameras.</p> <p>YPG: Continue acquisition of mobile, portable, and base station trunked land radio units. Upgrade tracking radar to provide increase data accuracy required for support of smart munitions testing. Initiate acquisition of data recorders, sensors and telemetry equipment to collect aerodynamic and flight dynamic data for airdrop systems. Initiate acquisition of a wireless link to transmit test data from remote sites at Cold Regions Test Center (CRTC). Initiate acquisition of data loggers, radios, modems and sensor test equipment at CRTC.</p> <ul style="list-style-type: none"> • 775 Provide quick reaction capability to respond to failed instrumentation and replacement needs, provide support for technical committees forging future instrumentation technology developments, and maintain/improve existing capability by replacement and limited upgrade of worn out, obsolete or unserviceable equipment/instrumentation at Army technical test ranges. Continue to develop Test Operations Procedures (TOPs) and International Test Operations Procedures (ITOPs) to ensure quality and consistency of test results throughout Army and for international cooperative applications. • 5359 HQ TECOM: Provide technical support costs to include salaries and benefits, travel, training and developmental assignments for Directorate for Technical Mission personnel, who manage requirements development, project prioritization, and execution of investment accounts for Small Business Innovative Research, Production Base Support, Army Test Technology and Sustaining Instrumentation, Major Test and Evaluation Investment, and the Central Test and Evaluation Investment Program. Provide management and support costs for direct interface with the T&E <p>FY 2000 Planned Program: (continued) Executive Agent, management of needs and solutions calls for T&E Reliance oversight, and support to the Army TERIB co-chair and the Army principal on the T&E Board of Operating Directors. Provide administrative support for Local Area Network and TECNET, contracts, patents, Symposia and Conferences, exhibits and printing. Continue funding support to the Joint Program Office (JPO) for Test and Evaluation under the tri-service Executive Agent for Test and Evaluation. Provide oversight to monitor issues and compliance for Y2K.</p>		
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Total	30470	
<p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 11080 Continue support of TECOM Virtual Proving Ground (VPG): <ul style="list-style-type: none"> ATC: Continue development of a Modeling & Simulation (M&S) Test Bed to integrate High Level Architecture-compliant models and simulations with ground truth data. Continue development of databases, detailed models and system interfaces to conduct virtual testing of ground vehicle systems. Continue funding the cooperative Technology Program Annexes (TPA) with the Army Research Lab in developing capabilities and implementation of VPG. Continue development of engineering models to support tri-service development and evaluation of the Joint Modeling and Simulation System (J-MASS). ATTC: Complete development of a M&S Testbed to develop and integrate high-fidelity Aviation models and simulations required to conduct virtual testing. Continue development of a physics-based helicopter simulation to conduct test and evaluation of the potential flight hazards associated with integration of new components into the aircraft. Continue development of a database management system to store, access, aggregate, and manipulate aircraft performance data. DPG: Continue acquisition and integration of hardware and software to develop a M&S Testbed. Continue development of a database management system to store, access, aggregate, and manipulate chemical/biological performance data. Conduct verification, validation and accreditation of the 4D Weather System at RTTC and YPG to perform micro/meso-scale weather analyses and forecasts which provide increased range efficiencies, enhanced range safety, and significantly upgraded project support, i.e., test windows (acceptable weather conditions) and reduced setup/teardown times for instrumentation. Continue development of validated model to replicate a chemical/biological point detection system. RTTC: Continue to acquire the capability to support virtual component/subsystem tests for small missile systems with open loop and closed loop non-destructive testing of imaging IR/MMW Seekers, and all-up-round missiles. Continue development of a 3-D smoke and obscurant model to generate IR scenes for the EOSFEL. Continue to procure and install fiber optic interface equipment. Continue to provide support to Project Constellation, a distributed virtual test capability using standard architectures, networks, and validation/ accreditation procedures. Initiate development of thermal state models of targets and backgrounds for arctic and desert environments. Continue acquisition of hardware and software to develop a small missile M&S testbed. Continue development of a standardization process to integrate various software components (synthetic environments, databases, data repositories, models, and interfaces) to support virtual testing. <p>FY 2001 Planned Program: (continued)</p>		
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<p>WSMR: Continue development of virtual reality mission planning for large missile systems. Continue development of C4I and EW testing capabilities to replace expensive airborne jammers with simulators that inject actual threat waveforms into the test items which significantly reduce test costs, test time, and provides test repeatability. Continue development of terrain and ground truth databases. Continue development of software tools to simulate C4I systems. Continue development of an Airblast Survivability Model for Comanche. Initiate development of an architecture to rehost existing C4I legacy test tools to support DT, OT and training exercises</p> <p>YPG: Continue development of an M&S Testbed to integrate simulations, models and databases. Continue development of a test instrumentation suite to merge real-time test data with simulation models and databases.</p> <p>HQ TECOM: Continue VPG program coordination and integration.</p> <ul style="list-style-type: none"> • 16151 Initiate/continue development, acquisition and sustainment of critical test instrumentation and equipment. <ul style="list-style-type: none"> ATC: Continue development of test site integration which consists of electronically linking test site instrumentation with a control facility to conduct test control, monitoring and real-time data analysis and review. Continue development of autonomous vehicle control and test range traffic monitoring systems. Continue acquisition of high-speed analysis and processing equipment. Continue development of a combined DT)/OT vehicle instrumentation package. Continue development of vehicle endurance/performance test data analyzers. Continue development of a soldier-system instrumentation suite to measure and record field test data. Continue development of a laser target scoring system to measure supersonic/subsonic projectiles. Initiate acquisition of amplifiers and digitizers to upgrade the collection of ballistic range data. Continue acquisition of a high-speed digital camera to reduce costly environmental hazardous waste. Continue development of a gun chamber pressure system. Continue development of a ballistic measurement system to measure shock levels generated by munitions on combat vehicles. ATTC: Continue upgrade of the helicopter icing spray system to ensure spray level characteristics are identical to natural clouds. Initiate acquisition of pre-flight instrumentation checkout equipment. Acquire airborne recorders to simultaneously record and reproduce multiple aircraft data channels. DPG: Acquire a large-scale data storage system for chemical and biological field-test data. Continue acquisition of atmospheric dispersion thermometers and process logic controllers to collect field test data from mini-cams. RTTC: Continue acquisition of electromagnetic radiation equipment used in physical environments testing. Continue acquisition of automated matrix switching devices and programmable conditioning equipment to allow insertion of flight test data into hardware-in-the-loop and six degree-of-freedom simulators. Continue acquisition of signal conditioning units and transducers to upgrade data acquisition instrumentation. Continue procurement and installation of fiber optic interface equipment. Continue development of signal conditioning units and transducers to upgrade data acquisition instrumentation. Continue acquisition of digital data recorders and receivers to receive, record, and display missile flight performance data. Acquire inertial measurement system to measure missile system physical characteristics. Complete development of a six degree of freedom motion simulator to perform non-destructive missile testing. <p>FY 2001 Planned Program: (continued)</p>		
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605602A Army Test Technology and Sustaining Instrumentation	D628
<p>WSMR: Continue development of instrumentation platform to remotely collect, analyze, transmit and log C4I message traffic. Continue upgrade of the Drone Formation Control System to control the QF-4 target drone. Continue acquisition of telemetry, range timing, operations control, data display, and video relay equipment and instrumentation to provide a smooth transition of range control from the Range Control Center to the new National Range Control Center. Continue development of the high speed/high capacity wireless data communication network to support data collection, analysis and reduction of C4I test data. Initiate acquisition of communications equipment to link test ranges to the range control center. Upgrade a suite of optical tracking instrumentation with high-resolution video cameras.</p> <p>YPG: Continue acquisition of mobile, portable, and base station trunked land radio units. Initiate upgrade of a scoring sensor suite for turreted gun systems on rotary wing aircraft (munitions from .50 caliber to 30mm) and for a gun pointing vector instrumentation package. Continue acquisition of data recorders, sensors and telemetry equipment to collect aerodynamic and flight dynamic data for airdrop systems. Continue acquisition of data loggers, radios, modems, sensor test equipment and a wireless link to transmit test data from remote sites at CRTC. Acquire of real-time, high-speed data analysis, network and data processing equipment.</p> <ul style="list-style-type: none"> • 775 Provide quick reaction capability to respond to failed instrumentation and replacement needs, provide support for technical committees forging future instrumentation technology developments, and maintain/improve existing capability by replacement and limited upgrade of worn out, obsolete or unserviceable equipment/instrumentation at Army technical test ranges. Continue to develop Test Operations Procedures (TOPs) and International Test Operations Procedures (ITOPs) to ensure quality and consistency of test results throughout Army and for international cooperative applications. • 5326 HQ TECOM: Provide technical support costs to include salaries and benefits, travel, training and developmental assignments for Directorate for Technical Mission personnel, who manage requirements development, project prioritization, and execution of investment accounts for Small Business Innovative Research, Production Base Support, Army Test Technology and Sustaining Instrumentation, Major Test and Evaluation Investment, and the Central Test and Evaluation Investment Program. Provide management and support costs for direct interface with the T&E Executive Agent, management of needs and solutions calls for T&E Reliance oversight, and support to the Army TERIB co-chair and the Army principal on the T&E Board of Operating Directors. Provide administrative support for the Local Area Network and TECNET, contracts, patents, symposia and conferences, exhibits and printing. Continue funding support to the Joint Program Office (JPO) for Test and Evaluation under the tri-service Executive Agent for Test and Evaluation. <p>Total 33332</p>		
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	32160	33439	35758	37991
Appropriated Value	33184	43939		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1024	-301		
b. SBIR/STTR	-773			
c. Omnibus or Other Above Threshold Reduction	-255			
d. Below Threshold Reprogramming	-614			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-5288	-4659
Current Budget Submit (FY 2000/2001 PB)	30518	43638	30470	33332

Change Summary Explanation: Funding: FY 1999 Congressional increase to fund critical instrumentation shortfalls at WSMR. FY 2000 and FY 2001 funds realigned to higher priority requirements.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)									DATE February 1999	
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	30263	34131	30138	33916	34293	34404	37716	40214	Continuing	Continuing
D670 Emerging Technology Systems	4945	5698	3754	4276	4457	4638	4920	5310	Continuing	Continuing
D671 Air Defense/Missile Defense Systems	5550	5718	5341	5866	5272	5491	5877	6360	Continuing	Continuing
D672 Aviation Systems	3112	3138	2576	2784	2946	3049	3320	3598	Continuing	Continuing
D675 Force XXI and C4I/IEW Systems	4217	6962	9837	11299	11477	10657	12075	12444	Continuing	Continuing
D677 Ground Combat Systems	4862	6334	3927	4435	4646	4840	5452	5920	Continuing	Continuing
D678 Munitions Systems	5258	5554	4289	4798	5016	5229	5537	5992	Continuing	Continuing
D679 Soldier Systems	773	727	414	458	479	500	535	590	Continuing	Continuing
D734 Survivability Evaluation	1546	0	0	0	0	0	0	0	0	1546

A. Mission Description and Budget Item Justification: This Program Element (PE) funds activities and functions to conduct objective and integrated survivability and lethality analyses (SLA) for all major and designated non-major Army systems. The analyses quantify the effects of electronic warfare (EW) and ballistic battlefield threats and meteorological conditions on Army individual soldiers and systems. This PE also funds vulnerability assessments of digitized systems for Force XXI.

The work is accomplished through threat research, theoretical and engineering analyses, signature measurements, modeling, simulations, laboratory experiments, and field investigations. Activities in progress include assessment of the effects of atmospheric, passive countermeasures, tactics, lasers, high-power microwave, electro-optical/radio frequency (EO/RF) jammers, electromagnetic environment effects (E3), information warfare (IW), decoys, and conventional ballistics on Army soldiers and systems. The PE work efforts provide U.S. Army decision makers, materiel and combat developers, system users, and independent evaluators critical soldier and system survivability analyses that quantify the soldier/system's survivability effectiveness in battlefield threat environments. Recommendations are provided to the materiel and combat developers on how to mitigate soldier/system deficiencies and enhance their survivability.

This PE funds civilian salaries, travel, development and maintenance of equipment and facilities, general management, administrative and contractor support required for program execution. The U.S. Army Research Laboratory (ARL) Survivability/Lethality Analysis Directorate (SLAD) conducts this effort.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE **February 1999**

BUDGET ACTIVITY

6 - Management and Support

PE NUMBER AND TITLE

0605604A Survivability/Lethality Analysis

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u> PB)	31308	30498	16363	18744
Appropriated Value	32330	34498		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1022	-367		
b. SBIR / STTR	-785			
c. Omnibus or Other Above Threshold Reductions	-260			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			+13775	+15172
Current Budget Submit (<u>FY 2000 / 2001</u> PB)	30263	34131	30138	33916

Change Summary Explanation:

- Funding - FY 1999 Funds (+4000) – congressional funding increase provides vulnerability assessments of First Digitized Division
- Funding - FY 2000 Funds (+7167) - funding continues electronic warfare vulnerability analysis of major and designated non-major Army systems.
 - (+3000) - funding provides for information warfare vulnerability assessments of C4I systems in the First Digitized Division.
 - (+3000) - funding provides chemical/biological/nuclear survivability analysis for U.S. Army systems.
- Funding - FY 2001 Funds (+7323) - funding continues electronic warfare vulnerability analysis of major and designated non-major Army systems.
 - (+4000) - funding provides for information warfare vulnerability assessments of C4I systems in the First Digitized Division.
 - (+3000) - funding provides chemical/biological/nuclear survivability analysis for U.S. Army systems.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D670
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D670 Emerging Technology Systems	4945	5698	3754	4276	4457	4638	4920	5310	Continuing	Continuing

Mission Description and Justification: This project performs integrated survivability/lethality analyses for the category of systems which include Horizontal Technology Integration systems, Advanced Technology Demonstration initiatives, and proposed survivability enhancements to weapon platforms. Survivability deficiencies are identified, and recommendations are made to Program Executive Officers and Program Managers (PEOs/PMs) to provide hardening fixes early in program development. Work is accomplished through threat research, theoretical and engineering analyses, laboratory experiments, models, simulations, and field investigations. This effort also supports HQDA, independent evaluators, and PEOs/PMs with technical expertise in electronic warfare (EW), ballistics, and meteorology to conduct special studies and to support Test Integration Working Groups (TIWGs), weapon system program reviews, acquisition documentation reviews, and Government testers. This project also provides oversight of the Army's Electromagnetic Environmental Effects (E3) Program. Horizontal Technology Integration systems include 2nd Generation FLIR (2nd GEN FLIR), Battlefield Combat Identification System (BCIS), Global Positioning System (GPS), and Enhanced Position Location Reporting System (EPLRS). Advanced Technology Demonstration initiatives include Hit Avoidance, Precision Guided Mortar Munition, Tank Extended Range Munition, Tactical Command and Control Protect (TCCP), Guided Multiple Launch Rocket System (MRLS) and Future Scout and Cavalry System (FSCS). Proposed survivability enhancements to weapon platforms include advanced armament technologies, defensive aide suites (DAS), missile countermeasure devices (MCD), emerging propellant technologies, advanced propulsion systems, advanced electronics, and improved spall liners in combat vehicles.

FY 1998 Accomplishments:

- 2512 Performed integrated EW survivability and lethality investigations and analyses of emerging technology systems, including performance predictions of hit avoidance concepts (laser/missile warning receivers, decoys, obscurants) and the effect of obscured atmosphere on the propagation of missile plume signatures for defensive aided suites, and recommendations for Electronic Counter-Countermeasure (ECCM) enhancements. Supported the Army's E3 program, and provided E3 shielding implications for composite materials for a ground system in development.
 - 1328 Performed ballistic effects investigations and survivability/lethality analyses of emerging technology systems, including the residual aerodynamic and structural properties of damaged composite rotary blades, the residual performance of novel vehicle drive trains and electro-optical components, blast effects of select mines, and vulnerabilities with Army's air fleet's transition to JP-8 fuel.
 - 1105 Provided engineering-based predictions of chemical and biological warfare contamination and decontamination and dirty battlefield conditions to support integrated survivability/lethality analyses of emerging technology systems and horizontal technology applications. Completed model to predict chemical infiltration hazards to crew and equipment inside a combat vehicle, and predict the effects of chemical agents and decontaminates on materials to obviate the need for testing all new candidate materials.
- Total 4945

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D670
FY 1999 Planned Program:		
•	2893 Conduct EW vulnerability investigations and analyses to support integrated survivability and lethality analyses of advanced 2nd and 3rd generation emerging technology and horizontal technology applications. Prepare interim survivability analysis reports.	
•	1463 Perform ballistic effects investigations and survivability/lethality analyses of candidate emerging technologies most influential on future system designs, including advanced armors (such as active protection systems), advanced armaments (such as electric armaments and Electro thermal chemical), advanced propellants, and advanced vehicle propulsion. Prepare interim survivability analysis reports.	
•	1249 Conduct vulnerability analysis of Army's digitized battlefield systems to radio frequency (RF) weapons. Identify possible countermeasure to threat RF weapons. Support the Army E3 program, and expand E3 predictive capabilities for other composite materials.	
•	93 Small Business Innovative Research/Small Business Technology Transfer Programs	
Total	5698	
FY 2000 Planned Program:		
•	1500 Continue EW vulnerability investigations and analyses to support integrated survivability and lethality analyses of advanced 2nd and 3rd generation emerging technology and horizontal technology applications. Prepare survivability analysis reports.	
•	1400 Perform ballistic effects investigations and survivability/lethality analyses of candidate emerging technologies most influential on future system designs, including advanced armors (such as active protection systems), advanced armaments (such as electric armaments and electro-thermal chemical), advanced propellants, and advanced vehicle propulsion. Investigate Advanced KE Cartridge, and Precision Guided Mortar Munition.	
•	854 Continue vulnerability analysis of Army's digitized battlefield systems to radio frequency (RF) weapons. Identify possible countermeasure to threat RF weapons. Expand E3 predictive capabilities for new materials and out year threats. Support Army E3 program.	
Total	3754	
FY 2001 Planned Program:		
•	1650 Perform ballistic effects investigations and survivability/lethality analyses of emerging technologies and support ballistic vulnerability and lethality studies of Armor and Munition ATDs.	
•	990 Support analysis of Army's ability to protect modern commercial based tactical information networks, components and data though TCCP. Analyze digitized battlefield systems to radio frequency (RF) weapons. Support Army E3 program.	
•	1636 Perform integrated EW survivability and lethality investigations and analyses of emerging technology systems, including performance predictions of new hit avoidance concepts.	
Total	4276	
<div style="display: flex; justify-content: space-between; margin-top: 20px;"> Project D670 Page 4 of 18 Pages Exhibit R-2A (PE 0605604A) </div>		

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis				PROJECT D671			
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D671	Air Defense/Missile Defense Systems	5550	5718	5341	5866	5272	5491	5877	6360	Continuing	Continuing
<p>Mission Description and Justification: This project provides the survivability/lethality analysis of U.S. Army air defense and missile defense systems to battlefield threats and recommends fixes to improve their battlefield survivability. The results are used by each Project Manager (PM) and the Program Executive Officer (PEO) to direct weapon system development efforts and structure product improvement programs; by the independent evaluator when they provide system evaluations in support of milestone decisions; by the user to develop survivability/lethality requirements, doctrine and tactics; and by decision makers in formulating program/production decisions. Anti-Radiation Missile (ARM) Counter-Arm efforts assess threat technologies against THAAD and National Missile Defense (NMD), PATRIOT, Medium Extended Air Defense System (MEADS), and FAAD-C21 ground based sensors. Also funds salaries, travel, equipment/facilities, and management/administrative support needed to execute the program.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 3507 Conducted electronic warfare vulnerability/survivability analysis and assessment of U.S. Army air defense and missile defense systems that are in development, undergoing P3I, or have been recently fielded to include PATRIOT, MEADS, Stinger, GBS, THAAD, and NMD. • 713 Conducted chemical, biological, nuclear, and atmospheric effects survivability analysis for U.S. Army air defense and missile defense systems. • 955 Conducted ballistic survivability/lethality analysis for U.S. Army air defense and missile defense systems. • 375 Provided integrated survivability/lethality analyses to support scheduled air defense/missile defense program decision milestones in FY 98. <p>Total 5550</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 3478 Conduct electronic warfare vulnerability assessments for developmental U.S. Army air defense and missile defense systems, pre-planned product improvements of current systems, and recently fielded systems. Provide interim susceptibility reports. Recommend ECCM enhancements. Complete PATRIOT PAC-3 MSIII ECCM Assessment Support THAAD/NMD Radar HWIL Simulation ECM Investigations. Develop a THAAD System MSII Integrated Survivability/Lethality Assessment. Conduct NMD Radar Far-Term Threat Analysis. • 900 Conduct chemical, biological, nuclear, and atmospheric effects survivability analysis for U.S. Army air defense and missile defense systems. • 950 Conduct ballistic survivability/lethality analysis for U.S. Army air defense and missile defense systems. Perform Stinger Block 2 Lethality Analysis. • 300 Provide integrated survivability/lethality analyses to support scheduled air defense/missile defense program decision milestones in FY 99. Develop MEADS multi-year survivability strategy. • 90 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 5718</p>											
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D671
<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2491 Provide strawman ECM parameters in support of PATRIOT post-MS III missile countermeasures experiments. Provide ECCM performance analysis of PACM risk reduction program. Support NMD ECM Analysis. Support THAAD Radar ECM Field Investigations. Conduct electronic warfare vulnerability assessments for other developmental U.S. Army air defense and missile defense systems, pre-planned product improvements of current systems, and recently fielded systems. Provide interim susceptibility reports. Recommend ECCM enhancements. • 500 Conduct ballistic survivability/lethality analysis for U.S. Army air defense and missile defense systems. • 1500 Complete PATRIOT MS III integrated survivability/lethality assessment. Support Sentinel P3I program. Develop NMD Integrated survivability/lethality assessment for deployment review. • 500 Focal Plane Array Countermeasures (FPACM) (Partner: United Kingdom): Characterize and assess advanced focal plane array missile seekers and develop electronic countermeasures (ECM) to defeat them through simulation, modeling and lab testing. • 350 Electronic Countermeasures (ECM) Simulation – Common Set (Partner: Australia): Develop a common set of ECM simulations for investigating the EW effects on specific threat missile systems. Develop methodologies to evaluate ECM against infrared, electro-optical, and radio frequency-guided missiles to determine degradation. <p>Total 5341</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 2758 Analyze ECM experiments in support of PATRIOT post-MS III missile countermeasures experiments. Support MEADS ECM analysis. Conduct THAAD BMC4I IW Countermeasure Investigations. Conduct electronic warfare vulnerability assessments for other developmental U.S. Army air defense and missile defense systems, pre-planned product improvements of current systems, and recently fielded systems. Provide interim susceptibility reports. Recommend ECCM enhancements. • 800 Conduct ballistic survivability/lethality analysis for U.S. Army air defense and missile defense systems. • 1458 Complete NMD Integrated survivability/lethality assessment for deployment final review. Provide survivability support to PATRIOT post-MS III growth program. Complete survivability analysis for Sentinel P3I program. • 500 Focal Plane Array Countermeasures (FPACM) (Partner: United Kingdom): Continue characterization and assessment of advanced focal plane array missile seekers and develop electronic countermeasures (ECM) to defeat them through simulation, modeling and lab testing. • 350 Electronic Countermeasures (ECM) Simulation – Common Set (Partner: Australia): Develop a common set of ECM simulations for investigating the EW effects on specific threat missile systems. Develop methodologies to evaluate ECM against infrared, electro-optical, and radio frequency-guided missiles to determine degradation. <p>Total 5866</p>		
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis					PROJECT D672	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D672 Aviation Systems	3112	3138	2576	2784	2946	3049	3320	3598	Continuing	Continuing
<p>Mission Description and Justification: Project investigates the Survivability/Lethality/Vulnerability (SLV) of Army aviation systems to battlefield threats. Aircraft SLV deficiencies are identified and hardening recommendations identified as appropriate. SLV analysis directly supports major decision milestone reviews, acquisition documentation, test and evaluation master plans, and cost/operational effectiveness analyses.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1776 Performed electronic warfare vulnerability analysis and assessment of U.S. Army aviation systems and aviation support equipment to include: AH-64D Longbow Apache; RAH-66 Comanche; Suite of Integrated RF Countermeasures; Suite of Integrated IR Countermeasures. • 663 Completed ballistic survivability/lethality analysis of UH-60Q Ambulance and Comanche. Conducted ballistic vulnerability analysis of Improved Cargo Helicopter (ICH). • 673 Conducted the chemical, biological, nuclear, and atmospheric effects survivability analysis for Comanche and Longbow Apache. <p>Total 3112</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1614 Continue electronic warfare vulnerability assessment for aviation systems and aviation support equipment that are in development, undergoing P3I, or have been recently fielded, including AH-64D Longbow Apache, RAH-66 Comanche, CH-47D Chinook, Suite of Integrated RF Countermeasures, and Suite of Integrated IR Countermeasures. Provide susceptibility reports. Provide electronic counter-countermeasures recommendations. • 798 Conduct the ballistic survivability/lethality analysis for Comanche and ICH. • 681 Complete chemical, biological, nuclear, and atmospheric effects survivability analysis for Comanche and aviation support systems. • 45 Small Business Innovative Research/Small Business Technology Transfer Programs <p>Total 3138</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 726 Continue electronic warfare vulnerability assessment for aviation systems and aviation support equipment that are in development, undergoing P3I, or have been recently fielded, including AH-64D Longbow Apache, RAH-66 Comanche, CH-47D Chinook. Provide electronic counter-countermeasures recommendations. Conduct E3 analysis of Suite of Radio Frequency Counter Measures (SIRFC). Perform SIRFC CM/CCM analysis in support of DT and OT. Conduct E3 analysis for Suite of Infra-red counter measures (SIIRCM). Conduct laser jamming susceptibility analysis of system sensors and jam head. 										
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605604A Survivability/Lethality Analysis	D672
<p>FY 2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 1750 Conduct Kiowa Warrior LFT& E survivability programs for Phases IB, IC, ID, IE, & II and prepare experiment and modeling reports. Develop target descriptions and perform ballistic vulnerability analysis of four configurations of the Improved Cargo helicopter and compare with the CH-47D. Continue support for Improved Cargo Helicopter LFT&E (damage assessments, pre-shot predictions, post-shot analyses, and input to independent evaluation). • 100 Perform MANPRINT SIRFC Solder Survivability (SSv) analysis and prepare domain report. <p>Total 2576</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 934 Continue electronic warfare vulnerability assessment for aviation systems and aviation support equipment that are in development, undergoing P3I, or have been recently fielded. • 1850 Continue development of target descriptions and perform ballistic vulnerability analysis of four configurations of the Improved Cargo Helicopter and compare with the CH-47D. Continue Kiowa LFT&E support and finalize report for Phase II. Continue support for Improved Cargo Helicopter LFT&E (experiments, damage assessments, preshot predictions, postshot analyses, and input to independent evaluation). <p>Total 2784</p>		
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis				PROJECT D675		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D675 Force XXI and C4I/IEW Systems	4217	6962	9837	11299	11477	10657	12075	12444	Continuing	Continuing
<p>Mission Description and Justification: Supports survivability analysis, information warfare, and information operations of Army communications, electronic equipment and Digitized Force against friendly and enemy threats. Provides field threat environment support for Electronic Warfare Vulnerability Analysis (EWVA). Analyzes vulnerabilities of foreign threat weapons and command, control, communications, computers and intelligence (C4I) and Intelligence Electronic Warfare (IEW) systems to U.S. Army EW systems. Provides threat weapon electronic design data to countermeasure developers and technical capability information to the intelligence community. Supports Army initiatives in vulnerability reduction of C4I/IEW systems against battlefield threats, including information warfare. Provides analysis for understanding potential vulnerabilities of digitized Force XXI developmental systems. Supports Army Warfighting Experiments and associated Information Operations Vulnerability Assessments for Force XXI Architecture.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1915 Conducted integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army command and control systems. Conducted information operations vulnerability analysis. This effort supports the Advanced Field Artillery Tactical Data System, Common Hardware and Software, Maneuver Control System, FAAD-C2I, Standard Integrated Command Post Shelter, All Source Analysis System, Combat Service Support Control System and FBCB2 (Applique). • 1400 Conducted integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army communications systems such as SINCGARS, EPLRS, GPS, Mobile Subscriber Equipment, Single Channel Anti-jam Man Portable radio, Secure Mobile Anti-jam Reliable Tactical Terminal, and the Near Term Digital Radio. • 702 Conducted integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army IEW systems such as the BCIS, Joint Surveillance Target Attack Radar System/Ground Station Module and 2nd Generation FLIR enhanced Firefinder radar. • 200 Provided integrated survivability/lethality analyses to support scheduled C4I/IEW systems program decision milestones in FY 98. <p>Total 4217</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1506 Conduct integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army command and control systems. Conduct information operations vulnerability analysis. This effort supports the Advanced Field Artillery Tactical Data System, Common Hardware and Software, Maneuver Control System, FAAD-C2I, Standard Integrated Command Post Shelter, All Source Analysis System, Combat Service Support Control System, and FBCB2 (Applique). 										
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis PROJECT D675	
<ul style="list-style-type: none"> • 3000 Conduct Radio Frequency Directed Energy (RFDE) vulnerability assessments on computer/communication systems of the First Digitized Division (FDD). Conduct IO vulnerability assessments against hackers, malicious codes, unauthorized users, etc., on critical command, control, communications, computers and intelligence (C4I) systems supporting FDD. Provide recommendations to mitigate susceptibilities/vulnerabilities <p>FY 1999 Planned Program: (continued) encountered during IO vulnerability investigations. Build database of results. Establish the technical core capability and initiate development of a prototype IO vulnerability assessment (IOVA) tool/model for conducting IOVA's of system and systems of systems supporting the FDD. The IOVA tool is founded in a Decision Related Structures (DRS) environment which addresses vulnerabilities in the context of data/information that directly influences the decision making process.</p> <ul style="list-style-type: none"> • 1405 Conduct integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army communications systems such as Mobile Subscriber Equipment, Single Channel Anti-jam Man Portable radio, Secure Mobile Anti-jam Reliable Tactical Terminal, and the Near Term Digital Radio. • 776 Conduct integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army IEW systems such as the BCIS, Joint Surveillance Target Attack Radar System/Ground Station Module, and enhanced Firefinder radar. • 147 Provide integrated survivability/lethality analyses to support scheduled C4I/IEW systems program decision milestones in FY 99. • 128 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 6962</p>	<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2515 Conduct integrated electronic and ballistic effects survivability analysis for U.S. Army command and control systems. Conduct information operations vulnerability analysis. This effort supports the Advanced Field Artillery Tactical Data System, Common Hardware and Software, Maneuver Control System, FAAD-C2I, All Source Analysis System, Combat Service Support Control System, FBCB2 (Applique), and A2C2S, and AMPS. • 2028 Conduct integrated electronic and information operations vulnerability analysis for U.S. Army communications systems such as Mobile Subscriber Equipment, Single Channel Anti-jam Man Portable radio, Secure Mobile Anti-jam Reliable Tactical Terminal, the Near Term Digital Radio, ARC-220, and SINCGARS ASIP, EPLR-VHSIC, SPITFIE, GBS, and ISYSCON. • 2294 Conduct integrated electronic and ballistic effects survivability analysis for U.S. Army IEW systems such as the BCIS, CIDDS, IEWCCS, ETLOS, enhanced Firefinder radar, TROJAN SPIRIT, and COCS-H. Conduct information operations vulnerability analysis for these systems. • 3000 Conduct integrated chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army systems. <p>Total 9837</p> <p>FY 2001 Planned Program:</p>	
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D675
<ul style="list-style-type: none"> • 2995 • 2656 <p>FY 2001 Planned Program: (Continued)</p> <ul style="list-style-type: none"> • 1648 • 1000 • 3000 <p>Total</p>	<p>Conduct integrated electronic and ballistic effects survivability analysis for U.S. Army command and control systems. Conduct information operations vulnerability analysis. This effort supports the Advanced Field Artillery Tactical Data System, Common Hardware and Software, Maneuver Control System, FAAD-C2I, All Source Analysis System, Combat Service Support Control System, FBCB2 (Applique), and A2C2S, and AMPS.</p> <p>Conduct integrated electronic and information operations vulnerability analysis for U.S. Army communications systems such as Mobile Subscriber Equipment, Single Channel Anti-jam Man Portable radio, Secure Mobile Anti-jam Reliable Tactical Terminal, the Near Term Digital Radio, ARC-220, and SINCGARS ASIP, EPLR-VHSIC, SPITFIE, GBS, and ISYSCON.</p> <p>Conduct integrated electronic and ballistic effects survivability analysis for U.S. Army IEW systems such as the BCIS, CIDDS, IEWCCS, ETLOS, enhanced Firefinder radar, TROJAN SPIRIT, and COCS-H. Conduct information operations vulnerability analysis for these systems.</p> <p>Conduct integrated information operations vulnerability analysis for First Digitized Corp weapon systems connected via the Tactical Internet: C2V, M1A2 SEP, AH-64-D, M2A3, Paladin, Linebacker, Wolverine, OH-58D, Avenger, and Land Warrior.</p> <p>Conduct integrated chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army systems.</p>	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis				PROJECT D677			
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D677	Ground Combat Systems	4862	6334	3927	4435	4646	4840	5452	5920	Continuing	Continuing
<p>Mission Description and Justification: Project investigates the survivability and vulnerability of Army ground combat systems to battlefield threats. Analysis will support weapon requirements, test and evaluation master plans, cost/operational effectiveness analysis, and major milestone decisions.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1234 Conducted integrated electronic warfare vulnerability analysis and assessment of U.S. Army ground combat systems – Future Scout Cavalry System, Crusader, Bradley A3, Command and Control Vehicle, ABRAMS M1A2, Grizzly and Wolverine. Provided interim susceptibility reports. Recommend EW survivability enhancements. • 2030 Conducted the ballistic survivability/lethality analysis for U.S. Army ground combat systems. • 1340 Conducted the chemical, biological, nuclear, and atmospheric effects survivability analysis for U.S. Army ground combat systems. • 258 Provided integrated survivability/lethality analyses to support scheduled ground combat systems program decision milestones in FY 98. <p>Total 4862</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1410 Conduct the electronic warfare vulnerability assessment for U.S. Army ground combat systems such as Crusader, Bradley A3, Command and Control Vehicle, ABRAMS 2000, Breacher. • 2146 Conduct the ballistic survivability/lethality analysis for U.S. Army ground combat systems (Abrams, Bradley, and Wolverine). • 1405 Conduct the chemical, biological, nuclear, and atmospheric effects survivability analysis for U.S. Army ground combat systems. • 270 Provide integrated survivability/lethality analyses to support scheduled ground combat systems program decision milestones in FY 99. • 1000 Conduct IO vulnerability assessments against hackers, malicious codes, unauthorized users, etc., on weapon platform systems supporting FDD. • 103 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 6334</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1240 Continue analytical support for Crusader survivability detailed design, development and fabrication of prototype vehicles. • 1927 Perform HMMWV II ballistic vulnerability analysis/vulnerability reduction on selected components. Perform Future Combat System (FCS) ballistic vulnerability assessments on selected concepts. Support Abrams Live Fire Test and Evaluation (LFT&E) including damage assessments, post shot analyses and input to Independent Evaluation. Conduct Grizzly LFT&E Pre-Shot Predictions. Support Future Scout and Cavalry System (FSCS) 											
Project D677				Page 12 of 18 Pages				Exhibit R-2A (PE 0605604A)			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605604A Survivability/Lethality Analysis	D677
FY 2000 Planned Program: (continued)		
	Ballistic survivability TRAC modeling effort. Support FSCS Ballistic survivability AMSAA Item Level Performance Analysis. Conduct Wolverine analyses of vulnerabilities in non-ballistic areas. Conduct Wolverine E3 Analysis.	
•	360	Provide FCS analyses which supports technology development (APS, Advanced. Armaments, Advanced Vehicle Propulsion Systems, Advanced Armor).
•	300	Provide integrated survivability/lethality analyses to support scheduled ground combat systems program decision milestones in FY 00 (i.e. C2V, Bradley A3).
•	100	Conduct Wolverine and Crusader Soldier Survivability (SSv) Assessment.
Total	3927	
FY 2001 Planned Program:		
•	1235	Continue the electronic warfare vulnerability assessment for U.S. Army ground combat systems as Crusader, Bradley A3, Command and Control Vehicle (C2V), and Breacher.
•	2850	Conduct the ballistic survivability/lethality analysis for U.S. Army ground combat systems. Initiate Crusader LFT&E support. Support Abrams LFT&E (damage assessments, post shot analyses and input to Independent Evaluation). Conduct Grizzly damage assessments of LFT shorts and provide post Shot analyses.
•	350	Provide integrated survivability/lethality analyses to support scheduled ground combat systems program decision milestones in FY01.
Total	4435	
Project D677	Page 13 of 18 Pages	Exhibit R-2A (PE 0605604A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis					PROJECT D678		
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D678	Munitions Systems	5258	5554	4289	4798	5016	5229	5537	5992	Continuing	Continuing
<p>Mission Description and Justification: This project funds the investigation of the lethality/vulnerability of Army fire support smart weapons (smart and conventional) to battlefield threats. The analysis is integrated across all battlefield threats, i.e., conventional ballistic, electronic warfare, and directed energy. This work is accomplished through theoretical and engineering analyses, signature measurements, modeling, simulations, laboratory experiments, and field investigations.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2524 Conducted the electronic warfare vulnerability assessment for developmental U.S. Army munitions systems and any associated P3I. Conducted electronic warfare countermeasure analysis/support for U.S. Army munitions to include Follow On To TOW, MSTAR, Precision Guided Mortar Munition (PGMM), and EFOG-M. • 1114 Conducted the ballistic survivability/lethality analysis for U.S. Army munitions systems. • 1220 Conducted the chemical, biological, nuclear, and atmospheric effects survivability analysis for U.S. Army munitions systems. • 400 Provided integrated survivability/lethality analyses to support scheduled munitions systems program decision milestones in FY 98. <p>Total 5258</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2497 Conduct electronic warfare vulnerability assessments for advanced developmental U.S. Army conventional and smart munition systems and any associated pre-planned product improvement programs. Conduct electronic warfare vulnerability analysis/support for U.S. Army munition systems to include BAT/IBAT, TOW 2B P3I, WAM PIP, and Tank Extended Range Munition (TERM). • 2471 Conduct ballistic survivability/lethality analysis for advanced developmental U.S. Army conventional and smart munition systems to include BAT/IBAT, SADARM, TERM, Javelin, Guided MLRS, SuperDragon, M829 and any associated pre-planned product improvement programs. • 500 Provide integrated survivability/lethality analyses to support scheduled munitions systems program decision milestones in FY 99. • 86 Small Business Innovative Research/Small Business Technology Transfer Programs <p>Total 5554</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2229 Conduct electronic warfare vulnerability assessments for advanced developmental U.S. Army conventional and smart munition systems and any associated pre-planned product improvement programs. Conduct electronic warfare vulnerability analysis/support for U.S. Army munition systems such as Army Tactical Missile System (ATACMS) with smart payloads such as BAT/IBAT, TOW 2B P3I, WAM PIP, and TERM. 											
Project D678				Page 14 of 18 Pages				Exhibit R-2A (PE 0605604A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D678
<p>FY 2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 1610 Conduct ballistic survivability/lethality analysis for U.S. Army munition systems to include BAT/IBAT, TERM, Guided MLRS and M829 and any associated pre-planned product improvement programs. • 450 Provide integrated survivability/lethality analyses to support scheduled munition systems program decision milestones during FY00. <p>Total 4289</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 1982 Conduct electronic warfare vulnerability assessments for developmental U.S. Army munition systems such as ATACMS with smart payloads such as BAT/IBAT, TOW 2B P3I, WAM PIP and TERM. • 1242 Conduct ballistic survivability/lethality analysis for U.S. Army munition systems to include BAT/IBAT, TERM, Guided MLRS and M829. • 1062 Conduct chemical, biological and atmospheric effects survivability analysis for U.S. Army munition systems. • 512 Provide integrated survivability/lethality analyses to support scheduled munition systems program decision milestones during FY01. <p>Total 4798</p>		
Project D678	<i>Page 15 of 18 Pages</i>	Exhibit R-2A (PE 0605604A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis				PROJECT D679			
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D679 Soldier Systems		773	727	414	458	479	500	535	590	Continuing	Continuing
<p>Mission Description and Justification: Supports individual-soldier related programs and material to maximize survivability and functionality under severe combat environments of electronic and information warfare, countermeasures, directed energy and ballistics. Provides for technical investigations and analyses into the survivability of soldiers in various combat environments with many types of equipment. Provides administration of the MANPRINT Soldier Survivability (SSv) Domain. Broad areas addressed by SSv are: fratricide reduction; soldier detectability reduction; attack prevention if detected; damage prevention; medical injury reduction; the reduction of mental and physical fatigue. The survivability of soldier systems is investigated and reported to milestone decision reviews.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 494 Conducted integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for the U.S. Army Land Warrior and Air Warrior Systems (Computer and Communication System, Weapon System, Protective Clothing and Individual Equipment, Chemical/Biological Mask, and Integrated Headgear), Force XXI Land Warrior ACTD components, the Mounted Warrior System and Military Operations in Urban Terrain ACTD. • 184 Coordinated preparation and direct execution of MANPRINT Soldier Survivability Assessments and Reports. • 20 Sustainment of international soldier activities (NATO); provided chem/bio/physiology expertise for operations other than war and less-than-lethal efforts. • 75 Provided integrated survivability/lethality analyses to support scheduled soldier systems program decision milestones in FY 98. <p>Total 773</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 422 Conduct integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis for the U.S. Army Land Warrior and Air Warrior Systems (Computer and Communication System, Weapon System, Protective Clothing and Individual Equipment, Chem/Bio Mask, and Integrated Headgear), Force XXI Land Warrior ACTD components, the Mounted Warrior System and Military Operations in Urban Terrain ACTD. • 144 Coordinate preparation and direct execution of MANPRINT Soldier Survivability Assessments and Reports. • 47 Sustainment of international soldier activities (NATO); provide chem/bio/physiology expertise for operations other than war and less-than-lethal efforts • 100 Provide integrated survivability/lethality analyses to support scheduled soldier systems program decision milestones in FY 99. • 14 Small Business Innovative Research/Small Business Technology Transfer Programs <p>Total 727</p>											
Project D679				Page 16 of 18 Pages				Exhibit R-2A (PE 0605604A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D679
FY 2000 Planned Program:		
<ul style="list-style-type: none"> • 180 • 134 • 100 	<ul style="list-style-type: none"> Conduct integrated electronic, and ballistic survivability analysis for the U.S. Army Land Warrior and Air Warrior Systems (Computer and Communication System, Weapon System, Protective Clothing and Individual Equipment, and Integrated Headgear). Review contractor capability for Air Warrior (AW) prototype testing for Soldier Survivability. Support PM ACIS with Survivability analysis of equipment usage with different operational scenarios. Conduct AW signature analysis. Support integration of AW into the overall JSAM program. Coordinate preparation and direct execution of MANPRINT Soldier Survivability Assessments and Reports. Provide integrated survivability/lethality analyses to support scheduled soldier systems program decision milestones in FY 00. Ballistics, Electronic Warfare, and Information Warfare technical support for MS III issues of Land Warrior. 	
Total	414	
FY 2001 Planned Program:		
<ul style="list-style-type: none"> • 204 • 145 • 109 	<ul style="list-style-type: none"> Conduct integrated electronic, and ballistic survivability analysis for the U.S. Army Land Warrior and Air Warrior Systems (Computer and Communication System, Weapon System, Protective Clothing and Individual Equipment, and Integrated Headgear). Support OPTEC in survivability analysis of (AW) in operational testing Coordinate preparation and direct execution of MANPRINT Soldier Survivability Assessments and Reports. Provide integrated survivability/lethality analyses to support scheduled soldier systems program decision milestones in FY 01 	
Total	458	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis				PROJECT D734		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D734 Survivability Evaluation	1546	0	0	0	0	0	0	0	0	1546
<p>Mission Description and Justification: Effective in FY 1998, all U.S. Army Research Laboratory (ARL) Survivability/Lethality Analysis Directorate (SLAD) evaluation functions in support of survivability/lethality testing were financed through Project D734 under the direction of the U.S. Army Operational Test and Evaluation Command (OPTEC). Starting in FY 1999, funding for Project D734 has been transferred to PE 0605716A, Army Evaluation Center, established under OPTEC to perform the Army's consolidated developmental and operational evaluation function. The FY 1998 program provided evaluations of soldier and materiel system survivability into an integrated Army evaluation supporting decision-makers at milestone reviews. It included the planning and coordination of developmental tests, experiments, and subsequent evaluation of results to determine system survivability in battlefield threat environments. Evaluators developed the strategy and incorporated SLAD efforts to ensure that electronic warfare (EW), information warfare (IW), conventional ballistics, nuclear, chemical, biological, electromagnetic environmental effects (E3), atmospheric/obscuration and meteorological effects on soldier/system survivability were properly addressed. Evaluation results were incorporated into a single Army evaluation and presented at all acquisition milestones.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1546 Conducted integrated survivability evaluations for Army weapon systems and Automated Information Systems for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. Developed the evaluation strategy, designed technical and operational tests, and evaluated the test results to address the survivability and lethality factors pertinent to the decision process such as: soldier survivability, performance in countermeasures, and system survivability. As the Army lead for Live Fire Test and Evaluation, planned and executed the Army Live Fire Test and Evaluation program for developmental systems as required. Specific efforts included: conducted evaluations of Crusader, Search and Destroy Armor (SADARM), Land Warrior (LW), Improved Cargo Helicopter (ICH), Armored Scout Vehicle (ASV), Army Tactical Missile System Block II/Brilliant Anti-armor Tank Pre-Planned Product Improvement (ATACMS Blk II/BAT P3I), Hellfire, Longbow, Follow-On To Tow (FOTT), and Wide Area Munition (WAM) Milestone III results; prepared System Evaluation Plans for Multiple Launch Rocket System (MLRS A1), Bradley Fire Support Team (BFIST), Breacher, Bradley Fighting Vehicle System, Command and Control Vehicle (C2V), Command, Control, Communication, Computer and Intelligence (C4I) systems, and Suite of Integrated Infrared Countermeasures (SIRFCM). Efforts included costs for 18 civilian authorizations. <p>Total 1546</p> <p>FY 1999 Planned Program: Project restructured to PE 0605716A Army Evaluation Center under OPTEC.</p> <p>FY 2000 Planned Program: Project restructured to PE 0605716A Army Evaluation Center under OPTEC</p> <p>FY 2001 Planned Program: Project restructured to PE 0605716A Army Evaluation Center under OPTEC.</p>										
Project D734			Page 18 of 18 Pages				Exhibit R-2A (PE 0605604A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605605A DOD High Energy Laser Systems Test Facility (HELSTF)				PROJECT DE97		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE97 DoD High Energy Laser Systems Test Facility (HELSTF)	28048	23848	14230	14260	14200	14201	17051	17569	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> The HELSTF provides a broad based high energy laser (HEL) RDTE capability located at White Sands Missile Range, NM in support of Tri-Service HEL research and development and damage, vulnerability, and lethality laser testing. The HELSTF's laser development support capabilities include a certified laser test range, a fully integrated laser support facility, an extensive array of fully instrumented test sites, the Sea Lite Beam Director (SLBD), the Mid-Infrared Advanced Chemical Laser (MIRACL), the Laser Device Demonstration (LDD), and the Low Power Chemical Laser (LPCL). This multiple use facility supports testing of laser effects for targets ranging from scaled laboratory up through full scale flying target.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 14033 Performed operation and maintenance and base operations support functions in support of the Army, Department of Defense and other agencies conducting high energy laser systems concept development studies and test and evaluation on candidate high energy laser weapons systems (Tactical High Energy Laser, Free Electron Laser, Air Force Airborne Laser, and other laser programs). • 9461 Conducted field testing of the Tactical High Energy Laser (THEL) Advanced Concept Technology Demonstration. • 4554 Continued the Solid State Laser (SSL) Demonstration Program. Completed single module device and beam distortion correction. Manufactured and integrated the first module of the 3 module device. Performed dynamic target tracking with Army Pointer Tracker (APT). <p>Total 28048</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 14529 Perform operation and maintenance and base operations support functions in support of the Army, Department of Defense and other agencies conducting high energy laser systems concept development studies and test and evaluation on candidate high energy laser weapons systems (Tactical High Energy Laser, Free Electron Laser, Air Force Airborne and space-based lasers, and other laser programs). • 8706 Manufacture and integrate modules 2 and 3 of the 3 module SSL device including edge cladding, Amplified Spontaneous Emission (ASE) control and wavefront distortion measurement/control. This device will be representative in demonstrating the relatively compact, lightweight, high power solid state laser technology. • 613 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 23848</p>										
Project DE97			Page 1 of 2 Pages				Exhibit R-2 (PE 0605605A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605605A DOD High Energy Laser Systems Test Facility (HELSTF)	PROJECT DE97

FY 2000 Planned Program:

- 14230 Perform operation and maintenance and base operations support functions in support of the Army, Department of Defense and other agencies conducting high energy laser systems concept development studies and test and evaluation on candidate high energy laser weapons systems (Tactical High Energy Laser, Free Electron Laser, Air Force Airborne and space-based lasers, other laser programs and live-fire test programs).
- Total 14230

FY 2001 Planned Program:

- 14260 Perform operation and maintenance and base operations support functions in support of the Army, Department of Defense and other agencies conducting high energy laser systems concept development studies and test and evaluation on candidate high energy laser weapons systems (Tactical High Energy Laser, Free Electron Laser, Air Force Airborne Laser, other space-based laser programs, and live-fire test programs).
- Total 14260

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	28965	15022	15086	15150
Appropriated Value	29952	24022		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-987	-174		
b. SBIR / STTR	-689			
c. Omnibus or Other Above Threshold Reduction	-228			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-856	-890
Current Budget Submit (FY 2000/2001 PB)	28048	23848	14230	14260

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605606A Aircraft Certification				PROJECT D092		
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
D092 Aircraft Certification	2734	2893	3021	3169	3519	3709	3605	3751	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: Performs all engineering functions essential for certifying the airworthiness of assigned Army aircraft. Performs safety-of-flight investigations/assessments and issues messages to the field. Manages/executes the Army's Aeronautical Design Standards (ADS) Program; ADS is a continuously evolving process incorporating revisions for each change to the standard design of an aircraft system. Manages airworthiness approval of new vendor qualification/testing on fielded aircraft and material changes for all assigned Army aircraft systems. Provides airworthiness-engineering support to the Army Aviation Program Executive Office (PEO) and the Army Aviation and Missile Command Program/Project/Product Manager requirements for major development/modification and any future system/subsystems. Manages the test and evaluation process to support airworthiness qualification of developmental and fielded aircraft systems. This project funds activities required for general research and development support of aircraft qualifications.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 883 Executed technical and airworthiness qualification mission for PEO Aviation force modernization aircraft systems. • 870 Conducted safety-of-flight investigations/assessments to include PEO Aviation force modernization aircraft systems. • 135 Executed the Army Aeronautical Design Standards Program. • 656 Provided continuing engineering support for technology upgrades to PEO Aviation force modernization aircraft systems. • 190 Provided test management capability for PEO Aviation Program/Project/Product Managers. <p>Total 2734</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 945 Manage/execute technical and airworthiness qualification mission for PEO Aviation force modernization aircraft systems. • 900 Continue to ensure safety-of-flight investigations/assessments to include PEO Aviation force modernization aircraft systems. • 144 Manage/execute the Army Aeronautical Design Standards Program. • 701 Provide continuing engineering support for technology upgrades to PEO Aviation force modernization aircraft systems. • 200 Continue to provide test management capability for PEO Aviation Program/Project/Product Managers. • 3 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 2893</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 969 Manage/execute technical and airworthiness qualification mission for PEO Aviation force modernization aircraft systems. • 959 Continue to ensure safety-of-flight investigations/assessments to include PEO Aviation force modernization aircraft systems. 										
Project D092	Page 1 of 2 Pages					Exhibit R-2 (PE 0605606A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605606A Aircraft Certification	PROJECT D092
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FY 2000 Planned Program: (continued)

- 163 Manage/execute the Army Aeronautical Design Standards Program.
 - 720 Provide continuing engineering support for technology upgrades to PEO Aviation force modernization aircraft systems.
 - 210 Continue to provide test management capability for PEO Aviation Program/Project/Product Managers.
- Total 3021

FY 2001 Planned Program:

- 1053 Manage/execute technical and airworthiness qualification mission for PEO Aviation force modernization aircraft systems.
 - 992 Continue to ensure safety-of-flight investigations/assessments to include PEO Aviation force modernization aircraft systems.
 - 174 Manage/execute the Army Aeronautical Design Standards Program.
 - 730 Provide continuing engineering support for technology upgrades to PEO Aviation force modernization aircraft systems.
 - 220 Continue to provide test management capability for PEO Aviation Program/Project/Product Managers.
- Total 3169

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	2828	2924	2935	2976
Appropriated Value	2919	2924		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-91	-31		
b. SBIR / STTR	-71			
c. Omnibus or Other Above Threshold Reductions	-23			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			+86	+193
Current Budget Submit (<u>FY 2000 / 2001 PB</u>)	2734	2893	3021	3169

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605702A Meteorological Support to Research, Development, Testing & Evaluation Activities					PROJECT D128	
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
D128 Meteorological Support to TECOM Activities	6235	6628	6843	6952	6896	7090	7930	8175	Continuing	Continuing
<p>A. <u>Mission Development and Budget Item Justification:</u> Provides standard and specialized weather forecasts and data for test reports to satisfy Army/DoD RDT&E-unique test requirements for modern weaponry, i.e., (1) unique atmospheric analysis and sampling to include atmospheric transmittance, extinction, optical scintillation, infrared temperature, aerosol/smoke cloud dispersion characteristics, ballistic meteorological measurements, snow characterization and crystal structure; (2) unique consultation forecasting to include prediction of sound propagation for ballistic tests, specialized prediction of light level and target to background predictions for electro-optical testing and ballistic meteorology; (3) advisory and warning products such as go-no-go advisories for ballistic and atmospheric probe missiles, smoke obscurant tests, hazard predictions for chemical agent munitions disposal, simulated nuclear blasts, and weather warnings for range/test safety. Provides technical support to Army Program Executive Officers (PEOs), Project Managers (PMs) and the Army test ranges and sites at WSMR, NM, Dugway Proving Ground, UT, Aberdeen Test Center, APG, MD, Redstone Technical Test Center, Huntsville, AL, Electronic Proving Ground, FT Huachuca, AZ, Yuma Proving Ground, AZ, Cold Regions Test Center, AK, FT Belvoir, VA, FT A.P. Hill, VA, CRREL, Hanover, NH, Tooele, UT. Develops methodologies and acquires instrumentation/systems that allow meteorological teams to support current and future Army/DoD RDTE requirements. This PE finances indirect meteorological support operating costs not billable to customers and replacement/upgrade of meteorological instrumentation. Direct costs for meteorological support services are not funded by this PE, but are borne by the customer (i.e. materiel developers and project/product managers).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2920 Provided indirect costs for generating weather forecasts, severe weather warnings/advisories, staff meteorological services, and atmospheric measurements in support of Army/DoD tests and projects at 10 Army sites/test ranges and as safari to off-range test sites. • 2279 Modernized operational equipment to meet customer requirements for meteorological support. <ul style="list-style-type: none"> - Installed Major Range Test Facility Base (MRTFB) Four-Dimensional Weather (4DWX) System at Dugway Proving Ground (DPG), UT. 4DWX is a leading-edge, predictive meteorology system that synthesizes national and real time range meteorology data sets into very high resolution analyses and forecasts (to 1.1Km resolution) in time and space. This capability leads the science of meteorology internationally, and provides unparalleled meteorological test support. - Sustainment of mobile meteorological support systems. - Global Positioning System (GPS) upgrades to upper atmospheric sampling systems. - Installed and evaluated auto-nowcasting (automated and precise forecasting of weather conditions starting “now” and continuing for one hour into the future) at White Sands Missile Range (WSMR), NM. 										
Project D128	Page 1 of 3 Pages					Exhibit R-2 (PE 0605702A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605702A Meteorological Support to Research, Development, Testing & Evaluation Activities	D128
FY 1998 Accomplishments: (continued)		
•	1036 Provided program management for meteorological support to RDTE and technical review/assistance to ranges and meteorological teams. - Weather forecast support systems/data: evaluated initial meteorological data sets for environmental modules to virtual testing. - Purchased Y2K compliant upgrades for seven remote atmospheric profilers. - Initiated installation of "4DWX" at Aberdeen Test Center (ATC), MD.	
Total	6235	
FY 1999 Planned Program:		
•	2258 Provide weather forecast, severe weather/advisories, staff meteorological services, and atmospheric measurements in support of Army/DoD tests and projects at 10 Army sites/test ranges and as safari to off-range test sites.	
•	3237 Modernize operational equipment to meet customer requirements for meteorological support. - Sustainment of mobile systems and atmospheric profilers. - Integrate meteorological instrumentation into MRTFB "4DWX" Weather System at DPG. - Install MRTFB "4DWX" weather system at Redstone Technical Test Center (RTTC), AL, complete "4DWX" installation at ATC.	
•	1077 Provide program management for meteorological support to RDTE and technical review/assistance to ranges and meteorological teams. - Weather forecast support systems/data: Improve/modify data sets for environmental modules to virtual testing.	
•	56 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs	
Total	6628	
FY 2000 Planned Program:		
•	1739 Provide weather forecast, severe weather/advisories, staff meteorological services, and atmospheric measurements in support of Army/DoD tests and projects at 9 Army sites/test ranges and as safari to off-range test sites.	
•	3993 Modernize operational equipment to meet customer requirements for meteorological support. - Upgrade and sustainment of mobile systems and atmospheric sounders/profilers to increase automation (of this labor-intensive manual function), fidelity and reliability. - Continue integration of meteorological instrumentation into MRTFB "4DWX" Weather System at DPG. - Install MRTFB "4DWX" Weather System at Yuma Proving Ground (YPG), AZ and provide system sustainment through contract support.	
•	1111 Provide program management for meteorological support to RDTE and technical review/assistance to ranges and meteorological teams. - Weather forecast support systems/data: Improve/modify data sets for environmental modules to virtual testing.	
Total	6843	
Project D128	<i>Page 2 of 3 Pages</i>	Exhibit R-2 (PE 0605702A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605702A Meteorological Support to Research, Development, Testing & Evaluation Activities	PROJECT D128

FY 2001 Planned Program:

- 1808 Provide weather forecast, severe weather/advisories, staff meteorological services, and atmospheric measurements in support of Army/DoD tests and projects at 10 Army test sites/ranges and as safari to off-range test sites.
- 2488 Modernize operational equipment to meet customer requirements for meteorological support.
 - Upgrade and sustainment of mobile systems and atmospheric sounders/profilers to increase reliability and programmed manpower reductions.
 - Upgrade "4DWX" supporting instrumentation to support upgraded model requirements.
- 2656 Provide program management for meteorological support to RDTE and technical review/assistance to ranges and meteorological teams.
 - Weather forecast support systems/data: Improve/modify data sets for environmental modules for virtual testing.
 - Install a dedicated "4DWX" support contract.

Total 6952

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	6235	6691	6712	6911
Appropriated Value	6434	6691		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-199	-63		
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reduction				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			+131	+41
Current Budget Submit (FY 2000/2001 PB)	6235	6628	6843	6952

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605706A Materiel Systems Analysis
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	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	27120	9617	8796	8718	6672	6582	6504	6829	Continuing	Continuing
M541 Materiel Systems Analysis	8715	9617	8796	8718	6672	6582	6504	6829	Continuing	Continuing
M542 Major Systems Test, Design and Evaluation	18405	0	0	0	0	0	0	0	0	18405

A. Mission Description and Budget Item Justification: The U.S. Army Materiel Systems Analysis Activity (AMSAA), as the Army's center for materiel systems analysis, provides the technical capability for the conduct of materiel systems analysis in support of Army decision makers throughout the materiel acquisition process. AMSAA responds with analyses required by the decision makers of the Army and the Department of Defense (DoD), the Program Executive Officers/Program Managers (PEO/PM), the Army's Independent Evaluator (Operational Test and Evaluation Command), and the Army analytical community.

In accomplishing its Materiel Systems Analysis Mission, AMSAA analyzes the performance and combat effectiveness of conceptual, developmental, and existing systems. AMSAA conducts and supports systems analyses, such as: analyses of alternatives (AoAs), system cost/performance tradeoffs, early technology tradeoffs, weapons mix analyses, and requirements analyses. These analyses are used by the Army Materiel Command (AMC) and Department of Army (DA) leadership in making acquisition, procurement, and logistic decisions in order to provide quality equipment and procedures to the soldiers. AMSAA provides Army-wide support in the development of methodologies, models, simulations, and databases for use in its and other Army agencies' analyses. AMSAA supports the Army modeling and simulation (M&S) community by providing item level performance methodology/data, and standardized algorithms. AMSAA is the Army's designated source of item level performance data and, as such, develops, maintains, and provides a diverse range of data for its and other Army and DoD agencies' analyses. AMSAA is the Army's executive agent for the verification, validation, and accreditation of item level performance models and for the Research, Development and Acquisition (RDA) domain as part of the Army's M&S Management Structure. AMSAA also develops reliability, availability, and maintainability (RAM) methodologies for use in its and other Army agencies' analyses.

FY 1998 funding in Project M542 supports the Army's independent technical evaluation role transferred from AMSAA to the Evaluation Analysis Center (EAC) under the U.S. Army Operational Test and Evaluation Command (OPTEC) as part of the Army consolidation of materiel evaluation. In the role of the independent technical evaluator, EAC provides the technical input to the single System Evaluation Report (SER) for Army acquisition programs. EAC provides technical evaluations for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive. EAC designs technical, developmental, and production tests to address factors pertinent to the decision process, such as: technical maturity, technical risk, technical system performance, producibility, supportability, etc. EAC conducts technical assessments for milestone acquisition evaluations of system tests (e.g. performance, reliability, availability, and maintainability assessments). EAC has a lead role in the planning and execution of the Army Live Fire Tests through its test design and evaluation responsibilities. The Operational Evaluation Command (OEC) under OPTEC transferred from the Operations and Maintenance, Army (OMA) appropriation into Project M542 in FY 1998. OEC plans and conducts independent operational evaluations to determine and report the effectiveness and suitability of Army systems in support of the OPTEC test and evaluation role in Army acquisition and force

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605706A Materiel Systems Analysis
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development. OEC is responsible for operational T&E and continuous evaluation of assigned Major Defense Acquisition Programs (MDAP), Major Automated Information Systems Review Council (MAISRC) programs, and In-Process Reviews (IPR).

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	27755	9711	9736	11155
Appropriated Value	29707	9711		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1952	-94		
b. SBIR / STTR	-477			
c. Omnibus or Other Above Threshold Reductions	-158			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB	-635		-940	-2437
Current Budget Submit (FY 2000 / 2001 PB)	27120	9617	8796	8718

Change Summary Explanation: Funding: FY2000 (-940) and FY2001 (-2437) reductions to the AMSAA mission were due to the funding of other higher priority Army requirements.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605706A Materiel Systems Analysis				PROJECT M541		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M541 Materiel Systems Analysis	8715	9617	8796	8718	6672	6582	6504	6829	Continuing	Continuing
<p>Mission Description and Justification: Project M541 funds the Army Materiel Systems Analysis Activity's (AMSAA) primary mission of materiel systems analysis. In accomplishing its Materiel Systems Analysis Mission, AMSAA analyzes the performance and combat effectiveness of conceptual, developmental, and existing systems. AMSAA conducts and supports systems analyses, such as: analyses of alternatives (AoAs), system cost/performance tradeoffs, early technology tradeoffs, weapons mix analyses, and requirements analyses. These analyses are used by the Army Materiel Command (AMC) and Department of Army (DA) leadership in making acquisition, procurement, and logistic decisions in order to provide quality equipment and procedures to the soldiers. AMSAA provides Army-wide support in the development of methodologies, models, simulations, and databases for use in its and other Army agencies' analyses. AMSAA supports the Army modeling and simulation (M&S) community by providing item level performance methodology/data, and standardized algorithms. AMSAA is the Army's designated source of item level performance data and, as such, develops, maintains, and provides a diverse range of data for its and other Army and DoD agencies' analyses. AMSAA is the Army's executive agent for the verification, validation, and accreditation of item level performance models and for the Research, Development and Acquisition (RDA) domain as part of the Army's M&S Management Structure. AMSAA also develops reliability, availability, and maintainability (RAM) methodologies for use in its and other Army agencies' analyses. This project funds the salaries of civilian employees assigned to the materiel system analysis mission.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> 8715 Developed and certified system performance data for U.S. and foreign systems used to support Army and Joint AoAs, force structure studies and theater level studies. Examples of programs where decisions were influenced: Army Tactical Missile System (ATACMS), Future Scout and Cavalry System (FSCS), and Follow-On-To-TOW (FOTT). Analyzed the performance and combat effectiveness of materiel systems and tech base programs in support of HQDA, AMC, PEOs/ PMs and R&D Centers. Included were conduct of and support to: cost and operational effectiveness analyses, analyses of alternatives, system cost/performance tradeoffs, early technology tradeoffs, weapons mix analyses, requirements analyses, technology insertion, and technology base analyses. Examples of programs where decisions were influenced: Grizzly, ATACMS, FOTT, Battlefield Identification, Military Operations in Urban Terrain (MOUT), Force XXI Battle Command Brigade and Below (FBCB2), and FSCS. Developed, modified, and maintained item level methodology used in tools to conduct systems analysis. Examples of such tools are: Ground Wars Model, Extended Air Defense Simulation, Virtual Proving Ground, and Close Combat Tactical Trainer. Developed methodologies (search and target acquisition) to characterize the performance and combat effectiveness of new technologies in force-on-force analyses. Performed verification and validation of item level performance models and methodologies which will be developed in-house. Funding supported approximately 100 civilians to include salary, benefits, and all other support costs (e.g., training, TDY, ...). <p>Total 8715</p>										
Project M541	Page 3 of 7 Pages					Exhibit R-2A (PE 0605706A)				

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY 6 - Management and Support		February 1999
PE NUMBER AND TITLE 0605706A Materiel Systems Analysis		PROJECT M541
FY 1999 Planned Program:		
•	9556	Develop and certify system performance data for U.S. and foreign systems to be used to support Army and Joint A0As, force structure studies and theater level studies. Examples of programs where decisions will be influenced: FSCS, Comanche, and Crusader. Analyze the performance and combat effectiveness of materiel systems and tech base programs in support of HQDA, AMC, PEOs/ PMs and R&D Centers. Included are conduct of and support to: AoAs, system cost/performance tradeoffs, early technology tradeoffs, weapons mix analyses, requirements analyses, technology insertion, and technology base analyses. Examples of programs where decisions will be influenced: Future Combat System (FCS), Bradley Fighting Vehicle System A3 (BFVS A3), Crusader, PATRIOT Advanced Capability-3 (PAC-3), and Grizzly. Develop, modify, and maintain item level methodology used in tools to conduct systems analysis. Examples of such tools are: Ground Wars Model, Extended Air Defense Simulation, and Modular Semi-Automated Force (ModSAF). Develop methodologies (e.g., command, control, and communications (C3)) to characterize the performance and combat effectiveness of new technologies in force-on-force analyses. Perform verification and validation of item level performance models and methodologies which will be developed in-house. Funding will support approximately 106 civilians to include salary, benefits, and all other support costs (e.g., training, TDY, ...).
•	61	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	9617	
FY 2000 Planned Program:		
•	8796	Develop and certify system performance data for U.S. and foreign systems to be used to support Army and Joint A0As, force structure studies and theater level studies. Examples of programs where decisions will be influenced: FSCS, Comanche, and Crusader. Analyze the performance and combat effectiveness of materiel systems and tech base programs in support of HQDA, AMC, PEOs/ PMs and R&D Centers. Included are conduct of and support to: AoAs, system cost/performance tradeoffs, early technology tradeoffs, weapons mix analyses, requirements analyses, technology insertion, and technology base analyses. Examples of programs where decisions will be influenced: Land Warrior, FCS, FSCS, and Comanche. Develop, modify, and maintain item level methodology used in tools to conduct systems analysis. Examples of such models are: Ground Wars Model, Evaluation of Air Defense Effectiveness. Develop methodologies to characterize the performance and combat effectiveness of new technologies in force-on-force analyses. Perform verification and validation of item level performance models and methodologies which will be developed in-house. Funding will support approximately 90 civilians to include salary, benefits, and all other support costs (e.g., training, TDY, ...).
Total	8796	
FY 2001 Planned Program:		
•	8718	Develop and certify system performance data for U.S. and foreign systems to be used to support Army and Joint A0As, force structure studies and theater level studies. Examples of programs where decisions will be influenced: FSCS and Comanche. Analyze the performance and combat effectiveness of materiel systems and tech base programs in support of HQDA, AMC, PEOs/ PMs and R&D Centers. Included are conduct of and
Project M541		
Page 4 of 7 Pages		
Exhibit R-2A (PE 0605706A)		

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605706A Materiel Systems Analysis	M541
<p>support to: AoAs, system cost/performance tradeoffs, early technology tradeoffs, weapons mix analyses, requirements analyses, technology insertion, and technology base analyses. Examples of programs where decisions will be influenced: FCS, FSCS, and Comanche. Develop, modify, and maintain</p> <p>FY 2001 Planned Program: (continued) item level methodology used in tools to conduct systems analysis, such as, Ground Wars. Develop methodologies to characterize the performance and combat effectiveness of new technologies in force-on-force analyses. Perform verification and validation of item level performance models and methodologies which will be developed in-house. Funding will support approximately 88 civilians to include salary, benefits, and all other support costs (e.g., training, TDY, ...).</p> <p>Total 8718</p>		
Project M541	Page 5 of 7 Pages	Exhibit R-2A (PE 0605706A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605706A Materiel Systems Analysis				PROJECT M542		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M542 Major Systems Test, Design and Evaluation	18405	0	0	0	0	0	0	0	0	18405
<p>Mission Description and Justification Project M542 supported the Army consolidation of the materiel evaluation function under the U.S. Army Operational Test and Evaluation Command (OPTEC), including the realignment of the Operational Evaluation Command (OEC) previously funded in the Operations and Maintenance, Army (OMA) appropriation. Beginning in FY 1999 this funding was restructured to PE 0605716A, Army Evaluation Center. This realignment completes the consolidation of Army evaluation. In FY 1998, Project M542 supported the OPTEC mission of evaluation and test design. This mission is shared by the Evaluation Analysis Center (EAC) and OEC, both subordinate commands to OPTEC. OPTEC provides integrated technical and operational evaluations and continuous evaluation of assigned Major Defense Acquisition Programs (MDAPs), Major Automated Information Systems Review Council (MAISRC), and In-Process Review (IPR) programs for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. OPTEC develops the evaluation strategy, designs technical and operational tests, and evaluates the test results to address the effectiveness, suitability, and survivability factors pertinent to the decision process, such as: Critical Operational Issues and Criteria (COIC), system performance, soldier survivability, performance in countermeasures, survivability, reliability, supportability, etc. OPTEC has a lead role in the planning and execution of the Army live fire tests through its evaluation and test design responsibilities. This project funded the salaries of civilian employees assigned to the evaluation and test design missions and associated costs including temporary duty, support contracts, supplies and equipment. This project did not finance test facility operations, test instrumentation or test equipment.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> 18405 Prepared integrated System Evaluation Plans (SEPs) and conducted integrated technical and operational evaluations and continuous evaluations of all Army weapon systems. Provided test designs and evaluations for weapon systems throughout the entire research and development of a system or those undergoing major materiel change. System evaluations provided input to program milestone decision reviews during FY 98. Developed test design and evaluation plans for tests to be conducted in FY 99 through FY 03. These efforts included evaluation and test design planning for systems projected to undergo live fire testing in FY 99-00. Early planning and analysis assured early identification of requirements for long lead procurement of experimental/prototype equipment or test instrumentation and integration of developmental and operational evaluations to support accelerated acquisition and technology transition programs. Major efforts included: Combat Service Support Control System (CSSCS); Force XXI Battle Command Brigade and Below (FBCB2); Army Tactical Missile System Block II (ATACMS Blk II); Bradley Fighting Vehicle System (BFVS); Extended Range – Multiple Launch Rocket System (ER-MLRS); Bradley Fire Support Team (BFIST); Command and Control Vehicle(C2V); Wide Area Munition (WAM) system; Army Tactical Missile System Block II/Brilliant Anti-armor Tank Pre-Planned Product Improvement (ATACMS BLK II/BAT-P3I); Search and Destroy Armor (SADARM); Advanced Field Artillery Tactical Data System (AFATDS); All Source Analysis System (ASAS); Battlefield Combat Identification System (BCIS); Close Combat Tactical Trainer (CCTT); Crusader; Forward Area Air Defense (FAAD- 										
Project M542	Page 6 of 7 Pages					Exhibit R-2A (PE 0605706A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605706A Materiel Systems Analysis	M542
C2I); Joint Stars; Joint Tactical Information Distribution System (JTIDS); Comanche; Long Bow Apache; Suite of Integrated Infrared Countermeasures (SIIRCM); Secure, Mobile, Anti-jam, Reliable, Tactical Terminal (SMART-T); and Tactical Unmanned Aerial Vehicle – Tactical Computer System (TUAV-TCS). Effort included costs for 166 civilian authorizations.		
Total	18405	
FY 1999 Planned Program: Project restructured to PE 0605716A.		
FY 2000 Planned Program: Project restructured to PE 0605716A..		
FY 2001 Planned Program: Project restructured to PE 0605716A.		
Project M542	Page 7 of 7 Pages	Exhibit R-2A (PE 0605706A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605709A Exploitation of Foreign Items
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	7277	4004	4143	3605	3538	3515	3659	3635	Continuing	Continuing
D650 Exploitation of Foreign Items	3135	0	0	0	0	0	0	0	0	3135
DC28 Acquisition/Exploitation of Threat Items	4142	4004	4143	3605	3538	3515	3659	3635	Continuing	Continuing

A. Mission Description and Budget Item Justification: This is a continuing project for acquisition and exploitation of foreign materiel to support force and materiel development, scientific and technical intelligence needs, operations and training. Primary program objectives are to reduce research and development times for U.S. systems by analyzing innovations and technology in foreign materiel, and to make research and development more efficient by reducing uncertainties concerning potential advanced technology threats to U.S. systems. The program also serves to develop counter measures and to support operational commanders with items for training the force. This program enables the Army to conserve research and development funds and man-hours, enhance and improve U.S. designs, and provide realistic testing and training. These projects fund foreign materiel acquisitions and exploitations in support of the U.S. Army testing, training and intelligence.

B. Program Change Summary	FY 1998	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 1999 PB)	7523	4031	3918	3794
Appropriated Value	7762	4031		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-239	-27		
b. SBIR / STTR	-185			
c. Omnibus or Other Above Threshold Reductions	-61			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+225	-189
Current Budget Submit (FY 2000/2001 PB)	7277	4004	4143	3605

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605709A Exploitation of Foreign Items				PROJECT D650		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D650 Exploitation of Foreign Items	3135	0	0	0	0	0	0	0	0	3135
<p>Mission Description and Justification: Project D650 - Exploitation/Evaluation of Foreign Items: This project affords the Army's research and development (R&D) community an opportunity to acquire and exploit/evaluate worldwide leading edge technologies. This exploitation/evaluation of foreign technological capabilities is required in order to prevent technological surprise, eliminate or compress the R&D time cycle, contribute to R&D cost avoidance, enhance U.S. system and program designs, and to explore non-developmental items.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1300 Continued on-going project evaluations and exploitations identified prior to FY 1998. • 1100 Planned new start FY 1998 acquisitions of 24 projects. • 735 Planned new start FY 1998 evaluations and exploitations of foreign materiel and /or technologies. <p>Total 3135</p> <p>FY 1999 Planned Program: Project is not funded in FY 1999.</p> <p>FY 2000 Planned Program: Project is not funded in FY 2000.</p> <p>FY 2001 Planned Program: Project is not funded in FY 2001.</p>										
Project D650			<i>Page 2 of 3 Pages</i>				Exhibit R-2A (PE 0605709A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605709A Exploitation of Foreign Items					PROJECT DC28	
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC28 Acquisition/Exploitation of Threat Items	4142	4004	4143	3605	3538	3515	3659	3635	Continuing	Continuing
<p>Mission Description and Justification: Project DC28 - Acquisition/Exploitation of Threat Items: This is a continuing project for acquisition and exploitation of foreign materiel constituting potential advanced technology threats to U.S. systems. The primary aim of this project is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties concerning these threats. The project also answers general scientific and technical intelligence requirements, aids in the development of countermeasures to threat materiel and threat technology, and provides materiel for realistic testing and training. Acquisitions and exploitations are executed according to an Army Foreign Materiel Review Board and with the approval of the Army Deputy Chief of Staff for Intelligence (DCSINT).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 565 Acquired threat systems identified and prioritized in the FY 1998 Army Foreign Materiel Program (FMP) Five Year Plan. • 2577 Initiated, continued or completed exploitation projects on ground systems of Army interest identified in the FY 1998 Army FMP Exploitation Plan. • 1000 Initiated, continued or completed exploitation projects on missile systems of Army interest identified in the FY 1998 Army FMP Exploitation Plan. <p>Total 4142</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 900 Acquire threat systems identified and prioritized in the FY 1999 Army Foreign Materiel Program (FMP) Five Year Plan. • 2098 Initiate, continue, or complete exploitation projects on ground systems of Army interest identified in the FY 1999 Army FMP Exploitation Plan. • 900 Initiate, continue, or complete exploitation projects on missile systems of Army interest identified in the FY 1999 Army FMP Exploitation Plan. • 106 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 4004</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 800 Acquire threat systems identified and prioritized in the FY 2000 Army Foreign Materiel Program (FMP) Five Year Plan. • 2400 Initiate, continue, or complete exploitation projects on ground systems of Army interest identified in the FY 2000 Army FMP Exploitation Plan. • 943 Initiate, continue, or complete exploitation projects on missile systems of Army interest identified in the FY 2000 Army FMP Exploitation Plan. <p>Total 4143</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 600 Acquire threat systems identified and prioritized in the FY 2001 Army Foreign Materiel Program (FMP) Five Year Plan. • 2258 Initiate, continue, or complete exploitation projects on ground systems of Army interest identified in the FY 2001 Army FMP Exploitation Plan. • 747 Initiate, continue, or complete exploitation projects on missile systems of Army interest identified in the FY 2001 Army FMP Exploitation Plan. 										
Project DC28			Page 3 of 3 Pages				Exhibit R-2A (PE 0605709A)			

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BUDGET ACTIVITY
6 - Management and Support

PE NUMBER AND TITLE
0605709A Exploitation of Foreign Items

Total 3605

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing
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COST <i>(In Thousands)</i>	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	74656	65460	68946	69038	71743	75872	76024	79899	Continuing	Continuing
DV02 Test Directorates	34158	40620	43202	44037	46540	48227	47870	49654	Continuing	Continuing
D001 OPTEC IOTE	19921	20041	19799	18954	18703	21010	20595	21922	Continuing	Continuing
D985 Concepts Evaluations of Materiel	15681	0	0	0	0	0	0	0	0	15681
D987 OPTEC Instrumentation & Development	4896	4799	5945	6047	6500	6635	7559	8323	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program funds the operational testing of developmental materiel systems. Project DV02 provides for the recurring costs of operating the test activities of the U.S. Army Operational Test and Evaluation Command (OPTEC). Project D001 provides for direct operational and joint test costs incurred by OPTEC including Multi-Service, Army After Next (AAN), First Digitized Division and Automated Information Systems (AIS). Excludes funding for Acquisition Category I (ACAT I) major weapon and Automated Information Systems, which are programmed within the PE funding development for each system. Project D985 enables U.S. Army Training and Doctrine Command (TRADOC) battle labs and schools to evaluate emerging technologies and other equipment to help define Army mission needs and operational requirements. Projects selected for funding are relatively low cost conceptual evaluations, with high potential for warfighting return on investment. Program provides direct support to battle lab minor Advanced Warfighting Experiments (AWEs). Program is also a first look at emerging technologies that have the potential to support the Army's Force XXI design needs. Project D987 provides for development and acquisition of non-major and sustaining instrumentation necessary to attain and maintain the data collection and analysis capability to conduct credible and robust operational tests as demanded by the DoD and Congress. It provides for replacement and improvements of existing obsolete inventory and for the development of new technologies to keep abreast of new weapon advancements.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

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BUDGET ACTIVITY
6 - Management and Support

PE NUMBER AND TITLE
0605712A Support of Operational Testing

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	76807	66320	64156	57651
Appropriated Value	81672	66320		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-4865	-860		
b. SBIR / STTR	-1617			
c. Omnibus or Other Above Threshold Reductions	-534			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+4790	+11387
Current Budget Submit (FY 2000 / 2001 PB)	74656	65460	68946	69038

Change Summary Explanation:

Funding: FY 2000 funding was increased to correct a shortfall in Project D001 OPTEC IOTE to fund Multi-Service Joint Tests, including: Joint Warfighter, Joint Theater Distribution , Joint Close Air Support, Joint Shipboard Helicopter Integration Process, Joint Cruise Missile Defense, Joint Electronic Combat Test Using Simulation, Joint Suppression of Enemy Air Defense, Live Fire Exercise, and Joint Missile Alert Broadcast.

Funding: FY 2001 funding was increased to correct a shortfall in Project DV02 and a shortfall in Project D001 to fund Warfighters' Simulation 2000, Battlefield Combat Identification System, Airborne Reconnaissance Low, Tactical Unmanned System, Unmanned Aerial Vehicle Payloads and IEW Tactical Proficiency Trainer Directorates.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605712A Support of Operational Testing				PROJECT DV02		
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
DV02 Test Directorates	34158	40620	43202	44037	46540	48227	47870	49654	Continuing	Continuing
<p>Mission Description and Justification: This project finances recurring costs, including civilian pay, support contracts, temporary duty, supplies and equipment of subordinate elements of the Test and Experimentation Command (TEXCOM): Airborne and Special Operations Test Directorate, Fort Bragg, NC; Air Defense Test Directorate, Fort Bliss, TX; Fire Support Test Directorate, Fort Sill, OK; and the Intelligence and Electronic Warfare Test Directorate, Fort Huachuca, AZ, and test directorates located at Fort Hood, TX (Aviation; Close Combat; Engineer/Combat Support; Command, Control, and Communications; Information Mission Area; Advanced Concepts). The primary mission of these test directorates is to conduct operational testing of developmental materiel and force development test and experimentation (FDTE). The FY 1998 program included the transfer of manpower and funds for the Test and Evaluation Coordination Offices (TECOs), Operational Threat Support Activity (OTSA), Test and Evaluation Support Activity and other test support from the OMA appropriation. Increase in FY 1999 completes the transfer of manpower and funds for OTSA and test support from the OMA appropriation.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 15675 Operational costs including 175 civilian authorizations at Fort Hood, TX Test Directorates (includes Test and Evaluation Support Activity) • 2353 Operational costs including 28 civilian authorizations at Fort Sill, OK Test Directorate • 2993 Operational costs including 35 civilian authorizations at Fort Huachuca, AZ Test Directorate • 2412 Operational costs including 40 civilian authorizations at Fort Bragg, NC Test Directorate • 2975 Operational costs including 38 civilian authorizations at Fort Bliss, TX Test Directorate • 6183 Operational costs including 9 civilian authorizations at Operational Threat Support Activity, Fort Bliss, TX • 1567 Operational costs including 18 civilian authorizations at Test and Evaluation Coordination Offices <p>Total 34158</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 17033 Operational costs including 161 civilian authorizations at Fort Hood, TX Test Directorates (includes Test and Evaluation Support Activity) • 2488 Operational costs including 28 civilian authorizations at Fort Sill, OK Test Directorate • 3162 Operational costs including 34 civilian authorizations at Fort Huachuca, AZ Test Directorate • 2523 Operational costs including 40 civilian authorizations at Ft. Bragg, NC Test Directorate • 3171 Operational costs including 37 civilian authorizations at Fort Bliss, TX Test Directorate • 10367 Operational costs including 18 civilian authorizations at Operational Threat Support Activity, Fort Bliss, TX • 1557 Operational costs including 18 civilian authorizations at Test and Evaluation Coordination Offices • 319 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 40620</p>										
Project DV02			Page 3 of 15 Pages				Exhibit R-2A (PE 0605712A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT DV02
FY 2000 Planned Program:		
•	17892 Operational costs including 161 civilian authorizations at Fort Hood, TX Test Directorates (includes Test and Evaluation Support Activity)	
•	2604 Operational costs including 28 civilian authorizations at Fort Sill, OK Test Directorate	
•	3327 Operational costs including 34 civilian authorizations at Fort Huachuca, AZ Test Directorate	
•	2683 Operational costs including 40 civilian authorizations at Fort Bragg, NC Test Directorate	
•	3319 Operational costs including 37 civilian authorizations at Fort Bliss, TX Test Directorate	
•	11696 Operational costs including 18 civilian authorizations at Operational Threat Support Activity, Fort Bliss, TX	
•	1681 Operational costs including 18 civilian authorizations at Test and Evaluation Coordination Offices	
Total	43202	
FY 2001 Planned Program:		
•	18430 Operational costs including 161 civilian authorizations at Fort Hood, TX Test Directorates (includes Test and Evaluation Support Activity)	
•	2669 Operational costs including 28 civilian authorizations at Fort Sill, OK Test Directorate	
•	3383 Operational costs including 34 civilian authorizations at Fort Huachuca, AZ Test Directorate	
•	2718 Operational costs including 40 civilian authorizations at Fort Bragg, NC Test Directorate	
•	3364 Operational costs including 37 civilian authorizations at Fort Bliss, TX Test Directorate	
•	11748 Operational costs including 18 civilian authorizations at Operational Threat Support Activity, Fort Bliss, TX	
•	1725 Operational costs including 18 civilian authorizations at Test and Evaluation Coordination Offices	
Total	44037	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605712A Support of Operational Testing				PROJECT D001		
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
D001 OPTEC IOTE	19921	20041	19799	18954	18703	21010	20595	21922	Continuing	Continuing
<p>Mission Description and Justification: This project funds the direct costs of planning and conducting operational testing on major and non-major materiel systems (ACAT II-IV), including Multi-Service systems (all ACATs), Joint Tests (JT), Army After Next (AAN), First Digitized Division (FDD) and Automated Information Systems (AIS). It funds those costs directly attributable to conducting early user tests and evaluations (EUTE), limited user tests (LUT), or initial operational tests and evaluations (IOTE) on major and non-major materiel systems. Test funding for ACAT I systems is programmed within the PE funding the development of each system. Operational testing is conducted under conditions as close as possible to those encountered in actual combat with typical user troops trained to employ the system. OPTEC provides Army leadership with an independent test and evaluation of effectiveness, suitability, and survivability of the system.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2 ASCIET 97 (JT) - All Services Combat Identification Evaluation Team • 54 MICAD (IOTE) – Multipurpose Integrated Chemical Agent Alarm • 23 TYQ-69, CCS (IOTE) – AN/TYQ-69 Communication Control Set • 2 P3I BIDS (IOTE) – Pre-Planned Product Improvement, Biological Integrated Detection System • 2912 FBCB2 (LUTE) – Force XXI Battle Command, Brigade and Below • 2327 FBCB2 (IOTE) – Force XXI Battle Command, Brigade and Below • 715 LW (IOTE) - Land Warrior • 5 SEP 97-1 (IOTE) – SHORTSTOP Electronic Protection System • 10 CHATS (DT/OT) – Counter-Intelligence HUMINT Automated Tool Set • 465 BIDS P3I (LUT) – Biological Integrated Detection System Pre-Planned Product Improvement • 80 JWF (JT) - Joint Warfighter • 3 JECSIM (JT) – Joint Electronic Combat Test Using Simulation • 20 JADS ETE PH II (JT) – Joint Advanced Distributed Simulation Phase II • 320 JSEAD LIVEX 98 (JT) – Joint Suppression of Enemy Air Defense • 1191 JCSAR (JT) – Joint Combat Search and Rescue • 524 JCALS (IOTE) – Joint Computer-aided Acquisition and Logistic Support • 186 ECV (LUT) – Expanded Capability Vehicle • 22 LRAS3 ((IOTE) – Long Range Scout Surveillance System • 2234 ISYSCON (IOTE) – Integrated System Control • 448 PKG 11 – AFATDS (LUT) – Package 11 – Advanced Field Artillery Tactical Data System 										
Project D001			Page 5 of 15 Pages				Exhibit R-2A (PE 0605712A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT D001
FY 1998 Accomplishments: (continued)		
•	65 SIRFC (DT/OT) – Suite Integrated Radio Frequency Countermeasures	
•	35 RSCCE (IOTE) – Replacement Satellite Configuration Control Element	
•	1 IVMMD (IOTE) – Interim Vehicle Mounted Mine Detector	
•	119 IFCS ESIT (LUT) – Improved Fire Control System Extended System Integration Test	
•	2944 CCTT (IOTE) – Close Combat Tactical Trainer	
•	24 USL (IOTE) – Universal Static Line	
•	213 LADS (EU) – Laundry Advanced System	
•	62 HAB (IOTE) – Heavy Assault Bridge	
•	19 SSP (IOTE) – Strategic Sealift Program	
•	10 CSEL (IOTE) – Combat Survivor Evader Locator	
•	946 GBCS-LIGHT (IOTE) – Ground Based Common Sensor-Light	
•	77 AMPS (IOTE) – Aviation Mission Planning System	
•	47 UH-60Q (IOTE) – Utility Helicopter 60Q	
•	1 MDS (IOTE) – Modular Decontamination System	
•	70 JTT (IOTE) – Joint Tactical Terminal	
•	3 CBPS (IOTE) – Chemically and Biologically Protected Shelter	
•	645 MICAD PH II (IOTE) – Multipurpose Integrated Chemical Agent Alarm, Phase II	
•	1 IMBC (LUT) – Improved Mortar Ballistic Computer	
•	379 NBCRS (LUT) – Nuclear, Biological and Chemical Reconnaissance System	
•	509 ASV (IOTE) – Armored Security Vehicle	
•	46 CABS UH-60 (IOTE) – Cockpit Airbag System UH-60	
•	4 JSLIST ((IOTE) – Joint Service Lightweight Integrated Suit Technology	
•	150 ATNAVICS (DT/OT) – Air Traffic Navigation, Integration and Coordination System	
•	128 JCALS (LUT) – Joint Computer-aided Acquisition and Logistics Support	
•	21 ER-MLRS (IOTE) – Extended Range – Multiple Launch Rocket System	
•	1198 M270A1 (IOTE) – M270A1 Multiple Launch Rocket System	
•	222 SOFTACS/STAR-T (IOTE) – Special Operations Forces Tactical Assured Connectivity System/SHF Tri-Band	
•	8 BFIST (XM7) (IOTE) – Bradley Fire Support Team (XM7)	
•	3 MACS (IOTE) – Modular Artillery Charge System	
•	52 UAV TCS (IOTE) – Unmanned Aerial Vehicle Tactical Control System	
•	2 CP LR-BSDS (IOTE) – Counterproliferation Long Range Biological Standoff Detection System	
•	2 JBPDS (IOTE) – Joint Biological Point Detection System	
Project D001	<i>Page 6 of 15 Pages</i>	Exhibit R-2A (PE 0605712A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT D001
FY 1998 Accomplishments: (continued)		
•	5 SEPS (IOTE) – Shortstop Electronic Protection System	
•	156 NAVWAR GPS (IOTE) – Navigation Warfare Global Positioning System	
•	2 NTDR (IOTE) – Near Term Digital Radio	
•	176 GRCS SYS II (LUT) – Guardrail/Common Sensor System II	
•	1 JCAD (IOTE) – Joint Chemical Agent Detector	
•	1 JLSCAD (IOTE) – Joint Services Lightweight Stand-off Chemical Agent Detector	
•	2 HDSB (IOTE) – Heavy Dry Support Bridge	
•	1 FF (EUTE) – Fire Finder AN/TPQ-39	
•	10 C130J (IOTE) – C130J Airdrop Qualification	
•	13 M270 ESIT (LUT) – M270A1 Multiple Launch Rocket System, Extended System Integration Test	
•	5 C2V (IOTE) – Command and Control Vehicle	
Total	19921	
FY 1999 Planned Program:		
•	1973 FBCB2 (IOTE) – Force XXI Battle Command, Brigade and Below	
•	231 C130 J (IOTE) – C130J Airdrop Qualification	
•	2077 LRAS3 (IOTE) – Long Range Advanced Scout Surveillance System	
•	1156 PKG 11 – AFATDS (LUT) – Package 11 - Advanced Field Artillery Tactical Data System	
•	2651 SSP (IOTE) – Strategic Sealift Program	
•	1625 JWF (JT) – Joint Warfighter	
•	537 JTD (JT) – Joint Theater Distribution	
•	305 JCAS (JT) – Joint Close Air Support	
•	350 JSHIP (JT) – Joint Shipboard Helicopter Integration Process	
•	250 JECSIM (JT) - Joint Electronic Combat Test Using Simulation	
•	2 JADS ETE PH IV (JT) – Joint Advanced Distributed Simulation End-to-End Test Phase IV	
•	5 JADS ETE PH III (JT) – Joint Advanced Distributed Simulation End-to-End Test Phase III	
•	510 JSEAD LIVEX (JT) – Joint Suppression of Enemy Air Defense, Live Fly Exercise	
•	5 JCSAR (JT) – Joint Combat Search and Rescue	
•	471 A2C2S (IOTE) – Army Airborne Command and Control System	
•	106 AMPS (IOTE) – Aviation Mission Planning System	
•	614 ASV (IOTE) – Armored Security Vehicle	
•	81 SIRFC (DT/OT) – Suite Integrated Radio Frequency Countermeasures	
Project D001	Page 7 of 15 Pages	Exhibit R-2A (PE 0605712A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	
		PROJECT D001
FY 1999 Planned Program: (continued)		
•	346 ATNAVICS (DT/OT) – Air Traffic Navigation, Integration and Coordination System	
•	64 LW (LUT) – Land Warrior	
•	78 JTAGS (DT/OT) – Joint Tactical Ground Station	
•	2133 ER-MRLS (IOTE) – Extended Range – Multiple Launch Rocket System	
•	3053 M270A1 (IOTE) - M270A1 Multiple Launch Rocket System	
•	332 M270A1 MIFEX (LUT) - M270A1 Multiple Launch Rocket System	
•	407 M270A1 ESIT (LUT) - M270A1 Multiple Launch Rocket System	
•	148 MACS (IOTE) – Modular Artillery Charge System	
•	531 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs	
•		
Total	20041	
FY 2000 Planned Program:		
•	119 SSP (IOTE) – Strategic Sealift Program	
•	7182 FBCB2 (IOTE) – Force XXI Battle Command, Brigade and Below	
•	68 ER-MLRS (IOTE) – Extended Range-Multiple Launch Rocket System	
•	310 M270A1 (IOTE) – M270A1 Multiple Launch Rocket System	
•	107 MACS (IOTE) – Modular Artillery Charge System	
•	163 CK (DT/OT) – Containerized Kitchen	
•	400 TC-AIMS-II (IOTE) – Transportation Coordinator’s Automated Information for Movement System II	
•	1196 A2C2S (IOTE) – Army Airborne Command and Control System	
•	147 AMPS (IOTE) – Aviation Mission Planning System	
•	3426 SIRFC (IOTE) – Suite of Integrated Radio Frequency Countermeasures	
•	449 SIRFC (LUT) – Suite of Integrated Radio Frequency Countermeasures	
•	1450 LW (LUT) – Land Warrior	
•	1425 JWF (JT) – Joint Warfighter	
•	570 JTD (JT) – Joint Theater Distribution	
•	605 JCAS (JT) – Joint Close Air Support	
•	650 JSHIP (JT) – Joint Shipboard Helicopter Integration Process	
•	10 JCMD (JT) – Joint Cruise Missile Defense	
•	2 JECSIM (JT) – Joint Electronic Combat Test Using Simulation	
•	510 JSEAD LIVEX (JT) – Joint Suppression of Enemy Air Defense, Live Fly Exercise	
•	1000 JMABS (JT) – Joint Missile Alert Broadcast System	
Project D001	Page 8 of 15 Pages	Exhibit R-2A (PE 0605712A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT D001
FY 2000 Planned Program: (continued)		
•	10 GPS-JBE (JT) – GPS in a Joint Battlespace Environment	
Total	19799	
FY 2001 Planned Program:		
•	3788 LW (LUT) – Land Warrior	
•	20 GRCS SYS II (LUT) – Guardrail/Common Sensor System II	
•	300 TC-AIMS-II (IOTE) – Transportation Coordinator’s Automated Information for Movement System II	
•	232 MEPS (IOTE) – Military Eye Protection System	
•	250 CSEL (IOTE) – Combat Survivor Evader Locator Excursion	
•	3000 JWF (JT) – Joint Warfighter	
•	570 JTD (JT) – Joint Theater Distribution	
•	1000 JMABS (JT) – Joint Missile Alert Broadcast System	
•	200 JCMD (JT) – Joint Cruise Missile Defense	
•	650 JSHIP (JT) – Joint Shipboard Helicopter Integration Process	
•	200 GPS-JBE (JT) – GPS in a Joint Battlespace Environment	
•	605 JCAS (JT) – Joint Close Air Support	
•	1395 NAVWAR GPS (IOTE) – Navigation Warfare Global Positioning System	
•	490 ATPS (IOTE) – Advanced Tactical Parachute System	
•	2852 WARSIM 2000 (IOTE) – Warfighters’ Simulation 2000	
•	2599 BCIS (IOTE) – Battlefield Combat Identification System	
•	530 ARL (LUT) – Airborne Reconnaissance Low	
•	68 TUS (LUT) – Tactical Unmanned System	
•	200 UAV PAYLOAD (LUT) – Unmanned Aerial Vehicle Payloads	
•	5 IEWTPT (LUT) – IEW Tactical Proficiency Trainer	
Total	18954	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605712A Support of Operational Testing					PROJECT D985	
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
D985 Concepts Evaluations of Materiel	15681	0	0	0	0	0	0	0	0	15681
<p>Mission Description and Justification: The Concept Experimentation Program (CEP) is a key innovative tool which provides TRADOC battle labs and schools the ability to capitalize on emerging technologies, emerging warfighting concepts, and new materiel initiatives. Funds are used to acquire, lease or fabricate equipment to conduct experiments to determine military utility or potential to satisfy Army Doctrine, Training, Leader Development, Organization, Materiel and Soldiers (DTLOMS) needs. TRADOC battle labs build on initiatives with greatest potential payoff. Program is also used as a first look at emerging technologies and emerging warfighting concepts that have the potential to support the Army's Force XXI design needs. As the Army moves toward Force XXI, the critical task of designing the force around information requires major investment in information-age capabilities. Constructive, virtual, and live simulations are used to examine warfighting concepts across DTLOMS domains. They cover all aspects of command and control, lethality, survivability, and tempo and are essential to technology insertion in future Army systems and force structure. Beginning in FY1999 funding restructured to PE 0605326A, Project D308, Concept Experimentation Program.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 150 Voice-Data Repeater • 8 Digital Aircraft Weighing Scale • 248 Manned and Unmanned Aerial Platform Operations on the Digital Battlefield • 33 Aviation Ground Recovery System • 77 Tele-Operation of the M1 Panther • 178 Teleops – D7G for Obstacle Clearing • 51 Engineer C4I • 110 Range Estimation with Seismic Sensors for Early Detection • 194 Smart Bridge • 85 Nonlethal Alternatives for Anti-personnel Landmines • 306 Operational Concept & Demo of the C2 Tactical Trainer (C2TT) • 340 Crusader Operations on the Digitized Battlefield • 199 Striker Acoustic Cueing Sensor (SACS) • 148 Training FS Skills with Infoscope Tech vs. GUARD FIST • 98 Enhanced Fire Support Simulations • 123 SOF Digital Fire Support Connectivity • 83 Voice Recognition Technology for AFATDS 										
Project D985	Page 10 of 15 Pages					Exhibit R-2A (PE 0605712A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT D985
<p>FY 1998 Accomplishments: (continued)</p> <ul style="list-style-type: none"> • 90 3 Dimensional Night Vision Goggles (3D NVG) • 192 Data Display Integration Technology Evaluation • 136 Dismounted Combat Identification Phase V • 74 Small, Hands Free, Squad Radio for Restricted or Urban Terrain • 310 Signal Support for Force XXI TOC • 213 Warfighter Information Network Support for the CSS C4I • 140 Battlefield Video Teleconferencing (BVTC) • 95 Information Protection (Intrusion/Detection) • 270 Next Generation Semi-Autonomous Recon Operations in the Digital Battlefield • 294 Multi-Agent Fire Control System • 140 Mounted Warrior Capability Assessment) • 85 Future Scout and Cavalry System Sensor Suite Configuration • 37 Pen Based Law Enforcement Systems (PBLES) • 85 Dynamically Distributed Overlays (DDO) • 300 Joint Collaborative Target System (JCTS) • 80 Automated Intelligence Preparation of the Battlefield / Automated DS • 105 USMC C3I Interoperability • 205 Automated Commander's Critical Information Requirements (AUTO CCIR) • 300 Small Lightweight Intercept Device (SLID) • 100 All Radiation Anti-Missile System • 300 SWORD Radar • 162 Rapid Optical Beam Steering System (ROBS) • 291 Course of Action War Gaming Tool • 233 Prototype ABCS Simulation Interface Support • 240 Tactical Class I Automation • 535 ICS3 Maintenance Model Embedded Training • 200 Forward Repair System – Heavy) • 240 Movement Tracking System + Radio Frequency ID + ICS3 (MRI-E) • 240 Wartime Usage of C/E Rechargeable Batteries • 170 Deployment Information Support System (DISS) • 136 Vehicle Integrated Mobile Electrical Power Source 		
Project D985	<i>Page 11 of 15 Pages</i>	Exhibit R-2A (PE 0605712A)

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT D985
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FY 1998 Accomplishments: (continued)

- 200 ASL Mobility
- 425 Battle Lab Experimentation
- 6627 Continued Division XXI AWE Support. Experimentation to examine Division level digital connectivity to validate digital training products. Simulation and analysis to validate DTLOMS insights that will fuel Army investments in FY 99-FY 06.

Total 15681

FY 1999 Planned Program: Program restructured to PE 0605326A

FY 2000 Planned Program: Program restructured to PE 0605326A

FY 2001 Planned Program: Program restructured to PE 0605326A

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605712A Support of Operational Testing				PROJECT D987		
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
D987 OPTEC Instrumentation & Development	4896	4799	5945	6047	6500	6635	7559	8323	Continuing	Continuing
<p>Mission Description and Justification: This project provides for the technical upgrade and maintainability of essential instrumentation to achieve cost effective data collection, telemetry, and processing capability for support of robust and credible operational tests as required by the DoD and Congress. Increased sophistication of new weapon and communication and control systems demands the ability to capture test data at greater rates and increased volumes and then to reduce the information rapidly to only those essential to effectively evaluate the test. As digitization of the battlefield continues, this effort allows OPTEC to modernize and develop its non-major instrumentation allowing it to be less intrusive, more reliable and more robust in terms of integrating combat simulation capability into operational tests. The goal is to expand measurement and test control capability while still reducing future test costs. This project supports multiple efforts associated with MAIS and separate, independent initiatives that lead to improved command and control, increased mobility, expanded remote data collection at various tactical sites with transmit capability to central receiving, control, and evaluation stations at various test directorates, new instrumentation capability in support of Real-Time Casualty Assessment (RTCA) which measures simulated attrition of forces during simulated battlefield engagements. These directorates are located at Fort Hood, TX; Fort Bliss, TX; Fort Huachuca, AZ; Fort Sill, OK; and Fort Bragg, NC.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 634 Video Telemetry and Recording System (Technical Insertion – Performance Increase) • 400 Multimedia Data Transfer System (Technical Insertion – Performance Increase) • 362 High-Speed Telemetry System (Quick Reaction in Support of Critical Operational Test) • 300 Radio Frequency Monitoring System (Technical Insertion – Performance Increase) • 765 Telemetry System Upgrade (Product Improvement) • 150 Command Audio / Visual Upgrade (Product Improvement) • 500 Image System Upgrade (Product Improvement) • 198 Test View and Visualization (Technical Insertion – Performance Increase) • 568 Improved Field Data Collector Enhancements (Product Improvement) • 430 Simulation Support Modules (Technical Insertion – Performance Increase) • 125 Video Tracking System (Quick Reaction in Support of Critical Operational Test) • 325 Mobile Automated Instrumentation Suite (MAIS) After Action Review (Technical Insertion – Performance Increase) • 39 Data Collection Vehicles (Product Improvement) • 100 Improved Field Data Collector/Advanced Field Artillery Tactical Data System Interface (Quick Reaction in Support of Critical Operational Test) <p>Total 4896</p>										
Project D987			Page 13 of 15 Pages				Exhibit R-2A (PE 0605712A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY 6 - Management and Support		February 1999
PE NUMBER AND TITLE 0605712A Support of Operational Testing		PROJECT D987
FY 1999 Planned Program:		
•	420 Multimedia Data Transfer System (Technical Insertion – Performance Increase)	
•	530 Automated Intelligence / Electronic Warfare Test System (Product Improvement)	
•	508 Video Telemetry and Recording System (Technical Insertion – Performance Increase)	
•	296 Simulation Support Modules (Technical Insertion – Performance Increase)	
•	2500 Improved Field Data Collector Enhancements (Product Improvement)	
•	318 Video Telemetry System (Product Improvement)	
•	100 TEXCOM Common Data Transfer Initiative (Technical Insertion – Performance Increase)	
•	127 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs	
Total	4799	
FY 2000 Planned Program:		
•	1200 Improved Field Data Collector Enhancements (Technical Insertion – Performance Increase)	
•	527 Multimedia Data Transfer System (Technical Insertion – Performance Increase)	
•	600 Common Data Transfer System (Technical Insertion – Performance Increase)	
•	718 High Speed Telemetry System (Technical Insertion – Performance Increase)	
•	587 Video Telemetry Recording System (Technical Insertion – Performance Increase)	
•	225 Geometric Pointing System (Technical Insertion – Performance Increase)	
•	720 GPS Modernization (Technical Insertion – Performance Increase)	
•	218 Image Doc Upgrade (Technical Insertion – Performance Increase)	
•	300 Video tracking System Modification (Product Improvement – Performance Increase)	
•	850 Automated Intel/Electronic Warfare Test System (Product Improvement)	
Total	5945	
FY 2001 Planned Program:		
•	800 Improved Field Data Collector Enhancements (Technical Insertion – Performance Increase)	
•	250 Multimedia Data Transfer System (Technical Insertion – Performance Increase)	
•	650 Common Data Transfer System (Technical Insertion – Performance Increase)	
•	807 High Speed Telemetry System (Technical Insertion – Performance Increase)	
•	494 Mobile Integrated Non-Intrusive Command, Control and Communication Instrumentation (Technical Insertion – Performance Increase)	
•	350 Geometric Pointing System (Technical Insertion – Performance Increase)	
•	400 Enhanced Telemetry and Display System (Product Improvement)	
•	325 Video Tracking System Modification in Service (Technical Insertion – Performance Increase)	
Project D987	<i>Page 14 of 15 Pages</i>	Exhibit R-2A (PE 0605712A)

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT D987
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FY 2001 Planned Program: (continued)

- 620 Secure Wide-Band Satellite Common Link System (Technical Insertion – Performance Increase)
 - 75 Information Warfare Suite (Technical Insertion – Performance Increase)
 - 200 Communication Assets (Technical Insertion – Performance Increase)
 - 500 Synthetic Jamming (Technical Insertion – Performance Increase)
 - 350 Electro-Optics Facility Instrumentation (Technical Insertion – Performance Increase)
 - 226 Air Defense Artillery Test Directorate Player and Event Tracking System (Technical Insertion – Performance Increase)
- Total 6047

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605716A Army Evaluation Center	PROJECT D302
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COST <i>(In Thousands)</i>	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
D302 Army Evaluation Center	0	25313	24255	26362	27330	33340	32889	31977	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project is not a new start. Funds were realigned from PE 0605601A Project D699, PE 0605604A Project D734, and PE 0605706A, Project M542 in support of the Army consolidation of the materiel evaluation function under the U.S. Army Operational Test and Evaluation Command (OPTEC). Funding also reflects the realignment of the OPTEC Operational Evaluation Command (OEC), previously funded in the Operations and Maintenance, Army (OMA) appropriation. Project D302 funds the Army Evaluation Center (AEC) mission of evaluation and test design. AEC is the Army's technical and operational evaluator of developmental systems and tests for all Army acquisition programs. AEC provides integrated technical and operational evaluations and continuous evaluation of assigned Major Defense Acquisition Programs (MDAP), Major Automated Information Systems Review Council (MAISRC), and In-Process Review (IPR) programs for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. AEC develops the evaluation strategy, designs technical and operational tests, and evaluates the test results to address the effectiveness, suitability, and survivability factors pertinent to the decision process, such as: Critical Operational Issues and Criteria (COIC), system performance, soldier survivability, performance in countermeasures, system survivability, reliability, supportability, etc. AEC has a lead role in the planning and execution of the Army live fire tests and evaluations through its evaluation and test design responsibilities. This project funds the salaries of civilian employees assigned to the evaluation and test design missions and associated costs including temporary duty, support contracts, supplies and equipment. This project does not finance test facility operations, test instrumentation or test equipment.

FY 1998 Accomplishments: Funded in PE 0605601A Project D699, PE 0605604A Project D734, and PE 0605706A Project M542.

FY 1999 Planned Program:

- 24937 Provide integrated technical and operational evaluations and continuous evaluation of assigned Major Defense Acquisition Programs (MDAPs), Major Automated Information Systems Review Council (MAISRC), and In-Process Review (IPR) programs for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. Develop the evaluation strategy, design technical and operational tests and evaluate the test results to address the Effectiveness, Suitability, and Survivability factors pertinent to the decision process. As the Army lead for Live Fire Test and Evaluation, plan and execute the Army Live Fire Test and Evaluation program for developmental systems as required, such as Crusader, Multiple Launch Rocket System, Breacher, Heavy Assault Bridge, and the M1A2 Abrams System Enhancement Program. Prepare integrated System Evaluation Plans and conduct integrated technical and operational evaluations for all Army weapon systems. Major efforts include: Forward Area Air Defense (FAAD-C21), Suite of Integrated Infrared Countermeasures (SIIRCM), Advanced Field Artillery Tactical Data System (AFATDS), Crusader, Army Tactical Missile System Block II/Brilliant Anti-armor Tank Pre-Planned Product Improvement (ATACMS BLK II/BAT-P3I), Land Warrior, Heavy Assault Bridge (HAB), All Source Analysis System (ASAS), Battlefield Combat Identification System (BCIS), Bradley Fighting Vehicle System (BFVS-A3), Command and Control Vehicle (C2V), Extended Range – Multiple Launch Rocket System (ER-

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BUDGET ACTIVITY 6 - Management and Support		PE NUMBER AND TITLE 0605716A Army Evaluation Center
		PROJECT D302
<p>FY 1999 Planned Program: (continued)</p> <p>MLRS), M1A2 Abrams System Enhancement Program (M1A2-SEP), MH-47E Aircraft, Comanche, Tactical Unmanned Aerial Vehicle (TUAV), Force Battle Command Brigade and Below (FBCB2), Warfighters' Simulation 2000 (WARSIM 2000), Joint Stars Command Ground Station (JSTARS CGS) and Suite of Integrated Radio Frequency Countermeasures (SIRFC). Includes costs for 171 civilian authorizations.</p> <p>376 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs</p> <p>Total 25313</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> 24255 Provide integrated technical and operational evaluations and continuous evaluation of assigned Major Defense Acquisition Programs (MDAPs), Major Automated Information Systems Review Council (MAISRC), and In-Process Review (IPR) programs for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. Develop the evaluation strategy, design technical and operational tests and evaluate the test results to address the Effectiveness, Suitability, and Survivability factors pertinent to the decision process. As the Army lead for Live Fire Test and Evaluation, plan and execute the Army Live Fire Test and Evaluation program for developmental systems as required, such as Crusader, Comanche, CH47 Improved Cargo Helicopter, M829E3, Breacher, and the M1A2 Abrams System Enhancement Program. Prepare integrated System Evaluation Plans and conduct integrated technical and operational evaluations for all Army weapon systems. Major efforts include: Forward Area Air Defense (FAAD-C21), Suite of Integrated Infrared Countermeasures (SIIRCM), Advanced Field Artillery Tactical Data System (AFATDS), Joint Chemical Agent Detector (JCAD), Crusader, Army Tactical Missile System Block II/Brilliant Anti-armor Tank Pre-Planned Product Improvement (ATACMS BLK II/BAT-P3I), Land Warrior, All Source Analysis System (ASAS) Block II, Battlefield Combat Identification System (BCIS), Bradley Fighting Vehicle System (BFVS-A3), Command and Control Vehicle (C2V), Extended Range – Multiple Launch Rocket System (ER-MLRS), M1A2 Abrams System Enhancement Program (M1A2-SEP), MH-47E Aircraft, Comanche, Tactical Unmanned Aerial Vehicle (TUAV), Force XXI Battle Command Brigade and Below (FBCB2), systems modified for the First Digitized Division, Warfighters' Simulation 2000 (WARSIM 2000), Joint Stars Command Ground Station (JSTARS CGS)P3I, and Suite of Integrated Radio Frequency Countermeasures (SIRFC). Effort includes costs for 171 civilian authorizations. <p>Total 24255</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> 26362 Provide integrated technical and operational evaluations and continuous evaluation of assigned Major Defense Acquisition Programs (MDAPs), Major Automated Information Systems Review Council (MAISRC), and In-Process Review (IPR) programs for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. Develop the evaluation strategy, design technical and operational tests and evaluate the test results to address the effectiveness, suitability, and survivability factors pertinent to the decision process. As the Army lead for Live Fire Test and Evaluation, plan and execute the Army Live Fire Test and Evaluation program for developmental systems as required, such as Objective Individual Combat Weapon, Light Tactical Vehicle (LTV), Crusader, Comanche, CH47 Improved Cargo Helicopter, 		
Project D302	Page 2 of 3 Pages	Exhibit R-2 (PE 0605716A)

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605716A Army Evaluation Center	PROJECT D302
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FY 2001 Planned Program: (continued)

M829E3, and the Breacher. Prepare integrated System Evaluation Plans and conduct integrated technical and operational evaluations for all Army weapon systems. Major efforts include: Firefinder II Radar, Forward Area Air Defense (FAAD-C21), Suite of Integrated Infrared Countermeasures (SIIRCM), Advanced Field Artillery Tactical Data System (AFATDS), Joint Chemical Agent Detection System (JCAD), Crusader, Army Tactical Missile System Block II/ Brilliant Anti-armor Tank Pre-Planned Product Improvement (ATACMS Blk II/BAT-P3I), Land Warrior, All Source Analysis System Remote Work Station (ASAS RWS), Airborne Standoff Minefield Detection System/Unmanned Aerial Vehicle (ASTAMIDS/UAV), Command and Control Vehicle (C2V), Extended Range – Multiple Launch Rocket System (ER-MLRS), MH-47E Aircraft, Comanche, Tactical Unmanned Aerial Vehicle (TUAV), Force XXI Battle Command Brigade and Below (FBCB2), systems modified for the First Digitized Division, Warfighters’ Simulation 2000 (WARSIM 2000), Joint Stars Command Ground Station (JSTARS CGS)P3I, and Suite of Integrated Radio Frequency Countermeasures (SIRFC). Effort includes costs for 171 civilian authorizations.

Total 26362

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President’s Budget (<u>FY 1999</u> PB)	0	25526	23992	25745
Appropriated Value	0	25526		
Adjustments to Appropriated Value				
a. Congressional General Reductions		-213		
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			263	617
Current Budget Submit (<u>FY 2000 / 2001</u> PB)	0	25313	24255	26362

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605801A Programwide Activities
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	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	79128	64047	64121	73259	70310	70745	68437	70201	Continuing	Continuing
M881 RDTE Command/Center/General	55846	50821	49089	51255	55714	55177	54231	55408	Continuing	Continuing
MM75 Federal Workforce Restructure	23282	12069	13820	20817	13415	14409	13020	13579	Continuing	Continuing
MM76 Armament Group Support	0	1157	1212	1187	1181	1159	1186	1214	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program funds the continued operation of non-Army Management Headquarters Activities (AMHA) management and administrative functions at U.S. Army Research, Development and Standardization Groups overseas, Army Research, Development, Test, and Evaluation (RDTE) commands, centers and activities required to accomplish overall assigned general research and development missions and international research and development not directly related to specific research and development projects. Project M881 reflects a glide path in response to Army infrastructure drawdown initiatives. The Standardization Groups play an integral role in the U.S. Army efforts for international cooperative research & development and interoperability and fulfill international memorandum of understanding requirements (especially the American, British, Canadian and Australia mission).

B. <u>Program Change Summary</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY99 PB)	79626	64588	69868	69318
Appropriated Value	82208	64588		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-2583	-541		
b. SBIR/STTR	-164			
c. Omnibus or Other above Threshold Reductions	-53			
d. Below Threshold Reprogramming	-280			
e. Rescissions				
Adjustments to Budget Years Since FY99 PB			-5747	3941
Current Budget Submit (FY00/01 PB)	79128	64047	64121	73259

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)									DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605801A Programwide Activities					PROJECT M881		
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M881	RDTE Command/Center/General	55846	50821	49089	51255	55714	55177	54231	55408	Continuing	Continuing
<p>Mission Description and Justification: Supports the non-AMHA management and administrative functions at the following Army RDTE commands, centers and activities: U.S. Army Research Institute for the Behavioral and Social Sciences, Alexandria, VA; U.S. Army Armament Research, Development and Engineering (RDE) Center, Picatinny Arsenal, NJ; U.S. Army Research Laboratory, Adelphi, MD; U.S. Army Aviation and Missile RDE Center, Redstone Arsenal, AL; U.S. Army Tank-Automotive RDE Center, Warren, MI; U. S. Army Soldier and Biological Chemical Command, Aberdeen Proving Ground, MD; U.S. Army Communications-Electronics Command RDE Center, Ft. Monmouth, NJ; U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, MD; and provides funding for salaries, administrative support other than that provided by Department of State agreements to include rent, utilities, guards, and travel for five international RDTE Standardization Groups located in Australia, Canada, France, Germany, and United Kingdom. This project also provides continued operations of contracting and acquisition management and related administrative functions performed by the Army Medical Research Acquisition Activity (USAMRAA) in support of the Army Medical Research and Materiel Command (USAMRMC) RDT&E programs and its tenant organizations at Ft. Detrick, MD, including medical materiel procurement contracts for the U.S. Army Medical Materiel Agency and the Office of the Surgeon General, Army. The project also provides funding for the headquarters activities at the USAMRMC, Ft. Detrick, Maryland to (1) develop medical RDTE program policy and guidance; (2) perform long range planning, programming and budgeting; (3) provide the management of resources; and (4) conduct program performance review and evaluation for the RDTE appropriation.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 44886 Provided continued operation of management and administrative functions at a level consistent with mission requirements and support needs at Army non-AMHA RDTE commands, centers and activities. • 3763 Continued operation of five Standardization Groups in support of international R&D and rationalization, standardization and interoperability missions. Funded salaries, travel and contracts for non-Department of State administrative support. • 7197 Provided acquisition management functions in support of USAMRMC RDT&E programs and its tenant organizations, Ft. Detrick, MD, including medical materiel procurement contracts, and procurement of biological defense vaccines. Fund the operation of the USAMRMC HQ activities which administers the medical research, development, and acquisition program to sustain military technology superiority. <p>Total 55846</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 39661 Provide continued operation of management and administrative functions at a level consistent with mission requirements and support needs at Army non-AMHA RDTE commands, centers and activities. • 3586 Continue operation of five Standardization Groups in support of international R&D and rationalization, standardization and interoperability missions. Fund pay of people, travel and contracts for non-Department of State administrative support. 											
Project M881				Page 2 of 5 Pages				Exhibit R-2A (PE 0605801A)			

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605801A Programwide Activities PROJECT M881	
FY 1999 Planned Program: (continued)		
•	7302	Continue to provide acquisition management functions in support of USAMRMC RDTE programs and its tenant organizations, Ft. Detrick, MD, including medical materiel procurement contracts and procurement of biological defense vaccines. Fund the operation of HQ, USAMRMC activities that administer the medical research, development, and acquisition program to sustain military technology superiority.
•	272	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	50821	
FY 2000 Planned Program:		
•	38436	Provide continued operation of management and administrative functions at a level consistent with mission requirements and support needs at Army non-AMHA RDTE commands, centers and activities.
•	3217	Continue operation of five Standardization Groups in support of international R&D and rationalization, standardization and interoperability missions. Fund pay of people, travel and contracts for non-Department of State administrative support.
•	7436	Continue to provide acquisition management functions in support of USAMRMC RDTE programs and its tenant organizations, Ft. Detrick, MD, including medical materiel procurement contracts and procurement of biological defense vaccines. Fund the operation of HQ, USAMRMC activities that administer the medical research, development, and acquisition program to sustain military technology superiority.
Total	49089	
FY 2001 Planned Program:		
•	40493	Provide continued operation of management and administrative functions at a level consistent with mission requirements and support needs at Army non-AMHA RDTE commands, centers and activities.
•	3011	Continue operation of five Standardization Groups in support of international R&D and rationalization, standardization and interoperability missions. Fund pay of people, travel and contracts for non-Department of State administrative support.
•	7751	Continue to provide acquisition management functions in support of USAMRMC RDTE programs and its tenant organizations, Ft. Detrick, MD, including medical materiel procurement contracts and procurement of biological defense vaccines. Fund the operation of HQ, USAMRMC activities that administer the medical research, development, and acquisition program to sustain military technology superiority.
Total	51255	
Project M881	Page 3 of 5 Pages	Exhibit R-2A (PE 0605801A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605801A Programwide Activities				PROJECT MM75		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
MM75 Federal Workforce Restructure	23282	12069	13820	20817	13415	14409	13020	13579	Continuing	Continuing
<p>Mission Description and Justification: Requirements were defined by the Federal Workforce Restructuring Act of 1994. Funds are to be used to offset the expenses of Voluntary Early Retirement Authority/Voluntary Separation Incentive Pay (VERA/VSIP), the \$80 per capita tax to be remitted to the Treasury (Civil Service Retirement and Disability Fund) for on-board personnel as of 31 March and the 9% tax on the final basic pay of each employee who retired under VERA/VSIP to be remitted to the Civil Service Retirement and Disability Fund (CSRDF). Distribution will be made in the year of execution.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 23282 Funded the transition costs associated with workforce reductions (VERA/VSIP) and required OPM taxes. <p>Total 23282</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 12069 Fund the transition costs associated with workforce reductions (VERA/VSIP) and required OPM taxes. <p>Total 12069</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 13820 Fund the transition costs associated with workforce reductions (VERA/VSIP) and required OPM taxes. <p>Total 13820</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 20817 Fund the transition costs associated with workforce reductions (VERA/VSIP) and required OPM taxes. <p>Total 20817</p>										
Project MM75			Page 4 of 5 Pages			Exhibit R-2A (PE 0605801A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605801A Programwide Activities				PROJECT MM76		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
MM76 Armament Group Support	0	1157	1212	1187	1181	1159	1186	1214	Continuing	Continuing
<p>Mission Description and Justification: This is not a new start. The goal of this program is to expand worldwide allied standardization and interoperability through cooperative research and development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. This program partially funds the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate in international fora, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. This program also includes: the United States' share of costs of the NATO Civil Budget, Chapter IX, which funds the NATO Industrial Advisory Group (NIAG) and the Special Fund for Cooperative Planning (U. S. Army is Executive Agent for this NATO bill); partially funds the Four Power Senior National Representatives Army [SNR (A)], the Technical Cooperative Program, bilateral staff talks, and Army armaments working groups with many nations.</p> <p>FY 1998 Accomplishments: Project was not funded in FY1998.</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 376 Fund domestic and international travel linked to scientific and technological exchanges having military application and mutual benefits to the United States and its Allies. • 750 Fund the United States' share of the NATO Civil Budget, Chapter IX (Defense Support Programs). U. S. Army is Executive Agent for this NATO bill. • 31 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 1157</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 462 Fund domestic and international travel linked to scientific and technological exchanges having military application and mutual benefits to the United States and its Allies. • 750 Fund the United States' share of the NATO Civil Budget, Chapter IX (Defense Support Programs). U. S. Army is Executive Agent for this NATO bill. <p>Total 1212</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 437 Fund domestic and international travel linked to scientific and technological exchanges having military application and mutual benefits to the United States and its Allies. 										
Project MM76			Page 5 of 5 Pages			Exhibit R-2A (PE 0605801A)				

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- 750 Fund the United States' share of the NATO Civil Budget, Chapter IX (Defense Support Programs). U. S. Army is Executive Agent for this NATO bill.
- Total 1187

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	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	15795	16006	15973	16330	16418	16674	18243	19087	Continuing	Continuing
DC16 Field Assistance in Science and Technology	2420	2715	2650	2644	2704	2762	3013	3227	Continuing	Continuing
DC18 Board on Army Science and Technology	629	697	730	740	751	762	816	856	Continuing	Continuing
M720 Technical Information Functional Activities	2761	2948	2872	2929	2997	3064	3308	3509	Continuing	Continuing
M727 Technical Information Activities	3353	2753	2941	3104	3120	3174	3443	3646	Continuing	Continuing
M729 Youth Science Activities	2111	2075	2230	2267	2310	2349	2512	2609	Continuing	Continuing
M735 Net Assessment Directorate	0	795	773	769	767	764	780	797	Continuing	Continuing
D730 Personnel and Training Analysis Activities	1755	2062	2060	2199	2244	2292	2406	2481	Continuing	Continuing
M733 Acquisition Technology Act	2766	1961	1717	1678	1525	1507	1965	1962	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program provides for upgrading the accuracy, timeliness, availability, and accessibility of scientific, technical, and management information at all levels of Army Research and Development (R&D). This includes initiatives to improve information derivation, storage, access, display, validation, transmission, distribution, and interpretation. This program addresses the need to increase the competitiveness and availability of scientific, engineering, and technical skills in the DoD and National workforce. It accomplishes this through outreach programs that provide direct working experience for high school students in Army laboratories, thereby exposing these students to the working world of science and engineering. Funding under this program provides for the conduct of analyses, using behavioral science-based analytic tools, to provide policy and decision makers with soldier oriented recommendations concerning manpower, personnel and training issues. This program also provides for science advisors to Commanders-in-Chief (CINCs) and major Army commands and engineering teams to directly solve field Army technical problems. Coordination of this program with other Services is achieved through interservice working groups. The work in this program element is consistent with rigorous peer review and the Army Science and Technology Master Plan (ASTMP). These programs are accomplished under the management of the Army Research Laboratory, the Army Materiel Command, the Army Research Office, the Army Research Institute, the Army Corps of Engineers and the Information Management Office.

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BUDGET ACTIVITY

6 - Management and Support

PE NUMBER AND TITLE

0605803A Technical Information Activities

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u> PB)	14673	16251	16189	16634
Appropriated Value	15451	16251		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-778	-245		
b. SBIR / STTR	-351			
c. Omnibus or Other Above Threshold Reductions	-116			
d. Below Threshold Reprogramming	+790			
e. Rescissions				
f. DoD Internal Reprogramming	+800			
Adjustments to Budget Years Since <u>FY 1999</u> PB			-216	-304
Current Budget Submit (<u>FY 2000 / 2001</u> PB)	15796	16006	15973	16330

Change Summary Explanation: Funding: FY 1998 – DoD internal reprogramming transferred +800K from the Defense Health Program to the Army's Technical Information Activities Program

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities				PROJECT DC16		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC16 Field Assistance in Science and Technology	2420	2715	2650	2644	2704	2762	3013	3227	Continuing	Continuing
<p>Mission Description and Justification: This program focuses Army Materiel Command (AMC) resources to rapidly identify and solve field Army technical problems affecting improved readiness, safety, training, and operations and support (O&S) cost reductions. The Commanding General, AMC, institutionalized AMC Field Assistance in Science and Technology (FAST) in 1988 to plan for and allocate all AMC FAST program funding for projects to support CINCs and commanders and to operate the director's office. FAST tours provide major professional growth for scientists and engineers. Science advisers are recruited from AMC engineering centers to serve Commanders-in-Chief (CINCs) and major Army commanders worldwide and are supported by assigned Quick Reaction Coordinators (QRCs) within each AMC engineering center. All costs associated with science advisor assignments are funded by AMC subordinate commands that supply the science advisers for two to three year tours. FAST manages a level of effort type project with most projects recouping many times their cost in O&S cost savings.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2420 Executed S&T programs to provide rapid technological solutions to materiel problems, prioritized by CINCs worldwide. Specific examples follow. <ul style="list-style-type: none"> -Conducted AMC/FORSCOM Technology Applications Conference at FT. Bragg, NC which identified near term solutions to improve operational readiness. -Led major range modernization initiatives for 7th Army Training Command, Grafenwoehr, Germany. -Exploited numerous technology enhancements for Special Forces community. -FAST developed Joint Sphere of Security (JSOS) force protection assessment tools incorporated into a Defense Technology Objective (DTO). -Science advisors deployed to Bosnia and Macedonia for Force Protection initiatives and to Latin America on humanitarian demining and counter narcotics efforts. - Provided professional growth opportunity for 20 science advisers on two year and three year tours and FAST-junior scientists and engineers on two to eight week tours. - Provided professional growth opportunity for civilian personnel participating in the Scientists and Engineers Field Experience With Soldiers (SEFEWS) program, which gives scientists and engineers the opportunity to observe training events in the field. <p>Total 2420</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2650 - Provide continuous activity on over 100 FAST projects. Define, test and recommend technological solutions to materiel problems identified by CINCs worldwide and prepare operational needs statements and test results for the highest priority programs. - Provide professional growth opportunity for 20 science advisers on two year and three year tours and FAST Junior scientists and engineers on two to eight week tours. 										
Project DC16			Page 3 of 18 Pages				Exhibit R-2A (PE 0605803A)			

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities	PROJECT DC16
FY 1999 Planned Program: (continued)		
	- Provide professional growth opportunity for civilian personnel participating in the Scientists and Engineers Field Experience With Soldiers (SEFEWS) program.	
•	65	- Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	2715	
FY 2000 Planned Program:		
•	2650	- Provide continuous activity on over 100 FAST projects. Define, test and recommend technological solutions to materiel problems identified by CINCs worldwide and prepare operational needs statements and test results for the highest priority programs.
		- Provide professional growth opportunity for 20 science advisers on two year and three year tours and FAST Junior scientists and engineers on two to eight week tours.
		- Provide professional growth opportunity for civilian personnel participating in the Scientists and Engineers Field Experience With Soldiers (SEFEWS) program.
Total	2650	
FY 2001 Planned Program:		
•	2644	- Provide continuous activity on over 100 FAST projects. Define, test and recommend technological solutions to materiel problems identified by CINCs worldwide and prepare operational needs statements and test results for the highest priority programs.
		- Provide professional growth opportunity for 20 science advisers on two year and three year tours and FAST Junior scientists and engineers on two to eight week tours.
		- Provide professional growth opportunity for civilian personnel participating in the Scientists and Engineers Field Experience With Soldiers (SEFEWS) program.
Total	2644	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)									DATE February 1999	
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities					PROJECT DC18	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC18 Board on Army Science and Technology	629	697	730	740	751	762	816	856	Continuing	Continuing
<p>Mission Description and Justification: The Board on Army Science and Technology (BAST) was created in 1982 by the National Research Council (NRC) through its Commission on Engineering and Technology Systems at the request of the Under Secretary of the Army. The BAST designs, conducts, and supervises the NRC's Army-related studies of scientific and technological issues. As such, the BAST defines problems, brings together leading experts to study them, and most importantly, draws conclusions, identifies alternatives and implications, and makes recommendations as appropriate. The major activities of this group include board meetings, special requests, standing committees, study committees and workshops and seminars.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 629 - Provided technical expert support for forecast of Army science and technology needs and responded to immediate science and technology requirements. - Provided experts to participate in peer reviews for annual ILIR and RDA awards review. - Completed BAST studies on "Compact Power" and "Logistics Demand". <p>Total 629</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 679 - Provide technical expert support for forecast of Army science and technology needs and respond to immediate science and technology requirements. - Provide experts to participate in peer reviews for annual ILIR and RDA awards review. 18 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 697</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 730 - Provide technical expert support for forecast of Army science and technology needs and respond to immediate science and technology requirements. - Provide experts to participate in peer reviews for annual ILIR and RDA awards review. <p>Total 730</p>										
Project DC18			Page 5 of 18 Pages				Exhibit R-2A (PE 0605803A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605803A Technical Information Activities	DC18
FY 2001 Planned Program:		
•	740	- Provide technical expert support for forecast of Army science and technology needs and respond to immediate science and technology requirements.
		- Provide experts to participate in peer reviews for annual ILIR and RDA awards review.
Total	740	
Project DC18	Page 6 of 18 Pages	Exhibit R-2A (PE 0605803A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities					PROJECT M720	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M720 Technical Information Functional Activities	2761	2948	2872	2929	2997	3064	3308	3509	Continuing	Continuing
<p>Mission Description and Justification: Technology transfer activities to support acquisition, storage, and utilization of technical information for both military and domestic applications. Activities supported are: Army participation in the Defense Technical Information Center (DTIC) Work Unit Information Summary (WUIS) database; Army support for the Federated Laboratory Consortium (FLC); the Army Science Board; administration of the Army's Small Business Innovation Research (SBIR) and Small Business Technology Transfer Pilot Program (STTR) in accordance with the "Small Business Research and Development Enhancement Act of 1992". These costs are funded here because the Act prohibits use of PE 0605502A for funding administrative costs, studies and analyses to support the Acquisition Corps acquisition and retention of scientists and engineers and improvement of productivity of laboratories and centers. Technology transfer activities make technical information available to both the public and private sectors to reduce duplication in R&D programs and to increase competitiveness in the U.S. business community. In addition, this project provides funding for patent fees and patent legal expenses for all U. S. Army Materiel Command (AMC) subordinate commands and laboratories. The requirement to fund this effort is a result of the Omnibus Budget Reconciliation Act requiring the U. S. Patent and Trademark Office to become a completely user-fee funded agency.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2761 - Provided managerial, programming, database, clerical and personnel support to process, store, control and report the WUIS on DD1498's. <ul style="list-style-type: none"> - Provided Army funding support for FLC as required by Public Law 99-502. - Provided administrative, contractual and travel support for the ASB. - Provided administrative support for SBIR/STTR programs. - Provided Army Science and Technology Reports. - Provided funding for patent fees and patent legal expenses for AMC commands and laboratories. - Provided funding for Army Science and Technology Summer Study and awards. - Provided funding for support of the Government/Industry Data Exchange Program (GIDEP). - Conducted technology seminar game. <p>Total 2761</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2877 - Provide managerial, programming, database, clerical and personnel support to process, store, control and report the WUIS, 1498's. <ul style="list-style-type: none"> - Provide Army funding support for FLC as required by Public Law 99-502. - Provide administrative and contractual support for the ASB. - Provide administrative support for SBIR/STTR programs. - Provide Army Science and Technology Reports. 										
Project M720	Page 7 of 18 Pages					Exhibit R-2A (PE 0605803A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities	
		PROJECT M720
FY 1999 Planned Program (continued):		
<ul style="list-style-type: none"> - Provide funding for patent fees and patent legal expenses for AMC commands and laboratories. - Provide funding for Army Science and Technology Summer Study and awards. - Provide funding for support of GIDEP. 		
<ul style="list-style-type: none"> • 71 	- Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs	
Total 2948		
FY 2000 Planned Program:		
<ul style="list-style-type: none"> • 2872 - Provide managerial, programming, database, clerical and personnel support to process, store, control and report the WUIS, 1498's. - Provide Army funding support for FLC as required by Public Law 99-502. - Provide administrative and contractual support for the ASB. - Provide administrative support for SBIR/STTR programs. - Provide Army Science and Technology Reports. - Provide funding for patent fees and patent legal expenses for AMC commands and laboratories. - Provide funding for Army Science and Technology Summer Study and awards. - Provide funding for support of GIDEP. 		
Total 2872		
FY 2001 Planned Program:		
<ul style="list-style-type: none"> • 2929 - Provide managerial, programming, database, clerical and personnel support to process, store, control and report the WUIS, 1498's. - Provide Army funding support for FLC as required by Public Law 99-502. - Provide administrative and contractual support for the ASB. - Provide administrative support for SBIR/STTR programs. - Provide Army Science and Technology Reports. - Provide funding for patent fees and patent legal expenses for AMC commands and laboratories. - Provide funding for Army Science and Technology Summer Study and awards. - Provide funding for support of GIDEP. 		
Total 2929		
Project M720	Page 8 of 18 Pages	Exhibit R-2A (PE 0605803A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities					PROJECT M727	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M727 Technical Information Activities	3353	2753	2941	3104	3120	3174	3443	3646	Continuing	Continuing
<p>Mission Description and Justification: This project supports development of decision aids, databases, and automation support for the management and execution of the Army Research, Development, Test and Evaluation (RDTE) Appropriation. It includes the hardware, software and contractor support required to develop and implement a set of management decision aids, databases, and hardware/software tools to support technical and budgetary decisions at the Office, Secretary of Defense (OSD), Department of the Army (DA), Corps of Engineers, Army Materiel Command (AMC) and Army Research Laboratory. This project includes support of the Acquisition Management Integration Subgroup (AMIS) dealing with acquisition management systems.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 3353 - S&T database computer engineering support contract. <ul style="list-style-type: none"> - Supported Army S&T strategic planning, analysis, and prioritization. - Supported to AMC database and Defense Reliance management. - Provided guidance and policy relative to the content, utilization, and requirements of current and future acquisition management systems for AMIS. <p>Total 3353</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2684 - S&T database computer engineering support contract. <ul style="list-style-type: none"> - Support to Army S&T strategic planning, analysis, and prioritization. - Support to AMC database and Defense Reliance management. - Provide guidance and policy relative to the content, utilization, and requirements of current and future acquisition management systems for AMIS. • 69 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 2753</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2941 - S&T database computer engineering support contract. <ul style="list-style-type: none"> - Support to Army S&T strategic planning, analysis, and prioritization. - Support to AMC database and Defense Reliance management. <p>Total 2941</p>										
Project M727			Page 9 of 18 Pages				Exhibit R-2A (PE 0605803A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities					PROJECT M729	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M729 Youth Science Activities	2111	2075	2230	2267	2310	2349	2512	2609	Continuing	Continuing
<p>Mission Description and Justification: Supports science activities to encourage over 100,000 high school youths to develop interest and achieve higher levels in science, engineering, and mathematics. These activities are consolidated within this program to "present the Army" to a potential pool of technical talent to fill future Army needs. No other program fulfills this long-range Army goal. The joint Army/Navy Washington regional area Science and Engineering Apprenticeship Program (SEAP) has been included in the overall effort. This provides an eight-week hands-on learning experience for high school students working with bench level scientists within Army laboratories in hopes of encouraging more of them to enter scientific fields of study in the future. This program enhances the National Laboratory Science and Engineering pool, which in turn supports Defense, industry, and laboratory needs.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2111 - Fostered high school student interest in science, mathematics, engineering and computer science, nationally, by sponsoring: JSHS, IMO, and REAP. - Joint Army/Navy Washington Regional Area SEAP and increased Army Laboratory/RDE Center sponsorship of students. - Special tutorial programs for Native Americans, African Americans, and Spanish-speaking Americans designed to increase their chances of attending and completing engineering and/or science curriculum at the university level. - West Point cadet research internship program to enhance cadet training through field experience within Army research laboratories and centers. <p>Total 2111</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2020 - Foster high school student interest in science, mathematics, engineering and computer science, nationally, by sponsoring: JSHS, IMO, and REAP. - Joint Army/Navy Washington Regional Area SEAP and increase Army Laboratory/RDE Center sponsorship of students. - Special tutorial programs for Native Americans, African Americans, and Spanish-speaking Americans designed to increase their chances of attending and completing engineering and/or science curriculum at the university level. - West Point cadet research internship program to enhance cadet training through field experience within Army research laboratories and centers. • 55 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 2075</p>										
Project M729			Page 11 of 18 Pages				Exhibit R-2A (PE 0605803A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605803A Technical Information Activities	M729
FY 2000 Planned Program:		
•	2230 - Foster high school student interest in science, mathematics, engineering and computer science, nationally, by sponsoring: JSHS, IMO, and REAP. - Joint Army/Navy Washington Regional Area SEAP and increase Army Laboratory/RDE Center sponsorship of students. - Special tutorial programs for Native Americans, African Americans, and Spanish-speaking Americans designed to increase their chances of attending and completing engineering and/or science curriculum at the university level. - West Point cadet research internship program to enhance cadet training through field experience within Army research laboratories and centers.	
Total	2230	
FY 2001 Planned Program:		
•	2267 - Foster high school student interest in science, mathematics, engineering and computer science, nationally, by sponsoring: JSHS, IMO, and REAP. - Joint Army/Navy Washington Regional Area SEAP and increase Army Laboratory/RDE Center sponsorship of students. - Special tutorial programs for Native Americans, African Americans, and Spanish-speaking Americans designed to increase their chances of attending and completing engineering and/or science curriculum at the university level. - West Point cadet research internship program to enhance cadet training through field experience within Army research laboratories and centers.	
Total	2267	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities					PROJECT M735	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M735 Net Assessment Directorate	0	795	773	769	767	764	780	797	Continuing	Continuing

Mission Description and Justification: The Net Assessment Directorate develops and coordinates net assessments of the standing, trends, and future prospects of U.S. military capabilities and military potential in comparison with those of other countries or groups of countries so as to identify emerging or future threats or opportunities for the United States. This includes, as required, net assessments of: (1) current and projected U.S. and foreign military capabilities by theater, region, function, or mission; and (2) specific current and projected U.S. and foreign capabilities, operational tactics, doctrine, and major categories of weapon systems. The Directorate provides for the preparation of net assessments by the Chairman of the Joint Chiefs of Staff; develops, advises, and consults on the net assessment portion of the Annual Report of the Secretary of Defense to the President and Congress; provides guidance and staff assistance in the development of national net assessments by the National Security Council and acts as the primary Office of the Secretary of Defense (OSD) focal point for joint efforts with the Intelligence Community to produce net assessments; and provides support for the improvement and development of net assessments within the Department of Defense.

FY 1998 Accomplishments: Program funded by a DOD appropriation.

FY 1999 Planned Program:

- 774 Develop net assessments and identify problems and/or opportunities for DoD in the following areas:
 - Net assess the role of space systems in future military competition and conflict, including the reliance of US and foreign military operations on space assets, the likely effectiveness of and countermeasures to those assets, and the changing military roles of US and foreign space systems.
 - Net assess the future US power projection as challenged by the development of anti-access capabilities of potential adversaries, including the impact of changing technology, possible new force structures and concepts of operations, and alternative kinds and degrees of adversary capability.
 - Continue to investigate the prospect of an emerging Revolution in Military Affairs, including assessment of foreign country military writings, research, and procurement for indications of the development and direction of revolutionary changes in military capability; investigate issues involved in revolutionary transformation of US military; support US military programs investigating promising military innovations.
- 21 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 795

FY 2000 Planned Program:

- 773 -Build on analyses accomplished in FY 1999 and/or identify additional topics for net assessment based on their prioritization by DoD leadership. Possible areas of analysis include Asian military competition; information warfare; non-nuclear strategic warfare; weapons of mass destruction and defenses against them; changing patterns of global energy markets.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605803A Technical Information Activities	M735
FY 2000 Planned Program: (continued)		
-Develop functional assessments of the emerging balance of powers in what appear to be key future warfare areas; regional assessments where changing geopolitical circumstances warrant; and/or assessment of special topics that bear on future political studies of the future security environment.		
-Continue investigation to understand US and foreign progress in a Revolution in Military Affairs.		
Total	773	
FY 2001 Planned Program:		
•	769	-Continue to build on existing assessments or develop new areas of analysis, including some of the candidates listed in the FY 2000 program.
Total	769	
Project M735	Page 14 of 18 Pages	Exhibit R-2A (PE 0605803A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities					PROJECT D730		
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D730	Personnel and Training Analysis Activities	1755	2062	2060	2199	2244	2292	2406	2481	Continuing	Continuing
<p>Mission Description and Justification: This project provides for the application of behavioral science-based analytical technologies by the U.S. Army Research Institute (ARI) for the Behavioral and Social Sciences to current and near-term soldier-related issues. The program is focused on policy issues to enhance soldier performance, and provides the Army a unique capability for addressing such issues as the effects of training on individual and unit readiness, the personnel costs of alternative force structures and the effects of a smaller Army on retention and readiness of quality soldiers. Requirements for studies and analyses for critical personnel and training issues of immediate importance are solicited on an annual basis.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1755 - Derived the information requirements for trainers to control force-on-force simulated battles, and provided the most beneficial feedback to units. <ul style="list-style-type: none"> - Determined the Force XXI leader training requirements for aviation battle staffs. - Developed method for selection of vehicle drivers to improve safety. - Determined situations when subject-matter-expert ratings of training effectiveness can be substituted for resource-intensive field trials. - Assessed how deleting sub-tests from the ASVAB impacts gender fairness. - Analyzed functional requirements for an Enlisted Personnel Allocation System. <p>Total 1755</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2013 - Identify impact of force modernization on requirements for live fire exercises. <ul style="list-style-type: none"> - Guidelines for integrating training development activities across schools and distributed training environments. - Analyze feasibility of implementing a centralized training analysis and feedback system to support exercises at separate sites simultaneously. - Survey and assess soldier's access to distance learning technology. - Determine operational requirements for implementing Enlisted Personnel Allocation System. - Assess the relationship of in-Service education to attrition, retention, and career progression. • 49 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs. <p>Total 2062</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2062 - Analyze issues identified by Training and Doctrine Command (TRADOC). <ul style="list-style-type: none"> - Conduct studies on personnel issues identified by the Chief of Staff of the Army (CSA) and Deputy Chief of Staff for Personnel (DCSPER). 											
Project D730				Page 15 of 18 Pages				Exhibit R-2A (PE 0605803A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605803A Technical Information Activities					PROJECT M733	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M733 Acquisition Technology Act	2766	1961	1717	1678	1525	1507	1965	1962	Continuing	Continuing
<p>Mission Description and Justification: This project provides for the engineering of Army acquisition process improvement through the application of decision support and expert information systems. This project provides funds to conduct analysis and evaluation of alternative acquisition strategies using techniques such as value-added analysis. Supports integrated management activities such as Horizontal Technology Integration and Army Ballistic Missile Defense. This project also provides an environment for the analysis and evaluation of new information technologies, concepts and applications in support of the Army acquisition community's dynamic requirements and for the engineering of Army acquisition process improvement through the application of decision support and expert information systems.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2766 - Developed simulation and logical modeling test and evaluation environment that provided a prototype development tool in support of technology base initiatives, and beta test selected modules. - Validated application programs and user interface utilities for executive level information systems that offered SQL services to AAC corporate and global databases. - Analyzed acquisition program financial programming and budgeting requirements. Continued development of Weapon Systems Handbook, Analytic/Technical Support for Army Support for Army Science and Technology Programs, Long-Range Planning and Policy Analysis, Resource Allocation Analysis, Cost Tracking and Analysis, Cost-Effectiveness and Database Management/Financial Analysis, SAR Technology Application Concept Research/Analysis. <p>Total 2766</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1909 - Validate simulation and logical modeling test and evaluation environment that provides a prototype development tool in support of technology base initiatives. - Distribute and beta test application programs and user interface utilities for executive level information systems that offer Standard Query Language (SQL) services to AAC corporate and global databases. - Analyze acquisition program financial programming and budgeting requirements. Continue development of Weapon Systems Handbook, Analytic/Technical Support for Army Support for Army Science and Technology Programs, Long-Range Planning and Policy Analysis, Resource Allocation Analysis, Cost Tracking and Analysis, Cost-Effectiveness and Database Management/Financial Analysis, SAR Technology Application Concept Research/Analysis. • 52 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 1961</p>										
Project M733			Page 17 of 18 Pages				Exhibit R-2A (PE 0605803A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605803A Technical Information Activities	M733
FY 2000 Planned Program:		
•	1717 - Validate simulation and logical modeling test and evaluation environment that provides a prototype development tool in support of technology base initiatives. - Distribute and beta test application programs and user interface utilities for executive level information systems that offer Standard Query Language (SQL) services to AAC corporate and global databases. - Analyze analysis of acquisition program financial programming and budgeting requirements. Continue development of Weapon Systems Handbook, Analytic/Technical Support for Army Support for Army Science and Technology Programs, Long-Range Planning and Policy Analysis, Resource Allocation Analysis, Cost Tracking and Analysis, Cost-Effectiveness and Database Management/Financial Analysis, SAR Technology Application Concept Research/Analysis.	
Total	1717	
FY 2001 Planned Program:		
•	1678 - Validate simulation and logical modeling test and evaluation environment that provides a prototype development tool in support of technology base initiatives. - Distribute and beta test application programs and user interface utilities for executive level information systems that offer Standard Query Language (SQL) services to AAC corporate and global databases. - Analyze acquisition program financial programming and budgeting requirements. Continue development of Weapon Systems Handbook, Analytic/Technical Support for Army Support for Army Science and Technology Programs, Long-Range Planning and Policy Analysis, Resource Allocation Analysis, Cost Tracking and Analysis, Cost-Effectiveness and Database Management/Financial Analysis, SAR Technology Application Concept Research/Analysis.	
Total	1678	
Project M733	<i>Page 18 of 18 Pages</i>	Exhibit R-2A (PE 0605803A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	10707	10422	10537	10814	10137	9986	11082	11293	Continuing	Continuing
DF21 North Atlantic Treaty Organization (NATO) Small Arms Evaluation	295	0	493	493	492	492	492	490	Continuing	Continuing
DF24 Conventional Ammunition Demilitarization	9106	6663	4558	4541	4646	4769	4901	5038	Continuing	Continuing
D293 Field Artillery Ammunition (NATO) Engineering Development	78	86	0	0	0	0	0	0	0	1672
D297 Munitions Survivability & Logistics	0	2481	3913	4215	4222	3937	4884	4939	Continuing	Continuing
M296 Pyrotechnic Reliability and Safety	663	650	794	800	0	0	0	0	0	3534
M857 Explosive Safety Standards	565	542	779	765	777	788	805	826	Continuing	Continuing

A. Mission Description and Budget Item Justification: This Program Element supports continuing technology investigations. It provides a coordinated tri-service mechanism for the collection and free exchange of technical data on the performance and effectiveness of all non-nuclear munitions and weapons systems in a realistic operational environment. It provides for NATO interchangeability testing; joint munitions effectiveness manuals used by all services; development of standardization agreements (STANAGS) and associated Manuals of Proof and Inspection (MOPI); operation of the North American Regional Test Center (NARTC); evaluation of demilitarization methods for existing conventional ammunition; evaluation of useful shelf life, safety, reliability and producibility of pyrotechnic munitions; and improvement of explosives safety criteria for DOD munitions via the DOD Explosives Safety Board. Pyrotechnic Reliability and Safety (M296) supports pyrotechnic research, development and testing to identify, characterize and resolve reliability, safety, storage and manufacturing issues that impact production availability and field use of pyrotechnics. It will result in the development and demonstration of new, safe, reliable and environmentally acceptable munitions. Munitions Survivability and Logistics (D297) will make Army units more survivable by testing and demonstrating munitions logistics system solutions that prevent or minimize catastrophic explosive events and accelerate ammunition resupply.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support		PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety		
B. Program Change Summary				
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	11064	8497	8812	8770
Appropriated Value	11417	10497		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-353	-75		
b. SBIR / STTR	-271			
c. Omnibus or Other Above Threshold Reductions	-91			
d. Below Threshold Reprogramming	+5			
e. Rescissions	0			
Adjustments to Budget Years Since FY 1999 PB			+1725	+2044
Current Budget Submit (FY 2000 /2001 PB)	10707	10422	10537	10814
<p>Change Summary Explanation: FY 2000: Funds realigned from Ammunition Procurement to higher priority ammunition related RDTE programs (+1725). FY 2001: Funds realigned from Ammunition Procurement to higher priority ammunition related RDTE programs (+2044).</p>				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety					PROJECT DF21		
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DF21	North Atlantic Treaty Organization (NATO) Small Arms Evaluation	295	0	493	493	492	492	492	490	Continuing	Continuing
<p>Mission Description and Justification: This program assures complete interchangeability of small caliber and automated cannon-caliber ammunition and weapons among all NATO countries with all of the associated logistic, strategic and tactical advantages. Project involves development, maintenance and testing compliance of NATO STANAGS and staffing of the NARTC.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 70 Continued to staff, equip and maintain the NARTC for 9mm, 5.56mm and 7.62mm • 80 Continued to maintain standardization of previously qualified calibers, including the 25mm • 35 Completed facilitation of NARTC for 12.7mm standardization testing • 35 Continued development of 40mm STANAG/MOPI • 60 Participation in D/14 working group, 25/40mm Panel Of Experts (POE) and 5.7mm Group of Experts • 15 Partnership for Peace <p>Total 295</p> <p>FY 1999 Planned Program: Project not funded in FY 1999</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 90 Continue to staff, equip, and maintain the NARTC for 9mm, 5.56mm, and 7.62mm. Add the 12.7mm to current program • 105 Continue to maintain standardization of previously qualified calibers, including the 25mm • 145 Initiate facilitation of NARTC for 40mm standardization testing • 50 Complete development of 40mm STANAG and MOPI • 48 Participate in D/14 working group, 25/40mm POE and 5.7mm Group of Experts • 55 Initiate activities associated with standardization of Advanced Soldier Systems <p>Total 493</p>											
Project DF21		Page 3 of 13 Pages					Exhibit R-2A (PE 0605805A)				

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety	PROJECT DF21
<p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 90 Continue to staff, equip and maintain the NARTC for 9mm, 5.56mm, 7.62mm and 12.7mm • 105 Continue to maintain standardization of previously qualified calibers, including the 25mm • 133 Continue facilitation of NARTC for 40mm standardization testing • 65 Complete 12.7mm qualification testing • 35 Participate in D/14 working group, 25/40mm Panel of Experts and 5.7mm Group of Experts • 65 Continue activities associated with standardization of Advanced Soldier Systems <p>Total 493</p>		
Project DF21	<i>Page 4 of 13 Pages</i>	Exhibit R-2A (PE 0605805A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety					PROJECT DF24	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DF24 Conventional Ammunition Demilitarization	9106	6663	4558	4541	4646	4769	4901	5038	Continuing	Continuing
<p>Mission Description and Justification: This project supports a continuing technology evaluation of demilitarization methods for existing conventional ammunition and conventional ammunition recovered from formerly used defense sites (FUDS). It will complete the development and demonstration of new, safe, and environmentally acceptable alternatives to open burning/open detonation (OB/OD) for recovery/recycle/reclamation equipment and processes to reduce the extremely large stockpile of munitions in the resource recovery disposition account and recovered munitions from FUDS.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1251 Completed installation and pre start-up testing of prototype Supercritical Water Oxidation (SCWO) system for demilitarization of colored smokes and dyes • 984 Continued development of explosives rework process for cast loaded munitions • 1268 Continued cryofracture development for demilitarization of anti-personnel landmines (APL) and other munitions • 503 Completed fabrication and continued installation of pilot scale plasma arc technology • 1038 Completed construction of Explosive Waste Incinerator • 4062 Initiated demonstration program using commercially available blast chamber technology <p>Total 9106</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2294 Continue cryofracture development for demilitarization of APL and other munitions • 2000 Continue demonstration program for blast chamber technology • 900 Complete test and evaluation of prototype SCWO system for the demilitarization of colored smokes and dyes • 250 Complete development of explosive rework process for cast loaded munitions • 1062 Continue testing of pilot scale plasma arc technology • 157 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 6663</p>										
Project DF24			Page 5 of 13 Pages				Exhibit R-2A (PE 0605805A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management and Support	0605805A Munitions Standardization Effectiveness and Safety	February 1999 DF24
FY 2000 Planned Program:		
•	2400 Complete testing, evaluation, and prove-out of pilot scale plasma arc technology	
•	900 Complete cryofracture development for demilitarization of APL and other munitions	
•	504 Initiate development of recycle/reuse technology for magnesium/aluminum	
•	402 Initiate development of multibase propellant recovery technology	
•	352 Initiate development of recovery/reuse technology for nitramine explosives	
Total	4558	
FY 2001 Planned Program:		
•	583 Continue development of recycle/reuse technology for magnesium/aluminum	
•	1152 Continue development of multibase propellant recovery technology	
•	851 Continue development of recovery/reuse technology for nitramine explosives	
•	586 Initiate development of nitrocellulose technology	
•	600 Explore advanced cutting technology	
•	769 Initiate development of electrochemical oxidation process	
Total	4541	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety				PROJECT D297		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D297 Munitions Survivability & Logistics	0	2481	3913	4215	4222	3937	4884	4939	Continuing	Continuing
<p>Mission Description and Justification: This project makes Army units more survivable by investigating, testing and demonstrating munitions logistics system solutions that prevent or minimize catastrophic explosive events and accelerate ammunition resupply. Key thrusts are munitions storage area survivability, insensitive munitions technology integration, weapon system rearm, explosive incompatibilities in strategic configured loads and advanced packaging and distribution system enhancements. Within each thrust, a broad array of solutions will be identified, tested, and evaluated against developed system measures of effectiveness. Optimum, cost effective solutions that enable the rapid projection of lethal and survivable forces will be demonstrated. The early stages of force deployment are especially critical. Theater ammunition storage areas are vulnerable and present the enemy with lucrative targets. These areas and distribution nodes contain the only available munitions stocks in theater, and loss of these munitions could cripple the force, jeopardize the mission, and result in high loss of life. This project mitigates vulnerabilities and ensures a survivable, effective fighting force.</p> <p>FY 1998 Accomplishments: Project not funded in FY 1998</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 873 Complete design architecture of prototype munitions storage area planning software tool that allows soldiers to quickly design survivable and efficient ammunition storage sites • 100 Complete study of the explosive safety hazards in storage and transport caused by incompatible munitions in proposed Strategic Configured Loads (SCL) and develop concepts for mitigating these hazards • 250 Populate database of Army munitions compliance status with DoD 5000.2-R requirement that all munitions be designed to withstand unplanned stimuli • 210 Complete concept and fabrication of a barrier system for tank ammunition packaging that makes the tank munition less sensitive to unplanned stimuli • 170 Evaluate less heat sensitive propellants and design a projectile venting system that relieves gas pressure for M915 and XM916 Dual Purpose Improved Conventional Munition (DPICM) cartridges to reduce reaction to unplanned stimuli • 210 Develop and evaluate low melting point ballistic protection material inserts for missile packaging (PAC-3, THAAD, MLRS, etc.) that will either contain the cycloid projectiles within the canister or, lower their exit velocity. The inserts will also protect the munition from bullet and fragment impacts • 50 Conduct testing of THAAD missile propellant to determine tensile strength and burning characteristics and prepare report to baseline future insensitive munitions (IM) propellant development 										
Project D297			Page 7 of 13 Pages				Exhibit R-2A (PE 0605805A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety	PROJECT D297
<p>FY 1999 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 110 Conduct reviews of munitions in development and production to determine if they meet the DoD 5000.2-R requirement to withstand unplanned stimuli and recommend technical approaches to meet this requirement • 153 Conduct market survey of corrosion prevention materials suitable for use in munitions packaging and select candidates for evaluation • 145 Select materials and candidate munition item and complete design of a lightweight packaging prototype for large munitions (VOLCANO dispenser system, Javelin, Multipurpose Individual Munition-Short Range Anti-tank Weapon (MPIM-SRAW), Precision Guided Mortar Munition, etc.) that will reduce the manpower and handling required to move heavy/bulky munitions • 65 Determine Special Operations Forces ammunition requirements and develop man-portable mixed ammunition packaging utilizing standard containers • 95 Conduct a study of the planned production levels and consumption rates of all Army munitions used for training to select likely candidates for reduced packaging configurations (to reduce operations and support costs and provide easier disposal of waste packaging) • 50 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 2481</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1100 Complete development of safety and survivability training information modules for the prototype munitions storage area planning software tool • 835 Conduct compatibility assessment tests and develop conceptual designs of packaging and mitigation solutions for incompatible munitions SCLs • 250 Identify specific IM technologies that can be applied to individual Army munitions, develop database, and identify IM improvement priorities • 250 Complete design modification, fabricate, and test tank ammunition packaging with a barrier system that makes the round less sensitive to unplanned stimuli. Test and evaluate a prototype plastic composite tank munitions container for improved IM performance • 380 Test less heat sensitive propellants and fabricate alternative projectile venting systems that relieve gas pressure for M915 and XM916 DPICM projectiles • 250 Complete testing of low melting point ballistic protection material inserts for missile packaging • 140 Continue reviews of munitions in development and production to determine if they meet DoD 5000.2-R requirement to withstand unplanned stimuli and recommend technical approaches to meet the requirement • 208 Complete concept and design of a venting system for Wide Area Mine (WAM) packaging that makes the WAM less sensitive to unplanned stimuli • 180 Purchase candidate corrosion prevention materials and conduct engineering testing to determine suitability for use in munitions packaging • 320 Complete functional element analysis of design and fabricate lightweight packaging prototype for large munitions. Conduct baseline testing of prototype <p>Total 3913</p>		
Project D297	Page 8 of 13 Pages	Exhibit R-2A (PE 0605805A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety	PROJECT D297
<p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 1000 Complete integration of safety and survivability planning information modules, develop linkage to Standard Army Ammunition System (SAAS), the ammunition management information system, and conduct engineering testing of a prototype munitions storage area planning software tool • 438 Design and fabricate prototype packaging and mitigation solutions for incompatible munitions SCLs and develop test plan • 600 Analyze test results and modify, if necessary, less heat sensitive propellants and projectile venting systems that relieve gas pressure for M915 and XM916 DPICM projectiles. Complete test plan for modified/improved prototypes • 150 Analyze test data and prepare final report on low melting point ballistic protection material inserts for missile packaging • 140 Conduct reviews of munitions in development and production to determine if they meet the DoD 5000.2-R requirement to withstand unplanned stimuli and recommend technical approaches to meeting the requirement • 300 Fabricate and test shipping and storage packaging with a venting system that makes the WAM less sensitive to unplanned stimuli • 262 Evaluate less sensitive high explosives as replacements for TNT in many Army munitions (artillery, mortars, mines, etc.) Replacing highly sensitive TNT will reduce reactions to unplanned stimuli and eliminate the environmental hazards of manufacturing TNT. Develop test plans. • 825 Evaluate less sensitive high explosives and propellants and impact and heat resistant rocket motor case materials for missiles (MLRS, ATACMS-BAT, PAC-3, THAAD, etc.) that will reduce the reaction to unplanned stimuli. Develop test plans • 200 Analyze test results, modify design and conduct instrumented testing of lightweight packaging prototype for large munitions • 110 Develop concepts and design prototype lightweight composite containers for medium and small caliber ammunition that will increase handling efficiency and reduce environmental impact compared to currently fielded containers • 190 Conduct a market survey and purchase candidate coatings and materials that, when applied or inserted into packaging, will reduce the accelerated aging of ammunition energetics, electronics and propellants due to solar heating <p>Total 4215</p>		
Project D297	Page 9 of 13 Pages	Exhibit R-2A (PE 0605805A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety				PROJECT M296		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M296 Pyrotechnic Reliability and Safety	663	650	794	800	0	0	0	0	0	3534
<p><u>Mission Description and Justification:</u> This project will support pyrotechnic research, development and testing to identify, characterize and resolve reliability, safety, storage and manufacturing issues that impact production availability and field use of pyrotechnics, including training realism. Project will result in the development and demonstration of new, safe, reliable and environmentally acceptable munitions.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 149 Successfully completed parametric formulation and formulation characterization to demonstrate the use of atomized aluminum as an effective substitute for magnesium fuel. Environmentally acceptable potassium nitrate/boron ignition mixture was demonstrated to replace environmentally incompatible barium chromate compound • 149 Successfully demonstrated 88% reduction in hydrogen outgassing of magnesium fuel containing countermeasure flare formulations by applying polymeric coating technology. Conventional processing techniques (dissolution, blending, pressing) have been employed • 365 Studied a radio frequency safe design technique relying on ferrite material. Conducted a market survey and an evaluation of industry posture and effectiveness on ferrite cable for the purpose of avoiding complete reliance on existing sole source product. Responses were minimal <p>Total 663</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 120 Develop and investigate merit of substitutes for critical, sole-source and toxic materials. Perform preliminary testing to screen candidate materials • 175 Design safer pyrotechnic munitions/systems for reduced fragmentation effects and tamper resistant configurations • 203 Develop alternative to magnesium. Conduct parametric formulations, performance characterization/evaluations and optimization of selected candidates in white, green, and red illuminants • 135 Complete technology pyrotechnic shelf life study. Conduct environmental tests under various temperature/humidity conditions. Perform function test and evaluation on conditioned items • 17 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 650</p>										
Project M296			Page 10 of 13 Pages				Exhibit R-2A (PE 0605805A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety	February 1999
FY 2000 Planned Program:		
•	236 Complete development of alternative to magnesium. Develop formulations and conduct performance characterization/evaluations. Optimize weapons effects simulator design.	
•	328 Develop safer pyrotechnic munition/systems specific to light amplification by stimulated emission of radiation techniques	
•	230 Investigate merit of substitutes for critical, sole-source, and toxic materials. Perform formulation development, parametric studies, and performance characterization	
Total	794	
FY 2001 Planned Program:		
•	232 Eliminate incompatible and hygroscopic pyrotechnic ingredients in pyrotechnic munitions/system. Initiate improvement of the pyrotechnic reliability and manufacturing process controls	
•	335 Develop and test safer pyrotechnic munition/systems specific to light amplification by stimulated emission of radiation techniques	
•	233 Investigate merit of substitutes for critical, sole-source, and toxic materials. Perform formulation development, parametric studies, and performance characterization	
Total	800	
Project M296	Page 11 of 13 Pages	Exhibit R-2A (PE 0605805A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety				PROJECT M857		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M857 Explosive Safety Standards	565	542	779	765	777	788	805	826	Continuing	Continuing
<p>Mission Description and Justification: Supports explosive effects research and testing to quantify hazards and to develop techniques to mitigate these hazards in all DOD manufacturing, testing, transportation, maintenance, storage and disposal of ammunition and explosives operations. Results are essential to the development and improvement of quantity-distance standards, hazard classification procedures, cost effective explosion-resistant facility design procedures, and personnel hazard/protection criteria.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 40 Collected and analyzed data for revising DOD and NATO hazard interpretation for Hazard Divisions 1.1 and 1.2 ammunition outside and inside structures • 110 Developed improved tri-service design procedures and improved computer codes for explosion-resistant structures • 47 Developed improved explosives and munitions tests and characterization data • 288 Developed improved DOD and NATO explosives safety guidelines for munitions storage, explosives operating and field operation facilities • 80 Conducted other hazards analyses and expanded/automated explosives safety data bases <p>Total 565</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 54 Continue to collect and analyze airblast/fragment/thermal data for revising DOD, NATO and United Nations hazard classification interpretations for Hazard Divisions 1.1, 1.2, 1.3, 1.4, 1.4S, 1.5 and 1.6 • 150 Continue development of improved explosives and munitions tests and characterization data • 303 Continue to develop improved DOD and NATO explosives safety guidelines for munitions storage, explosives operating and field operation facilities • 20 Continue to conduct other hazards analyses and expand/automate explosives safety data bases • 15 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 542</p>										
Project M857			Page 12 of 13 Pages				Exhibit R-2A (PE 0605805A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety	PROJECT M857
<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 150 Continue to collect and analyze airblast/fragment/thermal data for revising DOD, NATO and United Nations hazard classification interpretations for Hazard Divisions 1.1, 1.2, 1.3, 1.4, 1.4S, 1.5 and 1.6 • 150 Continue development of improved tri-service design procedures and improved computer codes for explosion-resistant structures • 100 Continue development of improved explosives and munitions tests and characterization data • 229 Continue to develop improved DOD and NATO explosives safety guidelines for munitions storage, explosives operating and field operation facilities • 150 Continue to conduct other hazards analyses and expand/automate explosives safety data bases <p>Total 779</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 150 Continue to collect and analyze airblast/fragment/thermal data for revising DOD, NATO and United Nations hazard classification interpretations for Hazard Divisions 1.1, 1.2, 1.3, 1.4, 1.4S, 1.5 and 1.6 • 150 Continue development of improved tri-service design procedures and improved computer codes for explosion-resistant structures • 100 Continue development of improved explosives and munitions tests and characterization data • 215 Continue to develop improved DOD and NATO explosives safety guidelines for munitions storage, explosives operating and field operation facilities • 150 Continue to conduct other hazards analyses and expand/automate explosives safety data bases <p>Total 765</p>		
Project M857	Page 13 of 13 Pages	Exhibit R-2A (PE 0605805A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605853A Environmental Conservation						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	2435	3174	0	0	0	0	0	0	0	5609
M0CC Environmental Conservation - AMC Test Ranges	2171	2884	0	0	0	0	0	0	0	5055
M1CC Environmental Conservation - AMC Major Subordinate Commands/Laboratories	140	153	0	0	0	0	0	0	0	293
M5CC Environmental Conservation - USASSDC	124	137	0	0	0	0	0	0	0	261

A. Mission Description and Budget Item Justification: This program ensures that resources are available to fund actions specifically required to protect or enhance natural and cultural resources, preserve access to improved and unimproved training areas, and make necessary repairs to minimize erosion and otherwise rehabilitate lands and waters at Army RDTE installations, laboratories and test ranges. It focuses on compliance with natural and cultural resource laws and on responsible management of natural and cultural resources to ensure resources are used wisely and are protected. It finances studies and surveys to identify, inventory, and manage natural (endangered or threatened species, other wildlife, timber, agricultural lands, training areas, etc.) and cultural resources and evaluation of the resources so identified and inventoried; Integrated Training Area Management; preparation of natural and cultural resource management plans; design, construction, maintenance or repair costs specifically required to restore, improve or maintain natural or cultural resources; supplies and equipment required to carry out applicable natural and cultural resources management activities. It includes appropriated RDTE funds attributable to fish, wildlife, agricultural outleasing and timber management activities. It does not include normal maintenance required for appearance, including landscaping, or normal building maintenance associated with present day, non-cultural uses of historic buildings. Army defines environmental effort as: Class O - Project needed to cover essential administrative, personnel, and other costs required to manage environmental activities and monitor environmental conditions associated with compliance. Class I - support compliance with legally binding agreements or judgments under applicable Federal, State, local or host nation natural or cultural resource environmental laws; correct deficiencies cited in an inspection or notice of violation by a natural or cultural resource regulatory agency, or host nation equivalent; correct deficiencies where a statutory or regulatory deadline has passed; Class II - projects required to comply with an established natural or cultural resource standard, and deadline for compliance is in the future. Beginning in FY2000, Environmental Conservation transfers to the Operations and Maintenance, Army (OMA) appropriation.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605853A Environmental Conservation
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	1723	3195	3501	3121
Appropriated Value	1778	3195		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-55	-21		
b. SBIR/STTR	-42			
c. Omnibus or Other Above Threshold Reductions	-14			
d. Below Threshold Reprogramming	768			
c. Rescissions				
Adjustments to Budget Years Since <u>FY1999 PB</u>			-3501	-3121
Current Budget Submit (FY2000/2001 PB Submission)	2435	3174	0	0

Change Summary Explanation: Funding - Beginning in FY 2000 the Environmental Conservation Program transfers to OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605853A Environmental Conservation				PROJECT M0CC		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0CC Environmental Conservation - AMC Test Ranges	2171	2884	0	0	0	0	0	0	0	5055
<p>Mission Description and Justification: Resources in this project ensure an adequate level of funding for environmental natural and cultural resource management requirements, at Yuma Proving Ground (YPG), AZ; Garrison Aberdeen Proving Ground (GAPG), MD; Dugway Proving Ground (DPG), UT; and White Sands Missile Range (WSMR), NM. The operations are critical to the infrastructure and execution of the Army testing mission. Improper management of natural and cultural resources at these installations could shut down the test mission.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2171 Funded Class O, Class I and Class II environmental natural and cultural resource management programs such as management/protection of endangered species, and preservation of cultural resources according to the national historic preservation plans. Also funded ecosystem management, wildlife surveys and habitat delineation. Included projects such as Support of Required National Register Sampling and Historic Property Stabilization at GAPG; Natural Resource Management Plan at DPG; Endangered Species Management Plan and Wetland Delineation at WSMR; National Historic Preservation Act Compliance Plan at YPG. <p>Total 2171</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2808 Fund Class O, Class I and Class II environmental natural and cultural resource management programs such as management/protection of endangered species, and preservation of cultural resources according to the historic preservation plans. Also fund ecosystem management, wildlife surveys and habitat delineation. Projects such as Pesticide Management at GAPG; Threatened and Endangered Species Survey at DPG; Development of Watershed Management Plan and Wetland ID/Mapping at WSMR; and Preservation and Management-White Tanks National Register District at YPG. 76 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 2884</p> <p>FY 2000 Planned Program: Project funded in OMA.</p> <p>FY 2001 Planned Program: Project funded in OMA.</p>										
Project M0CC			<i>Page 3 of 5 Pages</i>			Exhibit R-2A (PE 0605853A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605853A Environmental Conservation	PROJECT M1CC
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1CC Environmental Conservation - AMC Major Subordinate Commands/Laboratories	140	153	0	0	0	0	0	0	0	293

Mission Description and Justification: Resources in this project ensure an adequate level of funding for environmental natural and cultural resource management requirements at Army Research Laboratory (ARL), Adelphi, MD; Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, Dover, NJ; Soldier and Biological Chemical Command (SBCCOM), Natick, MA.

FY 1998 Accomplishments:

- 140 Funded Class I and Class II environmental natural and cultural resource management programs such as required surveys of historical buildings and preservation of the building.

Total 140

FY 1999 Planned Program:

- 149 Fund Class I and Class II environmental natural and cultural resource management programs such as required surveys of historical buildings and preservation of the building.
- 4 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 153

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605853A Environmental Conservation	PROJECT M5CC
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M5CC Environmental Conservation - USASSDC	124	137	0	0	0	0	0	0	0	261

Mission Description and Justification: Resources in this project ensure an adequate level of funding for environmental natural and cultural resource management requirements, at the U.S. Army Space and Missile Defense Command.

FY 1998 Accomplishments:

- 124 Continued development of Historic Preservation Plan for management of historic properties to comply with National Historic Preservation Act.
- Total 124

FY 1999 Planned Program:

- 134 Continue development of Historic Preservation Plan for management of historic properties to comply with National Historic Preservation Act
 - 3 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 137

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA..

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605854A Pollution Prevention						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	4773	10624	0	0	0	0	0	0	0	15397
M0PP Pollution Prevention - AMC Test Ranges	0	1150	0	0	0	0	0	0	0	1150
M1PP Pollution Prevention - AMC Major Subordinate Commands/Laboratories	146	145	0	0	0	0	0	0	0	291
M5PP Pollution Prevention - USASMDC	2146	1134	0	0	0	0	0	0	0	3280
M8PP Pollution Prevention - Acquisition Pollution Prevention	2481	8195	0	0	0	0	0	0	0	10676

A. Mission Description and Budget Item Justification: This program funds the non-research portion of the Army's RDTE funded environmental pollution prevention program. The program funds test and evaluation pollution prevention efforts addressing environmental compliance and mission readiness issues affecting Army weapon systems; supporting industrial facilities; and RDTE funded installations, laboratories and test ranges. Pollution prevention is any action designed to reduce or eliminate (rather than control or treat), through source reduction actions, the procurement and use of hazardous materials and the generation of hazardous waste; more efficient use of natural resources; recycling; and/or reduced emissions of toxins and other waste to the environment. Acquisition pollution prevention addresses the adverse impact of hazardous materials and hazardous waste on the operational readiness of Army weapon systems and facilities. Issues include prove-out/engineering of alternatives to (1) ozone-depleting chemicals and (2) hazardous and toxic chemicals and materials used in weapon system fire protection, cooling and refrigeration applications, manufacturing and maintenance processes and specialized test practices throughout the weapon system life cycle. These activities account for approximately 90 percent of the hazardous waste generated by the U.S. Army. This program includes the review and revision of standardized technical documentation containing design, procurement and maintenance requirements, and procedures supporting materiel procurement such as the Joint Group for Acquisition Pollution Prevention. Projects under this program meet Army definitions: Class O - Projects needed to cover essential administrative, personnel, and other costs required to manage environmental activities and monitor environmental condition associated with compliance; Class I - support compliance with legally binding agreements or judgments under applicable federal, state, local or host nation environmental laws; Class II - projects required to comply with established standard, and deadline for compliance in the future. Class I and II projects comply with the Montreal Protocol, the Clean Air Act, the Pollution Prevention Act, the Emergency Planning and Right-to-Know Act, and Executive Order 12856 (and others). Beginning in FY2000, Pollution Prevention is transferred to the Operations and Maintenance, Army (OMA) appropriation.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854A Pollution Prevention
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	5187	8694	13401	6396
Appropriated Value	5353	10694		
Adjustments to Appropriated Value				
a. Cong Gen Reductions	-166	-70		
b. SBIR/STTR	-130			
c. Omnibus or Other Above Threshold Reductions	-42			
d. Below Threshold Reprogramming	-242			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-13401	-6396
Current Budget Submit (FY 2000/2001 PB Submission)	4773	10624	0	0

Change Summary Explanation: Funding – FY 1999 - \$2M Congressional add.
 Beginning FY 2000, the Pollution Prevention Program transferred to OMA.

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854A Pollution Prevention	PROJECT MOPP
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
MOPP Pollution Prevention - AMC Test Ranges	0	1150	0	0	0	0	0	0	0	1150

Mission Description and Justification: Resources in this project ensure an adequate level of funding for pollution prevention requirements at Yuma Proving Ground (YPG), AZ; Garrison Aberdeen Proving Ground (GAPG), MD; Dugway Proving Ground (DPG), UT; and White Sands Missile Range (WSMR), NM. These operations are critical to the infrastructure and execution of the Army testing mission.

FY 1998 Accomplishments: Project was not funded in FY 1998.

FY 1999 Planned Program:

- 1119 Fund Class O, Class I and Class II pollution prevention programs and projects. Programs such as reporting of Toxic Release Inventories, solid and hazardous waste reduction programs, implementation of storm water pollution prevention plans, purchase of spill response supplies and equipment, etc. Also fund Emergency Planning and Community Right-to-Know Act (EPCRA) compliance preventive projects. Include projects such as Chlorine Replacement – Water treatment and Closed Loop Washrack at GAPG; Implementation of Pollution Prevention Opportunities at DPG; Yard Waste and Tire Shredder at WSMR; and Executive Order 12856 Implementing Strategy at YPG.
 - 31 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 1150

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605854A Pollution Prevention				PROJECT M1PP		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1PP Pollution Prevention - AMC Major Subordinate Commands/Laboratories	146	145	0	0	0	0	0	0	0	291
<p><u>Mission Description and Justification:</u> Resources in this project ensure an adequate level of funding for pollution prevention requirements at Army Research Laboratory (ARL), Adelphi, MD; Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, Dover, NJ; Soldier and Biological Chemical Command (SBCCOM), Natick, MA; and Army Research Laboratory Materials Technology Directorate (ARLMTD), APG, MD.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 146 Funded Class I and Class II pollution prevention programs such as waste solvent replacement programs, purchase of alternate fuel vehicles, construction of sound-absorbing barriers, implementation of storm water pollution prevention plans, purchase of spill response equipment, etc. <p>Total 146</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 141 Fund Class I and Class II pollution prevention programs such as waste solvent replacement programs, purchase of alternate fuel vehicles, construction of sound-absorbing barriers, implementation of storm water pollution prevention plans, purchase of spill response equipment, etc. • 4 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 145</p> <p>FY 2000 Planned Program: Project funded in OMA.</p> <p>FY 2001 Planned Program: Project funded in OMA.</p>										
Project M1PP			<i>Page 4 of 7 Pages</i>			Exhibit R-2A (PE 0605854A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605854A Pollution Prevention				PROJECT M5PP		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M5PP Pollution Prevention - USASMDC	2146	1134	0	0	0	0	0	0	0	3280
<p><u>Mission Description and Justification:</u> Resources in this project ensure an adequate level of funding for pollution prevention requirements at the USASMDC.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2146 Funded pollution prevention programs such as hazardous material satellite areas, recycling of metals, Halon reduction, pollution prevention, etc. <p>Total 2146</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1104 Fund pollution prevention programs such as hazardous material satellite areas, recycling of metals, Halon reduction, pollution prevention, etc. • 30 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 1134</p> <p>FY 2000 Planned Program: Project funded in OMA.</p> <p>FY 2001 Planned Program: Project funded in OMA.</p>										
Project M5PP			<i>Page 5 of 7 Pages</i>				Exhibit R-2A (PE 0605854A)			

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854A Pollution Prevention	PROJECT M8PP
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M8PP Pollution Prevention - Acquisition Pollution Prevention	2481	8195	0	0	0	0	0	0	0	10676

Mission Description and Justification: Develop and implement the Army Acquisition Pollution Prevention program to reduce requirements for hazardous materials and toxic chemicals used throughout the weapon system life cycle. The program supports Army compliance with the Montreal Protocol, the Clean Air Act, the Pollution Prevention Act and Executive Order 12856 (and others). This program primarily funds test and evaluation of environmentally acceptable alternative materials and processes used in weapon system design, testing, production, maintenance, operation and support. Issues directly affecting operational readiness of weapon systems and supporting facilities take top priority. Support is also provided for the Joint Group for Acquisition Pollution Prevention.

FY 1998 Accomplishments:

- 145 Toxicological Assessment of Alternative New Materials
- 251 Program Management and Oversight
- 600 Test and Evaluation related to Ammunition/Munition Production (test procedures, tracer composition, sealing and coating)
- 300 Test and Evaluation related to Aviation and Missile Production (powder coating, and alternative fuels)
- 85 Test and Evaluation related to Electronics Production and Support (batteries)
- 480 Test and Evaluation related to Chemical Biological Defense test procedures
- 620 Process Support in the Industrial Base
- Total 2481

FY 1999 Planned Program:

- 137 Toxicological Assessment of Alternative New Materials
- 282 Program Management and Oversight
- 2200 Test and Evaluation related to Ammunition/Munition Production
- 1215 Test and Evaluation related to Aviation and Missile Production
- 190 Test and Evaluation related to Electronics Production and Support
- 623 Test and Evaluation related to Track and Wheeled System Production
- 1006 Test and Evaluation related to Chemical Biological Defense
- 615 Test and Evaluation related to Soldier System
- 290 Process Support in the Industrial Base

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE September 1998
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854A Pollution Prevention	PROJECT M8PP
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- FY 1999 Planned Program: (continued)**
- 420 Process Support to the Test Activities
 - 1000 Joint Group for Acquisition Pollution Prevention
 - 217 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 8195

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605856A Environmental Compliance - Research, Development, Testing & Evaluation
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	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	55058	48986	0	0	0	0	0	0	0	104044
M0VV Environmental Compliance - AMC Test Ranges	33739	32231	0	0	0	0	0	0	0	65970
M1VV Environmental Compliance - AMC Major Subordinate Commands/Laboratories	11192	9927	0	0	0	0	0	0	0	21119
M4VV Environmental Compliance - Corps of Engineers	6558	4967	0	0	0	0	0	0	0	11525
M5VV Environmental Compliance - USASSDC	1869	1861	0	0	0	0	0	0	0	3730
M6VV Environmental Compliance - Landfill Remediation	1700	0	0	0	0	0	0	0	0	1700

A. Mission Description and Budget Item Justification: This program ensures that resources are available to fund legally mandated environmental compliance activities at U.S. Army RDTE installations, laboratories and test ranges. It finances environmental staff salaries; minor construction, repair and upgrade of facilities to meet environmental standards, including waste treatment and disposal; radon abatement; repair and clean up of underground storage tank hazards; management of hazardous waste storage and disposal; permits and licensing fees; environmental training, plans and studies; and environmental monitoring and audits. Funds cost of complying with Federal Facility Compliance Agreements (FFCA) and other environmental agreements, and correcting notices of violation. It does not finance construction or repairs unrelated to environmental compliance or Defense Environmental Restoration Account (DERA) funded environmental restoration. In summary, this program provides for environmental quality control of current defense operations and disposal of hazardous waste incident to defense operations funded by the RDTE appropriation. Army defines environmental effort as: Class O - projects needed to cover essential administrative, personnel, and other costs required to manage environmental activities and monitor environmental conditions associated with compliance. Class I - support compliance with legally binding agreements or judgments under applicable federal, state, local or host nation environmental law; correct deficiencies cited in an inspection or notice of violation by a regulatory agency, or host nation equivalent; correct deficiencies where a statutory or regulatory deadline has passed; Class II - projects required to comply with an established standard, and deadline for compliance is in the future; Class III - salaries and training for environmental personnel and projects required to maintain/improve environmental quality, but where non-compliance is not imminent. Beginning in FY2000, Environmental Compliance is transferred to the Operations and Maintenance, Army (OMA) appropriation.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE
February 1999

BUDGET ACTIVITY
6 - Management and Support

PE NUMBER AND TITLE
0605856A Environmental Compliance - Research, Development, Testing & Evaluation

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	56576	44116	40365	38356
Appropriated Value	58378	49116		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1802	-130		
b. SBIR/STTR	-952			
c. Omnibus or Other Above Threshold Reductions	-314			
d. Below Threshold Reprogramming	-252			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-40365	-38356
Current Budget Submit (FY 2000/2001 PB)	55058	48986	0	0

Change Summary Explanation:

Funding: FY 2000 funds (-40365) for the RDTE Environmental Compliance Program reprogrammed to OMA.
FY 2001 funds (-38356) for the RDTE Environmental Compliance Program reprogrammed to OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605856A Environmental Compliance - Research, Development, Testing & Evaluation					PROJECT M0VV	
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0VV Environmental Compliance - AMC Test Ranges	33739	32231	0	0	0	0	0	0	0	65970
<p><u>Mission Description and Justification:</u> Resources in the project ensure an adequate level of funding for legally mandated environmental compliance requirements at Yuma Proving Ground (YPG), AZ; Garrison Aberdeen Proving Ground (GAPG), MD; Dugway Proving Ground (DPG), UT; and White Sands Missile Range (WSMR), NM. These operations are critical to the infrastructure of the Army testing program.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 33739 Funded Class O, Class I, Class II, and other “Must Fund” environmental compliance programs and projects. Programs such as underground storage tank removal/remediation, Environmental Impact compliance, expansion of solid waste landfill, backflow prevention program and closure of solid waste management units. Also funds hazardous waste disposal and program management. Include projects such as Hazardous Materials Inventory/Tracking/Reporting Compliance and Solid Waste Compliance Management at GAPG; Management of Central Storage Facility at DPG; Monitoring of Drinking (Ground) Water at WSMR; and Sample and Analysis of Depleted Uranium at YPG. <p>Total 33739</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 32231 Fund Class O, Class I, Class II, and other “Must Fund” environmental compliance programs and projects. Programs such as underground storage tank removal/remediation, Environmental Impact Statement, asbestos disposal, wastewater compliance, expansion of solid waste landfill, backflow prevention program and closure of solid waste management units. Also funds hazardous waste disposal and program management. Include projects such as Inflow/Infiltration Reduction at GAPG; Permit Application for Open Burning & Open Denotation at DPG; Sewage Lagoon at WSMR; and Storm Water Control at YPG. <p>Total 32231</p> <p>FY 2000 Planned Program: Project is reprogrammed to OMA.</p> <p>FY 2001 Planned Program: Project is reprogrammed to OMA.</p>										
Project M0VV			<i>Page 3 of 7 Pages</i>				Exhibit R-2A (PE 0605856A)			

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605856A Environmental Compliance - Research, Development, Testing & Evaluation	PROJECT M1VV
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1VV Environmental Compliance - AMC Major Subordinate Commands/Laboratories	11192	9927	0	0	0	0	0	0	0	21119

Mission Description and Justification: Resources in this project ensure an adequate level of funding for legally mandated environmental compliance requirements at Army Research Laboratory (ARL), Adelphi, MD; Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, Dover, NJ; and Soldier and Biological Chemical Command (SBCCOM), Natick, MA.

FY 1998 Accomplishments:

- 11192 Funded Class I, Class II, and other environmental programs, such as, drinking water cross-connection program and compliance with sewage prevention requirement at ARDEC; continue upgrade of fume hood exhaust controls and underground storage tank compliance program; Funded compliance requirements such as hazardous waste disposal and program management.

Total 11192

FY 1999 Planned Program:

- 9927 Fund Class I, Class II, and other environmental programs, such as, drinking water cross-connection program and compliance with sewage prevention requirement; underground storage tank compliance program. Fund remaining compliance requirements such as hazardous waste disposal and program management.

Total 9927

FY 2000 Planned Program: Project is reprogrammed to OMA..

FY 2001 Planned Program: Project is reprogrammed to OMA.

Project M1VV Page 4 of 7 Pages Exhibit R-2A (PE 0605856A)

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605856A Environmental Compliance - Research, Development, Testing & Evaluation					PROJECT M4VV	
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4VV Environmental Compliance - Corps of Engineers	6558	4967	0	0	0	0	0	0	0	11525
<p><u>Mission Description and Justification:</u> This Congressional add funds industry cost-shared demonstration of low emission boiler and industry cost-shared demonstration for privatized fuel cell combined heat electrical supply technology at approximately 21 sites. The effort is managed by the Army Construction Engineering Research Laboratory (CERL).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 6558 Funded industry cost-shared demonstration of low emission boiler and Industry cost shared demonstration for privatized fuel cell combined heat and electrical supply technology at approximately 21 sites. Funded Navy, Army and Air Force fuel cell project review teams. Funds were added by Congress <p>Total 6558</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 4967 \$2.967M will support the Climate Fuel Cell Program. Approximately 13 federal grants will be issued to non-Federal entities to purchase and install fuel cell power plants, with priority to those installed at DoD facilities. \$2M will support the demonstration of Low NOx Boiler technology at Army installations in coordination with the Army Utility Modernization Program. Funding will purchase and install one Low NOx Boiler and develop thermal and environmental performance criteria from 3 ongoing demonstrations. Funds were added by Congress. <p>Total 4967</p> <p>FY 2000 Planned Program: Project not funded in FY 2000</p> <p>FY 2001 Planned Program: Project not funded in FY 2001</p>										
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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605856A Environmental Compliance - Research, Development, Testing & Evaluation				PROJECT M5VV		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M5VV Environmental Compliance - USASSDC	1869	1861	0	0	0	0	0	0	0	3730
<p><u>Mission Description and Justification:</u> Resources in this project ensure an adequate level of funding for legally mandated environmental compliance requirements at the U.S. Army Space and Missile Defense Command (USASMDC).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1869 Funded environmental compliance programs such as PCB removal, testing for hazardous materials, shipment and disposal of hazardous wastes, environmental staff training, water quality, clean up fuel/oil contamination, underground storage tank compliance, asbestos removal and shipment, mitigation monitoring, etc. <p>Total 1869</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1811 Fund environmental compliance programs such as PCB removal, testing for hazardous materials, shipment and disposal of hazardous wastes, environmental staff training, water quality, clean up fuel/oil contamination, underground storage tank compliance, asbestos removal and shipment, mitigation monitoring, etc. • 50 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 1861</p> <p>FY 2000 Planned Program: Project is reprogrammed to OMA</p> <p>FY 2001 Planned Program: Project is reprogrammed to OMA</p>										
Project M5VV			<i>Page 6 of 7 Pages</i>			Exhibit R-2A (PE 0605856A)				

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605856A Environmental Compliance - Research, Development, Testing & Evaluation					PROJECT M5VV	
<i>COST (In Thousands)</i>	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
M6VV Environmental Compliance - Landfill Remediation	1700	0	0	0	0	0	0	0	0	1700
<p><u>Mission Description and Justification:</u> The funds were for the continuation of an environmental remediation demonstration project at Fort Ord, CA.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1700 National Defense Center for Environmental Excellence (NDCEE) completed various environmental research and development tasks at Fort Ord, CA. These tasks complemented the original statement of work's research assignments and further investigated innovative environmental technologies at Fort Ord. The general public and environmental professionals were provided access to these research and development technology efforts through the existing internet media web page. <p>Total 1700</p> <p>FY 1999 Planned Program: Project is not funded in FY 1999</p> <p>FY 2000 Planned Program: Project is not funded in FY 2000</p> <p>FY 2001 Planned Program: Project is not funded in FY 2001</p>										
Project M5VV			<i>Page 7 of 7 Pages</i>				Exhibit R-2 (PE 0605856A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605876A Minor Construction - Research, Development, Testing & Evaluation
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	4003	4177	0	0	0	0	0	0	0	8180
M0WW Minor Construction - Test Ranges	2420	2584	0	0	0	0	0	0	0	5004
M1WW Minor Construction - AMC Subordinate Commands and Laboratories	1098	1120	0	0	0	0	0	0	0	2218
M4WW Minor Construction - Corps of Engineers	485	473	0	0	0	0	0	0	0	958

A. Mission Description and Budget Item Justification: This program element finances activities and functions necessary to provide facility related minor construction for U.S. Army RDTE installations, laboratories and test ranges. Minor construction includes: erection, installation, or assembly of a new real property facility; expansion, extension, alteration, conversion, relocation or replacement of an existing real property facility. Includes design costs directly associated with accomplishing a designated project undertaking. These projects substantially prolong the useful life of the facility and are all actually facility investments. Beginning in FY2000, Minor Construction is funded in the Operations and Maintenance, Army (OMA) appropriation.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	4258	4205	4097	4085
Appropriated Value	4393	4205		
Adjustments to Appropriated Value				
a. Cong Gen Reductions	-135	-28		
b. SBIR/STTR	-80			
c. Omnibus or Other Above Threshold Reductions	-26			
d. Below Threshold Reprogramming	-149			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-4097	-4085
Current Budget Submit (FY 2000/2001 PB)	4003	4177	0	0

Change Summary Explanation: Funding: FY 2000 (-4097) reduction reflects the realignment of the RDTE Minor Construction program from RDTE to OMA. FY 2001 (-4085) reduction reflects the realignment of the RDTE Minor Construction program from RDTE to OMA.

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605876A Minor Construction - Research, Development, Testing & Evaluation					PROJECT M0WW	
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0WW Minor Construction - Test Ranges	2420	2584	0	0	0	0	0	0	0	5004
<p><u>Mission Description and Justification:</u> Finances RDTE minor construction projects for U.S. Army Materiel Command (AMC) technical test ranges assigned to Test and Evaluation Command (TECOM), i.e., Yuma Proving Ground, AZ; Aberdeen Proving Ground, MD; Dugway Proving Ground, UT; and White Sands Missile Range, NM. In addition, project provides common service host support for over 100 tenants and satellites located on these four TECOM ranges. Facility assets managed include over approximately 4 million acres of land, over 24 million square feet of building space, 3 thousand miles of roads, and 2 thousand miles of utility lines.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1275 Funded minor construction projects at Aberdeen Proving Ground, MD • 281 Funded minor construction projects at Dugway Proving Ground, UT • 649 Funded minor construction projects at White Sands Missile Range, NM • 215 Funded minor construction projects at Yuma Proving Ground, AZ <p>Total 2420</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1307 Fund minor construction projects at Aberdeen Proving Ground, MD • 276 Fund minor construction projects at Dugway Proving Ground, UT • 629 Fund minor construction projects at White Sands Missile Range, NM • 303 Fund minor construction projects at Yuma Proving Ground, AZ • 69 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 2584</p> <p>FY 2000 Planned Program: Project is funded in OMA.</p> <p>FY 2001 Planned Program: Project is funded in OMA.</p>										
Project M0WW			Page 2 of 4 Pages				Exhibit R-2A (PE 0605876A)			

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605876A Minor Construction - Research, Development, Testing & Evaluation				PROJECT M1WW		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1WW Minor Construction - AMC Subordinate Commands and Laboratories	1098	1120	0	0	0	0	0	0	0	2218
<p>Mission Description and Justification: This project finances minor construction projects for U.S. Army Materiel Command major subordinate command RDTE installations and laboratories, i.e., Army Research Laboratory (ARL), Adelphi, MD; Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, Dover, NJ; and Soldier and Biological Chemical Command (SBCCOM), Natick, MA. Also provides common service host support to 36 tenants located at these installations. Facilities managed include 8,996 acres of land and 6.4 million square feet of building space.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 864 Funded minor construction projects at ARDEC, Picatinny Arsenal, NJ • 152 Funded minor construction projects at ARL, Adelphi, MD • 82 Funded minor construction projects at SBCCOM, Natick, MA. <p>Total 1098</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 647 Fund minor construction projects at ARDEC, Picatinny Arsenal, NJ • 280 Fund minor construction projects at ARL, Adelphi, MD • 163 Fund minor construction projects at SBCCOM, Natick, MA. • 30 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs. <p>Total 1120</p> <p>FY 2000 Planned Program: Project is funded in OMA.</p> <p>FY 2001 Planned Program: Project is funded in OMA.</p>										
Project M1WW			<i>Page 3 of 4 Pages</i>				Exhibit R-2A (PE 0605876A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605876A Minor Construction - Research, Development, Testing & Evaluation					PROJECT M4WW	
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4WW Minor Construction - Corps of Engineers	485	473	0	0	0	0	0	0	0	958
<p><u>Mission Description and Justification:</u> Project finances those minor construction projects for U.S. Army Corps of Engineers RDTE laboratories located at Waterways Experiment Station (WES), Vicksburg, MS; Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH; Topographic Engineering Center (TEC), Alexandria, VA and Construction Engineering Research Laboratory (CERL), Champaign, IL.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 96 Funded minor construction projects at TEC, Alexandria, VA • 229 Funded minor construction projects at CRREL, Hanover, NH • 160 Funded minor construction projects at WES, Vicksburg, <p>Total 485</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 95 Fund minor construction projects at TEC, Alexandria, VA • 222 Fund minor construction projects at CRREL, Hanover, NH • 156 Fund minor construction projects at WES, Vicksburg, MS <p>Total 473</p> <p>FY 2000 Planned Program: Project is funded in OMA.</p> <p>FY 2001 Planned Program: Project is funded in OMA.</p>										
Project M4WW			<i>Page 4 of 4 Pages</i>			Exhibit R-2A (PE 0605876A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	79639	80059	0	0	0	0	0	0	0	159698
M0YY Maintenance and Repair - AMC Test Ranges	56358	62902	0	0	0	0	0	0	0	119260
M1YY Maintenance and Repair - AMC Subordinate Commands/Laboratories	10533	14035	0	0	0	0	0	0	0	24568
M4YY Maintenance and Repair - U.S. Army Corps of Engineers	3407	3122	0	0	0	0	0	0	0	6529
M744 Modernization of Utilities	9341	0	0	0	0	0	0	0	0	9341

A. Mission Description and Budget Item Justification: This program element finances activities and functions necessary for maintenance and repair of real property at U.S. Army RDTE installations, laboratories and test ranges. Maintenance and repair of real property includes applicable expenses of cyclic and preventive maintenance and annual recurring repair incurred by building trade shops, construction units, grounds and pavements units, machine shops and contracts. Funding also provides for modernization of utility systems. These projects substantially prolong the useful life of the facility, and are all actually facility investments. Beginning in FY2000, Maintenance and Repair is funded in the Operations and Maintenance, Army (OMA) appropriation.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	83751	49233	63333	69246
Appropriated Value	86419	80233		
Adjustments to Appropriated Value				
a. Cong Gen Reductions	-2668	-174		
b. SBIR/STTR	-1645			
c. Omnibus or Other Above Threshold Reductions	-543			
d. Below Threshold Reprogramming	-1924			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-63333	-69246
Current Budget Submit (<u>FY 2000/2001 PB</u>)	79639	80059	0	0

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation	
<p>Change Summary Explanation: Funding: FY 2000 (-63333) reflects the realignment of the Maintenance and Repair program from RDTE to OMA. FY 2001 (-69246) reflects the realignment of the Maintenance and Repair program from RDTE to OMA.</p>		
<i>Page 2 of 6 Pages</i>		Exhibit R-2 (PE 0605878A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation				PROJECT M0YY		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0YY Maintenance and Repair - AMC Test Ranges	56358	62902	0	0	0	0	0	0	0	119260
<p><u>Mission Description and Justification:</u> This project finances the maintenance and repair for sustaining the infrastructure of the U.S. Army Materiel Command (AMC) installations assigned to the Test and Evaluation Command (TECOM), i.e. Aberdeen Proving Ground, MD; Dugway Proving Ground, UT; Yuma Proving Ground, AZ and White Sands Missile Range, NM. Funding provides maintenance and repair to over 24 million square feet of facilities, 3 thousand miles of road, 1400 miles of electric distribution systems, and over 600 miles of water and sewage distribution systems.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 31978 Funded sustainment costs at Aberdeen Proving Ground, MD. • 5427 Funded sustainment costs at Dugway Proving Ground, UT. • 12820 Funded sustainment costs at White Sands Missile Range, NM. • 6183 Funded sustainment costs at Yuma Proving Ground, AZ. <p>Total 56358</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 25567 Funds sustainment costs at Aberdeen Proving Ground, MD. • 4178 Funds sustainment costs at Dugway Proving Ground, UT. • 28132 Funds sustainment costs at White Sands Missile Range, NM. • 5025 Funds cost at Yuma Proving Ground, AZ. <p>Total 62902</p> <p>FY 2000 Planned Program: Project is funded in OMA.</p> <p>FY 2001 Planned Program: Project is funded in OMA.</p>										
Project M0YY			<i>Page 3 of 6 Pages</i>			Exhibit R-2A (PE 0605878A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation	PROJECT M1YY
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1YY Maintenance and Repair - AMC Subordinate Commands/Laboratories	10533	14035	0	0	0	0	0	0	0	24568

Mission Description and Justification: This project finances those maintenance and repair activities and functions necessary for maintaining and repairing infrastructure for the U.S. Army Materiel Command major subordinate command RDTE installations and laboratories, i.e., Army Research Laboratory, Adelphi, Maryland; Armament Research, Development and Engineering Center, Picatinny Arsenal, Dover, New Jersey; and Soldier and Biological Chemical Command, Natick, Massachusetts. Also provides common service host support to 36 tenants located at these installations. Facilities managed include 8,996 acres of land and 6.4 million square feet of building space with necessary utilities and road systems.

FY 1998 Accomplishments:

- 6132 Funded maintenance and repair projects at Picatinny Arsenal, NJ.
 - 2921 Funded maintenance and repair projects at Army Research Laboratory, Adelphi, MD.
 - 1480 Funded maintenance and repair projects at Soldier and Biological Chemical Command, Natick, MA.
- Total 10533

FY 1999 Planned Program:

- 7261 Funds maintenance and repair projects at Picatinny Arsenal, NJ.
 - 2580 Funds maintenance and repair projects at Army Research Laboratory, Adelphi, MD.
 - 4194 Funds maintenance and repair projects at Soldier and Biological Chemical Command, Natick, MA.
- Total 14035

FY 2000 Planned Program: Project is funded in OMA.

FY 2001 Planned Program: Project is funded in OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation					PROJECT M4YY	
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4YY Maintenance and Repair - U.S. Army Corps of Engineers	3407	3122	0	0	0	0	0	0	0	6529
<p>Mission Description and Justification: This project finances those maintenance and repair activities and functions necessary for maintaining and repairing infrastructure for the U.S. Army Corps of Engineers RDTE laboratories located at Waterways Experiment Station (WES), Vicksburg, MS; Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH; Construction Engineering Research Laboratory (CERL), Champaign, IL and Topographic Engineering Center (TEC), Alexandria, VA.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 681 Funded maintenance and repair projects at CERL, Champaign, IL. • 1635 Funded maintenance and repair projects at CRREL, Hanover, NH. • 443 Funded maintenance and repair projects at TEC, Alexandria, VA. • 648 Funded maintenance and repair projects at WES, Vicksburg, MS. <p>Total 3407</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 424 Fund maintenance and repair projects at CERL, Champaign, IL. • 2019 Fund maintenance and repair projects at CRREL, Hanover, NH. • 276 Fund maintenance and repair projects at TEC, Alexandria, VA. • 403 Fund maintenance and repair projects at WES, Vicksburg, MS. <p>Total 3122</p> <p>FY 2000 Planned Program: Project is funded in OMA.</p> <p>FY 2001 Planned Program: Project is funded in OMA.</p>										
Project M4YY			Page 5 of 6 Pages				Exhibit R-2A (PE 0605878A)			

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BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation				PROJECT M744		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M744 Modernization of Utilities	9341	0	0	0	0	0	0	0	0	9341
<p><u>Mission Description and Justification:</u> This project finances the repair of the steam heat distribution system, Edgewood Area, Aberdeen Proving Ground, MD. This steam heat distribution system is 40 to 50 years old. Corrosion-related problems and other deficiencies are discharging condensate into the ground. Some areas of the system are beyond repair and must be replaced. The condensate piping is severely corroded and in extremely poor condition. Leaks and steaming are common place. Standing water exists in many manholes causing deterioration and excessive spalling and cracking, posing serious safety and environmental concerns. Boilers in the Central Plant (Vintage 1940) need to be replaced. They are inefficient, in poor shape and technically obsolete. These funds will repair the entire steam system.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 9341 Repaired steam heat distribution system, Edgewood Area, Aberdeen Proving Ground, MD <p>Total 9341</p> <p>FY 1999 Planned Program: Project is not funded in FY 1999.</p> <p>FY 2000 Planned Program: Project is not funded in FY 2000.</p> <p>FY 2001 Planned Program: Project is not funded in FY 2001.</p>										
Project M744			Page 6 of 6 Pages				Exhibit R-2A (PE 0605878A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605879A Real Property Services (RPS)
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	84756	86441	0	0	0	0	0	0	0	171197
M0UU Real Property Services - TECOM	55459	58012	0	0	0	0	0	0	0	113471
M1UU Real Property Services - AMC MSC/LAB	24589	26191	0	0	0	0	0	0	0	50780
M4UU Real Property Services - COE	4708	2238	0	0	0	0	0	0	0	6946

A. Mission Description and Budget Item Justification: The Real Property Services program finances activities and functions necessary for operation of utilities (with the exception of communications). It includes purchase of electricity, operations of heating plants and water distribution and sewage systems. This program also finances the labor associated with real property support along with fire prevention, custodial service contracts, collection and disposal of refuse, pest control management, snow/ice and sand removal. It also supports the engineering, general management, supervision, mapping, planning, utilization inspection and other activities of a general nature performed by the Directorate for Public Works (DPW), both in-house and by contract. Beginning in FY2000, Real Property Services is funded in the Operations and Maintenance, Army (OMA) appropriation.

B. Program Change Summary	FY 1998	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 1999 PB)	86199	87172	86667	85871
Appropriated Value	88945	87172		
Adjustments to Appropriated Value				
a. Cong Gen Reductions	-2746	-731		
b. SBIR/STTR	-2162			
c. Omnibus or Other Above Threshold Reductions	-714			
d. Below Threshold Reprogramming	+1433			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-86667	-85871
Current Budget Submit (FY 2000/2001 PB)	84756	86441	0	0

Change Summary Explanation: Funding: FY 2000 (-86667) reduction reflects the realignment of the Real Property Services program from RDTE to OMA.
 FY 2001 (-85871) reduction reflects the realignment of the Real Property Services program from RDTE to OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605879A Real Property Services (RPS)	PROJECT M0UU
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0UU Real Property Services - TECOM	55459	58012	0	0	0	0	0	0	0	113471

Mission Description and Justification: This project funds the operations of utilities and other engineering services for the U.S. Army Materiel Command (AMC) installations assigned to the Test and Evaluation Command (TECOM), i.e. Aberdeen Proving Ground, MD; Dugway Proving Ground, UT; Yuma Proving Ground, AZ and White Sands Missile Range, NM. Funding provides for the utility costs and system operation of 1400 miles of electric distribution and 600 miles of water and sewer systems. Additionally, this project provides utilities services to the TECOM test mission and over 100 tenants and satellites that reside in 24 million square feet of facilities. Another major responsibility is the removal of snow and sand, extremely important to the safety of the workforce that travel on approximately 3000 mile road systems located on the TECOM installations. This account also funds the contracts for custodial and refuse collections and civilian firefighters responsible for the safety and health of the workforce that support the varied Army missions located on these installations.

FY 1998 Accomplishments:

- 32185 Funded operation of utilities and other engineering requirements at Aberdeen Proving Ground, Maryland.
 - 5159 Funded operation of utilities and other engineering requirements at Dugway Proving Ground, Utah.
 - 13319 Funded operation of utilities and other engineering requirements at White Sands Missile Range, New Mexico.
 - 4796 Funded operation of utilities and other engineering at Yuma Proving Ground, Arizona.
- Total 55459

FY 1999 Planned Program:

- 34656 Fund operations of utilities and other engineering at Aberdeen Proving Ground, Maryland.
 - 6242 Fund operations of utilities and other engineering at Dugway Proving Ground, Utah.
 - 11758 Fund operations of utilities and other engineering at White Sands Missile Range, New Mexico.
 - 4536 Fund operations of utilities and other engineering at Yuma Proving Ground, Arizona.
 - 820 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.
- Total 58012

FY 2000 Planned Program: Project is funded in OMA.

FY 2001 Planned Program: Project is funded in OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605879A Real Property Services (RPS)				PROJECT M1UU		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1UU Real Property Services - AMC MSC/LAB	24589	26191	0	0	0	0	0	0	0	50780
<p>Mission Description and Justification: Finances the operation of utilities and other engineering services for U.S. Army Materiel Command (AMC) installations and laboratories, i.e., Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, NJ; Army Research Laboratory (ARL), Adelphi, MD; and Soldier and Biological Chemical Command (SBCCOM), Natick, MA.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 15449 Armament Research, Development and Engineering Center, Picatinny Arsenal, NJ. • 6407 Army Research Laboratory, Adelphi, MD. • 2733 Soldier and Biological Chemical Command, Natick, MA. <p>Total 24589</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 16029 Armament Research, Development and Engineering Center, Picatinny Arsenal, NJ. • 7079 Army Research Laboratory, Adelphi, MD. • 2603 Soldier and Biological Chemical Command, Natick, MA. • 480 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs. <p>Total 26191</p> <p>FY 2000 Planned Program: Project is funded in OMA.</p> <p>FY 2001 Planned Program: Project is funded in OMA.</p>										
Project M1UU			<i>Page 3 of 4 Pages</i>			Exhibit R-2A (PE 0605879A)				

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605879A Real Property Services (RPS)	PROJECT M4UU
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4UU Real Property Services - COE	4708	2238	0	0	0	0	0	0	0	6946

Mission Description and Justification: Project M4UU - Operation of Utilities and Other Engineering - COE: Finances the operation of utilities and other engineering services for U.S. Corps of Engineers Laboratories, i.e., Waterways Experiment Station (WES), Vicksburg, MS; Cold Regions Research and Engineering Laboratories (CRREL), Hanover, NH; Construction Engineering Research Laboratory (CERL), Champaign, IL; and Topographic Engineering Center (TEC), Alexandria, VA.

FY 1998 Accomplishments:

- 1087 Waterways Experiment Station, Vicksburg, MS
 - 1327 Cold Regions Research and Engineering Laboratories; Hanover, NH
 - 1122 Construction Engineering Research Laboratory, Champaign, IL
 - 1172 Topographic Engineering Center, Alexandria, VA
- Total 4708

FY 1999 Planned Program:

- 537 Waterways Experiment Station, Vicksburg, MS
 - 539 Cold Regions Research and Engineering Laboratories; Hanover, NH
 - 560 Construction Engineering Research Laboratory, Champaign, IL
 - 519 Topographic Engineering Center, Alexandria, VA
- Total 2155

FY 2000 Planned Program: Project is funded in OMA.

FY 2001 Planned Program: Project is funded in OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	224968	229573	0	0	0	0	0	0	0	454541
M0ZZ Base Operations - Army Materiel Command (AMC) Test Ranges	143180	145378	0	0	0	0	0	0	0	288558
M1ZZ Base Operations - AMC Major Subordinate Commands and Laboratories	69441	72009	0	0	0	0	0	0	0	141450
M4ZZ Base Operations - Corps of Engineers	12347	12186	0	0	0	0	0	0	0	24533
<p>A. <u>Mission Description and Budget Item Justification:</u> The Base Operations (BASEOPS) program finances those activities and functions necessary for operating and maintaining U.S. Army RDTE installations, laboratories, test ranges and a significant tenant/satellite population. BASEOPS activities and functions include: (1) operation of post supply functions; (2) direct and general maintenance activities; (3) operation and maintenance of transportation equipment and local transportation; (4) operation of laundry and dry cleaning plants and contractual services where Army-owned plants are not operated; (5) Army food service program; (6) support to military and civilian personnel; (7) operation and administration of unaccompanied personnel housing; (8) command element activities required for commanding all Army units assigned or attached to the installation; (9) automation activities; (10) reserve component support; (11) development and administration of morale, welfare and recreation facilities and activities along with quality of life initiatives for the military and their families; (12) police and security services and counterintelligence; (13) resource management operations; (14) Defense Finance and Accounting Service (DFAS); (15) contracting operations; and (16) records management and publications. This is a labor intensive program, providing salaries and related personnel benefits for authorized civilian personnel and associated administrative support functions outlined above. Funding does not include dollars required for Commercial Activities (CA) study or implementation costs resulting from current CA reviews. Beginning in FY2000, Base Operations is funded in the Operations and Maintenance, Army (OMA) appropriation.</p>										

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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY99 PB)	224593	230029	227290	227972
Appropriated Value	231653	230029		
Adjustments to Appropriated Value				
a. Cong Gen Reductions	-7060	-456		
b. SBIR/STTR	-654			
c. Omnibus or Other Above Threshold Reductions	-215			
d. Below Threshold Reprogramming	1244			
e. Rescissions				
Adjustments to Budget Years Since FY99 PB			-227290	-227972
Current Budget Submit (FY00/01 PB Submission)	224968	229573	0	0

Change Summary Explanation: Funding - Beginning in FY 2000, the Base Operations Program is funded in OMA.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation					PROJECT M0ZZ	
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0ZZ Base Operations - Army Materiel Command (AMC) Test Ranges	143180	145378	0	0	0	0	0	0	0	288558
<p><u>Mission Description and Justification:</u> Finances installation management for operating and maintaining developmental test ranges assigned to the U.S. Army Test and Evaluation Command (TECOM), i.e., Yuma Proving Ground, AZ; Aberdeen Proving Ground, MD; Dugway Proving Ground, UT; and White Sands Missile Range, NM. Provides for the test infrastructure base support along with common service base support to over 100 tenants and satellites served by the four TECOM Major Range & Test Facility Bases (MRTFB). Base Operations infrastructure includes fixed costs for payroll as well as personnel costs associated with downsizing and re-engineering the civilian workforce. Funds are required to: maintain minimum operating levels necessary to support the developmental test mission at AMC test ranges; prevent facility failures which jeopardize the health, safety and quality of life of the military and civilian personnel that work on these installations; support new missions passed to the four TECOM installations without resources (i.e., BASOPS for an additional 1.2M square foot from BRAC consolidations and construction; commercial activity implementation costs; Defense Mega Center fees; Defense Finance and Accounting Service (DFAS) support; restoration of English Village; etc.) and for computer modernization to include Local Area Network Upgrades, Technology Advancements, Equipment Replacement and Productivity Enhancements.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 75260 Garrison, Aberdeen Proving Ground Support Activity, MD • 13640 Dugway Proving Ground, UT • 38378 White Sands Missile Range, NM • 15902 Yuma Proving Ground, AZ • Above funding includes specific projects below: <ul style="list-style-type: none"> - Civilian Illness and Injury Compensation Costs. - Defense Finance and Accounting Services (previously operated by Army Installations) - Civilian Personnel Operations Center (Regionalized Army Civilian Personnel Operations). - Fund transfer of Materials Technology Laboratory, Watertown, MA to Aberdeen Proving Ground, MD (BRAC Action) - Provides minimum funding for English Village operations at Dugway Proving Ground, UT. - Military Police (MP) conversion to civilian police/guards - Year 2000 Millenium Computer Upgrades. - Funds minimum essential requirements. <p>Total 143180</p>										
Project M0ZZ			Page 3 of 6 Pages				Exhibit R-2A (PE 0605896A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation	PROJECT M0ZZ
<p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 77108 Garrison, Aberdeen Proving Ground Support Activity, MD • 14072 Dugway Proving Ground, UT • 38610 White Sands Missile Range, NM • 15588 Yuma Proving Ground, AZ • Above funding includes specific projects below: <ul style="list-style-type: none"> - Civilian Illness and Injury Compensation Costs - Defense Finance and Accounting Services (previously operated by Army Installations). - Civilian Personnel Operations Center (Regionalized Civilian Personnel Operations). - Fund transfer of Materials Technology Laboratory, Watertown, MA to Aberdeen Proving Ground, MD (BRAC Action) - Provides minimum funding for English Village operations at Dugway Proving Ground, UT. - Military Policy (MP) conversion to civilian police/guards - Managerial Accountants (50 positions) transferred from DFAS back to TECOM Installations. - Funds minimum essential requirements. <p>Total 145378</p> <p>FY 2000 Planned Program: Beginning in FY2000, Base Operations is funded in OMA.</p> <p>FY 2001 Planned Program: Beginning in FY2001, Base Operations is funded in OMA.</p>		
Project M0ZZ	Page 4 of 6 Pages	Exhibit R-2A (PE 0605896A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation					PROJECT M1ZZ	
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1ZZ Base Operations - AMC Major Subordinate Commands and Laboratories	69441	72009	0	0	0	0	0	0	0	141450
<p>Mission Description and Justification: Finances installation management for operating and maintaining other U.S. Army Materiel Command RDTE installations and laboratories, i.e., Army Research Laboratory (ARL), Adelphi, MD; Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, NJ; and Soldier and Biological Chemical Command (SBCCOM), Natick, MA. Provides for the infrastructure base support along with common service base support to tenants and satellites.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 34095 ARDEC, Picatinny Arsenal, NJ • 23135 ARL, Adelphi, MD • 12211 SBCCOM, Natick, MA <p>Total 69441</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 35669 ARDEC, Picatinny Arsenal, NJ • 22934 ARL, Adelphi, MD • 13406 SBCCOM, Natick, MA <p>Total 72009</p> <p>FY 2000 Planned Program: Beginning in FY2000, Base Operations is funded in OMA.</p> <p>FY 2001 Planned Program: Beginning in FY2001, Base Operations is funded in OMA.</p>										
Project M1ZZ			Page 5 of 6 Pages			Exhibit R-2A (PE 0605896A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation					PROJECT M4ZZ	
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4ZZ Base Operations - Corps of Engineers	12347	12186	0	0	0	0	0	0	0	24533
<p><u>Mission Description and Justification:</u> Finances BASEOPS activities and functions necessary for operating and maintaining the following U.S. Army Corps of Engineers RDTE laboratories: Waterways Experiment Station (WES), Vicksburg, MS; Cold Regions Research and Engineering Laboratories (CRREL), Hanover, NH; Construction Engineering Research Laboratory (CERL), Champaign, IL; and Topographic Engineering Center (TEC), Alexandria, VA.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2624 CERL, Champaign, IL • 4218 CRREL, Hanover, NH • 2967 TEC, Alexandria, VA • 2538 WES, Vicksburg, MS <p>Total 12347</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 3034 CERL, Champaign, IL • 3047 CRREL, Hanover, NH • 3168 TEC, Alexandria, VA • 2937 WES, Vicksburg, MS <p>Total 12186</p> <p>FY 2000 Planned Program: Beginning in FY2000, Base Operations is funded in OMA.</p> <p>FY 2001 Planned Program: Beginning in FY2001, Base Operations is funded in OMA.</p>										
Project M4ZZ			<i>Page 6 of 6 Pages</i>			Exhibit R-2A (PE 0605896A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605898A Management Headquarters (Research and Development)
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	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	24361	22514	5191	5354	5242	2953	170	174	Continuing	Continuing
MM65 Army Research Laboratory	4687	4634	5191	5354	5242	2953	170	174	Continuing	Continuing
M831 AKAMAI	19674	17880	0	0	0	0	0	0	0	37554

A. Mission Description and Budget Item Justification: This program funds the Research, Development, Test and Evaluation (RDTE) Army Management Headquarters Activities (AMHA) for the U.S. Army Research Laboratory (ARL), Adelphi, MD. This program provides for (1) the development of policy and guidance, (2) long-range planning, (3) programming and budgeting, (4) management of resources (manpower and dollars), and (5) review and evaluation of program performance. Provides salaries and related personnel benefits for authorized civilian personnel and the associated administrative support (travel, supplies and equipment).

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	25039	4683	4996	5003
Appropriated Value	25837	22683		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-798	-169		
b. SBIR/STTR	-510			
c. Omnibus or Other Above Threshold Reductions	-168			
d. Below Threshold Reprogramming				
e. Rescissions				
<u>Adjustments to Budget Years Since FY 1999 PB</u>			195	351
<u>Current Budget Submit (FY 2000/2001 PB)</u>	24361	22514	5191	5354

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605898A Management Headquarters (Research and Development)				PROJECT MM65		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
MM65 Army Research Laboratory	4687	4634	5191	5354	5242	2953	170	174	Continuing	Continuing
<p><u>Mission Description and Justification:</u> This project provides the funding for management headquarters activities at the U.S. Army Research Laboratory (ARL), Adelphi, MD, to (1) develop RDTE program policy and guidance; (2) perform long range planning, programming and budgeting; (3) provide for the management of resources; and (4) conduct program performance review and evaluation. This project provides for the salaries and related personnel benefits for the authorized civilian personnel and the administrative support (temporary duty travel, operating supplies and equipment).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 4687 Funded the operation of ARL headquarters activities which administers the Army laboratory research and development program to sustain technological superiority. <p>Total 4687</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 4632 Funds the operation of ARL headquarters activities which administers the Army laboratory research and development program to sustain technological superiority. • 2 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 4634</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 5191 Funds the operation of ARL headquarters activities which administers the Army laboratory research and development program to sustain technological superiority. <p>Total 5191</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 5354 Funds the operation of ARL headquarters activities which administers the Army laboratory research and development program to sustain technological superiority. <p>Total 5354</p>										
Project MM65			<i>Page 2 of 3 Pages</i>				Exhibit R-2A (PE 0605898A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 6 - Management and Support				PE NUMBER AND TITLE 0605898A Management Headquarters (Research and Development)				PROJECT M831		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M831 AKAMAI	19674	17880	0	0	0	0	0	0	0	37554
<p><u>Mission Description and Justification:</u> By Congressional direction, this program funds implementation of tele-imaging and telemedicine at Tripler Army Medical Center, HI, and throughout the Pacific Rim. The goal is to facilitate proliferation of clinically effective time and distance independent medicine techniques through the use of state-of-the-art telecommunications.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 19674 Conducted efforts in the areas of Hyperspectral Diagnostic Imaging (HSDI) and Elastic Scattering Spectroscopy Convergence. Contract awarded to Los Alamos to pursue optical biopsy, noninvasive intracranial pressure monitor, and CU optical agent sensor system. Contract awarded to the University of Hawaii (John A. Burns School of Medicine) for development of a telemedicine curriculum (to include training modules, etc.). <p>Total 19674</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 17406 Continue management and execution of Congressionally mandated and clinical R&D efforts, including HSDI and telemedicine curriculum development. • 474 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 17880</p> <p>FY 2000 Planned Program: Project not funded in FY 2000.</p> <p>FY 2001 Planned Program: Project not funded in FY 2001.</p>										
Project M831			<i>Page 3 of 3 Pages</i>				Exhibit R-2A (PE 0605898A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0102419A Joint Land Attack Cruise Missile Defense (JLENS)				PROJECT DE55		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE55 Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS)	29910	14572	24903	25141	29533	29520	29476	29430	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> The Under Secretary of Defense (Acquisition and Technology) and the Army Acquisition Executive (AAE) directed the establishment of the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) Project Office (PO), formerly Aerostat, for Land Attack Cruise Missile Defense (LACMD). This is a multiservice effort with the Army as the lead service. The JLENS PO is assigned to the AAE with operational control assigned to the U. S. Army Space and Missile Defense Command. The program mission is to maximize the battlespace of land, sea and air based missile systems by providing Over-the-Horizon (OTH) surveillance and precision track for broad area defense against land attack cruise missiles. JLENS is a theater based system employing advanced technologies with specific focus on LACMD. JLENS sensors provide the OTH surveillance/precision tracking for the Air Directed Surface to Air Missile (ADSAM) concept. The role of the JLENS is to expand the battlefield commander's surveillance and engagement capability against cruise missiles and other targets by extending the battle space for systems such as Patriot, Medium Extended Air Defense System(MEADS)/Corps SAM, Aegis and Advanced Medium Range Air-to-Air Missile (AMRAAM). This project supports upgrades to surveillance and tracking systems.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 19241 Awarded Risk Mitigation & Design Contract and support contracts. • 2399 Maintained Test Bed Facility; Conducted Joint demonstrations and exercises using Cooperative Engagement Capability (CEC), Joint Tactical Information Distribution System (JTIDS), and continued vulnerability and survivability analysis/experiments. • 2579 CEC Development/Integration • 1640 SM-2 Development/Integration • 2850 JLENS Project Office. • 1201 Government Furnished Equipment (GFE) – COMSEC & MIDS <p>Total 29910</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 9972 Continue Contract Design and Demonstration Options with emphasis on prototype processing station; other support contracts. • 1374 Maintain Test Bed Facilities, OGA and Misc. Contracts, continue vulnerability and survivability analysis/experiments. • 1764 JLENS In House • 1462 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 14572</p>										
Project DE55				Page 1 of 5 Pages				Exhibit R-2 (PE 0102419A)		

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102419A Joint Land Attack Cruise Missile Defense (JLENS)	PROJECT DE55

FY 2000 Planned Program:

- 23004 Continue Contract Design and Demonstration Program, includes PATRIOT ADSAM Demonstration. Other Support Contracts
 - 200 Maintain Test Bed Facility
 - 300 Program Management Support
 - 1399 JLENS In-House
- Total 24903

FY 2001 Planned Program:

- 23096 Continue Demonstration Program includes joint demos/exercises. Other Support Contracts
 - 300 Maintain Test Bed Facility
 - 300 Program Management Support
 - 1445 JLENS In-House
- Total 25141

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	33011	103937	129095	123044
Appropriated Value	35000	15000		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1989	-428		
b. SBIR / STTR	-828			
c. Omnibus or Other Above Threshold Reduction	-2273			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-104192	-97903
Current Budget Submit (FY 2000/2001 BES)	29910	14572	24903	25141

Change Summary Explanation: FY 2000/2001 – Funds realigned to higher priority requirements.

C. Other Program Funding Summary: Not applicable

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102419A Joint Land Attack Cruise Missile Defense (JLENS)	PROJECT DE55
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D. Acquisition Strategy: The JLENS PO executed a successful Concept Studies Phase by soliciting Cruise Missile Defense (CMD) architecture concepts that employ elevated sensors. The JLENS PO through a formal selection process selected Hughes & Raytheon (H&R), a joint venture of Hughes Aircraft Company and the Raytheon Company (now Raytheon Systems Co.), as the prime contractor for the JLENS Demonstration Program. The JLENS program was required to restructure from a Design/Development/Demo/Test program to an upfront demonstration program and to slow/delay development of the surveillance radar. The new strategy requires more demonstrations leveraged on proven technologies. Restructuring of the program is in process.

E. Schedule Profile	<u>FY 1997</u>	<u>FY 1998</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 2004</u>	<u>FY 2005</u>
Risk Mitigation/Design		2-4Qtr	1-3Qtr	1-3Qtr	1-4Qtr					
Preliminary Design Review (PDR)		4Qtr		4Qtr						
System Requirements Review (SRR)		2Qtr								
System Functional Review (SFR)		1Qtr								
Critical Design Review (CDR)				4Qtr	4Qtr					
Development/Test/Demo			1-4Qtr							
Risk Mitigation/Test Bed	1-4Qtr									

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102419A Joint Land Attack Cruise Missile Defense (JLENS)	PROJECT DE55
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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. Concept Definition	CPFF	H&R/MA & CA	2007							0	2007	2007
b. Concept Definition	CPFF	Lockheed Martin/N.Y./OH/AL	2000							0	2000	2000
c. Concept Definition	CPFF	Northrop Grumman/MD	1981							0	1981	1981
d. OGAs	MIPR	Multiple	11148							0	11148	
e. Risk Mitigation, Design, Development	CR/CPIF/CPAF	H&R (Raytheon Sys) MA/CA/FL	19362	10434		22304		22396		CONT	CONT	292185
f. CEC/SM-2 CEC	MIPR MIPR	Navy/Multiple Navy/Multiple	4219							0	4219	
g. OGA'S	MIPR	Multiple/Multiple	905							0	905	
h. GFE	TBD	TBD	1201							0	1201	
i. Design/Dev/Demo Support	SS/CPFF	CAS/AL	3446	1000		700		700		0	5846	
j. Misc. Contracts	Multiple	Multiple/AL	1954							0	1954	
Subtotal Product Development:			48223	11434		23004		23096		CONT	CONT	

II. Support Costs & 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. Miscellaneous Contracts	Multiple		1834	250		300		300		CONT	2684	
b. In-House, JLENS			6579	1764		1299		1345		CONT	10987	
c. OGA Salaries				228		100		100		CONT	428	
Subtotal Support Costs:			8413	2242		1699		1745		CONT	14099	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102419A Joint Land Attack Cruise Missile Defense (JLENS)	PROJECT DE55
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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. Maintain Test Bed	SS/CPFF	CAS-TX, NM	2137	60		200		300			2697	
b. Misc. OGA&Contracts	Mul/MPR	AL/TX/NM	820	836							1656	
Subtotal Test and Evaluation:			2957	896		200		300			4353	

Project Total Cost:			59593	14572		24903		25141		CONT	CONT	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203610A Emergency Preparedness Training					PROJECT E33	
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
E33 Emergency Preparedness Training	0	15000	0	0	0	0	0	0	0	15000
<p>A. Mission Description and Budget Item Justification: This Congressional interest project provides support to the Reserve Component Consequence Management (RC CoM) Program which is a priority Department of Defense program to support the civil authorities in combating domestic weapons of mass destruction (WMD) terrorism. The program derives its requirements and authority from Defense Reform Initiative Directive #25, approved by the Deputy Secretary of Defense on 26 January 1998. The RC CoM program is a key component of the United States strategy to deter, prevent, and defeat terrorism and provide a community-based defense to protect the homeland against asymmetrical threats. Presidential Decision Directive Number 62 reiterates the interagency commitment to the combating terrorism mission.</p> <p>The military requirements associated with the program are to train, organize, equip, and exercise dedicated and mission task organized forces of the Reserve Component who are geographically dispersed across the United States. Commencing in FY 1999, the program plans to raise or enhance ten Military Support Detachments (Rapid Assessment and Initial Detection), 39 Military Support Detachments (Light), 127 Decontamination Detachments, 43 Nuclear/Biological/Chemical (NBC) Reconnaissance Detachments, and a RC Consequence Management Joint Task Force with functional missions such as medical, information, engineering, transportation, for an example, security.</p> <p>FY 1998 Accomplishments: Project not funded in FY 1998</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 7200 Develop a technical information system to 'reach-back' from remote sites to a military information base and transfer data in support of interagency response organizations via the Unified Command Suite. • 1000 Develop a front-end analysis for advanced CB technological applications. • 500 Chemical/Biological database improvement. • 500 Military information and research support to the civil authorities. • 500 Interagency Board for equipment standardization, interoperability, and research and development. • 5300 For National Guard WMD response interoperability with counterpart interagency first responder units, with emphasis on Distance Training Technology. <p>Total 15000</p> <p>FY 2000 Planned Program: Project not funded in FY 2000</p> <p>FY 2001 Planned Program: Project not funded in FY 2001</p>										
Project E33	Page 1 of 2 Pages					Exhibit R-2 (PE 0203610A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203610A Emergency Preparedness Training	PROJECT E33
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	0	0	0	0
Appropriated Value		0		
Adjustments to Appropriated Value				
a. Congressional General Reductions				
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming				
e. Rescissions				
f. Congressional Adjustments – Emergency Supplemental		15000		
Adjustments to Budget Years Since FY 1999 PB				
Current Budget Submit (FY 2000 / 2001 PB)	0	15000	0	0

Change Summary Explanation: Reflects the provisions of the Omnibus Consolidated and Emergency Supplemental Act, 1999 (Public Law 105-277), Chapter 2, Department of Defense Military, Section on Domestic Preparedness Against Weapons of Mass Destruction. Supplemental emergency appropriations to “initiate and expand activities of the DoD to prevent, prepare for, and respond to a potential terrorist attack in the U.S. involving weapons of mass destruction.”

C. Other Program Funding Summary: Not applicable

D. Acquisition Strategy: The program pursues a non-traditional acquisition strategy to defeat the asymmetric threat which the response forces face. The program intends to use common military and commercially available items to equip response forces. The program will source, instead of research, ‘tried, true, and tested’ equipment, which is interoperable with the Department’s interagency partners. The development portion of this program will focus on fielding emerging advanced technologies with prototypical equipment which can be rapidly developed in eighteen to twenty-four months, or earlier. The program intends to provide the response forces with the finest available equipment and use advanced technological applications to provide the decisive edge to these forces, in order to fulfill it’s mandated requirements and counter the asymmetric threats which the response forces are being trained, organized, equipped, and exercised to combat.

E. Schedule Profile: Not applicable

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System
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COST <i>(In Thousands)</i>	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	36225	34646	36222	34528	31191	25086	14857	12896	0	649731
D322 AFATDS Development	32078	30664	34264	30943	27835	23118	12891	12896	0	620918
D2ET AFATDS Operational Test	4147	3982	1958	3585	3356	1968	1966	0	0	28813

A. Mission Description and Budget Item Justification: The Advanced Field Artillery Tactical Data System (AFATDS) will broaden and modernize the US Army fire support command, control and communications (C3) system. As a battle management system, AFATDS will provide automated fire support in the Army Battle Command System (ABCS) architecture in support of close, rear and deep operations, fire planning and the coordination and employment of all service/combined fire support assets to complement the commander's scheme of maneuver. AFATDS will accomplish this by providing fully automated support for planning, coordination and control of all fire support assets (mortars, close air support, naval gunfire, attack helicopters, offensive electronic warfare, field artillery cannons, rockets and guided missiles) in the execution of close support, counterfire, interdiction, suppression of enemy air defense and deep operations. AFATDS will automatically implement detailed commander's guidance in the automation of operational planning, movement control, targeting, target value analysis and fire support planning. These projects support development of a replacement system for the Initial Fire Support Automated System (IFSAS).

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	37455	35111	25814	16907
Appropriated Value	39039	34881		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1584	-235		
b. SBIR / STTR	-924			
c. Omnibus or Other Above Threshold Reductions	-306			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+10408	+17621
Current Budget Submit (FY 2000 / 2001 PB)	36225	34646	36222	34528

Change Summary Explanation: Increase in FY00 and FY01 is to support the development of software IAW the AFATDS System Acquisition Program Baseline.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System				PROJECT D322		
<i>COST (In Thousands)</i>	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
D322 AFATDS Development	32078	30664	34264	30943	27835	23118	12891	12896	0	620918
<p><u>Mission Description and Budget Item Justification:</u> Project D322 – AFATDS Development: The project is composed of Army Battlefield Command System (ABCS) Common Hardware/Software (CHS) employed in varying configurations at different operational facilities (or nodes) and unique system software interconnected by tactical communications in the form of a software-driven, automated network. Both hardware and software will be capable of being tailored to perform the fire support command, control and coordination requirements at any level of command. This will permit variable command and control relationships and full fire support functionality at all echelons of field artillery and maneuver, from echelons above corps to battery or company in support of all levels of conflict. The Marine Corps will also utilize AFATDS. AFATDS will interoperate with Navy and Air Force Command and Control weapon systems as well as the Allied fire support systems ADLER (Germany), ATLAS (France), BATES (UK), and SIR (Italy).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 6323 Supported Limited User Test and Materiel Release of AFATDS '97 Software Release (1 package) • 24955 Continued AFATDS software development • 800 Prepared for AFATDS '98 Limited User Test <p>Total 32078</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 4323 Support Limited User Test and Materiel Release of AFATDS '98 Software Release (1 package) • 24749 Continue AFATDS software development in support of FDD/FDC • 800 Prepare for AFATDS '99 Limited User Test • 792 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 30664</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4876 Support Limited User Test and Materiel Release of AFATDS '99 Software Release (1 package) • 29388 Continue AFATDS software development in support of FDD/FDC. <p>Total 34264</p>										
Project D322			<i>Page 2 of 8 Pages</i>				Exhibit R-2A (PE 0203726A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System				PROJECT D322		
<p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 2610 Support Limited User Test and Materiel Release of AFATDS '99 Software Release (1 package) • 28333 Continue AFATDS software development in support of FDD/FDC. <p>Total 30943</p>										
B. Other Program Funding Summary										
	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
OPA - B28600	34954	36141	43343	48750	49626	49675	49598	51309	95300	458696
Spares (BS9708)	1620	3334	2688	2656	2843	2560	2632	3139	2700	24172
<p>C. Acquisition Strategy: AFATDS software will be developed in incremental releases. AFATDS '96, previously named Version 1, received Materiel Release on 13 December 1996. It automated 51% of the required tasks including fire support planning, target nomination, order of fire, and meteorological/survey operations. Subsequent releases will add additional functions, providing automated capabilities for the required tasks including fire support sensor planning and additional munitions. Completion of AFATDS '04 will result in automation of all the required tasks to meet the objective system, including full fire support planning, target acquisition support and field artillery mission support. Additionally, the completed software will utilize the Joint Common Operating Environment (JCOE) and the Army Technical Architecture. AFATDS will support FDD/FDC and other Army Warfighter Experiments through FY 2004.</p>										
D. Schedule Profile										
	<u>FY 1998</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>		
AFATDS '97 Materiel Release	4Q									
AFATDS '98 Materiel Release		4Q								
AFATDS '99 Materiel Release			4Q							
AFATDS '02 Limited User Test				4Q						
AFATDS '02 Materiel Release					2Q					
AFATDS '03 Materiel Release						3Q				
AFATDS '04 Materiel Release							4Q			

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ARMY RDT&E COST ANALYSIS (R-3)

DATE
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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0203726A Advanced Field Artillery Tactical Data System

PROJECT
D322

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. Software Development	SS/CPAF	Raytheon Systems Corp (prev. MX, HDC)	198292	26269	Jan 99	30348	Jan 00	27604	Jan 01	65320	347833	
b. Various, MX BOA	CPAF	Magnavox	34891	0						0	34891	
c. STRICOM/FSATS	MIPR	ARL/UT	12092	0						0	12092	
d. COE/Common Software	MIPR	DISA/ATCCS	11174	800	Jan 99	558	Jan 00	200		0	12732	
e. NRAD		USMC/Navy	244	0						0	244	
f. ADCCS	MIPR	ADCCS	2200	0						0	2200	
g. GFE: PSE	C/FFP	Miltope, Litton, GTE	37897	90	Jan 99	583	Jan 00	553	Jan 01	1144	40267	
Subtotal Product Development:			296790	27159		31489		28357		66464	450259	

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. Software Development Support	MIPR	CECOM SED	4345	281		362		366		1486	6840	
b. Software Development Support	MIPR	FSSD/TELOS	6065	720		613		417		1510	9325	
Subtotal Support Costs:			10410	1001		975		783		2996	16165	

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. OPTEC			6081	0						0	6081	
b. Test Management	MIPR	CECOM	1985	415		430		468		1575	4873	
c. TEST HARDWARE			18041	0						0	18041	
d. Test Support	MIPR	Misc	3455								3455	
Subtotal Test and Evaluation:			29562	415		430		468		1575	32450	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System					PROJECT D322		
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. PM Support	C/CPFF	CSC, NJ	11033	520		502		517		2451	15023	
b. PROGRAM MANAGEMENT:												
c. PM FATDS			19063	451		534		459		1777	22284	
d. MATRIX			15473	326		334		359		1477	17969	
e. Misc. Contracts												
f. CECOM			65976								65976	
g. SBIR/STTR				792							792	
Subtotal Management Services:			111545	2089		1370		1335		5705	122044	
Project Total Cost:			448307	30664		34264		30943		76740	620918	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System				PROJECT D2ET	
<i>COST (In Thousands)</i>	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
D2ET AFATDS Operational Test	4147	3982	1958	3585	3356	1968	1966	0	0	28813
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D2ET – AFATDS Operational Test: This project finances the direct costs of planning and conducting operational testing and evaluation of the Advanced Field Artillery Tactical Data System (AFATDS) by the Operational Test and Evaluation Command (OPTEC). AFATDS is an Acquisition Category (ACAT) I system which passed the Initial Operational Tests and Evaluation (IOTE) in FY 95. Limited User Tests (LUTs) are planned for AFATDS software releases in FY98, FY99, FY00, FY01, FY03 and FY04. LUTs are conducted under conditions, as close as possible, to those encountered in actual combat with typical user troops trained to employ the system. OPTEC provides Army leadership with an independent test and evaluation of effectiveness and suitability of the system.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1714 Conducted AFATDS '97 LUT and evaluate test results • 2433 Prepared for AFATDS '98 Limited User Test (LUT) <p>Total 4147</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1648 Conduct AFATDS '98 LUT and evaluate test results • 1410 Prepare for AFATDS '99 LUT • 818 Prepare for and Support ABCS testing • 106 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 3982</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1631 Conduct AFATDS '99 LUT and evaluate test results • 327 Prepare for and Support ABCS testing <p>Total 1958</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 3585 Prepare for and Conduct AFATDS '02 LUT <p>Total 3585</p>										
Project D2ET			<i>Page 6 of 8 Pages</i>				Exhibit R-2A (PE 0203726A)			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0203726A Advanced Field Artillery Tactical Data System

PROJECT
D2ET

B. Other Program Funding Summary: Not Applicable

C. Acquisition Strategy: Not Applicable

D. Schedule Profile	<u>FY 1998</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>
AFATDS '97 LUT	1Q							
AFATDS '98 LUT		2Q						
AFATDS '99 LUT			3Q					
AFATDS '02 LUT				4Q				
AFATDS '03 LUT						1Q		
AFATDS '04 LUT							2Q	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System					PROJECT D2ET		
I. Product Development: Not Applicable												
II. Support Costs: Not Applicable												
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.	OPTEC		11998	3876		1958		3585		7290	28707	
Subtotal Test and Evaluation:			11998	3876		1958		3585		7290	28707	
IV. Management Services												
	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
b.	SBIR/STTR			106							106	
Project Total Cost:			11998	3982		1958		3585		7290	28813	
Project D2ET												

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	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	151520	104000	29544	23938	19299	20036	97346	116137	Continuing	Continuing
D2TT Bradley A3 IOTE	5110	2904	0	0	0	0	0	0	0	9974
D330 Abrams Tank Improvement Program	37048	9359	12056	19270	18799	20036	83907	96566	Continuing	Continuing
D344 Fire Support Team Vehicle Integration	7093	10901	11368	2168	0	0	0	0	0	84938
D365 Bradley Linebacker	29	0	0	0	0	0	0	0	0	0
D371 Bradley Base Sustainment Program	71604	67476	3221	0	0	0	9508	9761	Continuing	Continuing
D718 Ground Combat Vehicle HTI	16945	8952	0	0	0	0	0	0	0	25897
D728 Heavy Assault Bridge Improvements	0	0	0	0	0	0	3931	9810	28000	41741
DC64 DC64	13691	4408	2899	2500	500	0	0	0	0	0

A. Mission Description and Budget Item Justification: This Program Element (PE) responds to vehicle deficiencies identified during Desert Storm, continues technical system upgrades, and addresses needed evolutionary enhancements to tracked combat (Abrams and Bradley) and tactical (Bradley FIST) vehicles. This PE provides combat effectiveness enhancements for the Abrams Tank through a series of product improvements to the current M1A2 production vehicles. Additional improvements allow the M1A2 SEP tank to operate effectively with the M2A3 Bradley. This PE also addresses future product improvements to the M2A3.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

DATE **February 1999**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0203735A Combat Vehicle Improvement Programs

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	161497	94756	28439	4983
Appropriated Value	167020	104756		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-5523	-756		
b. SBIR/STTR	-4050			
c. Omnibus or Other Above Threshold Reductions	-4000			
d. Below Threshold Reprogramming	-1927			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+1105	+18955
Current Budget Submit (FY 2000/ 2001 PB)	151520	104000	29544	23938

Change Summary Explanation: Funding added in FY 2000 and FY 2001 for Abrams Live Fire and Survivability Test.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs				PROJECT D2TT		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D2TT Bradley A3 IOTE	5110	2904	0	0	0	0	0	0	0	9974
<p>A. <u>Mission Description and Justification:</u> This project provides for the initial operational test and evaluation (IOTE) of Bradley A3 pre-production vehicles in order to generate a system performance profile in support of a Milestone III decision. Critical areas for test include lethality, survivability, mobility, and sustainability.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 5110 Provided Testing Support [Limited User Testing (LUT I & II)] <p>Total 5110</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 2827 Will Provide Testing Support [Initial Operational Test and Evaluation (IOTE)] • 77 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 2904</p> <p>FY 2000 Planned Program: Project not funded in FY 2000</p> <p>FY 2001 Planned Program: Project not funded in FY 2001</p>										
B. <u>Other Program Funding Summary</u>	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
Bradley Base Sustainment (G80717)	112723	269490	333233	399997	417690	364917	406986	406895	Cont	Cont
<p>C. <u>Acquisition Strategy:</u> All funding in this project will be executed for Operational Tests by OEC.</p>										
D. <u>Schedule Profile</u>	<u>FY 1997</u>	<u>FY 1998</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 2004</u>	<u>FY 2005</u>
LUT 1		3Q*								
LUT 2/OE		4Q*								
IOTE			3Q							
<p>Project D2TT Page 3 of 17 Pages Exhibit R-2A (PE 0203735A)</p>										

DATE
February 1999

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0203735A Combat Vehicle Improvement Programs

*Milestone Completed

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs				PROJECT D330		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D330 Abrams Tank Improvement Program	37048	9359	12056	19270	18799	20036	83907	96566	Continuing	Continuing
<p>A. Mission Description and Justification: This project funds improvements to the Abrams Main Battle Tank (M1 series). The Abrams mission is to close with and destroy enemy forces on the integrated battlefield using firepower, maneuver, and shock effect. The current production model, the M1A2, is the Army's first fully digital ground combat system. The M1A2 System Enhancement Program (SEP) is the name given to the latest group or "block" of improvements funded under this project. SEP is an upgrade to the computer core that is the essence of the M1A2. It provides better microprocessors, color flat panel displays, more memory capacity, better Soldier-Machine Interface (SMI), and a new open operating system. An Under Armor Auxiliary Power Unit (UAAPU) is being developed for production in order to mitigate power demands on the batteries so that all systems may operate without turning on the main engine. A new thermal management system will dissipate the heat generated by the electronic components. The M1A2's formidable target acquisition capabilities will also be significantly enhanced with the development for production of the 2nd Generation Forward Looking Infra-Red (2nd Gen FLIR) technology. Both the Gunner's Primary Sight (GPS) and the Commander's Independent Thermal Viewer (CITV) will be modified to integrate the improved thermal imaging capabilities of the new FLIR technology.</p> <p>The first M1A2 SEP tank is scheduled for production at the end of FY 1999. The M1A2 SEP tank will be capable of running the Army's Common Operating Environment (ACOE) software for digital communication with the rest of the combined arms team. ACOE software integration is funded in PE 0203758A. Its computer systems will also accommodate future growth without significant hardware changes. An M1A2 Live Fire Testing Program is planned for fiscal years 2000-2003. Post SEP efforts will focus on improvements yielding significant life cycle cost reductions or survivability enhancements.</p> <p>A program to digitize the M1A1 tank began in FY 1997 and continues through FY 1999. All of the development effort for this is being funded by PE 0203758A.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 25480 Completed fabrication and assembly of demonstration hardware, continued logistics, quality and other engineering efforts • 8322 Continued contractor component testing and began joint government / contractor system testing • 3246 Provided Government Support/GFE <p>Total 37048</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 3211 Complete engineering and testing of hardware/software on tank • 2900 Provide Government Support/GFE • 3000 Conduct Direct Support Electrical System Test Set (DSESTS) engineering efforts • 248 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 9359</p>										
Project D330				Page 4 of 17 Pages				Exhibit R-2A (PE 0203735A)		

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs	PROJECT D330
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- FY 2000 Planned Program:**
- 4933 Integration of Battlefield Combat Identification System (BCIS) into the M1A2 SEP tank
 - 7123 Begin DoD directed M1A2 Abrams Live Fire and Survivability Test
- Total 12056
- FY 2001 Planned Program:**
- 19270 Continue DoD directed M1A2 Abrams Live Fire and Survivability Test
- Total 19270

B. Other Program Funding Summary	<u>FY 1998</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
Abrams Upgrade Program (GA0750)	571820	683038	636402	486930	551392	454092	332538	147956	517821	
Abrams Vehicle Modification (GA0700)	18630	36207	29815	88600	125308	135389	315710	337674	Cont	
M1A2 Training Devices (GB1302)	13076	13376	8086	10606	11878	12195	13044	5880	Cont	
Training Device Mod (GA5208)	2176	8514	2640	5383	5575	5565	5885	3408	Cont	
Initial Spares (GE0161)	13351	9774	9756	14951	23682	25515	25697	26463	Cont	
PE 0203758A (D374)	4827	14200	0	0	0	0	0	0	0	

C. Acquisition Strategy: General Dynamics Land Systems Division (GDLS) is the prime contractor for this development program. Texas Instruments, Inc. is the principal contractor developing the FLIR sights, which the Government will provide to General Dynamics. The cost plus fixed fee contract with General Dynamics was awarded on 14 September 1994.

D. Schedule Profile	<u>FY 1997</u>	<u>FY 1998</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 2004</u>	<u>FY 2005</u>
PDR – Software	4Q*									
CDR – Software		3Q*								
Preliminary Manufacturing TDP Complete		3Q*								
Begin Government/Contractor Testing	4Q*									
Complete Government/Contractor Testing			3Q							
Contract Completion			3Q							
Begin Live Fire Test Planning			1Q							
Complete Live Fire Testing							4Q			

* Milestone Completed

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs						PROJECT D330		
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. Prior Contracts			472549								472549	472549
b. SEP/FLIR Phase I	SS-CPFF	General Dynamics	4688								4688	6984
c. SEP/FLIR Phase II	SS-CPFF	General Dynamics Sterling Heights, MI	115702								115702	137900
d. FLIR Integration	C-CPAF	Texas Instruments McKinney, TX	25000								25000	25000
e. BCIS Integration	TBD					4033					4033	
Subtotal Product Development:			617939			4033					621972	
Remark: GDLS contracts (Phase I / Phase II) include funding from 0203758A / D374 and 0604649A / DG26.												
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. Gov't Support / GFE	MIPR	TACOM / OGA's	44685	2900		900					48485	
b. DSESTS Requirements	MIPR	TACOM / OGA's		3000							3000	
c. SBIR / STTR				248							248	
Subtotal Support Costs:			44685	6148		900					51733	
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. Various Test Sites	MIPR		40178	3211		7123		19270			69782	
Subtotal Test and Evaluation:			40178	3211		7123		19270			69782	
IV. Management Services: Not applicable												
Project Total Cost:			702802	9359		12056		19270			743487	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs					PROJECT D344	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D344 Fire Support Team Vehicle Integration	7093	10901	11368	2168	0	0	0	0	0	84938
<p>A. Mission Description and Justification: The Bradley Fire Support (BFIST) vehicle program integrates Mission Equipment Packages (MEP) into a Bradley Fighting Vehicle and supports heavy maneuver force operations. BFIST replaces the aging M981 Fire Support Vehicle allowing for fire support teams in our heavy divisions. BFIST allows fire support operations to be performed on the battlefield in vehicles with the same signature, survivability, and mobility as other Bradley maneuver units. This program supports material development and conversion of selected Bradley A2 Operation Desert Storm (ODS) based upgrades and Bradley A3 vehicles to the BFIST configuration. The A2 ODS based BFIST is designated M7 and the A3 version is A3 BFIST.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1137 Phase I Design Engineering • 1324 Phase I Prototype Manufacturing • 1138 Program Management • 1620 3 LRIP IOTE/Test Vehicles • 1874 DSESTS <p>Total 7093</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 586 Phase I Test Planning • 8241 Phase II Design Engineering • 825 Phase II Pilot Production • 961 Program Management • 288 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 10901</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 6910 Phase II Design Engineering • 2300 Phase II Pilot Production • 1158 Program Management • 1000 Testing <p>Total 11368</p>										
Project D344			Page 7 of 17 Pages				Exhibit R-2A (PE 0203735A)			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs	PROJECT D344
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FY 2001 Planned Program:

- 968 Phase II Design Engineering
- 300 Program Management
- 900 Testing

Total 2168

B. <u>Other Program Funding Summary</u>	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
GZ2300 FIST Vehicle (M7/A3 BFIST)	15237	24656	27338	31103	35888	50948	40205	38646	15000	279021

C. Acquisition Strategy: The BFIST program is executed in two-phases: Phase I converts Bradley A2 ODS platforms to the M7 BFIST configuration and Phase II converts Bradley A3 platforms to the A3 BFIST configuration. A Phase I Cost Plus Incentive Fixed Fee (CPIF), Engineering and Manufacturing Development (EMD) contract through full and open competition requires design and fabrication of four (4) BFIST prototypes for pre-production/user testing. Sole Source/Firm Fixed Price (SS/FFP) Low Rate Initial Production (LRIP) contract with options followed a successful milestone decision. Follow-on Phase II focuses on the A3 BFIST. Full Rate Production contracts will be awarded for production of the Bradley BFIST.

D. <u>Schedule Profile</u>	<u>FY 1997</u>	<u>FY 1998</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 2004</u>	<u>FY 2005</u>
Phase I										
First A2 ODS BFIST Prototype	4Q*									
Pre-Production Verification Test C/G	4Q*									
Limited User Test #1	4Q*									
LRIP Milestone Decision	4Q*									
LRIP Contract Award		3Q*								
Phase II										
Begin Design Engineering Trade Studies		3Q*								
Contract Award			2Q							
Preliminary/Critical Design Reviews			4Q							
Vehicle Deliveries				4Q						
Vehicle Qualification Test					1Q					

* Milestone Completed

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs						PROJECT D344		
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. BFIST Phase I	C/CPIF	UDLP, San Jose, CA	35794	500	Nov 98						36294	
b. BFIST STS	CPFF	UDLP, San Jose, CA	7755								7755	
c. M7 LRIP	SS/FFP	UDLP, San Jose/York	1620								1620	
d. BFIST Phase II	CPAF	UDLP, York, PA		9354	Mar 99	9210	Dec 99	968	Dec 00		19532	
e. DSESTS	CPFF	PEI, Huntsville, AL	1874								1874	
Subtotal Product Development:			47043	9854		9210		968			67075	
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. PM/Govt	MIPR	PMO, Warren, I/AMCOM, Huntsville, AL	11904	961	Oct 98	1158	Oct 99	300	Oct 00		14323	
Subtotal Support Costs:			11904	961		1158		300			14323	
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. ATC/TECOM	MIPR	ATC, WSMR, YPG	1554	86	Nov 98	1000	Nov 99	900	Nov 00		3540	
Subtotal Test and Evaluation:			1554	86		1000		900			3540	
IV. Management Services: Not applicable												
Project Total Cost:			60501	10901		11368		2168			84938	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs				PROJECT D371		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D371 Bradley Base Sustainment Program	71604	67476	3221	0	0	0	9508	9761	Continuing	Continuing
<p>A. Mission Description and Justification: The Bradley A3 program upgrades a proven, tracked combat vehicle with digital command and control, increased situational awareness, enhanced lethality and survivability, and supportability/sustainability improvements. This project funds engineering and manufacturing development (EMD) of the Bradley A3. The effort develops and fully integrates digital electronics featuring a 1553 databus core electronic architecture and upgraded vehicle system software packages (command and control, navigation, communications, fire control, system/component diagnostics, and embedded training capabilities), 2nd Generation FLIR, and other systems/components into renovated (overhauled) Bradley A2s. Current plans call for conversion of 1109 Bradley A2s to the Bradley A3 configuration.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 64188 Continued Design Engineering Effort • 1400 Continued Prototype Manufacturing Effort • 2381 Continued Prototype Qualification Testing and Live Fire Testing • 3635 Project Management <p>Total 71604</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 46735 Continue Design Engineering Effort • 15888 Complete Live Fire and PQT Testing • 2289 Project Management • 2564 Small Business Innovative Research and Small Business Technology Transfer Program <p>Total 67476</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 657 Design closeout • 986 Combat ID • 978 Digitization • 600 Project Management <p>Total 3221</p>										
Project D371			Page 10 of 17 Pages				Exhibit R-2A (PE 0203735A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs	PROJECT D371
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FY 2001 Planned Program: Project not funded in FY 2001

B. <u>Other Program Funding Summary</u>	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To <u>Compl</u>	Total <u>Cost</u>
G80717 Bradley Base Sustainment	112723	269490	333233	399997	417690	364917	406986	406895	Cont	Cont
GE0163 Spares (Initial) BFVS	286	7111	9173	11628	10789	10990	5218	7086	Cont	Cont
G20900 Bradley FVS Training Devices		12695	23441	18715	2603	3195	2501	4430	Cont	Cont
PE 0203758A (Digitization)	2269	4600								6869

C. Acquisition Strategy: Milestone II/IV for the Bradley A3 was held in FY94 and the program was approved for EMD. United Defense was subsequently awarded a Cost Plus Incentive Fee (CPIF) contract for development and integration of advanced A3 systems and components. Ten principal subcontractors, comprising approximately 33% of the contract cost, are participating in the EMD work effort. The first of eight prototypes was completed in 4QFY96; six prototypes are currently undergoing contractor and government production qualification testing. Low Rate Initial Production (LRIP) procurements were awarded in FY 1997 and FY 1998. Limited User Testing and Live Fire Testing will be conducted in FY98 and FY 1999, respectively.

D. <u>Schedule Profile</u>	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2004	FY 2005
PQT-Government	4Q*									
LRIP IPR	4Q*									
LRIP Award (Phased Awards)	4Q*	3Q*	1Q*							
Limited User Test #1		3Q*								
Operational Experiment		4Q*								
LFTE		4Q	1,2,3Q							
LOG DEMO			2Q							
Limited User Test #2			4Q							
IOTE				1Q						
MS III				2Q						

* Milestone Completed

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<p align="center">ARMY RDT&E COST ANALYSIS (R-3)</p>											<p align="right">DATE February 1999</p>	
<p>BUDGET ACTIVITY 7 - Operational System Development</p>				<p>PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs</p>						<p>PROJECT D371</p>		
<p>I. Product Development</p>												
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. A3 EMD	CPIF	United Defense, San Jose, CA	274284	20716	Feb 99	300	Dec 99			295300		
b. IBAS EMD	SS/CPIF	Texas Instruments, McKinney, TX	65654							65654		
c. IBAS TPS Development	CPFF	Pentastar, Huntsville, AL	1863							1863		
d. Other Contracts			34746	28583	Feb 99	2321	Feb 99		19269	84919		
Subtotal Product Dev:			376547	49299		2621			19269	447736		
<p>II. Support Costs</p>												
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. PMO	MIPR	PMO, Warren, MI	7058	1049	Sep 99	400	Sep 00			8507		
b. PM CCAWS	MIPR	PMO, Huntsville, AL	17363	500	Jan 99					17863		
c. Other	MIPRs	Various OGAs	4551	740	May 99	200	May 00			5491		
Subtotal Support Costs:			28972	2289		600				31861		
<p>III. Test and Evaluation</p>												
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. PQT, LUT II, LFTE, IOTE	MIPR	ATC, WSMR, YPG, ARL, DPG, CRTA	6877	15888						22765		
Subtotal Test and Evaluation:			6877	15888						22765		
Project Total Cost:			412396	67476		3221			19269	502362		

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs	PROJECT D718
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D718 Ground Combat Vehicle HTI	16945	8952	0	0	0	0	0	0	0	25897

A. Mission Description and Budget Item Justification: The Suite of Survivability Enhancement Systems (SSES) is an effort to develop, produce and apply Defensive Aids Suites (DAS) to all Army ground combat vehicles. A DAS inhibits successful engagement of the host vehicle by providing advance warning of attack and activating countermeasures, which detect the incoming munitions. Advance warning enables the crew to take defensive action such as maneuvering or returning fire on the enemy. The Laser Warning Receiver (LWR) will provide warning of laser assisted engagement of the host vehicle. Current analysis shows that LWR's will reduce losses of Bradley Vehicles and casualties to Bradley crewmembers by 33%. In addition, LWR greatly improves the ability of the Bradley to detect targets and will allow the LWR equipped Bradley to kill attacking enemy weapons at twice the rate previously attained. The CDA will integrate current and future sensors and countermeasures into the host vehicle's electronic architecture and will provide sensor fusion, threat prioritization and manual, semi-automatic or automatic activation of countermeasures. SSES leverages hit avoidance technology developed for aviation electronic warfare (EW) systems, incorporates changes developed to meet ground vehicle requirements, and returns technical improvements to the aviation EW community. It also incorporates ground vehicle specific hit avoidance technology being developed within the technology base. The CDA leverages work accomplished under the Hit Avoidance Advanced Technology Demonstration.

The Field Emissive Display (FED) program, also known as the High Performance Flat Panel Display (FPD) technology development program, is an effort to develop common, multi-purpose displays for Army ground combat vehicles. This includes the capability for real time interpretation and application of command and control, target imagery and situation awareness information. The FPD will also provide common, multi-purpose, and high performance (low power, color, and sunlight readable, high-resolution) system displays. The application of the FPD supports the Force XXI Battle Command – Brigade and Below (FBCB2) operational requirement for the display of common imagery and data in removable and remote operations. In doing so, this program focuses on the near to mid-term opportunity to improve the performance of system displays for both tracked and wheeled combat and combat support vehicles. The high performance FPD program takes advantage of advanced display technologies under development by the Defense Advanced Research Projects Agency (DARPA) by incorporating changes to meet the requirements of ground systems. System display performance specifications will optimize industry standard interfaces allowing incremental and inexpensive upgrades for future information display requirements. This program has been funded through congressional plus-ups, with \$7.0M provided in FY97 and \$12.0M in FY98 and \$7.0M in FY99.

As additional HTI projects are identified with funding, these projects will be added to and funded under project D718.

FY 1998 Accomplishments:

- 10540 Research and develop high resolution FED display (FED)
- 225 Evaluate FED Prototype Vehicle Interfaces are in process (FED)
- 472 Support and Management (FED)
- 3018 Vehicle Integration on BFVS A3. (SSES)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs	PROJECT D718
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FY 1998 Accomplishments: (continued)

- 437 CDA Development and Test on Bradley A3 SIL (SSES)
 - 661 Testing (Including Operational) (SSES)
 - 262 Systems Engineering and Simulation (SSES)
 - 464 Logistics Development (SSES)
 - 866 Support and Management (SSES)
- Total 16945

FY 1999 Planned Program:

- 50 Product Integration and Test Support (SSES)
 - 523 Government Tech Support-LWR (SSES)
 - 938 Government Test and Testing Support (SSES)
 - 991 Program management administration (SSES and FED)
 - 6213 Design and build high resolution FPD engineering unit (FED)
 - 237 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 8952

FY 2000 Planned Program: Project not funded in FY 2000

FY 2001 Planned Program: Project not funded in FY 2001

B. Other Program Funding Summary: None

C. Acquisition Strategy: With regard to LWR effort, we used existing contracts for RDTE and enabled the return of technology improvement to aviation electronic warfare system.

D. Schedule Profile	<u>FY 1998</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>
LWR Technical Tests	2Q	2Q						
LWR Vehicle Integration Test		1-3Q						
LWR CDA Integration (SIL)	3Q							
LUT 1	1Q							
IOTE		1Q						

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs				PROJECT D718	
D. Schedule Profile	<u>FY 1998</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>	
PEO IPT		1Q							
FED Technical Evaluation		3Q							
Common FED Spec/ICD Development	1-4Q	1-2Q							
High Resolution Development FED		1-4Q							
Critical Item Development Spec		2Q							

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ARMY RDT&E COST ANALYSIS (R-3)

DATE **February 1999**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0203735A Combat Vehicle Improvement Programs

PROJECT
D718

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. LWR Development	STS/FFP	ROSI, Danbury CT	4170	0	-	0	-	0	-	0	4170	
b. LWR Integration	CPIF	UDLP, Santa Clara, CA	4989	50	2QTR99	0	-	0	-	0	5039	
c. LWR CDA	CPAF	SLM, Nashua, NH	470	0	-	0	-	0	-	0	470	
d. FED	Cost/Share	MICRON, Boise, ID	16761	5200	2QTR99	0	-	0	-	0	21961	
e. FED	CPIF	GDLS, Sterling Hts, MI	415	625	3QTR99	0	-	0	-	0	1040	
f. FED	CPIF	UDLP, Santa Clara, CA	140	625	3QTR99	0	-	0	-	0	765	
Subtotal Product Development:			26945	6500							33445	

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. Tech Spt LWR	MIPR	CECOM, NJ	1664	140	1Qtr99	0	-	0	-	0	1804	
b. Tech Spt LWR	MIPR	TARDEC, MI	205	20	1Qtr99	0	-	0	-	0	225	
c. Support Mgt LWR	CPFF	Sig/Rsch, MI	73	20	1Qtr99	0	-	0	-	0	93	
d. Engr Spt LWR	CPAF	Camber, MI	511	0	-	0	-	0	-	0	511	
e. Training Aid Develop LWR	MIPR	STRICOM, FL	148	135	1Qtr99	0	-	0	-	0	283	
f. IBAS Display LWR	MIPR	PM CCAWS, AL	30	0	-	0	-	0	-	0	30	
g. Engr Test Spt LWR	MIPR	SLAD (OMI), NM	454	208	2Qtr99	0	-	0	-	0	662	
Subtotal Support Costs:			3085	523							3608	

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. Field Test LWR	MIPR	RTTC, AL	68	0	-	0	-	0	-	0	68	
b. Missile Warning LWR	MIPR	Naval Rsch Wash DC	35			0	-	0	-	0	35	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs	PROJECT D718
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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
c. LWR User Eval	MIPR	Eglin AFB, FL	10	450	2QTR99	0	-	0	-	0	460	
d. LWR Tech Test	MIPR	Yuma, AZ	0	208	2QTR99	0	-	0	-	0	208	
e. LWR User Eval	MIPR	Ft. Benning, GA	0	130	2QTR99	0	-	0	-	0	130	
f. LWR User Eval	MIPR	Other	0	150	2QTR99	0	-	0	-	0	150	
Subtotal Test and Evaluation:			113	938							1051	

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. In House Spt LWR	MIPR	PM GSI, MI	916	379	1Qtr99	0	-	0	-	0	1295	
b. In House Spt FED	MIPR	PM GSI, MI	633	375	1Qtr99	0	-	0	-	0	1008	
c. SBIR/STTR	N/A		0	237	-						237	
Subtotal Management Services:			1549	991							2540	

Project Total Cost:			31692	8952							40644	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203740A Maneuver Control System				PROJECT D484		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D484 Maneuver Control System	23712	28623	45125	25682	8572	3783	15924	12960	14400	517100
<p>A. <u>Mission Description and Budget Item Justification:</u> This program element funds the evolutionary software development, integration and testing of the Maneuver Control System (MCS). Project D484, Maneuver Control System (MCS) satisfies an urgent need for efficient command and control (C2) of tactical operations on the battlefield. MCS is the Army's tactical C2 system used in command posts from corps to battalion to provide automated C2 for the commander and staff at and between echelons (i.e., Force Level Control). MCS is the heart of the Army Battle Command System (ABCS) and provides critical coordination among Battlefield Functional Areas (BFAs) within each echelon. The primary component of controlling Force Level Information transactions is MCS's management of common picture information. This includes information across all Battlefield Functional Areas (BFAs) consisting of the Situation Map (SITMAP) using Defense Mapping Agency map data to display friendly and enemy unit locations, control measures (e.g., boundaries, phase lines, etc.), Intelligence and Electronic Warfare graphics, Fire Support plans, combat service support location information, air corridors and air defense weapons control information.</p> <p>MCS software is based on the Common Operating Environment (COE) standard architecture with applications to automate C2 operations. MCS Block III software uses the Terrain Evaluation Module (TEM) for terrain analysis, planning and SITMAP graphical displays. The MCS Block IV effort converted from TEM to the Joint Mapping Tool Kit (JMTK) which is the Common Operating Environment (COE) product. The Unit Task Organization (UTO) Tool provides the commander and staff a means of organizing (graphically and textually) tactical Army units by echelon. Unit commanders and their staffs can quickly and efficiently prepare and disseminate combat orders with MCS's automated Operations Order (OPORD) generating tool. MCS's report displays provide resource information roll-ups on all reporting battlefield units. In addition to serving as the common tactical picture database for all ATCCS BFAs, MCS is an essential gateway for Situational Awareness information received from Force XXI Battle Command Brigade and Below (FBCB2). MCS provides the Army "ground track" segment of the joint tactical common picture to the Global Command and Control System-Army (GCCS-A).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 18587 Continued MCS software development • 3303 Block III IOTE • 1822 Battlefield Digitization <p>Total 23712</p>										
Project D484	Page 1 of 5 Pages					Exhibit R-2 (PE 0203740A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203740A Maneuver Control System	PROJECT D484
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FY 1999 Planned Program:

- 25973 Continue MCS Block IV software development
- 150 Milestone III ASARC/DAB
- 1776 Battlefield Digitization
- 724 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 28623

FY 2000 Planned Program:

- 25053 Continue MCS Block IV software development
- 20072 Battlefield Digitization

Total 45125

FY 2001 Planned Program:

- 15827 Continue MCS Block IV software development
- 9855 Battlefield Digitization

Total 25682

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	24510	28923	17976	10366
Appropriated Value	25641	28923		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1131	-300		
b. SBIR / STTR	-600			
c. Omnibus or Other Above Threshold Reductions	-198			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+27149	+15316
Current Budget Submit (FY 2000/2001 PB)	23712	28623	45125	25682

Change Summary Explanation:
 Funding: FY2000 (+27149) Increase for MCS Block IV software development, testing and experimentation efforts intended to satisfy Army Digitization schedule.
 FY2001 (+15316) Increase for MCS Block IV software development, testing and experimentation efforts intended to satisfy Army Digitization schedule.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203740A Maneuver Control System	PROJECT D484
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C. <u>Other Program Funding Summary</u>	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
Other Procurement, Army										
Maneuver Control System - BA9320	0	12998	52049	50729	625	20609	42889	55928	323991	943400
MCS Spares - BS9710	0	0	0	4983	0	0	0	0	39918	91900

D. Acquisition Strategy: Since the initial MCS was introduced in Europe in 1981, this program has been and will continue to be, evolutionary software development, broken out into Blocks. The MCS capability continues to expand in pre-planned, time-phased steps toward the objective system. The final block of MCS software, Block IV, consists of development of two versions; MCS Version 1.1 and MCS Version 1.2. MCS Version 1.2, the objective software will add applications and stand-alone functionality from MCS Version 1.1. Therefore technical risk associated with each version is minimized. The use of Common Hardware/Software (CHS) equipment enables the MCS to capitalize on state of the art ruggedized, commercial equipment and reduce life cycle costs. Commencement of the transition to CHS began in FY 1989 with the initiation of the porting of software as well as the initiation of the integration of CHS into both the Standardized Integrated Command Post System (SICPS) and the existing Command and Control Vehicle.

E. <u>Schedule Profile</u>	<u>FY 1998</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>
Division XXI Participation	1Q*							
Block III IOT&E	3Q*							
Milestone III Decision		3Q						
Initial Operational Capability			3Q					
MCS Version 1.1 OA/OT			4Q					
MCS Version 1.2 OA/OT					2Q			
P3I program						1-4Q	1-4Q	1-4Q

*Milestone Complete

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203740A Maneuver Control System					PROJECT D484			
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.	Block IV (LMC)	C/CPIF/AF	Lockheed Martin Corp, Tinton Falls, NJ	24700	19150	1Q	25000	1Q	15000	1Q	3000	86850	See Remark
b.	Block III (TKC)	C/CPIF/AF	CSC, Telos, MITRE	58969	0						0	58969	
c.	Other Contracts	C/Various		193174	3134	5702		2783		14215	219008		
d.	Technical Support	MIPR	CECOM	11343	994	1035		1076		4989	19437		
e.	In-House			23919	1453	1540		1602		7260	35774		
f.	PSE H/w &S/W	C/Various		9237	0	3000	1Q			4000	16237		
g.	MITRE Sys Engrg		Eatontown, NJ		1400	1Q	1470	1Q	1545	1Q	7530	11945	
Subtotal Product Development:				321342	26131	37747		22006		40994	448310		
Remark: Contract is being restructured to meet FDD requirements (schedule and software functionality). Total Cost represents Project Manager's best estimate. Includes a total of \$9.0M budgeted for award fees from FY99 through FY01.													
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.	In-House		15699	630		655		681		3085	20750		
b.	Other Contracts	C/Various	16456	642		693		750		3835	22376		
Subtotal Support Costs:				32155	1272	1348		1431		6920	43126		
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.	OGA	MIPR	1761								1761		
b.	Other Contracts	C/Various	1452	220		230		245		725	2872		
c.	CHS-1 HW	C/FPP	Miltope Corp	613							613		
d.	Operational Test/Planning	MIPR	TEXCOM/OPTEC	4618	1000	1Q	5800	1Q	2000	1Q	7000	20418	
Subtotal Test and Evaluation:				8444	1220	6030		2245		7725	25664		
IV. Management Services: None													
Project D484													

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203740A Maneuver Control System	PROJECT D484
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	Total PYs Cost	FY 1999 Cost		FY 2000 Cost		FY 2001 Cost		Cost To Complete	Total Cost	Target Value of Contract
Project Total Cost:	361941	28623		45125		25682		55639	517100	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program
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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	21847	26628	51644	61033	57237	50551	23977	22303	Continuing	Continuing
D028 Guardrail Common Sensor/Aerial Common Sensor	0	0	5643	7672	11413	8928	13977	7303	Continuing	Continuing
D179 CH-47 Product Improvement	0	0	0	0	507	0	0	0	0	507
D430 Improved Cargo Helicopter	20847	26628	28342	35819	6629	98	0	0	0	119363
D504 UH-60 Door Gun	0	0	0	0	0	0	10000	15000	0	0
D508 Apache 2nd Generation Forward Looking Infrared (FLIR)	0	0	17659	17542	38688	41525	0	0	0	115414
D510 Firehawk (UH-60)	1000	0	0	0	0	0	0	0	0	1000

A. Mission Description and Budget Item Justification: This PE provides for development of the Improved Cargo Helicopter (ICH) which extends the useful life of the CH-47D Cargo Helicopter as well as provides the means to conduct government test and evaluation of a Reliability, Maintainability and Survivability –Operations Support Cost Reduction (RMS-OSCR) funded Low Maintenance Rotor Head (LMRH) .

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	21567	26681	8325	2589
Appropriated Value	22609			
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1042	-53		
b. SBIR / STTR	-541			
c. Omnibus or Other Above Threshold Reductions	-179			
d. Below Threshold Reprogramming	+1000			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+43319	+58444
Current Budget Submit (FY 2000 / 2001 PB)	20847	26628	51644	61033

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	
<p>Change Summary Explanation: FY2000/2001 – Funds increased to support Improved Cargo Helicopter (+20900) and the development of the Apache Second Generation Forward Looking Infrared (FLIR) (+17700).</p>		

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D028
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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
D028 Guardrail Common Sensor/Aerial Common Sensor	0	0	5643	7672	11413	8928	13977	7303	Continuing	Continuing

A. Mission Description and Budget Item Justification: The Aerial Common Sensor/GUARDRAIL VII (ACS/GRVII) is an airborne intelligence collection system required to provide critical support to US-based early entry, forward deployed forces, and support the Army's intelligence seamless architecture. ACS will satisfy the Army's critical need for a worldwide, self-deployable, airborne reconnaissance, intelligence, surveillance, and target acquisition (RISTA) capability that can immediately begin operations when arriving in theater. The ACS/GRVII will merge the current Airborne Reconnaissance Low (ARL) and Guardrail Common Sensor (GRCS) into a single airborne system capable of providing a rapid response information dominance capability to Land Component Commanders required in the early 21st Century. ACS will be composed of a family of modular sensors mounted on an airborne platform that is capable of operating independently or remotely via SATCOM or line-of-sight datalinks from a ground processor. The sensors will be interoperable with the open C4ISR architecture and support all combat and combat support functions through the emerging DOD "global infosphere". The primary mission will be standoff Signals Intelligence (SIGINT) collection, with a secondary mission of overflight Imagery Collection (IMINT). ACS is primarily targeted against threat maneuver forces, logistic areas, rocket and artillery forces, air defense artillery, command control communications and intelligence nodes (C3I); and tactical fixed -wing, rotary wing and unmanned aerial vehicles. ACS will provide support to the operational commander and supports the mission areas covered by Tactical Intelligence and related Activities (TIARA), Land Warfare, Air Warfare, Naval Warfare, Amphibious Strike and Anti-Surface Warfare and Tactical Command and Control.

This project is unclassified and is a cooperative effort with the Joint Airborne SIGINT Program Office (JASPO) who are developing the Low Band (LBSS) and High Band (HBSS) Subsystems which will be integrated into ACS. The incorporation of the JASPO subsystems will ensure interoperability with the other services SIGINT platforms. The National Security Agency's Defense Cryptologic Program provides funding to support enhanced SIGINT capabilities.

The FY00/FY01 funding supports efforts to identify an airborne platform which best supports the multi-mission role of ACS and begins non-SIGINT Prime Mission Equipment (PME) development and integration efforts.

FY 1998 Accomplishments: Project not funded in FY 1998

FY 1999 Planned Program: Project not funded in FY 1999

FY 2000 Planned Program:

- 5643 Initiate contract(s) for ACS development, e.g. System design, modeling and simulation.
- Total 5643

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program			PROJECT D028				
FY 2001 Planned Program: <ul style="list-style-type: none"> • 7672 Continue System development, e.g. design, modeling and simulation. Total 7672												
B. Other Program Funding Summary			<u>FY 1998</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 Complete	Total Cost
Defense Cryptologic Program (DCP)					13725	13130	16694	18635	19678	17476		99338
Joint Airborne SIGINT program Office (JASPO)			6000	5000	4500	1500						17000
Guardrail/ACS (APA; A02005)									14981	66146	Cont.	Cont.
C. Acquisition Strategy: The Aerial Common Sensor development and aircraft integration contract will be a competitive cost plus award fee contract. The contract will include provisions for integration analysis and/or integration of non-SIGINT suites such as Moving Target Indicator (MTI)/Synthetic Aperture Radar (SAR), Electro Optic/Infrared (EO/IR), etc. The contractor will be required to support the program through a milestone III approval of the aircraft and sensor suites. The SIGINT payload for ACS will be comprised of the HBSS and LBSS systems being procured by the JASPO under separate action with additional enhancements being funded under the ACS DCP program.												
D. Schedule Profile			<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>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Milestone Decision						4Q						
Award development contract							1Q					
Conduct DT/OT											1Q	
Milestone III											3Q	
Award production contract											3Q	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program					PROJECT D028		
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. ACS modeling, simulation & design	C-CPAF	TBD	0	0		5223	1Q	6887	1Q	Cont'd	12110	
Subtotal Product Development:						5223		6887			12110	
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. Technical engineering and support	TDB	TBD	0	0		0		0		Cont'd		
Subtotal Support Costs:												
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	MIPR	EPG – Ft. Huachuca	0	0		0		0		1650	1650	
b. DT/OT	MIPR	Other	0	0		0		0		1000	1000	
Subtotal Test and Evaluation:										2650	2650	
Remark: Test Location and type of government furnished test equipment and operators will have to be negotiated with contractor.												
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. Gov't Engineering & Logistics	MIPR	CECOM, Ft. Monmouth	0	0		110	1Q	235	1Q	Cont'd	345	
b. In-House	Direct		0	0		240	1Q	415	1Q	Cont'd	655	
c. Contractor Engineering and support	C-FP	TBD, Ft. Monmouth, NJ	0	0		70	1Q	135	1Q	Cont'd	205	
Subtotal Management Services:						420		785			1205	

ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D028
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	Total PYs Cost	<u>FY 1999</u> Cost		<u>FY 2000</u> Cost		<u>FY 2001</u> Cost		Cost To Complete	Total Cost	Target Value of Contract
Project Total Cost:		0		5643		7672		2650	15965	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program				PROJECT D430		
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
D430 Improved Cargo Helicopter	20847	26628	28342	35819	6629	98	0	0	0	119363
<p>A. Mission Description and Budget Item Justification: The Improved Cargo Helicopter (ICH) is a program to extend useful life of the CH-47D Cargo helicopter. This funding will assure heavy lift capability into the 21st century. This program awarded a contract for Engineering Manufacturing Development (EMD) which includes decreasing operation and support costs through vibration reduction/airframe stiffening, incorporating a new electronics/architecture system for compatibility with the digital battlefield and structural modifications as necessary to extend the life of the airframe. This program will be the basis for establishing remanufacture, modernization, and upgrade program to meet the readiness needs of the future for heavy lift capability. The ICH Program will include testing of the two engineering development models plus component testing for Live Fire.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 18090 Awarded Engineering Manufacture Development (EMD) • 2127 Continued In-house and program management administration • 630 Continued Government Test and Evaluation <p>Total 20847</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 23763 Continue Engineering Manufacture Development (EMD) • 1335 Continue In-house and program management administration • 1530 Continue Government Test & Evaluation <p>Total 26628</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 21653 Continue Engineering Manufacture Development (EMD) • 1417 Continue In-house and program management administration • 5272 Continue Government Test & Evaluation <p>Total 28342</p>										
Project D430			Page 7 of 15 Pages				Exhibit R-2A (PE 0203744A)			

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D430
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FY 2001 Planned Program:

- 30076 Continue engineering Manufacture Development (EMD)
 - 1800 Continue In House and program management administration
 - 3943 Continue Government Test & Evaluation
- Total 35819

B. Other Program Funding Summary	<u>FY 1998</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
APA, SSN AA0254, CH-47 ICH	0	0	0	82900	158400	208100	304400	301300	1917500	2972600

C. Acquisition Strategy: The ICH will sustain the aging fleet and bridge the gap until the development of a follow-on aircraft. This will be achieved in a cost effective manner as the ICH program will be based on a three-pronged remanufacture approach which will include rebuilding the airframe, improving mission capability, and reducing vibrations to provide for longer term O&S cost reductions.

D. Schedule Profile	<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>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
EMD Contract & Funding Increments			3rd Qtr	2ndQtr	1 st Qtr	1 st Qtr	1 st Qtr			
Critical Design Review (CDR)				4 th Qtr						
LRIP I Award							2 nd Qtr			
Initial Oper Test & Eval (IOTE)							4 th Qtr			

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program						PROJECT D430		
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. Boeing	SS/FP	Boeing, PA	12192								12192	12192
b. Boeing Defense/Space Grp	SS/CPIF	Boeing, PA	13900	21100	Feb 99	20700	Oct 99	28735	Dec 00	2356	86791	86791
c. GFE	Requisitions	Redstone Arsenal, AL	3015								3015	3015
Subtotal Product Development:			29107	21100		20700		28735		2356	101998	101998
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	Reimbursable	Various government	7383	1145	Qtrly	955	Qtrly	1625	Qtrly	873	11981	
b. Surv/Vulner Test Spt		TBD	9	190	Qtrly	462	Qtrly	175	Qtrly		836	
Subtotal Support Costs:			7392	1335		1417		1800		873	12817	
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. Developmental Test (DT)	Reimbursable	Various government	89	60	Qtrly	1227	Qtrly	1738	Qtrly	1359	4473	
b. Operational Test (OT)	Reimbursable	Various government	0	45	Qtrly	745	Qtrly	880	Qtrly	1637	3307	
c. Pre-EMD DT	Reimbursable	Ft. Rucker	2218								2218	
d. Live Fire Test & Eval	Reimbursable	Various government	430	1425	Qtrly	3300	Qtrly	1325	Qtrly	1375	7855	
Subtotal Test and Evaluation:			2737	1530		5272		3943		4371	17853	
IV. Management Services	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. CAMBER	SS/FP	Huntsville, AL	2668								2668	2668
b. Westar	SS/FP	Huntsville, AL	217								217	217
c. Data, Inc.	SS/FP		70								70	70
d. Arinc	SS/FP		302								302	302

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D430
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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
e. Assur Tech Corp	SS/FP	St. Paul	121								121	121
f. ICH Support		TBD		2663		953		1341			4957	4957
Subtotal Management Services:			3378	2663		953		1341			8335	8335

Project Total Cost:			42614	26628		28342		35819		7600	141003	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D508
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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
D508 Apache 2nd Generation Forward Looking Infrared (FLIR)	0	0	17659	17542	38688	41525	0	0	0	115414

A. Mission Description and Budget Item Justification: Apache Second Generation Forward Looking Infrared (FLIR) is a U.S. Army program to develop, test, integrate and produce a Second Generation FLIR (SGF) for the Army's entire fleet of AH-64A and AH-64D aircraft. The FLIR system allows for pilotage of the aircraft and the engagement of targets during night operations and adverse weather conditions. The Apache SGF program will leverage technology already invested in electronics, sensors and optics to provide the best sensor available at the lowest cost. The SGF enhancements over the present Apache FLIR include increased range for detection, recognition and identification of targets; higher resolution for a sharper, clearer image; improved sensitivity, especially in adverse weather; increased capability to identify friend versus foe during hostilities; and increased reliability. These enhancements will improve the overall warfighting capability of the Apache aircraft by: 1) providing improved clarity and ability to fly and navigate using FLIR imagery; 2) significantly enhancing the pilot's visibility and safety while improving target designation and acquisition; and 3) improving aircraft survivability with increased standoff ranges; 4) reducing the risk of fratricide and 5) reducing the operation and support costs of the system.

FY 1998 Accomplishments: Project not funded in FY 1998

FY 1999 Planned Program: Project not funded in FY 1999

FY 2000 Planned Program:

- 16776 Award Engineering & Manufacturing Development (EMD) Contract for 2nd Generation FLIR
 - 883 In-house & Program Management Administration/Complete Source Selection Evaluation Board (SSEB) for EMD Program
- Total 17659

FY 2001 Planned Program:

- 16665 Continue EMD Contract for 2nd Generation FLIR Development/First Prototype Delivery
 - 877 Continue in-house and Program Management Administration
- Total 17542

B. Other Program Funding Summary	<u>FY 1998</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>
APA, BA 2, AA6606, AA6607, AA0978, AA6608, Modification of Aircraft	555077	686541	813737	785728	935233	981131	837925	530210	Cont	Cont

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D508
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C. Acquisition Strategy: A cost plus incentive fee (CPIF) type contract is anticipated through a competitive award process. Six prototypes will be designed, developed and tested. The program will culminate with qualification flight testing on the Apache Attack Helicopter. The design will be compatible with both the A and D model Apache helicopters.

D. Schedule Profile	<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>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Issue RFP				4Qtr						
Receive Proposals				4Qtr						
SSEB				4Qtr						
Contract Award					4Qtr					
PDR/CDR					4Qtr	4Qtr				
Prototype Deliveries						4Qtr	4Qtr	4Qtr		
Qual Testing							4Qtr			
Air Worthiness Release								4Qtr		
Flight Testing								4Qtr		

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program					PROJECT D508		
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. 2 nd Gen FLIR Develop	C, CPIF	TBD				16776	Jan 00	16665	Oct 00	59765	93206	93206
Subtotal Product Development:						16776		16665		59765	93206	93206
II. Support Costs: None												
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. Qual, Air Worth, Demo	C, CPIF	TBD								16437	16437	16437
Subtotal Test and Evaluation:										16437	16437	16437
IV. Management Services	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. In-House & SSEB		PEO AVN				883	Oct 99	877	Oct 00	4011	5771	5771
Subtotal Management Services:						883		877		4011	5771	5771
Project Total Cost:						17659		17542		80213	115414	115414

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D510
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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
D510 Firehawk (UH-60)	1000	0	0	0	0	0	0	0	0	1000

A. Mission Description and Budget Item Justification: The Fire Hawk Kit is a congressional interest program to develop a fire fighting capability for the Army National Guard's UH-60 Blackhawk Helicopters. The development is being conducted under a Cooperative Research and Development Agreement (CRDA) pursuant to the Federal Technology Transfer Act of 1986, Public Law No. 99-502, 20 October 1986, as amended, between the U.S. Army Aviation Research, Development and Engineering Center and Sikorsky Aircraft Company (SAC).

FY 1998 Accomplishments Program:

- 100 System Integration and Test
 - 145 Developed Interface Control Documents
 - 125 Developmental Testing
 - 75 Air Worthiness Release (AWR)
 - 25 Safety Confirmation
 - 175 Operational Test
 - 90 User Evaluation
 - 265 Developed Technical Data Package (TDP)
- Total 1000

FY 1999 Planned Program: Project not funded in FY 1999

FY 2000 Planned Program: Project not funded in FY 2000

FY 2001 Planned Program: Project not funded in FY 2001

B. Other Program Funding Summary	<u>FY 1998</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>To Comp</u>	<u>Total Cost</u>
APA Budget									
AA0480 UH-60 MODS	2000								2000

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D510
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C. Acquisition Strategy: The Army Acquisition Strategy, as a result of the CRDA, is to use the design information and technical data for a full and open competition procurement of Firehawk kits. However, procurement will occur only after the Army National Guard has provided a valid requirement to OSD.

D. Schedule Profile	<u>FY 1998</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>FY 2006</u>
System Integration And Test		2 Qtr							
Develop Interface Control Documents		2 Qtr							
Developmental Testing		2 Qtr							
Air Worthiness Release (AWR)		3 Qtr							
Safety Confirmation		3 Qtr							
Operational Test		4 Qtr							
User Evaluation		4 Qtr							
Develop Technical Data Package (TDP)		4 Qtr							

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program				PROJECT D106			
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
D106	Aircraft Engine Component Improvement Program (CIP)	2756	6901	2900	2946	3132	3202	3382	3463	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification Aircraft Engine Component Improvement Program (CIP) develops, tests, and qualifies improvements to aircraft engine components to correct service revealed deficiencies, improve flight safety, enhance readiness and reduce operating and support (O&S) costs. In addition, CIP provides the test vehicles for the testing and qualification efforts required as a part of the Army's Flight Safety Parts program. CIP is included in the RDTE budget vice procurement appropriations in accordance with congressional direction.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 663 T700 Engine: Completed qualification of improved oil sump to reduce O&S costs. Develop improved high temperature connector for Speed & Torque sensor cables to reduce maintenance costs. Begin analysis for the update of the life limits for the -701C turbine rotor to improve readiness and increase flight safety. Install field performance monitors on four Blackhawk aircraft to gather mission data to increase accuracy of life limit updates. Developed repair procedures to allow use of scrapped high-dollar hardware and reduce O&S costs. • 992 T55 Engine: Continued to develop bearing improvements to improve reliability and fatigue life while reducing O&S costs. Began development of redesigned tailpipe which will improve reliability and readiness while reducing performance losses, extending service life and reducing O&S costs. • 189 T53 Engine: Completed qualification testing of an improved N2 Accessory Drive Carrier that will improve reliability by preventing bearing race spinning and assembly sensitivities. This design also includes a METCO coated spur gear which dampens engine vibrations and prevents known gear fracture problems in order to resolve a known flight safety issue. Completed qualification of an improved output reduction gear box (RGB) with an integral torque meter ring that increases reliability by correcting misalignment problems which increases gear wear. RGB improvement also removes thorium from the front cover and includes new gear profile/silver plated planetary gears for improved lubricity. • 425 GTCP 36 APU: Evaluated potential for commonality of parts between Blackhawk, Apache, and Air Force APUs to reduce O&S cost. Compared life cycle cost benefits of Mar-M turbine wheel and dual alloy turbine wheel for use on both Apache and Blackhawk, and initiated design of an erosion resistant common dual alloy turbine wheel with an improved stress rupture life to extend service life and reduce O&S cost. Investigated Longbow clutch cold oil leak problem, and initiated testing of various possible solutions to improve readiness and reduce O&S cost. • 446 Navy: To increase support of field data gathering program for UH-60 Blackhawk. • 41 In-House: In-house support for the component improvement program engineers. <p>Total 2756</p>											
Project D106		Page 1 of 7 Pages				Exhibit R-2 (PE 0203752A)					

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE
BUDGET ACTIVITY 7 - Operational System Development		February 1999
PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program		PROJECT D106
<p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1260 T700 Engine: Continue development of repair procedures to allow use of scrapped high-dollar hardware. Continue gathering data from installed field performance monitors. Perform materials analysis of power turbine (PT) disks to develop safe operating life limits. Develop and test engine auto-relight capability for UH-60 to improve flight safety. Develop improved installed engine diagnostic methods to preclude "no fault found" LRU removals and decrease O&S costs. Develop and test new material for Woodward Governor HMU Temperature sensor to increase service life and reduce O&S costs. • 1030 T55 Engine: Complete the development and testing of redesigned tailpipe to improve reliability and readiness and extend service life while reducing performance losses and O&S costs. Begin development of depot/field level repair techniques for high-dollar hardware to reduce O&S costs and improve readiness. Complete testing of the improved bearings which will increase life and reduce O&S costs. Design optimized plumbing system to reduce maintenance costs and weight while improving reliability. • 300 GTCP 36 APU: Complete design of a common dual alloy turbine wheel for use on both Apache and Blackhawk. Initiate design of a common ECU box capable of running the Apache, Apache Longbow, and Blackhawk auxiliary power units (APUs). Teardown and analyze high-time Blackhawk APUs to determine incipient failures/identify need for redesign to extend service life and reduce O&S cost. Perform 200 hour engine test to qualify improved hardware developed in previous CIP efforts. Investigate service revealed difficulties arising during the course of the year to improve readiness. • 2000 FDU: Develop a Fuel Delivery Unit (FDU) for the Subsystem Power Unit (SPU) for the RAH-66 Comanche • 2000 FADEC: Develop a Full Authority Digital Engine Control (FADEC) training device for the New Training Helicopter (NTH) Engine that will permit manual control of the engine. • 100 RTTC: Initiate component and engine test capability at Redstone Arsenal in support of the Aircraft Engine Component Improvement Program. • 30 In-House: In-house support for the component improvement program engineers. • 181 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) programs. <p>Total 6901</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1343 T700 Engine: Complete engine data collection from UH-60 aircraft and analyze data to develop updated mission profiles/parts life limits. Complete materials analysis of PT disks and begin analysis of blisks. Continue development of improved on-wing LRU diagnostic methods. Continue development of new repair procedures for high-dollar hardware. Complete qualification of UH-60 auto-relight capability. • 1200 T55 Engine: Qualify new plumbing system to reduce weight and O&S costs while improving reliability. Continue development of new depot/field level repair procedures to reduce O&S costs and improve readiness. Perform material life analysis for compressor and turbine parts to improve safety. Begin development of improved N2 sensor to reduce O&S costs and improve reliability. • 300 GTCP 36 APU: Initiate demonstration test of APU parts identified as candidates for commonality to reduce O&S cost. Design, fabricate, and qualify a stiffer Apache planetary carrier to preclude vibration-induced planetary bearing failures in order to extend service life and reduce O&S cost. 		
Project D106	Page 2 of 7 Pages	Exhibit R-2 (PE 0203752A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program	PROJECT D106
<p>FY 2000 Planned Program: (continued)</p> <p>Develop new depot repair techniques and extend wear limits as new failure modes and/or wear patterns are discovered in order to reduce O&S cost and enhance mission readiness. Initiate development of an Apache/Longbow inlet particle separator, including concept evaluation, design and fabrication of the selected concept, and preparation of a kit for a demonstrator program; an inlet particle separator will reduce erosion, thereby improving readiness and reducing O&S cost.</p> <ul style="list-style-type: none"> • 57 In-House: In-house support for the component improvement program engineers. <p>Total 2900</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 1382 T700 Engine: Begin development of improved oil sump to reduce coking which will reduce O&S costs while improving readiness. Begin effort to eliminate rare and expensive materials from the engine to reduce O&S costs while improving maintainability. Design improved durability stage 3 power turbine blades to reduce O&S costs and increase engine life. Continue development of new repair procedures to allow refurbishment of high dollar hardware which will reduce O&S costs while improving readiness. Complete materials analysis of blisks and begin analysis of tierod and spacer to improve flight safety. Begin acquisition of engine performance data to derive mission spectrum for Air Force H-60's to improve flight safety. Begin development of improved seal to reduce O&S costs and improve reliability. • 1200 T55 Engine: Begin effort to improve the electrical shielding of the ignition system and overspeed valve to improve flight safety and readiness. Continue development of new repair procedures to reclaim unusable high dollar hardware to reduce O&S costs while improving readiness. • 300 GTCP 36 APU: Continued demonstration test of APU parts identified as candidates for commonality to reduce O&S cost. Continue developing new depot repair techniques and extend wear limits as new failure modes and/or wear patterns are discovered in order to reduce O&S cost and enhance mission readiness. Initiate demonstration testing of a common ECU box capable of running the Apache, Apache Longbow, and Blackhawk auxiliary power units (APUs). Continue development of an Apache/Longbow inlet particle separator, including concept evaluation, design and fabrication of the selected concept, and preparation of a kit for a demonstrator program. Initiate development of a ceramic turbine nozzle which will reduce sand erosion. • 64 In-House: In-house support for the component improvement program engineers. <p>Total 2946</p>		
Project D106	Page 3 of 7 Pages	Exhibit R-2 (PE 0203752A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program	PROJECT D106
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	2849	2948	3026	3098
Appropriated Value	2940	6948		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-91	-47		
b. SBIR / STTR	-70			
c. Omnibus or Other Above Threshold Reductions	-23			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-126	-152
Current Budget Submit (<u>FY 2000 / 2001 PB</u>)	2756	6901	2900	2946

C. Other Program Funding Summary	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
There are no other RDTE or other Appropriation efforts.										

D. Acquisition Strategy: Improved designs will be implemented via Engineering Change Proposal (ECP) and follow-on procurement or modification to a production contract to introduce the improved hardware.

E. Schedule Profile	<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>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
T700 – Perform materials analysis of PT disks, develop and qualify auto-relight capability for Blackhawk, develop improved diagnostic methods for LRU's, design and qualify new WGC HMU Tem sensor material, develop auto-relight capability for UH-60				4Qtr						
T700 – Perform materials analysis of blisks, develop improved diagnostic methods for LRU's, qualify auto-relight capability for UH-60					4Qtr					

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program				PROJECT D106			
E. Schedule Profile	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	
T700 – Design improved oil sump, begin elimination of rate/expensive materials, design improved stage 3 blades, complete materials analysis of blisks, begin gathering Air Force H-60 engine data, develop improved seal						4Qtr					
T55 – Design improved bearings, develop improved tailpipe			4Qtr								
T55 – Complete testing of improved tailpipe, begin development of repair procedures for high cost hardware, complete qualification of improved bearings, develop optimized plumbing system				4Qtr							
T55 – Complete qualification of optimized plumbing system, continue development of repair procedures for high cost hardware, evaluation of new material for PT disks and shaft, design improved N2 sensor system					4Qtr						
T55 - Complete testing of new material for PT disk and shaft						4Qtr					
APU – Evaluated potential for commonality of parts between Blackhawk, Apache, and Air Force APUs, initiated design of an erosion resistant common dual alloy turbine, investigated Longbow clutch cold day oil leak problem			4Qtr								
APU – Initiated testing of various possible clutch oil leak solutions, complete design of a common dual alloy turbine wheel, initiate design of a common ECU box capable of running the Apache, Apache Longbow, and Blackhawk APUs, teardown and analyze high-time Blackhawk APUs to determine incipient failures/identify need for redesign, perform 200 hour engine test to qualify improved hardware developed in previous CIP efforts.				4Qtr							

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program				PROJECT D106			
E. Schedule Profile	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	
APU – Initiate demonstration test of APU parts identified as candidates for commonality; design, fabricate, and qualify a stiffer Apache planetary carrier to preclude vibration-induced planetary bearing failures; develop new depot repair techniques and extend wear limits as new failure modes and/or wear patterns are discovered; initiate development of an Apache/Longbow inlet particle separator, including concept evaluation, design and fabrication of the selected concept, and preparation of a kit for a demonstrator program					4Qtr						
APU – Continue demonstration test of APU parts identified as candidates for commonality to reduce O&S cost, continue development of new depot repair techniques and extend wear limits as new failure modes and/or wear patterns are discovered, initiate demonstration testing of a common ECU box, continue development of an Apache/Longbow inlet particle separator, initiate development of a ceramic turbine nozzle which will reduce sand erosion						4Qtr					

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program						PROJECT D106		
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. T700	SS/CPFF	General Electric Lynn, MA	40623	1079	Jan 99	1343		1382		Cont	44427	44427
b. T55	SS/CPFF	Allied Signal Phoenix, AZ	19217	1030	Jan 99	1200		1200		Cont	22647	22817
c. APUs	MIPR	Kelly AFB, TX	13200	300	Dec 98	300		300		Cont	14100	14100
d. T700/T55/T53/APUs	TBD		0	2000	TBD						2000	2000
e. T700/T55/T53/APUs	TBD		0	2000	TBD						2000	2000
Subtotal Product Development:			73040	6409		2843		2882			85174	
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. T53 Engine	SS/CPFF	Allied Signal Phoenix, AZ	352	0	0	0	0	0	0		352	352
Subtotal Support Costs:			352								352	
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. RTTC	N/A	Redstone Arsenal, AL	0	100	Jan 99	0	0	0	0	0	100	100
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. AMCOM In-house	N/A	Redstone Arsenal, AL	10491	30		57		64		Cont	10642	10662
Subtotal Management Services:			10491	30		57		64			10642	
Project Total Cost:			83883	6901		2900		2946		10342	106630	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D374 Horizontal Battlefield Digitization	91248	46240	28180	26830	26341	25650	27119	27910	Continuing	Continuing

A. Mission Description and Budget Item Justification: Battlefield Digitization is a strategy that allows warfighters, from the individual soldier and platform to echelons above corps, to share critical situational awareness (SA) and command and control information. It applies digital information technologies to acquire, exchange, and employ data throughout the battlespace, providing a clear and accurate common relevant picture of the battlespace for leaders at all levels. This timely sharing of information significantly improves the ability of commanders and leaders to quickly make decisions, synchronize forces and fires, and increase the operational tempo. Digitization is a means of realizing a fully integrated command and control capability to the platoon level, including interoperability links with joint and multinational forces. The major FY00-01 efforts included in the program element are: 1) The horizontal battlefield operating integration office (Army Digitization Office), responsible for the integration and synchronization of the Army's digitization efforts; coordination of digitization efforts between joint and multi-national forces; and synchronization of combat material and training efforts to develop and deploy Army XXI information technologies. 2) System engineering and integration of physical interfaces and logical mechanisms between and across multiple battlefield operating systems to provide improved capability to operate in the common battlefield picture/SA and common operating environment (COE) dimensions. This will provide enhanced synchronization of maneuver, direct/indirect fires, intelligence and targeting, and reduced fratricide. The goal of Horizontal Battlefield Digitization is to integrate modern information technology into the Army of the 21st Century.

FY 1998 Accomplishments:

- 1500 Equipped and trained 1Bn test unit and conducted Limited User Test (LUT).
- 3000 Hardware to support IOTE testing.
- 20926 Continued Brigade and Below Command and Control Software/Hardware developments/upgrades.
- 11700 Continued Force XXI Battle Command, Brigade and Below (FBCB2) system engineering and architecture development, modeling and simulation
- 9900 FBCB2 Integration and Testing; training management.
- 1350 FBCB2 Site operations and Integrated Logistics Support at Fort Hood and Fort Huachuca.
- 6349 FBCB2 Program Management.
- 4848 Continued test, simulation, experimentation and evaluation of prototype hardware and software.
- 3385 System Engineering/Development/Platform Integration.
- 7616 Interoperability: Abrams/Bradley/FBCB2 digital connectivity, and Battlefield Interoperability Program.
- 3432 Completed development of FBCB2 software interface with Abrams and Bradley.
- 5665 Continued rapid acquisition of software enhancements for the Tactical Internet.
- 1885 Analyzed (including modeling/simulation) overall digitized system of systems performance.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374
<p>FY 1998 Accomplishments: (continued)</p> <ul style="list-style-type: none"> • 3279 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout. • 1320 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products. • 5093 Support integration of Tactical Personal Communications Systems for wireless inter and intra-Tactical Operations Centers. <p>Total 91248</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 4915 Data engineering evaluation and analysis testing, experimentation, and interrelated simulation of hardware/software. • 4099 System/Platform Integration of heavy/light forces; synchronization assessments, battlefield digitization impact studies, and system of systems issue resolutions. • 2300 Joint and Coalition interoperability programs for improving digitization including, C4I Coalition Warfare, Command and Control System Interoperability Program (C2SIP) efforts; specific tasks to include: database development, operational system architecture development, and Multilateral Interoperability Program (MIP) Phase I testing and Phase 1 demonstrations. • 1445 Analysis (including modeling/simulation) to predict overall digitized system of systems performance. • 17320 Continue software/hardware integration, prototype development, and initiate testing of FBCB2/Embedded Battle Command on Abrams tanks and Bradley fighting vehicles. • 1850 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout. • 1885 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems. • 6795 Evaluate emerging interfaces to ensure interoperability across all functional areas including: 1) Development of EBC on VxWorks, SSAT for Beta version and ADA bindings solutions for the Aviation communications requirements for full tactical internet (TI) connectivity/mobility and support of integration into each platform; STORM stimulator interoperability; TOC server integration; Aviation integration into the TI, and STAMIS/CSSCS/MTS integration 2) Resolution to the electronic interface security issue and the TI interface 3) Support system integration of interoperability analysis and design and demonstration of capabilities. • 1875 Digital Intelligence Situation Mapboard. • 1875 Digitization research at Foot Hood. • 1881 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 46240</p>		
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374
<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 5450 Data engineering evaluation and analysis testing, experimentation, and interrelated simulation of hardware/software. • 4642 System/Platform Integration of heavy/light forces; synchronization and integration of fielding plans, assessments, and resources; battlefield digitization impact studies, and system of systems issue resolutions. • 3388 Joint and Coalition interoperability programs for improving digitization including C4I Coalition Warfare, Command and Control System Interoperability Program (C2SIP) efforts; specific tasks to include: database development, operational system architecture, and Multilateral Interoperability Program (MIP) Phase I testing and the International Remote Command Post Exercise (CPX). • 1700 Analysis (including modeling/simulation) to predict overall digitized system of systems performance. • 2915 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout. • 3585 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems. • 6500 Evaluate emerging interfaces to ensure interoperability across all functional areas including: improved locating, tracking, and management of transportation assets; support tactical internet and electronic interfaces required for logistic functions; solution development for Aviation communications requirements for full tactical internet connectivity/mobility, and support system integration of interoperability analysis, design, and demonstration of capabilities to minimize platform modifications to achieve maximum benefits of open architecture. <p>Total 28180</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 4800 Data engineering evaluation and analysis testing, experimentation, and interrelated simulation of hardware/software. • 4660 System/Platform Integration of heavy/light forces; synchronization assessments, battlefield digitization impact studies, and system of systems issue resolutions. • 3460 Joint and Coalition interoperability programs for improving digitization including C4I Coalition Warfare, Command and Control Information Interoperability Program (C2SIP) through MIP Phase I demonstrations to the International Digitization CPX. • 1800 Analysis (including modeling/simulation) to predict overall digitized system of systems performance. • 2200 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout. • 4000 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems. • 5910 Evaluate emerging interfaces to ensure interoperability across all functional areas including: improved locating, tracking, and management of transportation assets; support tactical internet and electronic interfaces required for logistic functions; Combat Service Support and Medical Communication for Combat supporting system integration of interoperability analysis, design, and demonstration of capabilities to minimize platform modifications to achieve maximum benefits of open architecture. <p>Total 26830</p>		
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u>)	94103	45007	29445	28248
Appropriated Value	71560	47007		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-2457	-767		
b. SBIR / STTR	-1733			
c. Omnibus or Other Above Threshold Reduction	+24428			
d. Below Threshold Reprogramming	-550			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			-1265	-1418
Current Budget Submit (<u>FY 2000/2001</u> ,PB)	91248	46240	28180	26830

Change Summary Explanation:

FY 1998 - Congressional reprogramming for Digitization – (\$16.2M FBCB2 Software development and hardware to support IOTE testing, and \$8.8M for Systems Integration.)

FY 1999 - Congressional \$2M plus-up for digitization research at Fort Hood.

C. Other Program Funding Summary: Not applicable

D. Acquisition Strategy: To validate/demonstrate concepts and requirements, near term efforts were focused on developing a seamless battlefield software architecture and digitized appliqué hardware systems supporting experimentation to include: evaluation of the horizontal battlefield digitization resources of systems, acquisition, integration, and testing of digital capability across multiple command and control, communications, sensor and weapons platforms. The result will be an integrated digital capability designed to meet the near-term requirements of the First Digitized Division by end of FY00 and First Digitized Corps by the end of FY04. Also, it supports the Army's role in joint and multi-national digitization programs; coordinates/manages security, vulnerability and "Red Teaming" functions; and manages Manpower and Personnel Integration (MANPRINT), modeling and simulations, and analysis.
(Starting in FY99, FBCB2 was transferred to a new program element 0203759A entitled, "Force XXI Battle Command, Brigade and Below.")

E. Schedule Profile	<u>FY 1998</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>
Army Tactical Cmd & Ctrl Info Sys (ATCCIS)		1Q,4Q						
National Tests								
ATCCIS International Test		1Q,4Q						
ATCCIS Evaluation Cycles		2Q,3Q	1Q					

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development			PE NUMBER AND TITLE 0203758A Digitization				PROJECT D374	
E. Schedule Profile	<u>FY 1998</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>
US/UK Lab Interop Demo		4Q						
Develop ATCCIS International Stds	4Q		2Q					
Develop International C2 Op Arch.	4Q							
- MIP Phase I Testing		2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q		
- MIP Phase I Demos			1Q, 2Q	1Q,2Q				
Develop International (ABCS) Gateway (QIP)		1Q						
Tactical Personal Communications	3Q	4Q						
Corps Warfighter Exercises	4Q	1Q	2Q		2Q, 3Q	2Q, 3Q	2Q, 3Q	2Q, 3Q
- Operational Readiness Eval.		2Q,3Q,4Q						
Limited User Test (LUT)	4Q							
Integrate FBCB2 in Abrams tanks and Bradley fighting vehicles	4Q	4Q						
- FDD Hardware Contract Award		3Q						
- Equipping First Digitized Division			4Q					
- Force Development Test & Evaluation		4Q						
- Initial Operation Test & Evaluation			1Q					
- Initial Operation Capability				2Q				
- EBC Follow-on Tests			2Q					
Evaluate electronic interface to tactical internet and to C2 systems	4Q	4Q	4Q					
Conduct analysis to support system design, experimentation, and implementation			2Q,3Q	1Q,2Q				
Light Force Digitization					1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	
First Digitized Corps			1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203758A Digitization						PROJECT D374		
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. System Integration	MIPR/PWD	Various	47230	10530	Various	13000	Various	12110	Various		82870	
b. International Digitization	Various	Various	12800	2300	Various	3388	Various	3460	Various		21948	
c. Technical Analysis	MIPR/PWD	MITRE Pentagon, McLean, VA	4400	1100	Oct 98	1100	Oct 99	1800	Oct 00		8400	
d. Tank/Brad	CPFF	GDLS Warren, MI / UDLP San Jose, CA	73720	17320	1Q	N/A					91040	
e. Other Govt. Agencies	MIPR/PWD	Various	22832	9699		5920		4988			43439	
Subtotal Product Development:			160982	40949		23408		22358			247697	
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
f. ADO Office Support (salaries and travel)	N/A	Pentagon	6504	1626		1623		1623			11376	
g. Digitization Plans, Internet, & graphic design support	MIPR/PWD	Signal Corp Pentagon Arlington, VA	4200	1200	Oct 98	1000	Oct 99	1000	Oct 00		7400	
h. Info Ops, System Eng., Integ & Ops Support	MIPR/PWD	Quantum Pentagon, Ft. Monroe, VA, and Ft. Hood, TX	5295	1395	Oct 98	1300	Oct 99	1300	Oct 00		9290	
i. Various	MIPR	Pentagon	720	180	Oct 98	207	Oct 99	207	Oct 00		1314	
Subtotal Product Development:			16719	4401		4130		4130			29380	
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. Other Govt. Agencies	MIPR/PWD	Various	3560	890	Oct 98	642	Oct 99	342	Oct 00		5434	
Subtotal Test and Evaluation:			3560	890		642		342			5434	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203758A Digitization					PROJECT D374		
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.												
Subtotal Management Services:												
Project Total Cost:			181261	46240		28180		26830			282511	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203759A Force XXI Battle Command, Brigade & Below (FBCB2)	PROJECT D120
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COST <i>(In Thousands)</i>	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
D120 Force XXI Battle Command, Brigade & Below (FBCB2)	0	52121	44225	28876	19175	19111	9825	0	0	173333

A. Mission Description and Budget Item Justification: The initial FBCB2 effort was developed under Program Element 0203758A, Project D374 as part of the Army's digitization initiative and was transferred to this Program Element for central management by the Program Executive Officer for Command, Control and Communications (PEO C3S)/PM FBCB2 beginning in FY 1999. The mission of FBCB2 is to field a Digital Battle Command information system that provides mounted tactical combat, combat support, and combat service support commanders, leaders and soldiers integrated, on-the-move, real-time/near real-time, battle command and information and situation awareness from brigade down to the soldier/platform level across all Battlefield Functional Areas (BFAs). FBCB2 is located in the mounted and dismounted maneuver (divisional, separate, heavy and light) calvary/reconnaissance and armored cavalry, mechanized infantry and aviation units; FBCB2 integrates Army Tactical Command and Control Systems (ATCCS) located within the brigade and battalion. Battlefield digitization allows the Army's primary weapons and battle command systems seamless battlefield architecture and digitized applique systems (computer with graphics display, global positioning system, communications link, and command and control software) required to field the first digitized division by FY 2000 and first digitized corps by FY 2004.

FY 1998 Accomplishments: Program funded in Program Element 0203758A Project D374.

FY 1999 Planned Program:

- 18834 Brigade and Below Command and Control software/hardware development/upgrades
 - 12866 Integration, Testing (FT2 & IOT&E) and Training
 - 9865 Systems Engineering and Architecture, Modeling and Simulation
 - 1276 ILS Management and Site Operations
 - 2900 Procure remaining Hardware for IOT&E (116 packages)
 - 5000 PM FBCB2 Program Management
 - 1380 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 52121

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 1999							
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203759A Force XXI Battle Command, Brigade & Below (FBCB2)				PROJECT D120						
FY 2000 Planned Program:														
•	23039	Brigade and Below Command and Control software/hardware development/upgrades												
•	5862	Integration, Testing and Training												
•	10165	Systems Engineering and Architecture, Modeling and Simulation												
•	3159	ILS Management and Site Operations												
•	2000	PM FBCB2 Program Management												
Total	44225													
FY 2001 Planned Program:														
•	14422	Brigade and Below Command and Control new software capabilities												
•	2982	Integration, Testing and Training												
•	9462	Systems Engineering and Architecture												
•	1103	ILS Management and Site Operations												
•	907	PM FBCB2 Program Management												
Total	28876													
B. Program Change Summary					<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>						
Previous President's Budget (FY 1999 PB)					0	52469	47000	30000						
Appropriated Value						52469								
Adjustments to Appropriated Value														
a.	Congressional General Reductions					-348								
b.	SBIR / STTR													
c.	Omnibus or Other Above Threshold Reductions													
d.	Below Threshold Reprogramming													
e.	Rescissions													
Adjustments to Budget Years Since FY 1999 PB							-2775	-1124						
Current Budget Submit (FY 2000 / 2001 PB)					0	52121	44225	28876						
C. Other Program Funding Summary					<u>FY 1998</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	Total
													Compl	Cost
Other Procurement Army Activity 2 SSN W61900					0	0	66423	62140	81832	110418	157273	168352	Cont.	Cont.
OMA, PE 423829							400	1000	2400	5600	5600	5600	Cont.	Cont.
Project D120					Page 2 of 5 Pages			Exhibit R-2 (PE 0203759A)						

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203759A Force XXI Battle Command, Brigade & Below (FBCB2)	PROJECT D120
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D. Acquisition Strategy: The primary goal of the FBCB2 acquisition is to minimize the time, cost, and technology risks of satisfying requirements while providing a capability that is fully integrated with the overall Division's warfighting capabilities. The technical approach involves the incorporation of digital communications, situation awareness and digital message traffic capabilities in a variety of embedded and non-embedded platforms. These platforms are then connected through communications infrastructure provided by the Tactical Internet. Interoperability is provided through the use of graphics, images common messages and data elements. The interfaces between FBCB2 and ATCCS systems will provide users at all levels a common picture of their battlespace. The Program Executive Office for Command, Control and Communications (PEO C3S) is responsible for executing the FBCB2, ATCCS, communications infrastructure, and weapon platforms.

E. Schedule Profile	<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>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Version 3.0 FBCB2 Software Delivery				2Q						
Version 3.1 FBCB2 Software Delivery				3Q						
Force Development Test & Evaluation				4Q						
Initial Operational Test & Evaluation (IOT&E)					1Q					
Milestone III Decision					2Q					
Production Contract Award					2Q					
Version 4.0 FBCB2 Software Delivery					3Q					
First Digitized Division (FDD)					4Q					
Version 4.2 FBCB2 Software Delivery						2Q				
Initial Operational Capability (IOC)						2Q				
Version 4.4 FBCB2 Software Delivery							3Q			
Field First Cavalry - Complete							4Q			
Field First Digitized CORPS – Start - Complete							Start 1Q		End 4Q	
Army Pre-position Stock – Start - Complete									Start 1Q	End 4Q
Field 3 rd Infantry Division – Start- Complete									Start 1Q	End 4Q
Field 101 st Air Mobile – Start - Complete									Start 1Q	End 4Q

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ARMY RDT&E COST ANALYSIS (R-3)

DATE **February 1999**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0203759A Force XXI Battle Command, Brigade & Below (FBCB2)

PROJECT
D120

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. Software Development	CPIF	TRW, LA, CA		37841	Jun 99	42225	Jun 00	17953	Jun 01	0	98019	169800
b. Hardware Development	FFP	TRW, LA, CA		2900	Jun 99	0	N/A	0	N/A	0	2900	5900
c. Software Upgrade	CFIF	TRW, LA, CA	0	0	N/A	0	N/A	10016	N/A	Cont.	10016	Cont.
Subtotal Product Development:				40741		42225		27969			110935	Cont.

Remark: Previously funded under Program Element 0203758A, Project D374 funding line of the Army Digitization Office (ADO).

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. PM Office Support	N/A	CECOM, Ft. Monmouth, NJ		2605	Oct 98	1000	Oct 99	450	Oct 00	Cont.	4055	Cont.
b. Matrix Support	MIPR	CECOM, Ft. Monmouth, NJ		887	Oct 98	350	Oct 99	170	Oct 00	Cont.	1407	Cont.
c. Misc. Contracts Support	MIPR/PWD	CECOM, Ft. Monmouth, NJ		1508	Oct 98	650	Oct 99	287	Oct 00	Cont.	2445	Cont.
Subtotal Support Costs:				5000		2000		907			7907	Cont.

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. Other Gov't Agency	MIPR	Various		5000							5000	
b. DTE*		Ft. Hood, TX										
c. IOTE*		Ft. Hood, TX										
Subtotal Test and Evaluation:				5000							5000	

Remark: *These efforts are funded by OPTEC.

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203759A Force XXI Battle Command, Brigade & Below (FBCB2)	PROJECT D120
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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. SBIR/STTR	N/A			1380							1380	
Subtotal Management Services:				1380							1380	

Project Total Cost:				52121		44225		28876			125222	Cont.
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Remark: *Previously funded under Program Element 0203758A, Project D374.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)				PROJECT D394			
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D394	Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)	8686	26942	55921	66058	94549	94322	96254	98219	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: Force XXI Initiatives (Warfighting Rapid Acquisition Program) continues as one of the Army's successful Acquisition Reform initiatives. The overall intent of the Force XXI Initiatives is to put proven technologies in the hands of the soldiers sooner while gaining significant time and dollar savings. Candidates considered for funding through this program are compelling, mature technologies capable of achieving a milestone III decision immediately or following one to two years of continued development. Initiatives can originate from virtually anywhere. "Good ideas" continue to emerge from such sources as the Training and Doctrine Command (TRADOC) Centers, Schools and Battle Labs, the user community, the Army Materiel Command (AMC), Research Development & Engineering Centers (RDECs), the Project Manager/Program Executive Officer (PM/PEO) community, industry, Academia, Horizontal Technology Integration (HTI), General Officer Steering Committees (GOSCs), and the Federally Funded Research and Development Centers (FFRDCs). In FY 1999, the primary sources for WRAP Initiatives will be the Battle Lab Warfighting Experiments (BLWEs), Advanced Concepts and Technology (ACT II) and the Advanced Concept Technology Demonstrations (ACTDs). The Force XXI Initiative (WRAP) program is the bridge linking Army's compelling successes in experimentation to systems acquisition.</p> <p>This program element was established to serve as a holding account for all funding appropriated by Congress to support the Force XXI Initiatives program, consistent with Congressional language reflected in the Department of Defense Appropriations Bill. As experienced with prior year WRAP funding, which required a number of internal realignments of funds for WRAP initiatives associated with on-going programs, future WRAP funding will require reprogramming of funds from this line to other program elements or other appropriations, as deemed appropriate under current congressional or legal constraints.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 870 Air and Missile Defense Planning and Control System (AMDPCS) • 750 Analysis & Control Team – Enclave • 2500 Grenadier Brat • 2150 High Speed Multiplexer • 870 Digital Topographical Support System – Light (DTSS-L) • 1546 Near Term Digital Radio <p>Total 8686</p>											
Project D394				Page 1 of 4 Pages				Exhibit R-2 (PE 0203761A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999																																																							
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)	PROJECT D394																																																							
<p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 26029 FY 99 Force XXI Initiative candidates • 913 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 26942</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 55921 FY 00 Force XXI Initiative candidates <p>Total 55921</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 66058 FY 2001 Force XXI Initiatives candidates <p>Total 66058</p>																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">B. Program Change Summary</th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget (FY 1999 PB)</td> <td style="text-align: center;">43126</td> <td style="text-align: center;">99528</td> <td style="text-align: center;">99421</td> <td style="text-align: center;">99345</td> </tr> <tr> <td>Appropriated Value</td> <td style="text-align: center;">44500</td> <td style="text-align: center;">27168</td> <td></td> <td></td> </tr> <tr> <td>Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>a. Congressional General Reductions</td> <td style="text-align: center;">-1374</td> <td style="text-align: center;">-226</td> <td></td> <td></td> </tr> <tr> <td>b. SBIR / STTR</td> <td style="text-align: center;">-1080</td> <td></td> <td></td> <td></td> </tr> <tr> <td>c. Omnibus or Other Above Threshold Reductions</td> <td style="text-align: center;">-28114</td> <td></td> <td></td> <td></td> </tr> <tr> <td>d. DoD Internal Reprogramming</td> <td style="text-align: center;">-5246</td> <td></td> <td></td> <td></td> </tr> <tr> <td>e. Rescissions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Adjustments to Budget Years Since FY 1999 PB</td> <td></td> <td></td> <td style="text-align: center;">-43500</td> <td style="text-align: center;">-33287</td> </tr> <tr> <td>Current Budget Submit (FY 2000 / 2001 PB)</td> <td style="text-align: center;">8686</td> <td style="text-align: center;">26942</td> <td style="text-align: center;">55921</td> <td style="text-align: center;">66058</td> </tr> </tbody> </table>			B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Previous President's Budget (FY 1999 PB)	43126	99528	99421	99345	Appropriated Value	44500	27168			Adjustments to Appropriated Value					a. Congressional General Reductions	-1374	-226			b. SBIR / STTR	-1080				c. Omnibus or Other Above Threshold Reductions	-28114				d. DoD Internal Reprogramming	-5246				e. Rescissions					Adjustments to Budget Years Since FY 1999 PB			-43500	-33287	Current Budget Submit (FY 2000 / 2001 PB)	8686	26942	55921	66058
B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>																																																					
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Adjustments to Budget Years Since FY 1999 PB			-43500	-33287																																																					
Current Budget Submit (FY 2000 / 2001 PB)	8686	26942	55921	66058																																																					
<p>Change Summary Explanation: Funding - FY 1998: Internal Reprogramming to PE/project 0203762A/D008, Striker (-3654) and 0203763A/D007, Radio Frequency Tags (-1592) for program execution. FY 1999 funds to be realigned to existing PE/projects upon Congressional approval of FY 1999 new candidate systems. FY 2000/2001: Funds realigned to higher priority requirements.</p>																																																									
Project D394	Page 2 of 4 Pages	Exhibit R-2 (PE 0203761A)																																																							

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)	PROJECT D394
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C. Other Program Funding Summary	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
Army Airborne Command & Control System (A2C2s)- PE 0604201.DC97	10298								0	10298
Mortar Fire Control System (MFCS)- PE 0604802.D613	9692								0	9692
Light Weight Laser Designator Range Finder (LLDR)-PE 0604710.L70	2627								0	2627
Applique – PE 0203758.374	2432								0	2432
Tactical Internet - PE 0203758.374	5665								0	5665
Combat Synthetic Training Assessment Range (CSTAR)-PE 0604715.241	5045								0	5045
Palletized Load System-Enhanced (PLSE) Other Procurement, A	3000								0	3000
Striker – PE 0203762.008	3779								0	3779
Radio Frequency Tags (RF Tags) – PE 0203763.007	1647								0	1647
Radio Frequency Tags (RF Tags) Other Procurement, A	1200								0	1200
Gun Laying Positioning System (GLPS) Other Procurement, A	5316								0	5316
Avenger Slew to Cue – Missile Procurement, A	7200								0	7200

D. Acquisition Strategy: This program element serves as a holding account for Force XXI Initiatives selected by the Army, consistent with the Warfighting Rapid Acquisition Program process and the selection criteria established by Congress in the FY 1997 Department of Defense Appropriations Bill, and approved by Congress each fiscal year.

E. Schedule Profile: Not applicable

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)	PROJECT D394
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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. Various						10700					10700	
b. Force XXI Initiatives candidates				26942		45221		66058			138221	
Subtotal Product Development:				26942		55921		66058			148921	

II. Support Costs: Not applicable

III. Test and Evaluation: Not applicable

IV. Management Services: Not applicable

Project Total Cost:				26942		55921		66058			148921	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203762A Striker (Warfighting Rapid Acquisition Program)				PROJECT D008	
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D008 Striker - Force XXI Initiatives (WRAP)	3654	0	0	0	0	0	0	0	0	9500
<p>A. <u>Mission Description and Budget Item Justification:</u> The Striker support vehicle integrates the same modern Bradley Fire Support Vehicle (BFIST) Mission Equipment Package into a High Mobility Multi-purpose Wheeled Vehicle (HMMWV) chassis. Specifically, the program provides the Combat Observation Lasing Teams (COLT), both heavy and light, with unprecedented mobility, flexibility, stealth and a highly automated targeting/C3 package.</p> <p>FY 1998 Planned Program:</p> <ul style="list-style-type: none"> • 3654 Continue Engineering, Manufacturing Development under contract with Systems Electronics Inc. (SEI) <p>Total 3654</p> <p>FY 1999 Planned Program: Project not funded in FY 1999</p> <p>FY 2000 Planned Program: Project not funded in FY 2000</p> <p>FY 2001 Planned Program: Project not funded in FY 2001</p>										
B. Program Change Summary										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>						
Previous President's Budget (FY 1999 PB)	0	0	0	0						
Appropriated Value	0									
Adjustments to Appropriated Value										
a. Congressional General Reductions	0									
b. SBIR / STTR	0									
c. Omnibus or Other Above Threshold Reductions	0									
d. Below Threshold Reprogramming	+3654									
e. Rescissions										
Adjustments to Budget Years Since FY 1999 PB										
Current Budget Submit (FY 2000 / 2001 PB)	3654	0	0	0						
Change Summary Explanation: FY 1998: Funds reprogrammed from PE 0203761A/D399										
Project D008			Page 1 of 3 Pages				Exhibit R-2 (PE 0203762A)			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203762A Striker (Warfighting Rapid Acquisition Program)	February 1999
C. <u>Other Program Funding Summary</u> Not applicable		
D. <u>Acquisition Strategy</u> : Use of existing contract for Engineering and Manufacturing Development (EMD)		
E. <u>Schedule Profile</u> : Not applicable		
Project D008	Page 2 of 3 Pages	Exhibit R-2 (PE 0203762A)

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203762A Striker (Warfighting Rapid Acquisition Program)					PROJECT D008		
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. Systems Electronics Inc. (SEI)	CPAF		1000								1000	
b. SEI	CPAF		1454								1454	
Subtotal Product Development:			2454								2454	
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. TACOM			1200								1200	
Subtotal Support Costs:			1200								1200	
III. Test and Evaluation: Not applicable												
IV. Management Services: Not applicable												
Project Total Cost:			3654								3654	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203763A Radio Frequency Technology (RF Tags)	PROJECT D007
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D007 Radio Frequency Tags (RF Tags)(Force XXI Initiative)	1592	0	0	0	0	0	0	0	0	3400

A. Mission Description and Budget Item Justification: . Radio Frequency Technology (RF Tags)/Interrogators provide total asset visibility/in-transit capability to units and managers. RF Tags are fixed to containers to provide the ability to track materiel through the distribution system. RF Tags have embedded data of container contents, shipment data and vehicle identification. Interrogators provide passive tracking of RF Tags.

FY 1998 Planned Program:

- 1592 Integrated RF Tags technology into Global Combat Support System Army (GCSS-Army) for supply and ammunition for the passing of information through maintenance and management modules.
- Total 1592

FY 1999 Planned Program: Project not funded in FY 1999

FY 2000 Planned Program: Project not funded in FY 2000

FY 2001 Planned Program: Project not funded in FY 2001

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	0	0	0	0
Appropriated Value	0			
Adjustments to Appropriated Value				
a. Congressional General Reductions	0			
b. SBIR / STTR	0			
c. Omnibus or Other Above Threshold Reductions	0			
d. Below Threshold Reprogramming	+1592			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB				
Current Budget Submit (FY 2000 / 2001 PB)	1592	0	0	0

Change Summary Explanation: FY 1998: Funds reprogrammed from PE 0203761A/D414

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203763A Radio Frequency Technology (RF Tags)	PROJECT D007
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C. <u>Other Program Funding Summary</u>	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
Radio Frequency Data Tags (Other Proc, A)- to procure RF hardware to support R&D technology in the GCSS-Army module.	1172								0	1172

D. Acquisition Strategy: Fielding of RF Tags to First Digital Division in FY 2000.

E. Schedule Profile: Not applicable

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203763A Radio Frequency Technology (RF Tags)	PROJECT D007
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I. Product Development: Not applicable

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. In-House			1592								1592	
Subtotal Support Costs:			1592								1592	

III. Test and Evaluation: Not applicable

IV. Management Services: Not applicable

Project Total Cost:			1592	0		0		0		0	1592	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program
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COST (<i>In Thousands</i>)	FY1998 Actual	FY 1999 Estimate	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	29471	15151	29985	28649	46730	61904	66162	53535	Continuing	Continuing
D036 Patriot Product Improvement Program	21017	9224	7761	6741	4550	4778	9040	8044	Continuing	Continuing
D038 Avenger Product Improvement Program	0	0	0	0	2016	0	4225	15000	Continuing	Continuing
D303 Stinger RMP Product Improvement Program	8454	5927	22224	21908	40164	57126	50932	21662	Continuing	Continuing
D633 THAAD P3I	0	0	0	0	0	0	1965	8829	Continuing	Continuing

A. Mission Description and Budget Item Justification: The goal of the Air Defense Artillery (ADA) modernization is to provide the most capable systems to well-trained soldiers at the right time to defeat the evolving threat. The ADA systems under this Program Element achieve the AMD force which will assist the Army and the joint force in gaining Full Spectrum Dominance in any operational requirement, from smaller-scale contingency operations to major theater wars (MTW). ADA must continually be upgraded and modernized to meet these challenges. The FY00-FY01 budget funds critical improvements to Patriot and Stinger.

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	30443	11252	32105	31034
Appropriated Value	31412	15252		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-969	-101		
b. SBIR / STTR	-731			
c. Omnibus or Other Above Threshold Reductions	-241			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-2120	-2385
Current Budget Submit (<u>FY 2000/2001 PB</u>)	29471	15151	29985	28649

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program				PROJECT D036		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D036 Patriot Product Improvement Program	21017	9224	7761	6741	4550	4778	9040	8044	Continuing	Continuing
<p>A. <u>Mission Description and Justification</u> D036 - Patriot Product Improvement Program: The Patriot system is being upgraded through a series of individual materiel changes (MC) culminating in the attainment of the Patriot Advanced Capability - 3 (PAC-3) system. The communication upgrades improve Patriot's above and below battalion communication equipment. These changes eliminate Patriot peculiar communications equipment and improve Patriot's interoperability between systems and between the Services. FY00 will be the first year for the Remote Launch Communication Enhancement Upgrade (RLCEU) Link 16 Phase 1 and Post Deployment Build 5 (PDB5). RLCEU Link 16 will develop and test the hardware required for a Link-16 terminal, terminal control and communications processing equipment required to receive and process the Link 16 Joint Data Net information. PDB 5 will improve system capability against advanced threats (Theatre Ballistic Missiles and Air-Breathing Threats (TBMs and ABTs) in all environments to include clutter and/or intense Electronic Counter Measures (ECM). Program objective will be to define the software changes necessary to enhance system capabilities against advanced TBM threat and advanced cruise missile threats. In addition, interoperability improvements [e.g., Cooperative Engagement Capability (CEC) interface, cueing, and Tactical Data Information Link (TADIL-J) direct to Fire Unit (FU)], PAC-3 missile integration improvements in ground software Classification Discrimination & Identification (CDI3) enhancements, and on-line diagnostic evolution will be addressed.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 5571 P3I test program • 6198 Communication upgrade • 9248 Anti-Cruise Missile Upgrade <p>Total 21017</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 5612 P3I test program • 600 Responsive threat analysis • 2768 Horizontal Battlefield Digitization • 244 Small Business Innovative Research/Small Business Technology Transfer Programs <p>Total 9224</p>										
Project D036			Page 2 of 10 Pages				Exhibit R-2A (PE 0203801A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program				PROJECT D036		
<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2452 RLCEU Link 16 Phase I • 5309 PDB 5 <p>Total 7761</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 2452 RLCEU Link 16 Phase I • 4289 Post PDB 5 <p>Total 6741</p>										
B. Other Program Funding Summary										
Missile Procurement, Army	<u>FY 1998</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 Complete</u>	<u>Total Cost</u>
Budget Activity 3 - Patriot Mod (C50700)	7732	14275	30840	22884	23754	22855	37651	68834	Cont	Cont
Budget Activity 3 – Patriot Mod Initial Spares	2713	4920	3657	2667	735	1468	3969	5307	Cont	Cont
<p>C. Acquisition Strategy: The design objective of the Patriot system was to provide a baseline system capable of being modified to cope with the evolving threat. This alternative minimizes technological risks and provides a means of enhancing system capability through planned upgrades of deployed systems. The Patriot program consists of two interrelated acquisition programs - The Patriot growth program and the PAC-3 missile program. Growth program modifications are grouped into configurations which are scheduled to be fielded in the same time frame. Configuration groupings are a convenience for managing block changes of hardware and software and are not a performance-related grouping. However, incremental increases in performance will be determined for each configuration in order to provide benchmarks for configuration testing and for the development of user doctrine and tactics.</p>										
D. Schedule Profile										
	<u>FY 1998</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>FY 2006</u>	<u>FY 2007</u>
Configuration 3 Contractor Development Test & Evaluation		2Q								
Configuration 3 Initial Operational Test & Evaluation		1Q								
PDB-5 Software Improvements Initiated			1Q							
PBD-5 Software Improvements Continuation				1-4Q						
RLCEU Link 16 Phase I Program Initiated				1Q						
RLCEU Link 16 Phase I Program Continuation				1-4Q						
PAC-3 FUE			3Q							
Project D036		Page 3 of 10 Pages				Exhibit R-2A (PE 0203801A)				

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program	PROJECT D036
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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.	DAAH0182CA181	Raytheon/MA	3722							Cont	Cont	
b.	DAAH0187CA025	Raytheon/MA	22455							Cont	Cont	
c.	DAAH0189C0458	Raytheon/MA	23228							Cont	Cont	
d.	DAAH0192C0036	Raytheon/MA	5000							Cont	Cont	
Small Contracts			1168							Cont	Cont	
e.	DAAH0187CA006	General Electric/FL	4824							Cont	Cont	
f.	DAAH0189C0167	Brunswick/	3100							Cont	Cont	
Martin Marietta												
g.	DAAH0192C0301	SS/CPFF Lockheed-Martin/AL	4314							Cont	Cont	
h.	DAAH0191C0602	SS/CPIF Raytheon/MA	23077							Cont	Cont	
i.	DAAH0192C0006	SS/CPAF Raytheon/MA	56460							Cont	Cont	
j.	DAAH0195C0043	SS/CPAF Raytheon/MA	16113	400	Dec 98					Cont	Cont	
k.	DAAH0196C0406	Lockheed Martin/AL	200							Cont	Cont	
l.	DAAH0196C0062	Raytheon/MA	62937							Cont	Cont	
m.	DAAH0196C0018	Raytheon/MA	5046							Cont	Cont	
n.	RLCEU Link 16 Phase I					1226	Dec 99	1226	Dec 00	Cont	Cont	
o.	Horiz Btlfld Digit			2768	Feb 99					Cont	Cont	
p.	Post PBD 5					2060	Feb 00	1654	Feb 01	Cont	Cont	
q.	RAM Improvements											
Subtotal Product Development:			231644	3168		3286		2880		Cont	Cont	

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.	DAAH0187CA008	CAS, Inc/AL	2270								Cont	
b.	DAAH0190C0487	CAS, Inc/AL	6266								Cont	
c.	DAAH0194C0105	C/CPAF CAS, Inc/AL	6135								Cont	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program					PROJECT D036		
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
d. DAAH0197C0324		CAS,Inc/AL	2737	791	Mar 99						Cont	
e. In-House Support		RSA/AL	11920	1131	Mar 99	1000	Mar 00	900	Mar 01		Cont	
f. Matrix Support		RSA/AL	1250	950	Feb 99	800	Feb 00	700	Feb 01		Cont	
Subtotal Support Costs:			30578	2872		1800		1600			Cont	
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. Missile Command	1095	RSA/AL	11428	250	Mar 99	2062	Mar 00	1661	Mar 01	Cont	15401	
b. White Sands Missile Range	MIPR	WSMR/NM	11725	1694	Jan 99	613	Jan 00	600	Jan 01	Cont	14632	
c. Other Govt Agent	MIPR		9063	1240	Feb 99					Cont	10303	
d. RDEC and Other Govt Agent	1095/MIPR	RSA/AL	95377							Cont	95377	
Subtotal Test and Evaluation:			127593	3184		2675		2261			135713	
Project Total Cost:			389815	9224		7761		6741		Cont	Cont	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program				PROJECT D303		
<i>COST (In Thousands)</i>	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
D303 Stinger RMP Product Improvement Program	8454	5927	22224	21908	40164	57126	50932	21662	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> This project provides a product evolution of the Stinger-RMP to improve countermeasures capability via externally loaded software, which is downloaded from a reprogrammable module. This concept allows for timely upgrades to correct system deficiencies, rapid reaction to new threats or threat countermeasures, development of specialty software programs where full capability may not be desired, and accommodation of new missions. The Block I upgrade project, which adds a roll sensor and enhanced software, extends the missile service life, solves the recognized system performance deficiencies in countermeasures and other engagement conditions, and increases terminal accuracy. The Block II program is a development of an advanced infrared (IR) Focal Plane Array Seeker which improves the performance of the missile against an expanded target and in background clutter. The program develops the improved missile for adaptation to any or all of the Stinger firing platforms, extends the missile service life and establishes a government post deployment software support posture. The Block II engineering, manufacturing and development (EMD) program provides for development to a performance specification, design qualification of guidance section conducted as part of the production qualification, and platform integration. Funds also developed MIL-STD 1760 launcher electronics to be fielded with the Apache Longbow Helicopter air-to-air requirements, based on Joint Service (U.S. Air Force and U.S. Army) doctrine. The air-to-air requirement satisfies three tasks: self-protection, protect force, and augmentation of air defense forces.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2865 Finalized Block II Packaging; Fabricate and Assemble Three Tactical size Guidance Sections • 1464 Integrated Guidance Assembly with Control Section • 1516 Block II Airframe Dynamic Analysis, Tests, Performance Prediction • 759 Continued Telemetry Unit Design • 200 Conducted Target Acquisition Sensor Study • 1650 Completed VSHORADS/SHORADS Feasibility Study and Forward NATO Staff Requirement <p>Total 8454</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1400 Build and Evaluate Block II Guidance Sections • 1773 Hardware-in-the-Loop Flight Simulation Development, Missile Airframe and Missile Simulation Analyses • 300 Continue Telemetry Development • 500 Rate Sensor Evaluation 										
Project D303			<i>Page 6 of 10 Pages</i>				Exhibit R-2A (PE 0203801A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program	PROJECT D303
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- 1800 Performance Prediction; Weapon System Integration; Preparation for Entry into EMD
- FY 1999 Planned Program: (continued)**
- 154 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 5927
- FY 2000 Planned Program:**
- 1250 Conduct System Trade Studies and Initiate System/Subsystem Performance Specifications
 - 15390 Initiate Preliminary Design of Guidance Section Upgrade (hardware and software)
 - 4318 Initiate Preliminary Design of System Interfaces, Launch System Modifications and Support Equipment
 - 1266 Initiate Guidance Section Production Pilot Line Definition
- Total 22224
- FY 2001 Planned Program:**
- 13251 Complete Detailed Design of Guidance Section (hardware and software)
 - 4385 Complete Detailed Design of System Interfaces, Launch System Modifications and Support Equipment
 - 2399 Continue Production Pilot Line Development and Initiate Prototype Manufacturing Activities
 - 1873 Initiate System Test and Evaluation Planning
- Total 21908

B. Other Program Funding Summary	<u>FY 1998</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>
Missile Procurement, Army										
Budget Activity 3 – Stinger Mods (C21300)	17283	13495	17712	22421	28365	26869	28192	17210	0	238593
Budget Activity 3 – Stinger Mods (C21400)							14000	68300	Cont'd	Cont'd
Budget Activity 3 – Bradley LB Mods (C21500)	3701								0	5201

C. Acquisition Strategy: The Block I development program is a Sole Source/Cost Plus Incentive Fee contract awarded in 1992. The Block II development began FY 1993 as a Technology Base Broad Agency announcement with a SS/CPFF contract. Current SS/CPFF contract awarded 1996 for pre-Engineering, Manufacturing and Development (EMD). The sole source EMD contract is planned in 1QFY 2000, currently funded through FY 2005. A SS/CPFF contract was awarded mid-FY 1997 for the MIL-STD Launcher electronics development. The VSHORADS/SHORADS Competitive/Firm Fixed Price contract was awarded to two international consortia; the United Kingdom was designated as the Pilot Nation, serving as contracting authority.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development		PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program
		PROJECT D303

D. Schedule Profile	<u>FY 1998</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>
PDRR Contract Award 2Q FY 1996								
Complete Guidance Section Integration Design	4Q							
Milestone II		3Q						
EMD Contract Award			1Q					
Performance Design Review				1Q				
Critical Design Review					1Q			
Engineering Development Tests Start						1Q		
Low Rate Initial Production Long Lead Item							1Q	
PQT-C/G Start							3Q	
PVT Start								4Q

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program	PROJECT D303
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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. DAAH0192C0213	SS-CPIF	Hughes, Tucson, AZ	20838							0	20838	
b. DAAH0193CR127	SS-CPFF	Hughes, Tucson, AZ	4629							0	4629	
c. DAAH0195C0028	SS-CPFF	Hughes, Tucson, AZ	1965							0	1965	
d. DAAH0196C0180	SS-CPFF	Hughes, Tucson, AZ	16837	1491	2Q					0	18328	
e. DAAH0197C0084	SS-CPFF	Raytheon(Hughes), Tucson, AZ	1000							0	1000	
f. DAAH0197C0099	SS-CPFF	Raytheon(Hughes), Tucson, AZ	3101	1500	2Q					0	4601	
g. Block II EMD	TBD	Raytheon, Tucson, AZ	0			12057	1Q	16607	1Q	Cont'd	28664	
h. Block I Aggregate	Various	Various	7025							0	7025	
i. BSFV Aggregate	Various	Various	8569							0	8569	
j. In-House Support	1095	RDEC, Redstone Arsenal, AL	5382	900	2Q	5322	1Q	3776	1Q	Cont'd	15380	
k. Other Govt Agency	MIPR/1095	Various	406	1000	2Q	244	1Q	249	1Q	Cont'd	1899	
Subtotal Product Development:			69752	4891		17623		20632			112898	

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. DAAH0195CA032	SS-FFP	Sigma Tech, Huntsville, AL	1198							0	1198	
b. OSD MOU (Barclay Bank 42779277)	SS/C-FFP & 1080	United Kingdom Ministry of Defense	4090							0	4090	
Subtotal Support Costs:			5288								5288	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program	PROJECT D303
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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. Targets	1095	ITTS, Redstone Arsenal, AL	2100							Cont'd	2100	
b. Telemeters	1095	RTTC, Redstone Arsenal, AL	1004							Cont'd	1004	
c. Countermeasures	1095	ARL, WSMR, NM				3367				Cont'd	3367	
Subtotal Test and Evaluation:			3104			3367					6471	

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	In-House	SHORAD PMO, DSA AMCOM	1331	438	2Q	836		851		Cont'd	3456	
b. DLA90093D00121	SS-FFP	II TRI, Huntsville, AL	775							0	775	
c. Contracted Services	Various	Various	333	444	2Q	398		425		Cont'd	1600	
d. SBIR/STTR				154							154	
Subtotal Management Services:			2439	1036		1234		1276			5985	

Project Total Cost:			80583	5927		22224		21908			130642	
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Project D303 Page 10 of 10 Pages Exhibit R-3 (PE 0203801A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	1613	1239	9914	14817	29173	19552	86858	101829	Continuing	Continuing
045 Hellfire Product Improvement Program	675	0	0	0	0	0	0	0	0	0
D336 TOW Product Improvement Program	938	1239	9914	2464	10809	3513	0	0	14322	374899
D689 ATACMS BLK IIIB	0	0	0	0	0	0	0	5200	Continuing	Continuing
D785 Longbow Hellfire PIP	0	0	0	12353	18364	16039	54040	75537	Continuing	Continuing
D786 Laser Guided Rocket	0	0	0	0	0	0	32818	21092	0	53910

A. Mission Description and Budget Item Justification: The TOW PIP provides advances in the day/night sight improvements, fire control and missile improvements. Improvements are required to maintain the infantry's capability to support the US Army mission of crisis response to regionally based threat and allows for TOW to continue to be integral to the strategic principle of forward presence. Included in this PIP are missile improvements to include a lethality effort against new/evolving threats to include Counter Active Protection System (CAPS) and the Improved Target Acquisition System (ITAS). The missile improvements are accomplished through technology insertion (TI) to enhance TOW missile performance against the evolving threat and to support the resumption of TOW missile production by replacing obsolete technologies with design for manufacturing and affordability improvements. The ITAS is a technology insertion program using Second Generation Forward Looking Infrared (FLIR) technology to upgrade the current TOW Target Acquisition and Fire Control subsystems. The ITAS program includes development of training devices. The Army TACMS IIIB will achieve ranges equivalent to the Army TACMS Block IA and will employ an earth penetrator warhead designed to neutralize "Hard and Deeply Buried Targets." These target sets might include underground command and control facilities, or surface-to-surface missile storage and assembly areas. An evolutionary improvement program is needed to maintain the effectiveness of the Hellfire Army TACMS, TOW and Hydra-70 systems. The Longbow Hellfire missile provides a fire-and-forget capability, greatly increasing the Longbow weapon system effectiveness and aircraft survivability. The Longbow system is deployable by day or night, in adverse weather, and in countermeasures environment. The Longbow Hellfire PIP will develop Home-on-Jam (HOJ)/Anti-Jam (AJ) and limited Counter-Active Protection System (CAPS) capabilities for the missile. The HOJ/AJ and CAPS objective is to maintain the Longbow systems low vulnerability and susceptibility to existing and future "hard kill" Active Protection System (APS) threats and battlefield jammer threats. Modernized Hellfire will provide the AH-64 and RAH-64 with a fire-and-forget Hellfire capability, greatly increasing weapon system effectiveness and aircraft survivability. The Modernized Hellfire missile will effectively engage and destroy advanced armor on the digital battlefield well into the next century. Modernized Hellfire will enter Engineering Manufacturing Development (EMD) in FY03. Modernized Hellfire missile will be designed and tested to achieve the following: fire-and-forget, increased range, increased survivability (both missile and platform),

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs				PROJECT D336		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D336 TOW Product Improvement Program	938	1239	9914	2464	10809	3513	0	0	14322	374899
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D336 -TOW Product Improvement Program: Provides for continued development of improvements to the TOW missile system. Improvements are required to maintain the Infantry's capability to support the US Army mission of crisis response to regionally based threats and allow TOW to continue to be integral to the strategic principle of forward presence. Included in this PIP are missile improvements (sensor, lethality, aerodynamics, guidance, control, reduced missile time of flight), and Improved Target Acquisition System (ITAS). The missile improvements are accomplished through technology insertion (TI) to enhance TOW missile performance against the evolving threat (CAPS) and to support the resumption of TOW missile production by replacing obsolete technologies with design for manufacturing and affordability (DFMA) improvements. The ITAS increases the capability of the TOW Heavy Antitank Weapon System by providing improved target detection and acquisition range, improved probability of hit, enhanced fire control capabilities and improved logistics supportability through modular design and extensive built-in test equipment. The ITAS program includes development of training devices, contains the Army's pathfinder common components for its Second Generation FLIR and sustains common components production concurrent with the Improved Bradley Acquisition System (IBAS). The ITAS design provides simple growth potential for digitization applications and upgrades the anti-armor capability of light forces using the TOW System.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 553 Continued EMD efforts on ITAS Indoor Trainer • 385 Continued missile enhancement efforts against the evolving threat [to include Counter Active Protection System (CAPS)] <ul style="list-style-type: none"> - Updated analytical/simulation model based on latest intelligence reports - Designed/tested long stand-off warhead - Demonstrated electrical active/passive measures <p>Total 938</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 202 Complete ITAS Indoor Trainer • 1016 Continue missile enhancement efforts against the evolving threat [to include Counter Active Protection System (CAPS)] <ul style="list-style-type: none"> -Update analytical/simulation model based on latest intelligence reports - Test long stand-off warhead - Test electrical active/passive measures • 21 Small Business Innovative Research/Small Business Technology Transfer Programs <p>Total 1239</p>										
Project D336			Page 3 of 11 Pages				Exhibit R-2A (PE 0203802A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs	PROJECT D336
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FY 2000 Planned Program:

- 3837 System design and integration of A-CAPS into the TOW 2B missile to maintain capability against threat armor equipped with Active Protective System (APS)
 - 1265 Procure component/prototype hardware for qualification of A-CAPS
 - 1944 Initiate A-CAPS system qualification flight tests
 - 2568 Begin design/integration of RF Data Link into TOW 2B missile
 - 300 Conduct analyses/trade studies on design for manufacturing and affordability (DFMA) candidates
- Total 9914

FY 2001 Planned Program:

- 2464 Complete A-CAPS system qualification flight tests
- Total 2464

B. Other Program Funding Summary

	<u>FY 1998</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 Complete</u>	<u>Total Cost</u>
Missile Procurement, Army										
C61700 ITAS/TOW Mods	61601	62141	68306	60785	64148	56477	59097	60706	0	1040712
TOW 2 C59300	732					22664	36604	54491		2388008

C. Acquisition Strategy: The ITAS is a technology insertion program utilizing Second Generation FLIR technology to upgrade the current TOW Target Acquisition and Fire Control subsystems. The second Low Rate Initial Production (LRIP) contract was awarded to the EMD contractor in FY 98. First Full Rate Production (FRP) contract will be awarded in FY 99. The TOW Technology Insertion program will enhance TOW 2B missile performance against threat armor equipped with Active Protective System (APS) and integrate DFMA improvements to replace obsolete technologies to support resumption of TOW 2B missile production. The development contract will be awarded in FY 2000. The first production contract will be awarded in FY 2003.

D. Schedule Profile

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
ITAS LRIP II		2 nd Qtr*					
ITAS Milestone III Review			3 rd Qtr				
Award TOW 2B development contract				2 nd Qtr			
Conduct TOW 2B PDR				4 th Qtr			
Conduct TOW 2B CDR					3 rd Qtr		

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs			PROJECT D336	
D. Schedule Profile	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	
Fabricate TOW 2B prototypes/conduct qualification tests						1 st -4 th Qtr		
Complete TOW 2B Qualification Testing							1 st Qtr	
TOW 2B Production Decision IPR							1 st Qtr	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs					PROJECT D336		
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. PY Sunk Cost		60640	145427								145427	
b. Texas Instruments, McKinney, TX	C/CPIF/AF		59724								59724	
c. STRICOM, Orlando, FL	MIPR		9128								9128	
d. Misc.	Various		4197	493							4690	
e. TOW 2B (TBD)	TBD					6807		633			7440	
Subtotal Product Development:			218476	493		6807		633			226409	
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. PY Sunk Cost			46912								46912	
b. PM CCAWS, RSA	PO		2827	29		1657		1831			6344	
c. MICOM, RSA,AL	PO		14993	110							15103	
d. Misc.	Various		2683								2683	
Subtotal Support Costs:			67415	139		1657		1831			71042	
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. PY Sunk Cost			42221								42221	
b. TECOM,APG,MD	PO		15836	607							16443	
c. TEXCOM, Ft Bliss, TX	MIPR		1557								1557	
d. Misc.	Various		1726								1726	
e. TECOM, RTTC	MIPR					1450					1450	
Subtotal Test and Evaluation:			61340	607		1450					63397	

ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs	PROJECT D336
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IV. Management Services: Not applicable

	Total PYs Cost	FY 1999 Cost		FY 2000 Cost		FY 2001 Cost		Cost To Complete	Total Cost	Target Value of Contract
Project Total Cost:	347231	1239		9914		2464			360848	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)									DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs					PROJECT D785	
<i>COST (In Thousands)</i>	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
D785 Longbow Hellfire PIP	0	0	0	12353	18364	16039	54040	75537	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> Expanding regional power threats require an evolutionary improvement program to maintain the effectiveness of the Hellfire, Army TACMS, TOW and Hydra-70 systems. The Longbow Hellfire missile provides a fire-and-forget capability, greatly increasing the Longbow weapon system effectiveness and aircraft survivability. The Longbow system is deployable by day or night, in adverse weather, and in countermeasures environment. The Longbow Hellfire PIP will develop Home-on-Jam (HOJ)/Anti-Jam (AJ) and limited Counter-Active Protection System (CAPS) capabilities for the missile. The HOJ/AJ and CAPS objective is to maintain the Longbow systems low vulnerability and susceptibility to existing and future "hard kill" Active Protection System (APS) threats and battlefield jammer threats. Modernized Hellfire will provide the AH-64 and RAH-64 with a fire-and-forget Hellfire capability, greatly increasing weapon system effectiveness and aircraft survivability. The Modernized Hellfire missile will effectively engage and destroy advanced armor on the digital battlefield well into the next century. Modernized Hellfire will enter Engineering Manufacturing Development (EMD) in FY03. Modernized Hellfire missile will be designed and tested to achieve the following: fire-and-forget, increased range, increased survivability (both missile and platform), decreased timeline, decreased weight, decreased size, and modularity for future enhancements. Modernized Hellfire will be compatible with existing launch platforms and the RAH-66. Funding for FY 2001 and 2002 applies only to the Longbow Hellfire PIP program.</p> <p>FY 1998 Accomplishments: Project not funded in FY 98.</p> <p>FY 1999 Planned Program: Project not funded in FY 99.</p> <p>FY 2000 Planned Program: Project not funded in FY 00.</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 10870 Product Development • 494 Support Costs • 371 Test and Evaluation Support • 618 Management Services Support <p>Total 12353</p>										
Project D785			Page 8 of 11 Pages				Exhibit R-2A (PE 0203802A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)									DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs				PROJECT D785	
B. Other Program Funding Summary	<u>FY 1998</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	Total
Missile Procurement Army									Compl	Cost
C70300 Longbow Hellfire/LBHF	231164	345125	294269	288330	225387	186111	26405	22457	1137500	3232438
<p>C. Acquisition Strategy: Development for HOJ/AJ and CAPS improvements will be done by AMCOM labs and contract development by Longbow Limited Liability.</p>										
D. Schedule Profile	<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>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Concept formulation/acquisition strategy LBHF PIP						1 st Qtr				
LLC contract award LBHF PIP						1 st Qtr				
Requirements definition LBHF PIP						2 nd Qtr				
Complete detailed design LBHF PIP							1 st Qtr			
Integration and testing LBHF PIP							2 nd Qtr			
Missile firings LBHF PIP							4 th Qtr			
Engineering Change Proposal LBHF PIP							4 th Qtr			
EMD Modernized Hellfire								2 nd Qtr		
Integration and testing Modernized Hellfire									3 rd Qtr	
Design/Test/Qual Modernized Hellfire										1 st Qtr
Qualification Modernized Hellfire										3 rd Qtr
Rail Flights										2 nd Qtr

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs					PROJECT D785		
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
Longbow HF PIP												
a. LLL	LC/CPFF	TBD						10590	Nov	16246	26836	
b. RDEC Spt Contracts	TBD	TBD						280	Dec	296	576	
Modernized Hellfire												
c. LLL	LC/CPFF	TBD								260270	260270	
d. RDEC Spt Contracts	TBD	TBD								3924	3924	
Subtotal Product Development:								10870		280736	291606	
Remarks: *Includes requirements/threat definition, preliminary/detailed design, and testing in hardware-in-the-loop and missile firings.												
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
Longbow HF PIP												
a. In-House Gov't Support								136	Qtrly	216	352	
b. RDEC Support								358	Qtrly	512	870	
Modernized Hellfire												
c. In-House Gov't Support										3067	3067	
d. RDEC Support										6542	6542	
Subtotal Support Costs:								494		10337	10831	
Remarks: *Includes salaries and travel for other government agencies in support of Longbow PIP and Modernized Hellfire.												
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
Longbow HF PIP												
a. RTTC Gov't Support								371	Qtrly	657	1028	
Modernized Hellfire												
b. RTTC Gov't Support										26362	26362	
Subtotal Test and Evaluation:								371		27019	27390	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs	PROJECT D785
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Remarks: *Includes RDEC and RTTC support for system reviews and testing, as well as support from RTTC and ARL for test assets and range support.

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
Longbow HF PIP												
a. In-House Support								618	Qtrly	727	1345	
Modernized Hellfire												
b. In-House Support										15461	15461	
Subtotal Management Services:								618		16188	16806	

Remarks: *Includes salaries and travel for collocated and core personnel.

Project Total Cost:								12353		334280	346633	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)									DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)					PROJECT D107		
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
D107	Integrated System Control (ISYSCON) Development	20815	35664	18432	19666	7784	7766	8843	17712	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: A requirement exists to automate Signal Corps unit's capability to manage multiple tactical communications systems in support of battlefield operations. The Integrated System Control (ISYSCON) facility will provide centralized management of the tactical communications network, establish an interface with each technical control facility in the Army Tactical Command and Control System (ATCCS) architecture, and enable automated configuration and management in a dynamic battlefield data network. ISYSCON is being developed with incremental software releases. The ISYSCON Program serves as a baseline foundation to support future network management initiatives tied to and part of the digitized division and the WIN Architecture. ISYSCON (V4) is also being developed to manage the Tactical Internet at brigade and battalion levels. FY 2000 supports the development of software (P2 Increments 2 & 3), operational test and training, and software releases. FY 2001 supports the development of software (P2 Increment 3 & P3 Increment 1), operational test and training, and software releases. This program element also supports any development required for PM, Warfighter Information Network – Terrestrial (WIN-T).</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 2500 Conducted Unit Test, System Test for IOT&E Baseline • 1200 Conducted Formal Qualification Testing (FQT) in support of IOT&E Phase I • 2500 Conducted test and training support of IOT&E Phase I • 818 Post IOT&E Test Support & Report Preparation • 1975 Corrected Software Deficiencies Resulting from IOT&E Phase I • 2200 Division XXI AWE Support – Router Management Task (RMT) • 1700 Conducted FQT in support of IOT&E Phase II • 2535 Conducted Concept Requirement Review for P2 Inc 1 • 3087 Conducted System Requirements Analysis for P2 Inc 1 • 2300 IOT&E Phase II Training & Test Conduct Support <p>Total 20815</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 800 Conduct Post Test Support & Report Preparation for IOT&E Phase II • 2000 Continue Software Requirements Analysis Phase 2 Inc 1 • 1541 Conduct Software Coding for P2 Inc 1 Baseline • 1200 Conduct Unit Test System Test for P2 Inc 1 Baseline 											
Project D107				Page 1 of 6 Pages				Exhibit R-2 (PE 0208010A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0208010A Joint Tactical Communications Program (TRI-TAC)	D107
<p>FY 1999 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 1300 Conduct FQT for P2 Inc 1 • 2100 Migration to COE Compliance – Level 6 • 1000 Conduct P2 Inc 1 Software Release • 2100 Conduct Concept Requirement Review for P2 Inc 2 • 3100 Conduct Software Requirements Analysis for P2 Inc 2 • 1700 Complete System Design for P2 Inc 2 Baseline • 3064 Conduct Software Coding for P2 Inc 2 • 1500 Conduct Unit Test, System Test for P2 Inc 2 • 3800 Software & Requirement Analysis for ISYSCON V4 (TI Manager) • 2100 Complete System Design for ISYSCON V4 (TI Manager) • 3414 Conduct Software Coding for ISYSCON V4 (TI Manager) • 2100 Integration of V4 Requirements into FBCB2 (TI Manager) • 1900 Develop emerging FDD (WIN-T) Dynamic Management Capabilities • 945 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 35664</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1200 Conduct P2 Inc 1 Limited User Test (LUT) Training • 2500 Conduct P2 Inc 1 LUT Testing • 2000 Conduct P2 Inc 2 FQT • 1800 Conduct P2 Inc 2 FOT&E I Training • 1900 Conduct P2 Inc 2 FOT&E I • 1200 Conduct P2 Inc 2 Software Release • 2700 Concept Requirements Review for P2 Inc 3 • 2932 Conduct Software Requirements Analysis for P2 Inc 3 • 2200 Conduct System Design P2 Inc 3 <p>Total 18432</p>		
Project D107	Page 2 of 6 Pages	Exhibit R-2 (PE 0208010A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)	PROJECT D107
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FY 2001 Planned Program:

- 4700 Conduct Software Coding for P2 Inc 3
 - 2000 Conduct Unit Test, System Test for P2 Inc 3
 - 2500 Conduct FQT P2 Inc 3
 - 1855 Conduct P2 Inc 3 FOT&E II Training
 - 2000 Conduct P2 Inc 3 FOT&E II
 - 1200 Conduct P2 Inc 3 Software Release
 - 2900 Conduct Concept Requirements Review for P3 Inc 1
 - 2511 Initiate Software Requirements Analysis P3 Inc 1
- Total 19666

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	21105	35941	19071	20431
Appropriated Value	8983	35941		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-278	-277		
b. SBIR / STTR	-218			
c. Omnibus or Other Above Threshold Reductions	+12328			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-639	-765
Current Budget Submit (<u>FY 2000 PB</u>)	20815	35664	18432	19666

Change Summary Explanation: FY 1998 Congressionally approved reprogramming in support of digitization (+12328).

C. Other Program Funding Summary	<u>FY 1998</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</u>	<u>Total</u>
									<u>Compl</u>	<u>Cost</u>
Other Procurement, Army-2, BX0007	14740	15133	14714	17149	19244	2931	0	3	0	99356

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)	PROJECT D107
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D. Acquisition Strategy: Competitive Engineering & Manufacturing Development (EMD) contract was awarded to GTE in September 1992. IOT&E I was conducted Mar 98, with IOT&E II conducted/completed in Oct 98. LRIP decision received May 1995. LRIP systems supported IOT&E. MSIII IPR scheduled for FEB 99. P2 Inc 1 software will support FDD fielding of production systems. Production systems will include acquisition of GFE (CHS/SICPS) hardware for the integration into system assemblages and fielding.

E. Schedule Profile	<u>FY 1998</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>
IOT&E Phase I	2Q							
Phase 1+ / IOT&E II		1Q						
Milestone III		2Q						
Production Contract Award		2Q						
Phase 2 – Increment 1		4Q						
LUT P2 Inc 1			2Q					
Phase 2 – Increment 2			4Q					
FOT&E I			4Q					
First Digitized Division IOC				1Q				
Phase 2 – Increment 3				2Q				
FOT&E II				4Q				
Phase 3 – Increment 1					3Q			
Phase 3 – Increment 2						3Q		
Phase 3 – Increment 3							3Q	
Phase 4 – Increment 1								3Q

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0208010A Joint Tactical Communications
Program (TRI-TAC)

PROJECT
D107

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. ISYS SW Development	CPAF	GTE, Raleigh, NC	70856	16114	DEC 98	10534	DEC 99	12924	DEC 00	Cont'd.	Cont'd	
b. Award Fee Contingencies	CPAF	GTE, Raleigh, NC	2909	2000	MAR 99	1045	MAR 00	2063	MAR 01	Cont'd.	Cont'd	
c. TI Manager (V4)												
(1)	IDIQ	Raytheon, Fullerton, CA		650	JAN 99	TBD		TBD		Cont'd	Cont'd	
(2)	CPIF	TRW, Carson, CA		10764	JAN 99	TBD		TBD		Cont'd	Cont'd	
d. GFE	FFP	GTE, Taunton, Mass	2239	-0-		-0-		-0-		-0-	Cont'd	
Subtotal Product Development:			76004	29528		11579		14987		Cont'd	Cont'd	

Remark:

- I.a Supports ongoing ISYS (V1-3) software development to produce incremental software products. (Prior year Includes \$5.7M for Force XXI)
- I.b ISYSCON Award Fee cycles are semi-annually. (PY at 7%/FY99> at 12%)
- I.c Supports V4 TI Manager Software Development (FBCB2 & EPLRS Network Mgt)
- I.d Supports prototype hardware requirements in support of IOT&E. FY00> = OPA.

II. Support Costs: Not applicable

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 Support		TEXCOM	1352	700	NOV 98					-0-	2052	
Subtotal Test and Evaluation:			1352	700						-0-	2052	

Remark:

Prior year funds provided TEXCOM, APG, EPG, Signal Ctr, & 3rd Signal Brigade test support for IOT&E I & II activity.
 FY99 supports TEXCOM test report activity in support of MS III.
 FY00-01 Test support converts to OPA for FOT&E activity.

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)						PROJECT D107		
IV. Management Services	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. Contractor Engr	NA	See remarks	14640	4003	NOV 98	3414	NOV 99	3337	NOV 00	Cont'd.	Cont'd	
b. Government Engr	NA		10305	1151	NOV 98	3197	OCT 99	1098	OCT 00	Cont'd.	Cont'd	
c. PM Support-CORE	NA		715	132	OCT 98	112	OCT 99	114	OCT 00	Cont'd.	Cont'd	
d. Travel	NA		655	150	FY99	130	FY00	130	FY01	Cont'd.	Cont'd	
Subtotal Management Services:			26315	5436		6853		4679		Cont'd	Cont'd	
Remark: IV.a. Contractor engineering includes PM Support contractor (Nations) , and software development support contractors [MITRE (FFDRC-CPFF) & JSC (CPAF 8%)]. IV.b. Govt Engr (FY00) includes \$2M Post Deployment SW Support (PDSS). IV.d. Travel will be expended throughout the year for Program Management Support.												
Project Total Cost:			103671	35664		18432		19666		Cont'd	Cont'd	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0208053A Joint Tactical Ground Station (TIARA)				PROJECT D635		
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
D635 Joint Tactical Ground Station P3I (TIARA)	4835	12148	28061	6306	5243	3089	2744	3751	4058	70235
<p>A. Mission Description and Budget Item Justification: This program element supports development of critical improvements to the Joint Tactical Ground Station (JTAGS). JTAGS is a transportable information processing system which receives and processes in-theater, direct down-linked data from Defense Support Program satellites and the follow-on Space Based Infrared System Satellites. JTAGS disseminates warning, alerting and cueing information on Tactical Ballistic Missiles (TBMs) and other tactical events of interest throughout the theater using existing communication networks. JTAGS is designated the in-theater element of the United States Space Command's Theater Event System. JTAGS supports all Theater Missile Defense pillars and by being located in-theater, provides the shortest sensor to shooter connectivity. The objectives of the JTAGS improvements are to integrate the Joint Tactical Distribution System (JTIDS) into the communication net, increase system accuracy and timeliness, and upgrade JTAGS to the Multi-Mission Mobile Processor (M3P) for operation with the next generation of the space based infrared satellites. The M3P development for the Space Based Infrared System includes shared funding by US Air Force and US Army and results in a combined development of M3Ps.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 782 Complete Phase I fusion development and initiate TACDAR fusion development. • 633 Completed Phase I beacon development • 1420 Continued Phase I JTIDS development and Year 2000 (Y2K) planning • 2000 Initiated Phase II M3P development <p>Total 4835</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 330 Complete Phase I JTIDS development • 760 Continue Phase II M3P development and Y2K development • 6940 Provide Phase II M3P Integrated Product & Process Development (IPPD) Support • 336 Provide Phase II M3P Management support • 3460 Provide Phase II M3P Integrated Product & Process Development (IPPD) Support • 322 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 12148</p>										
Project D635			Page 1 of 4 Pages				Exhibit R-2 (PE 0208053A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208053A Joint Tactical Ground Station (TIARA)	PROJECT D635
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FY 2000 Planned Program:

- 21428 Continue Phase II M3P development
 - 6290 Continue Phase II M3P IPPD support
 - 343 Continue Phase II M3P Management Support
- Total 28061

FY 2001 Planned Program:

- 4698 Continue Phase II M3P IPPD Support
 - 1288 Continue Phase II M3P development
 - 320 Continue Phase II M3P Management Support
- Total 6306

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u> PB)	5001	12229	29034	6551
Appropriated Value	5195	12229		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-194	-81		
b. SBIR / STTR	-125			
c. Omnibus or Other Above Threshold Reductions	-41			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			-973	-245
Current Budget Submit (<u>FY 2000 / 2001</u> PB)	4835	12148	28061	6306

C. Other Program Funding Summary	<u>FY 1998</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</u>	<u>Total</u>
									<u>Compl</u>	<u>Cost</u>
Other Procurement Army, OPA-2										
BZ8420 Joint Tactical Ground Station Mods	99	2630								2729

D. Acquisition Strategy: Critical JTAGS improvements under this PE will be developed making maximum use of NDI/Commercial Off-The Shelf (COTS) elements. After selection and assembly, the modification design will be subjected to thorough integration and performance testing to verify operational effectiveness and suitability. Phase II M3P will be a joint development effort with the US Air Force and will involve cost sharing of the acquisition effort.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208053A Joint Tactical Ground Station (TIARA)	PROJECT D635
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E. Schedule Profile	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Conducted P3I Phase I IPR	Sep 96									
Initiated P3I Phase I Program		Oct 96								
Conducted P3I Phase II IPR			Oct 97							
Implemented P3I Phase II Program			Oct 97							
Conducted Preliminary Design Review			Dec 97							
Exercise M3P Contract Option			Aug 98							
Complete P3I Phase I Development				Aug 99						
Conduct Critical Design Review				Aug 99						
Continue P3I Phase II Development					Oct 99					
Begin M3P Acceptance Test						Jan 01				
Conduct M3P Certification Test							Jan 02			
Conduct Ground Certification Test								Mar 03		
Complete M3P Acceptance Test								Apr 03		
Conduct P3I Phase II IPR								Sep 03		
Initiate P3I Phase III Program									Oct 03	
Continue P3I Phase III Development										Oct 04

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208053A Joint Tactical Ground Station (TIARA)	PROJECT D635
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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. Primary Hardware Development	C/CPAF	Lockheed / Sunnyvale, CA	360	7262	Oct 98	21428	Oct 99	1288	Oct 00	4484	34822	34822
b. Engineering Services	C/CPFF	Aerojet / Azusa, CA	1244	1090	Oct 98						2334	2334
c. In-House IPPD Support	N/A	Various	1588	1774	Oct 98	1813	Oct 99	1884	Oct 00	7877	14936	0
d. Contractor Engineering IPPD Support	C/CPFF	Various	1345	1215	Oct 98	1241	Oct 99	1269	Oct 00	3174	8244	8244
e. Government Engineering IPPD Support	N/A	Various	298	471	Oct 98	1009	Oct 99	1545	Oct 00	2391	5714	
f. Government Furnished Equipment	N/A	Various				2227					2227	
Subtotal Product Development:			4835	11812		27718		5986		17926	68277	45400

II. Support Costs: Not applicable

III. Test and Evaluation: Not applicable

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. Management Support	N/A	N/A		336	Oct 98	343	Oct 99	320	Oct 00	957	1956	
Subtotal Management Services:				336		343		320		957	1956	

Project Total Cost:			4835	12148		28061		6306		18885	70235	45400
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	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	11406	11338	9426	8178	8897	9325	9700	10470	Continuing	Continuing
D491 Command and Control (C2) Protect Development	8151	10177	8123	6884	7757	8044	8300	9000	Continuing	Continuing
D501 Army Key Management System (AKMS)	3255	1161	1303	1294	1140	1281	1400	1470	Continuing	Continuing

A. Mission Description and Budget Item Justification: The Communications Security Equipment Program develops Information Systems Security (ISS) equipment and techniques required to combat threat Signal Intelligence capabilities and to insure the integrity of data network. This program will also develop, integrate, and demonstrate C2 Protect Common Tools into C4I systems that consist of hardware, software, and applications which can manage, protect, detect and react to C2 system vulnerabilities, threats, reconfigurations, and reconstitution. The Army's RDTE ISS program objective is to implement National Security Agency (NSA) developed security technology in Army information systems. The Communications Security Equipment Technology (COMSEC) insures total signals and data security of all Army information systems, to include any operational enhancement and specialized Army configurations. The Army Key Management System (AKMS) automates key generation and distribution while supporting joint interoperability. It provides communications and network planning with key management. AKMS is a part of the management/support infrastructure for the Warfighter Information Network (WIN) program. Additional modifications to the AKMS baseline shall be required to support the emerging WIN architecture. System security engineering, integration of available information security (INFOSEC) products, development (when required), and testing are services provided to ensure that C4I systems are protected against malicious or accidental attacks by our enemies or friends. Modeling, simulation, and risk management tools will be used to develop C2 Protect capabilities that will enable the warfighter to distribute complete and unaltered information while maintaining a dynamic, continuous synchronous operational force. Several joint service/NSA working groups exist in the area of key management to avoid duplication and to assure interoperability between all Services' systems to include standards and testing. For the emerging multilevel network security, the Defense Information Systems Agency (DISA) Multi-Level Security (MLS) working group coordinates the Services different technology efforts.

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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0303140A Information Systems Security Program

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u> PB)	11771	7433	7433	8174
Appropriated Value	12147	11433		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-376	-95		
b. SBIR / STTR	-295			
c. Omnibus or Other Above Threshold Reductions	-98			
d. Below Threshold Reprogramming	28			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			+1993	+4
Current Budget Submit (<u>FY 2000 /2001</u> PB)	11406	11338	9426	8178

Change Summary Explanation: FY2000 funds in project D491 increased for Electronic Key Management System (EKMS) Tier 1 - A joint effort with NSA and the Navy.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program	PROJECT D491
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D491 Command and Control (C2) Protect Development	8151	10177	8123	6884	7757	8044	8300	9000	Continuing	Continuing

A. Mission Description and Budget Item Justification: Project D491 – Command and Control (C2) Protect Development: Project implements National Security Agency (NSA) developed security technology in Army information systems. Project objectives are to provide systems security mechanisms through encryption, trusted software or standard operating procedures to protect the information and to integrate these mechanisms into specified systems so secure operations are as transparent as possible to the users. This entails performing architecture studies and modeling, development models, system integration and testing, installation kits and certifications and accreditation of Automation Information Systems. Project will also assess, develop, integrate and demonstrate C2 Protect Common tools (hardware and software) that will provide protection for fixed infrastructure post, camp and station networks. Results of this effort are also leveraged into and complement the Tactical C2 Protect ATD in PEs 0602782A and 0603006A.

FY 1998 Accomplishments:

- 1360 Army contribution to NSA TACLANE program
- 1080 Continued the merger of TEED Internet Security Manager (TISM) to include both FASTLANE and TACLANE Security Management capabilities. (TISM is now a joint Army-NSA Program, “TACLANE/FASTLANE Internet Security Manager”)
- 619 Embed COMSEC into Multi-Media Communications System (MMCS) and Radio Access Point (RAP) programs; supported all KY-100 AIRTERM testing and prepared and coordinated Type Classification (TC) Package for the KY-100. Designed new installation kits for employment of KY-100 in Army aircraft.
- 2341 Support Defense Health Care Information Assurance Program (DHIAP)
- 2751 Initiated development of Common Tools Set for C2 Protect (Information Operations/Warfare) by accomplishing the following tasks;
 - Investigated and evaluated four COTS/GOTS tools for Network Access Control
 - Investigated and evaluated six COTS/GOTS tools for Intrusion Detection Systems
 - Investigated and evaluated six COTS/GOTS tools to protect against host machine vulnerabilities (Eight of the sixteen tools investigated/evaluated went into the tool box.)
 - Leveraged results into Tactical C2 Protect ATD by recommending solutions which also had applicability to FBCB2.

Total 8151

FY 1999 Planned Program:

- 650 Complete the development of TACLANE/FASTLANE Internet Security Manager (TISM).
- 200 Provide support to NSA TACLANE program.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program	PROJECT D491
<ul style="list-style-type: none"> 447 Complete KY-100 AIRTERM Type Classification and design of installation kits; start Type Classification action on TACLANE; perform Evaluation on latest NSA INFOSEC crypto chips. 		
FY 1999 Planned Program: (continued)		
<ul style="list-style-type: none"> 4761 Supported development and evaluation of Common Protect Tools by doing the following; <ul style="list-style-type: none"> Investigation and evaluation of Network Access Control, Network Mapping and Password Generation/Authentication COTS/GOTS Products Investigation and evaluations of Network Intrusion Detection System. Investigation and evaluations of Host systems in the area of Anti-Viruses, purge tools and vulnerabilities. Initiate investigation and evaluation of COTS/GOTS products for Risk Management Initiate investigation of techniques for Audit Analysis 		
<ul style="list-style-type: none"> 3869 Continue Demonstration Program for Military Health Care Information Protection. 		
<ul style="list-style-type: none"> 250 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs 		
Total 10177		
FY 2000 Planned Program:		
<ul style="list-style-type: none"> 1097 Perform in-house evaluations and integration of INFOSEC NDI equipment into both trusted and untrusted computer Computer platforms and secure applications. 		
<ul style="list-style-type: none"> 470 In-house support for TACLANE/FASTLANE by doing development of installation kits and providing engineering support during system fielding. 		
<ul style="list-style-type: none"> 250 Perform in-house study/evaluation for Secure Gateway (SEGAT) providing seamless, secure connectivity between major Army tactical communications networks and different security levels. 		
<ul style="list-style-type: none"> 4306 Complete development and evaluation of Common Protect Tools by doing the following; <ul style="list-style-type: none"> Complete investigation and evaluation of Network Access Control, Network Mapping and Password Generation/Authentication COTS/GOTS Products. Complete investigation and evaluation of Network Intrusion Detection System Complete investigation and evaluation of Host systems in the area of Anti-Viruses, purge tools and vulnerabilities Complete investigation and evaluation of COTS/GOTS products for Risk Management. 		
<ul style="list-style-type: none"> 2000 Support for Electronics Key Management System (EKMS) Tier One 		
Total 8123		
FY 2001 Planned Program:		
<ul style="list-style-type: none"> 980 Support development efforts on Secure Gateway program. 		
<ul style="list-style-type: none"> 1000 Support in-house evaluations of NDI and NSA INFOSEC devices and chips, provide engineering/fielding support to TACLANE and ATM encryption program with development of necessary installation kits. 		
<ul style="list-style-type: none"> 4904 Continue the development and evaluation of Common Protect Tools by doing the following: 		
Project D491	Page 4 of 10 Pages	Exhibit R-2A (PE 0303140A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program	PROJECT D491
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- Advanced C2 Protect operation assessment
- Validate security solutions

FY 2001 Planned Program: (continued)

- Complete systems integration into Tactical Internet
- Validate/Evaluate C2 Protection through Field Demonstrations

Total 6884

C. <u>Other Program Funding Summary</u>	<u>FY 1998</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 Comp</u>	<u>Total Cost</u>
OPA TA0600	21440	33621	28750	29766	25997	25270	19488	21584	cont'd	cont'd

D. Acquisition Strategy: The object of the C2 Protect Program is to develop, integrate, and validate hardware and software tools that will secure the Tactical Internet (TI) in the First Digitized Division (FDD). The FY 1998 focus is on developing and evaluating tools for the Force XXI Battle Command Brigade and Below (FBCB2)-lower Tactical Internet. FY 1999 and beyond will focus on completing development and evaluation of C2 Protect tools for the FDD that will support the procurement of C2 Protect tools that will secure the TI for the lower and upper levels of the Tactical Internet.

D. <u>Schedule Profile</u>	<u>FY 1998</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>
AIRTERM (KY-100)								
• OEC Test	4QTR							
• Type Classification (conditional)		4QTR						
• Installation Kit Development		4QTR						
• Installation Kit Test & Evaluation		4QTR						
• Acquisition of Installation Kits			4QTR					
• OEC Test of Wideband Mode of KY-100			4QTR					
• Type Classification Standard (TC Standard)			4QTR					
• Full fielding of AIRTERM				4QTR				
TISM								
• Prototype Development	4QTR							
• Laboratory Testing		4QTR						
Secure Gateway								
• Study			4QTR					
• Prototype Development Initiation				4QTR				

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program	PROJECT D491
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D. Schedule Profile	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
C2 Protect								
• Network Access Control	4QTR	4QTR	4QTR	4QTR				
• Intrusion Detection Control	4QTR	4QTR	4QTR	4QTR				
• Host Machine Vulnerabilities	4QTR	4QTR	4QTR	4QTR				
• Risk Management		4QTR	4QTR	4QTR				
• Anti-Viruses	4QTR	4QTR	4QTR	4QTR				
• Purge Tools	4QTR	4QTR	4QTR	4QTR				
• Audit Analysis		4QTR	4QTR	4QTR				

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program	PROJECT D491
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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. TISM	C-CPFF	GTE, Waltham, MA	4978	640	11/15/98					0	5618	
b. System Engineering	PO	CECOM, RDEC	5198	4951	01/01/99	5253	01/01/00	5284	01/01/01	Cont'd	20686	
c. TACLANE	MIPR	NSA	2452							0	2452	
d. SEGATE	CPFF	TBA				250	01/01/00	980	01/01/01	Cont'd	1230	
e. EKMS	MIPR	Navy, Washington				2000	01/01/00			0	2000	
f. Contracted Services												
(1)	C-CPFF	Booz, Allen & Hamilton, Linthicum MD	822	375	02/04/99	375	02/04/00	375	02/04/01	2250	4197	
(2)	C-CPFF	SYTEX, Inc Tinton Falls, NJ	692	245	02/10/99	245	02/10/00	245	02/10/01	1470	2897	
g.	TBD	Army Medical Command	2341	3966	TBD					TBD	6307	
Subtotal Product Development:			16483	10177		8123		6884		3720	45387	

II. Support Costs: not applicable

III. Test and Evaluation: not applicable

IV. Management Services: not applicable

Project Total Cost:			16483	10177		8123		6884		3720	45387	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)									DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303140A Information Systems Security Program					PROJECT D501	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D501 Army Key Management System (AKMS)	3255	1161	1303	1294	1140	1281	1400	1470	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D501 - Army Key Management System (AKMS): This program provides decentralized and automated key generation, distribution and management while enhancing joint interoperability. It eliminates paper encryption key and provides communications network planning with key management.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 3255 Provided software development upgrades for AKMS Workstation to complete development of the “core” module for the ACES modular architecture. <p>Total 3255</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1130 Provide software development upgrades for AKMS Workstation to complete development of the general purpose module to support the MILSATCOM satellite terminals. • 31 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 1161</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1303 Provide software development upgrades for AKMS Workstation to complete development of the modules for the aviation communities Army Aviation Command and Control Program. <p>Total 1303</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 1294 Provide software development upgrades for AKMS Workstation to support development of software modules for the Land Warrior and Comanche Acquisition Programs. <p>Total 1294</p>										
C. <u>Other Program Funding Summary</u>	<u>FY 1998</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 Comp</u>	<u>Total Cost</u>
OPA BA1201	4542	10315	11038	12131	12270	13233	3801	4022	cont'd	cont'd

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program	PROJECT D501
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D. Acquisition Strategy: AKMS Initial Operational Test and Evaluation (IOTE) occurred in August – September FY97. Direction was provided to separate the Local COMSEC Management Software (LCMS) from the Automated Communication Engineering System (ACES). The IOC for ACES is scheduled for December 2000.

D. <u>Schedule Profile</u>	<u>FY 1998</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>
PEO IPR	4Q							
Critical Design Review		2Q						
ACES Software Functional Testing			1Q					
FOT&E			3Q					
Material Release			4Q					
ACES IOC				1Q				
AKMS Material Release for new Army Acquisition Programs					1-4Q	1-4Q	1-4Q	1-4Q

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303140A Information Systems Security Program					PROJECT D501		
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. Software development	C/T&M	GTC, Tampa, FL	19013	1161	1/99	1303	1/00	1294	1/01	Cont'd	22771	
Subtotal Product Development:			19013	1161		1303		1294			22771	
II. Support Costs: Not applicable												
III. Test and Evaluation: Not applicable												
IV. Management Services: Not applicable												
Project Total Cost:			19013	1161		1303		1294			22771	

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<p align="center">ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</p>								<p align="right">DATE February 1999</p>		
<p>BUDGET ACTIVITY 7 - Operational System Development</p>				<p>PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment</p>						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	45679	52447	36230	47743	40578	42853	52542	62925	Continuing	Continuing
D2PT SMART-T Operational Test	3174	0	0	0	0	0	0	0	0	4452
D253 Defense Satellite Communications Systems-Defense Communications Systems (DSCS-DCS)(Phase II)	13846	16053	8984	7882	11406	11581	13657	13636	Continuing	Continuing
D384 SMART-T	13775	24232	13931	17434	15072	14470	7217	6910	0	300337
D386 SCAMP Block I	2138	0	0	0	0	0	0	0	0	99787
D456 MILSATCOM System Engineering	3835	4028	6298	12213	11484	11730	14739	9810	Continuing	Continuing
D559 Automated Communications Management System (ACMS)	8911	8134	6009	9191	0	0	0	0	0	32245
D561 Military Individual Communicator (MIC)	0	0	1008	1023	854	956	1208	1177	Continuing	Continuing
D562 Multiband Integrated Satellite Terminal (MIST)	0	0	0	0	0	0	9826	24525	Continuing	Continuing
D566 Transit Case MDR (TRAM)	0	0	0	0	1762	4116	5895	6867	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: Military Satellite Communications (MILSATCOM) systems are joint program/project efforts with each Service, Joint Chiefs of Staff (JCS), National Command Authority, Commanders-In-Chief (CINCs), National Security Agency and Office of the Secretary of Defense assigned specific responsibilities as specified in JCS Memorandum of Policy (MOP) 37. The worldwide MILSATCOM systems are the following: Ultra High Frequency (UHF) Fleet Satellite/Air Force Satellite (FLTSAT/AFSAT) system; the Super High Frequency (SHF) Defense Satellite Communications System (DSCS); the Extremely High Frequency (EHF) MILSTAR system; the UHF Follow-On Satellite system; and all MIL-STD-1582C compatible payloads. MOP 37 designated Army as the Executive Agent for MILSATCOM Ground Subsystems. As Executive Agent for MILSATCOM Ground Subsystems, Army is responsible for developing, procuring, and maintaining the life cycle logistics support for satellite terminals; satellite control subsystems; communications subsystems; and all related equipment required to achieve end-to-end connectivity to satisfy JCS Command, Control, Communications, and Intelligence (C3I) supporting the President; JCS; CINCs; Military Departments; Department of State; and other Departments and Agencies of the government.</p>										
<p>Page 1 of 24 Pages</p>						<p>Exhibit R-2 (PE 0303142A)</p>				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0303142A Satellite Command (SATCOM) Ground Environment

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	48939	53897	37846	34714
Appropriated Value	56227	53897		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-3288	-1450		
b. SBIR / STTR	-1322			
c. Omnibus or Other Above Threshold Reductions	-437			
d. Below Threshold Reprogramming	-5501			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			-1616	+13029
Current Budget Submit (<u>FY 2000 / 2001 PB</u>)	45679	52447	36230	47743

Change Summary Explanation: FY 2001 funding increase in Projects D384 SMART-T and D456 MILSATCOM Systems Engineering in support of Advanced EHF (AEHF) modifications and related efforts IAW AEHF satellite launch schedule (+13029). These modifications are necessary for the ground terminals to benefit from the increased capability of the new satellite system.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment				PROJECT D253		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D253 Defense Satellite Communications Systems- Defense Communications Systems (DSCS-DCS)(Phase II)	13846	16053	8984	7882	11406	11581	13657	13636	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D253 - DSCS-DCS Phase II: This project provides funds required to develop strategic and tactical Ground Subsystem equipment to support JCS validated Command, Control, Communications and Intelligence (C3I) for the worldwide Super High Frequency (SHF) Defense Satellite Communications System (DSCS) program. Continuing upgrades for the DSCS are vital to support the emerging power projection and rapid deployment role of the Armed Forces. DSCS provides warfighters multiple channels of tactical connectivity as well as interface with strategic networks and national decision-makers.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 4115 Continued DIMS Interface Software • 267 Completed the NDI Adaptation Phase for the RSCCE • 4612 Continued the RBATSON program • 1767 Completed the IBWS program • 673 Completed the specification and acquisition requirements package for the Common Network Planning Software(CNPS) program • 2412 Continued IRF, PM Admin, and SETA efforts <p>Total 13846</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 492 Complete the RBATSON program • 3610 Continue the DIMS Interface Software program • 3702 Initiate the CNPS program • 5607 Develop prototype microwave link from Kaiserslautern through Donnersburg to Heidelberg Germany • 2217 Continue IRF, PM Admin, and SETA efforts • 425 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 16053</p>										
Project D253			Page 3 of 24 Pages				Exhibit R-2A (PE 0303142A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D253
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FY 2000 Planned Program:

- 3267 Continue the DIMS Interface Software program
 - 4449 Continue CNPS program
 - 1268 Continue IRF, PM Admin and SETA efforts
- Total 8984

FY 2001 Planned Program:

- 2970 Continue the DIMS Interface Software program
 - 3665 Continue CNPS program
 - 1247 Continue IRF, PM Admin and SETA efforts
- Total 7882

B. Other Program Funding Summary	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
OPA 2 - SSN: BB8500	82428	94201	68489	70799	56675	55654	78776	74029	Cont	Cont

C. Acquisition Strategy: The Replacement Satellite Configuration Control Element (RSCCE), Microwave Test Link, and Replacement BATSON (RBATSON) programs will be followed by competitive firm fixed price procurement programs that contain a basic production year followed by one or more option years of production. The RSCCE provides real-time monitoring and control of the DSCS III satellite platform and communications payload. A total of 18 RSCCE units will be procured and fielded to DSCS Operations Centers (DSCSOC) at worldwide locations. The Microwave Test Link provides a microwave link from Kaiserslautern through Donnersburg to Heidelberg, Germany. The RBATSON provides security, authenticity, and anti-jam waveform protection to satellite commands generated by the RSCCE for transmission to DSCS III satellites. A total of 21 RBATSON units will be procured and fielded to DSCS Operations Centers and contingency sites worldwide. The DSCS Integrated Management System (DIMS) and Common Network Planning Software (CNPS) programs are software development programs that are not planned to have follow-on production. DIMS provides the capability to electronically disseminate network plans to the monitoring and controlling DSCS Operations Control System (DOCS) subsystems and to retrieve and display subsystem monitoring data. It also provides a comprehensive view of network operations at DSCSOCs and DISA management sites. CNPS plans strategic and Ground Mobile Forces (GMF) satellite communications networks for DSCS and commercial satellites. DIMS and CNPS will be installed at DSCS Operations Centers and DISA Management Sites at worldwide locations.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D253

D. Schedule Profile	<u>FY 1998</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>
Complete RSCCE Testing		1Q*						
RSCCE MS III Production Decision		2Q						
RSCCE Option Award		2Q						
Complete RBATSON Testing		2Q						
Award CNPS Contract		2Q						
Complete CNPS Testing						4Q		
Award Microwave Test Link Contract		2Q						
DIMS Version 2.0 Software Testing		1Q*						
DIMS Version 3.0 Software Testing			3Q					
DIMS Version 4.0 Software Testing				3Q				

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment					PROJECT D253		
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. DIMS Software	SS / CPFF	JHU/APL, Laurel, MD		3152	Jan 99	2867	Jan 00	2570	Jan 01	14944	23533	
b. CNPS	C / FFP	TBS		3000	Mar 99	3949	Jan 01	3165	Jan 01	9624	19738	
c. Microwave Prototype	C / FFP	TBS		5607	Feb 99						5607	
Subtotal Product Development:				11759		6816		5735		24568	48878	
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	Fort Monmouth, NJ		1074		600		600		Cont	2274	
b. SETA Support	C / CPFF	Fort Monmouth, NJ		277		200		200		Cont	677	
c. Engineering Support	SS / CPFF	JHU/APL, Laurel, MD		301		100		100		Cont	501	
d. Core Support	Various	Fort Monmouth, NJ		300		300		300		Cont	900	
Subtotal Support Costs:				1952		1200		1200			4352	
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. Integrated Research Facility	MIPR	Fort Monmouth, NJ		750		195		193		Cont	1138	
Subtotal Test and Evaluation:				750		195		193			1138	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D253
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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. PM Admin	Various	Fort Monmouth, NJ		1167		773		754		Cont	2694	
b. SBIR/STTR				425							425	
Subtotal Management Services:				1592		773		754			3119	
Project Total Cost:				16053		8984		7882		24568	57487	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment				PROJECT D384		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D384 SMART-T	13775	24232	13931	17434	15072	14470	7217	6910	0	300337
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D384 - SMART-T: The Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T) will provide a range extension capability for the Army's Mobile Subscriber Equipment (MSE) to support the Force Projection Army. Specifically, it will provide a satellite interface to permit uninterrupted communications as our advancing forces move beyond the line-of-sight capability of MSE. This equipment will communicate at both low and medium data rates (LDR/MDR) over the MILSTAR satellite constellation. It will also be compatible with the UHF Follow-On (UFO); the Navy Fleetsatcom EHF satellite package; and MIL-STD-1582C compatible payloads. It will provide the security, mobility, and anti-jam capability required to defeat the threat and satisfy the critical need as stated above. The SMART-T will also have Low Probability of Interception and Low Probability of Detection (LPI/LPD) to avoid being targeted for destruction, jamming or intercept. The prime mover will be a High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) configured with all the electronics and the self-erectable antenna.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 10129 Continued development of Demand Assigned Multiple Access (DAMA) • 2545 Continued development of Network Control and Payload specification • 1101 Completed development of interactive training courseware <p>Total 13775</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 10733 Complete development of Demand Assigned Multiple Access (DAMA), and begin development of Asynchronous Transfer Mode (ATM) DAMA • 8030 Continue development of Network Control and begin development of an Advanced Extremely High Frequency (AEHF) test bed • 4822 Continue Payload Specification Change development work resulting from test with on-orbit MDR Payload satellite • 647 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 24232</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 5650 Complete development of Network control, and continue development of AEHF test bed • 5000 Continue development of ATM DAMA • 3281 Continue payload specification change development work 										
Project D384			Page 8 of 24 Pages				Exhibit R-2A (PE 0303142A)			

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D384
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Total 13931

FY 2001 Planned Program:

- 7000 Complete development of ATM DAMA, and complete development of AEHF test bed
 - 6647 Begin development of AEHF
 - 3787 Continue payload specification change development work
- Total 17434

B. Other Program Funding Summary	<u>FY 1998</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
Other Procurement Army 2 - SSN: BC 4002	20728	57370	61761	46834	19623	12685	32860	20165	12330	368897
Other Procurement Army 4 - SSN: BS 9720	1042	1403	0	2733	2555	1969	1364	1168	0	13817

C. Acquisition Strategy: The SMART-T program employed a competitive development strategy. The development phase included two contractors performing under Cost-Plus-Incentive-Fee (CPIF) contracts. The contracts were awarded on 9 November 1992 to Raytheon Company (Marlborough, MA) and Rockwell International (Richardson, TX). Twelve Engineering Development Model (EDM) terminals (6 from each contractor) were developed under the two contracts. The streamlining features of this phase included a reliability growth plan to achieve the required reliability by Follow-On Test and Evaluation (FOT&E). The Low Rate Initial Production (LRIP) and Full Rate Production (FRP) contract was competitively awarded to Raytheon Company on 7 February 1996. SMART-T Milestone III Decision was successfully completed Nov 98. Award of the first FRP Option is scheduled for 1QFY99. The FRP contract will include implementation of RDTE-funded terminal Baseline modifications for development of Demand Assigned Multiple Access (DAMA), ATM DAMA, and Advanced EHF Waveform. Development efforts for these modifications will be conducted in accordance with the schedule provided in this submission. The total Army terminal requirement is 209, of which 43 will be procured during LRIP (base year plus one option) to ensure sufficient quantities are available for the launch of the first MDR satellite in FY 1999. The Air Force will also be procuring 9 terminals during LRIP. The Full Rate Production (FRP) quantities (166 Army terminals) will be awarded as fixed price options to the LRIP/FRP contract. Additional quantities (i.e., 95) will be procured for the Air Force, Marine Corps, and JCSE.

D. Schedule Profile	<u>FY 1998</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>
Completed IOT&E	3Q*							
MS III		1Q*						
FRP Award		2Q						
FOT&E			4Q					
Complete DAMA Development		2Q						

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D384
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D. Schedule Profile	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Begin Development of ATM DAMA		2Q						
IOC			1Q					
Complete Development of Network Control			4Q					
Begin AEHF Development				2Q				
Complete Development of ATM DAMA				4Q				
Continue AEHF Development					1-4Q			
Complete AEHF Development						4Q		
Continue Payload Specification Change Development							1-4Q	
Complete Payload Specification Change Development								4Q

*Denotes Milestone Completion

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D384
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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. Dual Development	C / CPIF	Rockwell Richardson, TX	117173								117173	
b. Contracts		Raytheon Marlborough, MA										
c. Baseline Mods	SS / CPAF	Raytheon Marlborough, MA	26852	18055	Jan 99	9181	Jan 00	12484	Jan 01	39769	106341	
d. Govt Support	MIPR	Various	12239	450		450		550		1500	15189	
e. GFP	MIPR	Various	149								149	
Subtotal Product Development:			156413	18505		9631		13034		41269	238852	

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. Other Contracts	MIPR	Various	11290								11290	
b. Core Support	N/A	PM Milsatcom, NJ	4152	300		300		400		1400	6552	
c. Lab Activities	MIPR	Various	3406	1800		1000		1000		1000	8206	
Subtotal Support Costs:			18848	2100		1300		1400		2400	26048	

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. Simulator Development	MIPR	Lincoln Labs Lexington, MA	12510								12510	
b. DT&OT Test Support	MIPR	Lincoln Labs Lexington, MA	6700								6700	
c. Test Bed Development	MIPR	Lincoln Labs Lexington, MA		2980	Feb 99	3000		3000			8980	
Subtotal Test and Evaluation:			19210	2980		3000		3000			28190	

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D384
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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. Tech Support of SMART-T Development	MIPR	Lincoln Labs Lexington, MA	6600								6600	
b. SBIR/STTR				647							647	
Subtotal Management Services:			6600	647							7247	
Project Total Cost:			201071	24232		13931		17434		43669	300337	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment				PROJECT D456		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D456 MILSATCOM System Engineering	3835	4028	6298	12213	11484	11730	14739	9810	Continuing	Continuing
<p>A. Mission Description and Budget Item Justification: Project D456 - MILSATCOM System Engineering: . As Executive Agent for MILSATCOM Ground Subsystems, Army is responsible for developing, procuring, and maintaining the life cycle logistics support for satellite terminals; satellite control subsystems; communications subsystems; and all related equipment required to achieve end-to-end connectivity to satisfy JCS Command, Control, Communications, and Intelligence (C3I) supporting the President; JCS; CINCs; Military Departments; Department of State; and other Departments and Agencies of the government. This project provides centralized funding for advanced systems engineering, analysis, research, development, test, and evaluation of new and emerging technologies that optimize terminal performance and interoperability on the digitized battlefield.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 1549 Conducted various development efforts or analysis to provide enhanced Spitfire capability • 321 Completed SATCOM-on-the-Move analysis, acquisition, and test efforts • 750 Battlefield Digitization integration efforts • 1215 Advanced SATCOM architecture development <p>Total 3835</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1142 Conduct various development efforts or analysis to provide enhanced terminal capability • 750 Continue Battlefield Digitization architecture efforts for FDD • 1036 Advanced SATCOM architecture development (Advanced EHF (AEHF) and Advanced Wideband (AWB) Gap Filler) • 993 AEHF waveform development • 107 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 4028</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 2343 Conduct various development efforts or analysis to provide enhanced terminal capability • 1941 Continue Battlefield Digitization architecture efforts for FDD and FDC • 1050 Advanced SATCOM architecture development (AEHF and AWB) • 964 AEHF waveform development 										
Project D456			Page 13 of 24 Pages				Exhibit R-2A (PE 0303142A)			

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D456
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Total 6298

FY 2001 Planned Program:

- 5492 Conduct various development efforts or analysis to provide enhanced terminal capability (EHF, SHF and Commercial Bands)
 - 3900 Continue Battlefield Digitization architecture efforts for FDC
 - 1500 Advanced SATCOM architecture development (AEHF and AWB)
 - 1321 AEHF waveform development
- Total 12213

B. Other Program Funding Summary	<u>FY 1998</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
Other Procurement Army 2 - SSN: K77200	7038	2447	1547	0	0	0	0	28106	0	39138
Other Procurement Army 2 - SSN: BB8417	2398	1470	500	0	0	0	0	0	0	9779
Other Procurement Army 2 - SSN BA9350	15281	25259	31950	62183	70288	49157	49599	11489	Cont	Cont
Other Procurement Army 2 - SSN BC4002	20728	57370	61761	46834	19623	12685	32860	20165	Cont	Cont

C. Acquisition Strategy: This project funds advanced systems engineering, research, development, test and evaluation of new and emerging technologies to optimize terminal performance and communications control. Once the technologies are mature and deemed feasible, funding and management responsibility for implementation of the technology is transitioned to cognizant MILSATCOM programs.

D. Schedule Profile	<u>FY 1998</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>
Begin Integration of SATCOM Terminals into Digitized Architecture	1Q							
Comm-On-The-Move (COTM) Integration for FDD		2Q						
Intersegment Post Launch Verification (Flight 3)		4Q						
Intersegment Post Launch Verification (Flight 4)			4Q					
Intersegment Post Launch Verification (Flight 5)				4Q				
Intersegment Post Launch Verification (Flight 6)					4Q			
Begin UHF/EHF Terminal Integration with Tactical Internet		1Q						

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment			PROJECT D456	
D. Schedule Profile	<u>FY 1998</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>
Complete UHF/EHF Terminal Integration with Tactical Internet			4Q					
Conduct Advanced EHF and Wideband System			1Q					
Complete Advanced EHF and Wideband System								4Q

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment						PROJECT D456		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Terminal Upgrades	Various	Various	174	450	Jan 99	743	Jan 00	3667	Jan 01	Cont	5034	
Subtotal Product Development:			174	450		743		3667			5034	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Engineering (In-House)	MIPR	Various	571	845	Jan 99	1299	Jan 00	2551	Jan 01	Cont	5266	
b. Engineering (Contract)	Various	Various	747	797	Jan 99	1314	Jan 00	1825	Jan 01	Cont	4683	
Subtotal Support Costs:			1318	1642		2613		4376			9949	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Test Support	MIPR	Lincoln Labs, Lexington, MA	800	600	Jan 99	1000	Jan 00	1200	Jan 01	Cont	3600	
b. Test Support	Various	Various	343	336		642		1170		Cont	2491	
Subtotal Test and Evaluation:			1143	936		1642		2370			6091	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Advanced EHF & Architecture	MIPR	Lincoln Labs Lexington, MA	1200	893	Jan 99	1300	Jan 00	1800	Jan 01	Cont	5193	
b. SBIR/STTR				107							107	
Subtotal Management Services:			1200	1000		1300		1800			5300	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D456
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	Total PYs Cost	<u>FY 1999</u> Cost		<u>FY 2000</u> Cost		<u>FY 2001</u> Cost		Cost To Complete	Total Cost	Target Value of Contract
Project Total Cost:	3835	4028		6298		12213			26374	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment				PROJECT D559		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D559 Automated Communications Management System (ACMS)	8911	8134	6009	9191	0	0	0	0	0	32245
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D559 - ACMS: ACMS is critical to the dynamic and efficient operation of battlefield command and control networks using Air Force developed MILSTAR satellites and Army developed MILSTAR terminals. ACMS enables Army users to take advantage of advanced features of the MILSTAR system, to include directly tasking the satellite constellation, repointing payload antennas, and rapidly changing network configurations. The ACMS must be integrated into ISYSCON to make it available to the tactical user and to coordinate MILSTAR range extension of MILSTAR networks. All Services (USAF, Army, and Navy) are funding for their unique software and hardware requirements.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 7676 Began development, integration, test and fielding of incremental control capability • 463 Participated in MILSTAR Intersegment Testing • 772 Participated in Joint Technical Reviews, System Requirement Reviews, Management Reviews, Technical Interchange Meetings, and Technical Demonstrations <p>Total 8911</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 6507 Continue development, integration, test and fielding of incremental control capability (includes Interim Control System) • 576 Participate in MILSTAR Intersegment Testing • 836 Participate in Joint Technical Reviews, System Requirement Reviews, Management Reviews, Technical Interchange Meetings, and Technical Demonstrations • 215 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 8134</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 5138 Continue development, integration, test and fielding of incremental control capability (includes Interim Control System) • 480 Support terminal test programs • 391 Participate in Joint Technical Reviews, Management Reviews, Technical Interchange Meetings, and Technical Demonstrations <p>Total 6009</p>										
Project D559			Page 18 of 24 Pages				Exhibit R-2A (PE 0303142A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D559

FY 2001 Planned Program:

- 7489 Continue development, integration, test and fielding of incremental control capability
 - 825 Support terminal test programs
 - 877 Participate in Joint Technical Reviews, Management Reviews, Technical Interchange Meetings, and Technical Demonstrations
- Total 9191

B. Other Program Funding Summary: Not applicable

C. Acquisition Strategy: Development efforts for ACMS were initiated in FY 1996 under Projects D384 and D386. Project D559 ACMS Development funding line was created in FY 1998. ACMS is a Joint Service MILSTAR community initiative which is an integral part of the MILSATCOM Architecture. The MILSTAR Joint Program Office (MJPO) is managing the overall development effort. Input and interaction with the terminal offices is required to ensure a comprehensive system solution is achieved. Development work began in FY 1996 and will continue through FY 2001, as ACMS is phased in and tested incrementally.

D. <u>Schedule Profile</u>	<u>FY 1998</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 2004</u>	<u>FY 2005</u>
Complete ACMS Build 2			4Q						
Initiate Interim Support of Terminal Deployments		1Q							
Participate in MST-6000	4Q								
Participate in MST-8000		3Q							
Complete FDD Testing, Training & Deployment			2Q						
Complete ISYSCON Integration / Interim Capability		3Q							
Complete ISYSCON Integration / ACMS Build 2 Capability				4Q					

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D559
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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. Terminal Control	MIPR	JHU/APL Laurel, MD	1000	1000	Nov 98	1000	Nov 99	2300	Nov 00	0	5300	
b. ACMS Development	MIPR	NRAD San Diego, CA	2000	2000	Jan 99	2000	Jan 00	2000	Jan 01	0	8000	
c. MCPT-I Development	SS / CPAF	CSC/Lincom Eatontown, NJ	2977	2007	Jan 99	1000	Jan 00	2177	Jan 01	0	8161	
Subtotal Product Development:			5977	5007		4000		6477			21461	

Remark: ACMS Development (NRAD, San Diego): NRAD manages all contract activity associated with ACMS development. US Army provides funds for Army-unique control requirements; NRAD distributes funds provided over multiple contracts.

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. Program Management	Various	Various	374	565	Jan 99	454	Jan 00	404	Jan 01	0	1797	
Subtotal Support Costs:			374	565		454		404			1797	

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 Support	MIPR	Lincoln Labs Lexington, MA	800	600	Jan 99	300	Jan 00	600	Jan 01	0	2300	
b. Test Support	Various	Various	560	847	Jan 99	805	Jan 00	810	Jan 01	0	3022	
Subtotal Test and Evaluation:			1360	1447		1105		1410			5322	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment						PROJECT D559		
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. Systems Engineering and Test Support	MIPR	Lincoln Labs Lexington, MA	1200	900	Jan 99	450	Jan 00	900	Jan 01	0	3450	
b. SBIR/STTR				215							215	
Subtotal Management Services:			1200	1115		450		900			3665	
Project Total Cost:			8911	8134		6009		9191			32245	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment				PROJECT D561		
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D561 Military Individual Communicator (MIC)	0	0	1008	1023	854	956	1208	1177	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> Project D561 – MIC: The Military Individual Communicator (MIC) will satisfy a critical joint warfighter requirement for limited, one-way communications capability in a hand-held configuration. The army anticipates initial market analysis and limited initial investments of RDTE will yield miniaturized technologies that can then be inexpensively procured on a large scale to satisfy joint service requirements.</p> <p>FY 1998 Accomplishments: Project not funded in FY 1998</p> <p>FY 1999 Planned Program: Project not funded in FY 1999</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 338 Conduct market survey to identify/assess industry interest and capability for development/production of MIC • 250 Conduct engineering analysis to determine feasibility of achieving miniaturization to hand-held configuration • 420 Conduct equipment demonstrations for industry participants with existing or emerging MIC capabilities <p>Total 1008</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 185 Conduct decision reviews. • 618 Award development contract for units to support initial test activities - RDTE Test Article Quantities: 20 • 220 Begin developmental test activities <p>Total 1023</p>										
B. <u>Other Program Funding Summary</u>										
	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
Other Procurement Army 2 – SSN: BC4160					4906	12311	9957	14621	Cont	Cont
Project D561										
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Exhibit R-2A (PE 0303142A)										

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment	PROJECT D561

C. Acquisition Strategy: This project funds advanced systems engineering, research, development, test and evaluation of technologies associated with the realization of one-way miniaturized communications capability in a hand-held configuration. Following initial feasibility analysis, which will include a market survey and industry equipment demonstrations, authorization to procure a limited number of end items to support test program activities will be sought. Development test activities, including interoperability demonstrations with existing SATCOM equipment, will begin in FY 2001 and continue into FY 2002. Operational Test (OT) will be conducted in FY 2003. Following a successful OT and Milestone III Decision Review, Full Rate Production will begin in FY 2003. RDTE dollars in FY 2003 and beyond will be utilized to fund engineering analysis to achieve further miniaturization and increased reliability of MIC components.

D. Schedule Profile	<u>FY 1998</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>
Initiate Market Survey			1Q					
LRIP Decision Review				1Q				
Award LRIP Contract/Option				2Q	2Q			
Begin Development Testing				4Q				
Equipment Interoperability Demos					4Q			
Limited IOTE						4Q		
FRP Decision Review						4Q		
Award FRP Contract							4Q	
Initiate Miniaturization & Reliability Upgrade Development Efforts							4Q	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment						PROJECT D561		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. MIC	C / CPFF	TBD	0	0	N/A	772	Nov 99	823	Nov 00	Cont	1595	
Subtotal Product Development:						772		823			1595	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Systems Engineering	Various	Ft Monmouth, NJ	0	0	N/A	111	Nov 99	75	Nov 00	Cont	186	
Subtotal Support Costs:						111		75			186	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Test Support	MIPR	Ft Monmouth, NJ				50	Nov 99	50	Nov 00	Cont	100	
Subtotal Test and Evaluation:						50		50			100	
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Core Support	MIPR	Ft Monmouth, NJ	0	0	N/A	75	Nov 99	75	Nov 00	Cont	150	
Subtotal Management Services:						75		75			150	
Project Total Cost:						1008		1023			2031	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150A Army Global Command and Control System (AGCCS)	PROJECT DC86
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC86 Army Global Command and Control System	14094	17339	11606	14295	14151	13227	3717	5894	9000	155310

A. Mission Description and Budget Item Justification: Project DC86 – Army Global Command and Control System (AGCCS): This project is the Army component system that directly supports the implementation of the Joint Global Command and Control System (GCCS). This support is being accomplished through the Army's Global Command and Control System (AGCCS), which is a selection of the Army's best-of-breed command and control functionality. The AGCCS-developed software systems will dramatically improve the Army's ability to analyze courses of action; develop and manage Army Forces supporting joint war plans; and ensure that the Army portions of war plans are feasible. The AGCCS will provide a layered architecture and functional best-of-breed software applications to develop a totally integrated component of the joint GCCS.

- FY 1998 Accomplishments:**
- 699 Performed Systems Engineering
 - 10324 Continued Prime Mission Software Development
 - 500 Performed Data Engineering
 - 741 Conducted Systems Test and Evaluation
 - 1830 Performed Program Support and Management Efforts
- Total 14094

- FY 1999 Planned Program:**
- 2408 Perform Systems Engineering
 - 11577 Continue Prime Mission Software Development
 - 411 Perform Data Engineering
 - 1021 Conduct Systems Test and Evaluation
 - 1559 Perform Program Support and Management Efforts
 - 363 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 17339

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150A Army Global Command and Control System (AGCCS)	PROJECT DC86

FY 2000 Planned Program:

- 5115 Continue Prime Mission Software Development
 - 2587 Perform Systems Engineering
 - 717 Perform Data Engineering
 - 1424 Conduct Systems Test and Evaluation
 - 1763 Perform Program Support and Management Efforts
- Total 11606

FY 2001 Planned Program:

- 2754 Perform Systems Engineering
 - 7009 Continue Prime Mission Software Development
 - 954 Perform Data Engineering
 - 1529 Conduct Systems Test and Evaluation
 - 2049 Perform Program Support and Management Efforts
- Total 14295

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	14581	17543	9526	14633
Appropriated Value	15045	17543		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-464	-204		
b. SBIR / STTR	-366			
c. Omnibus or Other Above Threshold Reduction	-121			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			+2080	-338
Current Budget Submit (<u>FY 2000/2001 PB</u>)	14094	17339	11606	14295

Change Summary Explanation: Funding: FY 2000 funds increased (+2080) to fund Joint/Army mandated changes to software baseline.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150A Army Global Command and Control System (AGCCS)	PROJECT DC86

C. Other Program Funding Summary	<u>FY 1998</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
Procurement OPA-2										
BA8250 Army Global Cmd & Cont Sys (AGCCS)	15079	20505	12963	8526	6289	6285	8389	30011	81000	238049

D. Acquisition Strategy: The AGCCS software integration and development effort is a multi-year incrementally funded spiral development effort. A hybrid (Cost-Plus-Award Fee and Firm-Fixed-Price) contract was awarded to Lockheed Martin Corporation (LMC) in December 1994. The contract consists of software development, software maintenance and relocation/de-installation of the test facility upon completion of the contract. PM STCCS established an Integrated Process Team (IPT) to review the status of software integration and development functional deliveries. The results of the IPT were instituted providing the users of AGCCS, mission software deliveries identified as Capability Package 1 (CP1), Deliveries one through four, and followed by required functional enhancements. CP1, which was delivered in second quarter FY 1996 and designated IOC in fourth quarter FY 1996, provided the replacement for the AWIS strategic mission support applications/software and the Army's GCCS interface to selected HQDA, and FORSCOM sites. Deliveries one through four, will provide the integration and migration of selected STACCS, TACCIMS, and CSSCS Echelons Above Corps (EAC) mission support applications/software into a common baseline. Deliveries one through four are scheduled to be delivered to ten Army sites located throughout the world. A common hardware platform will be used within the Army to implement AGCCS/GCCS. This will include products from the Army's Common Hardware/Software-2 (CHS-2) contract, which consists of Commercial Off -the-Shelf (COTS) hardware and software. The COTS hardware and software will provide computers with expanded processing, storage and communications capability, as well as office-automation and management software.

E. Schedule Profile	<u>FY 1998</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>
AGCCS Delivery 1 Complete	*1Q							
AGCCS Delivery 3 Start	*3Q							
AGCCS Delivery 2 Complete		3Q						
AGCCS Delivery 3 Complete			1Q					
Incremental Enhancements Start			2Q					
AGCCS Delivery 4 Start				2Q				
Incremental Enhancements Complete				3Q				
ORD Objective Capabilities Start				3Q				
ORD Objective Capabilities Continue				4Q	1-4Q	1-4Q	1-4Q	1-4Q
AGCCS Delivery 4 Complete					3Q			

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ARMY RDT&E COST ANALYSIS (R-3)

DATE **February 1999**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0303150A Army Global Command and Control System (AGCCS)

PROJECT
DC86

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. Lockheed-Martin Corp	HYBRID	LMC, Springfield, VA	44378	10300	1 Oct 98	1307	1 Oct 99				55985	76571
b. COE Support	MIPR	Various	1450	300		200		300		1500	3750	
c. GFE	MIPR	Various	1089	375						2150	3614	
d. TBD	TBD	TBD				5243		8913		24516	38672	
Subtotal Product Development:			46917	10975		6750		9213		28166	102021	

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. CECOM Matrix	MIPR	Various	1205	392		356		356		1511	3820	
b. Vitro/FCBS/Sytex	MIPR/Del Ord	Various	2125	264		248		248		2794	5679	
c. SAIC	MIPR/Del Ord	Various	1545	846		797		797		1848	5833	
Subtotal Support Costs:			4875	1502		1401		1401		6153	15332	

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. Government	MIPR	Various	1956	199		205		218		618	3196	
b. EPG	MIPR	Various	786								786	
c. OPTEC	MIPR	Various	202	100		100		100			502	
Subtotal Test and Evaluation:			2944	299		305		318		618	4484	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150A Army Global Command and Control System (AGCCS)	PROJECT DC86
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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. PM STCCS	N/A	Various	11345	4563		3150		3363		11052	33473	
Subtotal Management Services:			11345	4563		3150		3363		11052	33473	

Project Total Cost:			66081	17339		11606		14295		45989	155310	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305114A Joint Precision Approach Landing System (JPALS)				PROJECT D711		
<i>COST (In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D711 Joint Precision Approach Landing System (JPALS)	610	0	0	788	787	984	983	1962	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> The Joint Precision Approach Landing System (JPALS) is a precision approach and landing system providing joint operational capability for U.S. forces assigned to conventional and special operation missions operating from fixed base, ship, tactical and austere environments. The effort will develop methodology to incorporate JPALS into aircraft while considering aircraft environment, electrical power, system space, weight, antenna placement and electromagnetic compatibility without nullifying low observable capability requirements. The project in this Program Element supports research efforts in the engineering and manufacturing development phase of the acquisition strategy.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 610 Supported JPALS research and development efforts. <p>Total 610</p> <p>FY 1999 Planned Program: Project not funded in FY 1999</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"> • 788 Support JPALS research and development efforts. <p>Total 788</p>										
B. Program Change Summary										
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>						
FY99 President's Budget (Feb 98)	728	0	0	0						
Appropriated Value	750									
Adjustments to Appropriated Value										
a. Congressional General Reductions	-22									
b. SBIR / STTR	-18									
c. Omnibus or Other Above Threshold Reductions	-6									
d. Below Threshold Reprogramming	-94									
e. Rescissions										
Adjustments to Budget Years Since <u>FY 1999</u> PB					+788					
Current Budget Submit (<u>FY 2000 / 2001</u> PB)	610	0	0	788						
Project D711			Page 1 of 2 Pages				Exhibit R-2 (PE 0305114A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305114A Joint Precision Approach Landing System (JPALS)				PROJECT D711			
Change Summary Explanation: FY 2001 funds increased to support JPALS research and development efforts.											
C. <u>Other Program Funding Summary</u> : Not applicable											
D. <u>Acquisition Strategy</u> : The acquisition strategy is to support the joint research and development project leading to production of a joint system.											
E. Schedule Profile	<u>FY 1997</u>	<u>FY 1998</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 2004</u>	<u>FY 2005</u>	
Support JPALS efforts		4Q			4Q						
Project D711			<i>Page 2 of 2 Pages</i>				Exhibit R-2 (PE 0305114A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305128A Security and Intelligence Activities					PROJECT H12	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
H12 Intelligence Support to Force XXI	468	944	0	0	0	0	0	0	0	1418
<p>A. Mission Description and Budget Item Justification: This program element provides funding to develop Proof of Concepts to define fundamental capabilities and limitations of Focused Intelligence XXI technologies which supports Force XXI. Focused Intelligence addresses the functional areas of Situational Awareness, Information Management, and Predictive Analysis. This requires a comprehensive understanding of the following seven critical technologies when integrated into live, virtual or constructive environments. These critical technology areas include: displays (public, cockpit and heads-up), computer hardware capable of high-speed analytical and graphical processing, computer software for distributed tactical or simulation environments (including tools such as Knowledge Based Reasoning and Artificial Intelligence), networks which link tactical and high-speed wide area capabilities [utilizing Asynchronous Transfer Mode (ATM), Synchronous Optical Net (SONET), and multi-level security capabilities] throughout all echelons, sensors for real-time information of the battlefield throughout the electromagnetic spectrum, the Dynamic Visualization Databases for live or synthetic environment (including terrain, features, texture, images, weather, environment, entities and units as a minimum) , and the Automatic Target Recognition (ATR) and Assisted Target Recognition (AITR) for timeline reductions</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 468 Expanded Proofs of Concepts vertically to Divisions with quarterly integration tests <p>Total 468</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 919 Transition technology horizontally to Corps/Divisions continuing Proofs of Concept test with quarterly integration tests • 25 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 944</p> <p>FY 2000 Planned Program: Project not funded in FY 2000</p> <p>FY 2001 Planned Program: Project not funded in FY 2001</p>										
Project H12	Page 1 of 2 Pages					Exhibit R-2 (PE 0305128A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305128A Security and Intelligence Activities	PROJECT H12
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B. Program Change Summary	<u>FY1998</u>	<u>FY1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999 PB</u>)	484	950	942	933
Appropriated Value	500	950		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-16	-6		
b. SBIR / STTR	-12			
c. Omnibus or Other Above Threshold Reduction	-4			
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY1999 PB</u>			-942	-933
Current Budget Submit (<u>FY2000/2001 PB</u>)	468	944	0	0

Change Summary Explanation: FY 2000/2001 funds realigned to higher priority requirements.

C. Other Program Funding Summary: Not applicable

D. Acquisition Strategy: Utilize existing INSCOM and the Defense Advanced Research Project Agency contracts to obtain hardware and software integration support. Major integrated Proofs of Concepts, with U.S. Forces Korea and the 18th Airborne Corps (101st Airborne Division and 525th Military Intelligence Brigade) as the user, will occur on a quarterly basis.

E. Schedule Profile	<u>FY1997</u>	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Proofs of Concept		1-4 Q	1-4 Q						

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305204A Tactical Unmanned Aerial Vehicles	PROJECT D114
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COST (<i>In Thousands</i>)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D114 Tactical Unmanned Aerial Vehicles	0	53224	3866	4309	5274	5008	0	0	0	71846

A. Mission Description and Budget Item Justification: The Tactical Unmanned Aerial Vehicle (TUAV), provides Army brigades/battalions with dedicated day/night, reconnaissance, surveillance and target acquisition (RSTA) and intelligence. TUAV provides the tactical warfighting commander with critical battlefield information in the rapid cycle time required for success at the tactical level. The TUAV system consists of multiple air vehicles, each configured with an electro-optic (EO)/infrared (IR) sensor payload, ground control equipment, including communications equipment, and launch and recovery equipment, remote video terminal, Highly Mobile Multi Wheeled Vehicles and a trailer(s), and one mobile maintenance facility capable of supporting up to three TUAV systems. This TUAV development effort provides for the placement of systems in the hands of the operational users as quickly as possible for use in demonstrations/Initial Operational Test & Evaluation (IOT&E) and provides for the spiral development of TUAV system improvements.

FY 1998 Accomplishments: FY 1998 Program was funded under Program Element 0603003A, Project D464.

FY 1999 Planned Program:

- 13800 Award Contract for quantity of 4 each Low Rate Initial Production (LRIP) Systems, Logistics Support, Training and Engineering Services.
 - 4500 Development of 2 each Prototype Army Ground Control Stations
 - 300 Heavy Fuel Engine Demonstration/Testing
 - 350 Army Apache/UAV Interoperability Demonstration
 - 12406 Outrider Advance Concept Technology Demonstration (ACTD) Bridge Contract
 - 1000 Tactical Common Data Link Integration
 - 11836 Outrider Residuals
 - 3100 Hunter Residuals (Joint Requirements Training Center non-recurring)
 - 4200 Program Management support
 - 1732 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 53224

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305204A Tactical Unmanned Aerial Vehicles	PROJECT D114
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FY 2000 Planned Program:

- 2866 Partially fund completion of Low Rate Initial Production (LRIP) contract
- 1000 Tactical Common Data Link Test and Demonstration
 - Outrider Residuals
 - Program Management Support
 - Initial Operational Test & Evaluation (IOT&E)
 - Engineering Development required through IOT&E

Total 3866

FY 2001 Planned Program:

- 4309 Partially fund IOT&E
 - Program Management support
 - Engineering Development support required through IOT&E.
 - Unmanned Aerial Vehicle Payloads

Total 4309

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	0	75636	4000	4476
Appropriated Value		53636		
Adjustments to Appropriated Value				
a. Congressional General Reductions		-412		
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reduction				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			-134	-167
Current Budget Submit (FY 2000/2001 PB)	0	53224	3866	4309

Change Summary Explanation: Congressional language reduced the FY 1999 PB by \$22M due to the elimination of the maritime requirements from the Outrider Advanced Concept Technology Demonstration program.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305204A Tactical Unmanned Aerial Vehicles	PROJECT D114
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C. Other Program Funding Summary	<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
6.3 RDTE 0603003A, Outrider UAV (D464)	42156	0	0	0	0	0	0	0	0	42156
Procurement Defense-Wide/TUAV/Outrider (BA0330)	0	0	45863	61062	71586	53952	56894	52873	0	350023

D. Acquisition Strategy: The Army plans to hold a full and open competition to meet the Army's Close Range requirement. Joint Requirements Oversight Council (JROC) approval of a revised Army's Operational Requirements Document (ORD) is anticipated by the end of February 1999 with a decision to immediately follow from the Office of the Secretary of Defense (OSD) Management Decision Authority on whether to proceed with the Advanced Concept Technology Demonstration contractor or compete. Upon approval of the revised Army only ORD, a Request for Proposal will be issued which will result in System Capabilities Demonstrations from several contractors each with a Fixed Price Incentive Fee option for Low Rate Initial Production (LRIP) Systems, a full rate production option and various support options. The results from these demonstrations in conjunction with proposal evaluations will result in the competitive down select to the award of an LRIP option. In the event OSD decides to proceed with the Outrider contractor, a new solicitation and contract award will need to be negotiated on a non-competitive basis.

E. Schedule Profile	<u>FY 1998</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>
Complete TUAV ACTD Development Contract	3Q							
Complete Military User Assessment (MUA)	3Q							
Defense Acquisition Board meeting to decide post ACTD Program Strategy		2Q						
Conduct System Capabilities Demonstration		3Q						
Milestone II / LRIP Decision		3Q						
Award LRIP Contract		4Q						
Outrider Fielding to National Training Center		4Q						
LRIP System Delivery			4Q					
IOT&E Preparation and IOT&E			2Q-4Q	1Q-2Q				
Milestone III / Production Decision				3Q				
Award Full Rate Production Option				3Q				
TUAV First Unit Equipped with LRIP systems				3Q				

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305204A Tactical Unmanned Aerial Vehicles					PROJECT D114		
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. Hardware	Comp / FPIF	To Be Selected		4190	4Q	2866	2Q			Continue	7056	
b. Engineering Dev	Comp / FPIF	To Be Selected		3800	3Q					Continue	3800	
c. Army Ground Control Station	Comp / FPIF	To Be Selected		4500	1Q					Continue	4500	
d. TCDL	Comp / FPIF	To Be Selected		1000	3Q	1000	1Q			Continue	2000	
e. UAV Payloads	Comp / FPIF	To Be Selected		0								
f. Heavy Fuel Engine	Comp / FPIF	To Be Selected		300	3Q					Continue	300	
g. Army Apache/UAV Interoperability Demo	Comp / FPIF	To Be Selected		350	3Q					Continue	350	
h. SSEB/Flyoff	Comp / FPIF	To Be Selected		4000	3Q					Continue	4000	
i. Spiral Development	Comp / CPFF	To Be Selected								Continue		
j. Outrider ACTD Bridge	SS / FPIF	Alliant Techsystems Hopkins, MN		12406	1Q					Continue	12406	
k. Outrider Residuals	SS / FPIF	Alliant Techsystems Hopkins, MN		11836	2Q					Continue	11836	
l. Hunter Residuals	SS / FPIF	TRW Sierra Vista, AZ		3100	2Q					Continue	3100	
m. SBIR/STTR				1732							1732	
Subtotal Product Development:				47214		3866					51080	
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. Contractor Engr Support	CPFF	Various AMCOM Contractors/Locations		1320	1Q					Continue	1320	
b. Government Engr Spt	MIPR	AMCOM Redstone		1240	1Q					Continue	1240	
c. GFE	Reqn	Depot/PM To Be Determined		1810	1Q					Continue	1810	
Subtotal Support Costs:				4370							4370	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305204A Tactical Unmanned Aerial Vehicles					PROJECT D114		
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. IOT&E	MIPR	OPTEC						4309	2Q	Continue	4309	
b. Limited User/Op Test	MIPR	Various								Continue		
Subtotal Test and Evaluation:								4309			4309	
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 Mgt Personnel		PM UAV Redstone		1640	1Q					Continue	1640	
Subtotal Management Services:				1640							1640	
Project Total Cost:				53224		3866		4309			61399	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305206A Tactical Reconnaissance Sensors				PROJECT DK98		
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
DK98 Tactical Reconnaissance Sensors	0	7451	4932	4928	6891	4920	4883	5255	0	0
<p>A. Mission Description and Budget Item Justification: This project continues development of advanced tactical reconnaissance and surveillance sensor technologies that were devolved from the Defense Airborne Reconnaissance Office. Hyperspectral, multi-spectral, interferometric synthetic aperture radar sensors, advanced target and image exploitation software will be developed for imaging intelligence (IMINT) and measurement and signature intelligence(MASINT) applications. The adaptive spectral reconnaissance program (ASRP) is a joint DARPA/Army effort funded in this project. ASRP develops the next generation, airborne day/night hyperspectral reconnaissance sensor for the detection and identification of camouflaged and concealed targets in all terrain environments. The Interferometric Synthetic Aperture Radar (IFSAR) Program is executed out of the Joint Precision Strike Demonstration Project Office (JPSD PO). IFSAR provides the capability to rapidly generate three dimensional (3-D) high resolution Digital Terrain Elevation Data (DTED III-V).</p> <p>FY 1998 Accomplishments: Project funded in DoD PE 035206D.</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 3451 Develop a compact Long Wave Infrared (LWIR) Hyperspectral Sensor (HSS) system, and full Adaptive Spectral Reconnaissance Sensor System designs for manned and unmanned reconnaissance platforms. Integrate advanced spectral detection software processing techniques and a real time algorithm processor for airborne applications. Conduct data collection activities of various terrain and environmental backgrounds. Conduct real time tests of algorithm processed hyperspectral imaging (HSI) data to cue high resolution imagery of tactical targets. • 3803 Complete development of near-real time IFSAR system and begin integration and flight testing on reconnaissance aircraft. Demonstrate initial high resolution spotlight, stripmap, and IFSAR functionality. • 197 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 7451</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4000 – Complete design of LWIR HSS system and integrate on airborne hyperspectral testbed aircraft. – Develop and integrate multiple algorithm fusion processing techniques of the advanced spectral detection software. – Conduct ASRP data collection activities of various terrain and environmental backgrounds. Conduct real time tests of fusion algorithm processed hyperspectral imaging (HSI) data. • 932 – Demonstrate near real time DTED III-V capability. – Demonstrate very fine resolution geographically accurate IFSAR imagery for 3-D earth-centered targeting. <p>Total 4932</p>										
Project DK98			Page 1 of 2 Pages				Exhibit R-2 (PE 0305206A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305206A Tactical Reconnaissance Sensors	PROJECT DK98
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FY 2001 Planned Program:

- 1928 Complete development and test of the LWIR HSS system and complete integration and tests on the airborne hyperspectral testbed aircraft. Demonstrate LWIR HSS on manned reconnaissance aircraft.
 - 3000 Conduct demonstrations, measure performance, and complete evaluation of military utility with XVIII Airborne and III Corps. Support Warfighter experiments with data collections of IFSAR over prioritized areas of interest.
- Total 4928

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 1999</u> PB)	0	0	0	0
Appropriated Value		7500		
Adjustments to Appropriated Value				
a. Congressional General Reductions		-49		
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999</u> PB			+4932	+4928
Current Budget Submit (<u>FY 2000 / 2001</u> PB)	0	7451	4932	4928

Change Summary Explanation: Program transferred from DoD PE 035206D into Army PE

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305208A Common Imagery Ground/Surface System (CIG/SS)					PROJECT D956	
<i>COST (In Thousands)</i>	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
D956 Common Imagery Ground/Surface System	0	8853	8066	7943	8276	8360	8525	8767	Continuing	Continuing
<p>A. <u>Mission Description and Budget Item Justification:</u> This project supports the engineering development and acquisition of Army Common Imagery Ground/Surface Systems (CIG/SS). The objective of CIG/SS is to enable all systems to receive, process, exploit, and report any imagery source regardless of platform or sensor type to meet the intelligence and targeting needs of tactical commanders. The CIG/SS project provides the warfighter with an integrated and interoperable airborne reconnaissance imagery processing and exploitation capability that can be tailored for all levels of conflict. This project incorporates Army funds divested from Defense Airborne Reconnaissance Office for the Enhanced Tactical Radar Correlator (ETRAC) Modernized Imagery Exploitation System (MIES), and the imagery portion of the Tactical Exploitation System (TES). MIES receives and exploits imagery from national and theater sources and provides intelligence reports and exploited imagery products to the field commander. ETRAC is a C-130 drive on/off capable system that receives Synthetic Aperture Radar (SAR) data inputs from various platforms, converts the SAR data to exploitable images, and is capable of stand-alone operations. ETRAC and MIES functionality are combined in the Tactical Exploitation System (TES) to be fielded beginning in FY00. Specific details are provided in the Joint Military Intelligence Programs Congressional Budget Justification Book, Vol. II.</p> <p>FY 1998 Accomplishments: Project not funded in FY 1998.</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 6828 Continue CIG/SS elements sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (ETRAC and MIES). • 1791 Continue CIG/SS elements development engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (TES). • 234 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs <p>Total 8853</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 3754 Continue CIG/SS elements sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (ETRAC and MIES). • 4312 Continue CIG/SS elements development engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (TES). <p>Total 8066</p>										
Project D956			Page 1 of 4 Pages				Exhibit R-2 (PE 0305208A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208A Common Imagery Ground/Surface System (CIG/SS)	PROJECT D956
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FY 2001 Planned Program:

- 2433 Continue CIG/SS elements sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (ETRAC and MIES).
 - 5510 Continue CIG/SS elements development engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (TES).
- Total 7943

B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	0	0	0	0
Appropriated Value		8912		
Adjustments to Appropriated Value				
a. Congressional General Reductions		-59		
b. SBIR / STTR				
c. Omnibus or Other Above Threshold Reductions				
d. Below Threshold Reprogramming				
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB			+ 8066	+7943
Current Budget Submit (FY 2000 / 2001 PB)	0	8853	8066	7943

Change Summary Explanation: Funded under PE 0305208D in previous President's Budget.

C. Other Program Funding Summary	<u>FY 1998</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</u> <u>Compl</u>	<u>Total</u> <u>Cost</u>
RDTE, A Budget Activity 4										
PE 0603766A	18957									
RDTE, A Budget Activity 5										
PE 0604766A	17221	43950	70940	57008	88953	71418	65472	61538	Cont	Cont
RDTE, D Budget Activity 7										
PE 0305208D Project PD8Z DARP	29062									
Other Procurement Army, OPA-2										
BZ7315 TENCAP	1618	6073	4370	12946	13876	15713	3897	2943	Cont	Cont
BZ7316 CIG/SS		2501	2791	2853	2624	2637	2683	2751	Cont	Cont

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0305208A Common Imagery Ground/Surface System (CIG/SS)				PROJECT D956			
C. Other Program Funding Summary		<u>FY 1998</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 <u>Compl</u>	Total <u>Cost</u>
Procurement, Defense Wide											
PE 0305208D Project PD8Z DARP		91824									
<p>D. Acquisition Strategy: As pioneers in streamlined acquisition, ASPO's success in delivering systems as those described above to warfighters can be directly attributed to an environment emphasizing stable funding, low density acquisition, minimal use of MILSPECS, and managed competition. By tailoring existing technology, leveraging the best commercial practices and using commercial and government-off the shelf software, ASPO minimizes risk while maximizing efficiency. Finally, dedicated cradle to grave Integrated Logistics Support (ILS) for TENCAP systems is accomplished through a coordinated effort by Government and contractor personnel and facilities.</p>											
E. Schedule Profile		<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>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Defield MIES						4 th QTR -	4 th QTR				
Defield ETRAC					4 th QTR	----->	4 th QTR				
Field TES *						3 rd QTR	4 th QTR	4 th QTR		4 th QTR	4 th QTR
Integrate DCGS Standards into TES							2 nd QTR	----->	----->		
<p>* Majority of TES development is funded under PE 0604766A.</p>											

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0305208A Common Imagery Ground/Surface System (CIG/SS)					PROJECT D956		
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. ETRAC CIG/SS	C/CPAF	Classified		5385		2094	1/00	773	12/00	Cont	8252	
b. MIES CIG/SS	SS/CPFF	TEC, Alex, VA		1677		1660	3/00	1660	2/01	Cont	4997	
c. TES CIG/SS	C/CPFF	Classified		1791		4312	11/98	5510	11/00	Cont	11613	
Subtotal Product Development:				8853		8066		7943			24862	
II. Support Costs: Not applicable												
III. Test and Evaluation: Not applicable												
IV. Management Services: Not applicable												
Project Total Cost:						8853		8066		7943		24862

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	33022	25159	36540	58591	39053	22574	9578	84350	92742	450499
D027 MLRS ILMS	20085	0	0	0	0	0	0	0	0	68975
D090 MLRS HIMARS	0	4966	6017	37094	24042	22082	0	31000	0	125201
D093 MLRS Joint Technical Architecture-Army	122	2409	2161	0	0	0	0	0	0	4692
D783 MLRS Smart Tactical Rocket	0	0	0	0	0	0	9578	53350	92742	155670
D784 Guided MLRS	12815	17784	28362	21497	15011	492	0	0	0	95961

A. Mission Description and Budget Item Justification: Expanding regional power threats require an evolutionary improvement program to maintain the effects of the Multiple Launch Rocket System (MLRS). This Product Improvement Program (PIP) provides for the Engineering and Manufacturing Development (EMD) of an Improved Fire Control System (IFCS), Improved Launcher Mechanical System (ILMS), Guided MLRS Rocket (GMLRS), Joint Technical Architecture-Army (JTA-A), High Mobility Artillery Rocket System (HIMARS), and MLRS Smart Tactical Rocket (MSTAR). The IFCS corrects present and future supportability problems resulting from electronic component obsolescence in the existing design. The ILMS, by decreasing the stow to aim point timeline, will increase responsiveness, improve survivability, and enhance effectiveness in countering surface to surface missile fire. A multinational GMLRS program will greatly enhance the capability of the existing MLRS by providing greater range and significantly enhanced accuracy and interoperability among the nations signing the MLRS Memorandum of Understanding (MOU). The improvement in accuracy and range will reduce the number of rockets required to defeat targets, thus dramatically reducing the logistics burden, and will increase crew survivability. The JTA-A will implement dual protocol capability and Force XXI Situational Awareness in M270A1 launchers and trainers. HIMARS will allow MLRS capability to be C-130 transportable by mounting one rocket or missile pod on a 5-ton truck. It gives early entry forces immediate fire support within a hot landing zone without waiting for heavy-lift aircraft. The MSTAR will be a guided MLRS rocket carrying terminally guided smart submunitions that will detect, classify, and engage stationary or moving high-valued targets.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	36171	20244	25148	40032
Appropriated Value	37678	25244		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-1507	-85		
b. SBIR / STTR	-907			
c. Omnibus or Other Above Threshold Reductions	-300			
d. Below Threshold Reprogramming	-1942			
e. Rescissions				
Adjustments to Budget Years Since <u>FY 1999 PB</u>			+11392	+18559
Current Budget Submit (FY 2000/ 2001 PB)	33022	25159	36540	58591

Change Summary Explanation: FY 2000/FY 2001 – Accelerate HIMARS development (FY 00 +3275/FY 01 +23577); GMLRS increased to accommodate Multinational performance requirements (FY 00 +7999/FY 01 -3376); JTA-A increase (FY 00 +118/FY 2001 - JTA-A funding was decreased to fund higher priority requirements -1642).

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program	PROJECT D090
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D090 MLRS HIMARS	0	4966	6017	37094	24042	22082	0	31000	0	125201

A. Mission Description and Budget Item Justification: The High Mobility Artillery Rocket System (HIMARS) project provides for the maturation phase of the HIMARS launcher. HIMARS will be a C-130 transportable, wheeled version of the MLRS launcher and will be capable of firing all rockets and missiles in the current and future Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM). The HIMARS will provide tactical and operational fires during both offensive and defensive operations. The HIMARS will be a part of a "system of systems" including the launcher and a resupply vehicle. The HIMARS will consist of the MLRS Improved Fire Control System (IFCS), a wheeled carrier, an on-board reload capability, and a Launcher Loader Module (LLM) portion similar to the M270A1 that will perform all operations necessary to complete a fire mission. The HIMARS will be deployable worldwide and will operate in a wide range of climatic conditions. HIMARS units will functionally/ operationally mirror current MLRS units and will be assigned to Corps field artillery brigades in support of light, airborne, air assault Divisions and forced/early entry contingency force operations.

FY 1998 Accomplishments: Project not funded in FY98

FY 1999 Planned Program:

- 2000 Risk Reduction Tasks including Reloader/Hydraulic Robustness/Reliability Efforts
- 710 Component Relocation/Cab Improvements
- 500 Technical Assessments/Evaluations, Simulation Support
- 645 Development Testing
- 980 Minor Tasks Including In-House
- 131 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
- Total 4966

FY 2000 Planned Program:

- 2500 System Design
- 2000 Government Furnished Equipment (GFE), Communication & Trucks
- 400 Maturation Preparation: Milestone Documentation, Technical Assessments
- 200 Development Testing
- 917 Minor Tasks Including In-House

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program	PROJECT D090
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Total 6017

FY 2001 Planned Program:

- 19654 System Design, Test & Integration
 - 12200 GFE, Communication & Trucks
 - 3840 Development Testing
 - 100 Technical Assessments
 - 1300 Minor Tasks Including In-House
- Total 37094

B. Other Program Funding Summary	<u>FY 1998</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
Missile Procurement, Army										
Budget Activity 2:										
HIMARS Launcher (C03000)	0	0	0	0	0	29969	71573	129234	1199150	1429926
Budget Activity 4:										
Initial Spares, HIMARS (CA0288)	0	0	0	0	0	0	0	769	60200	60969

C. Acquisition Strategy: HIMARS is expected to be designated an ACAT II program with the Maturation phase beginning in FY00 with the First Unit Equipped (FUE) planned for FY06. The contracting strategy (sole source, competition, etc.) has not been determined at this time.

D. Schedule Profile	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>
Risk Reduction Contract Award		2QTR						
Maturation IPR, Maturation 42 Months, Contract Award			3QTR					
Critical Design Review (CDR)				1QTR				
8 Launchers, Integrated Developmental Test/Operational Test (DT/OT)					1QTR			
LRIP IPR						2QTR		
1 Btry Prototypes & Maturation, MS III							4QTR	

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program					PROJECT D090		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Risk Reduction/Maturation Contract	TBD	TBD		2000	2 nd QTR	2500	3 rd QTR	19654	1 st QTR	34506	58660	
b. Component Relocation/Cab Improvements	TBD	TBD		716	2 nd QTR						716	
c. GFE,Comm & Trucks	TBD	TBD				2000	3 rd QTR	12200	1 st QTR		14200	
Subtotal Product Development:				2716		4500		31854		34506	73576	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Support Contract	C & CPFF	Madison Research Hsv AL		500	2 nd QTR	400	1QTR	100	1 st QTR	838	1838	
Subtotal Support Costs:				500		400		100		838	1838	
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Test Support	N/A	APG MD*, WSMR NM* & RTTC RSA*		645	As Req.	200	As Req.	3840	As Req.	10145	14830	
Subtotal Test and Evaluation:				645		200		3840		10145	14830	
Remark: *APG MD – Aberdeen Proving Ground, Maryland *WSMR NM – White Sands Missile Range, New Mexico *RTTC RSA – Redstone Technical Test Center, Redstone Arsenal												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 1999 Cost</u>	<u>FY 1999 Award Date</u>	<u>FY 2000 Cost</u>	<u>FY 2000 Award Date</u>	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. In-House Support	N/A	MLRS Proj Ofc , RSA		1105		917	QTRLY	1300	QTRLY	31635	34957	

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ARMY RDT&E COST ANALYSIS (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program				PROJECT D090			
Subtotal Mgmt Services:				1105		917		1300		31635	34957
		Total PYs Cost	<u>FY 1999</u> Cost		<u>FY 2000</u> Cost		<u>FY 2001</u> Cost		Cost To Complete	Total Cost	Target Value of Contract
Project Total Cost:			4966		6017		37094		77124	125201	
Project D090			Page 6 of 13 Pages			Exhibit R-3 (PE 0603778A)					

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program					PROJECT D093	
COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D093 MLRS Joint Technical Architecture-Army	122	2409	2161	0	0	0	0	0	0	4692
<p>A. <u>Mission Description and Budget Item Justification:</u> The MLRS Joint Technical Architecture - Army (JTA-A) will integrate the Force XXI/JTA-A mandated 188-220 protocol and convert existing MLRS fire support messages to Variable Message Format (VMF) for M270A1 launchers. JTA-A hardware and software development effort will implement Force XXI, First Digitized Division, message processing capability for M270A1 launchers.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 122 Conducted Minor Tasks Including In-House <p>Total 122</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1970 Develop VMF and Dual Protocol Logic Software • 90 Development Testing • 285 Minor Tasks Including In-House • 64 SBIR/STTR <p>Total 2409</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 1533 Develop Engineering Design Test (EDT) Units • 372 Development Testing • 256 Minor Tasks Including In-House <p>Total 2161</p> <p>FY 2001 Planned Program: Project not funded in FY 2001</p>										
Project D093			<i>Page 7 of 13 Pages</i>				Exhibit R-2A (PE 0603778A)			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program
PROJECT D093	

B. <u>Other Program Funding Summary</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>To Complete</u>	<u>Total Cost</u>
Missile Procurement, Army										
Budget Activity 2:										
MLRS Launcher (C65900)	123708	120143	146627	222211	193728	208966	171047	232006	666228	4172858
Budget Activity 3:										
MLRS Mods(C67500)	556	2186	6654	16664	6316	61333	6177	17649	181100	535502
Budget Activity 4:										
MLRS Initial Spares (CA0257)	291	6840	6257	10325	12396	13206	13691	14060	72100	307535
MLRS Mod Spares (CA0265)	0	620	479	843	866	5782	1379	5995	47480	78024

C. Acquisition Strategy: The JTA-A standards will be implemented for the M270A1 launcher to perform the Force XXI capabilities for the First Digitized Division.

D. <u>Schedule Profile</u>	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>
Industry Search, Cost/ Performance Trades	2QTR							
Prototype Hardware, Sys Integration & Test		3QTR						
Production Decision, Multi-year Procurement (MYP) Award			3QTR					
Deliveries: M270A1			4QTR					

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ARMY RDT&E COST ANALYSIS (R-3)										DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program						PROJECT D093		
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	SS & CPIF	LMVS Dallas, TX	0	1970	1 st QTR	1533	1 st QTR				3503	
Subtotal Product Development:				1970		1533					3503	
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. Support Contract	C & CPFF	Madison Research, Hsv AL		62	1 st QTR	55	1 st QTR				117	
Subtotal Support Costs:				62		55					117	
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 Support	N/A	WSMR & TBD		154	As Req.	372	As Req.				526	
Subtotal Test and Evaluation:				154		372					526	
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. In-House Support	N/A	MLRS Proj Ofc, RSA	122	223	QTRLY	201	QTRLY				546	
Subtotal Mgmt Services:			122	223		201					546	
Project Total Cost:			122	2409		2161					4692	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program					PROJECT D784	
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D784 Guided MLRS	12815	17784	28362	21497	15011	492	0	0	0	95961
<p>A. <u>Mission Description and Budget Item Justification:</u> The Guided Multiple Launch Rocket System (GMLRS) project provides for US participation in a Multinational Engineering and Manufacturing Development (EMD) of a GMLRS that will greatly enhance the capability of the existing MLRS by providing greater range and significantly enhanced accuracy. Since fewer rockets are required to defeat a target, the logistics burden also will be reduced. The GMLRS will result in reduced mission times and increased survivability of the system.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 10933 Conducted Simulation Development, Define and Design Code Software, System Trade Studies • 672 Prepared Milestone II Documentation • 270 Conducted Development Testing • 940 Conducted Minor Tasks Including In-House <p>Total 12815</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 15250 Assembly of Components, Components Lab Testing and Static Tests • 480 Develop Management Data Base, Technical Assessments/Evaluations, Simulation Support, and Preparation for Preliminary Design Review (PDR) and Critical Design Review (CDR) • 1001 Development Testing • 1053 Minor Tasks Including In-House <p>Total 17784</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 24510 EDT Flight Tests, Production Qualification Testing (PQT) Ground Tests, Hardware Assembly and Integration • 268 Continue Technical Assessments/Evaluations and Simulation Support • 2439 Development Testing • 1145 Minor Tasks Including In-House <p>Total 28362</p>										
Project D784			Page 10 of 13 Pages				Exhibit R-2A (PE 0603778A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program	PROJECT D784
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FY 2001 Planned Program:

- 15087 PQT Ground and Flight Tests, Hardware Assembly and Prove-out, Test Results Analysis
 - 440 Preparation of LRIP IPR Documentation
 - 4825 Development Testing
 - 1145 Minor Task Including In-House
- Total 21497

B. Other Program Funding Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	<u>To Complete</u>	<u>Total Cost</u>
Missile Procurement, Army										
Budget Activity 2:										
ER-MLRS (C65402)	19197	0	3338	9511	40908	63005	65738	98123	3094999	3484744

C. Acquisition Strategy: The GMLRS acquisition strategy is a streamlined product improvement program which permits entering Low Rate Initial Production (LRIP) (funded with Missile Procurement) and subsequent Full-Scale Production, after completion of a 48-month EMD program. The primary objective of the EMD phase is to develop a rocket with greater range and significantly enhanced accuracy with a minimum impact on existing MLRS companion hardware and software. This effort will incorporate the results of other development efforts for a modified submunition and a new rocket motor for increased range. The acquisition alternative most advantageous to the government is a sole source EMD contract to the system prime contractor, Lockheed Martin Vought Systems (LMVS), with maximum competition of non-developmental items (NDI) components at the vendor-level.

D. Schedule Profile	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>
Advanced Technology Development Flt Test, MS II, EMD Contract, Sys Design	2-4QTR							
Harmonized Req Rev/Prioritization,PDR		1QTR						
EDT Grd & Flt Test, CDR			1-4QTR					
PQT Grd Test, Facilitization IPR, PQT Flt Test, Interim Product Definition Data Package, LRIP IPR				1-4QTR				
LRIP I Option, Gov Functional Configuration Audit (FCA), Final PDDP					1-4QTR			

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)							DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program			PROJECT D784	
D. Schedule Profile	<u>FY1998</u>	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>
LRIP II Option, Production Validation Test (PVT) Grd & Flt Test, 1 st LRIP Rkt Del, Initial Operational Test (IOT) Grd & Flt Test						1-3QTR		
MS III, FRP Contract, Initial Operational Capability (IOC)							1-4QTR	

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ARMY RDT&E COST ANALYSIS (R-3)

DATE **February 1999**

BUDGET ACTIVITY
7 - Operational System Development

PE NUMBER AND TITLE
0603778A Multiple Launch Rocket System Product Improvement Program

PROJECT
D784

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	SS & CPAF	LMVS Dallas, TX	8500	13213	QTRLY	21413	QTRLY	12292	QTRLY	5131	60549	
b. Government Support	N/A	RDEC*, IMMC*, RSA*	2433	2037	QTRLY	3097	QTRLY	2795	QTRLY	3003	13365	
Subtotal Product Development:			10933	15250		24510		15087		8134	73914	

Remarks: *RDEC – Research, Development and Engineering Centers
*IMMC – Integrated Materiel Management Center
*RSA – Redstone Arsenal

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. Support Contract	C & CPFF	Madison Research, Hsv, AL	672	480	2nd QTR	268	1 st QTR	440	1 st QTR	768	2628	
Subtotal Support Costs:			672	480		268		440		768	2628	

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 Support	N/A	WSMR & TBD	270	1001	As Req	2439	As Req	4825	As Req	5456	13991	
Subtotal Test and Evaluation:			270	1001		2439		4825		5456	13991	

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. In-House Support	N/A	MLRS Proj Ofc, RSA	940	1053	QTRLY	1145	QTRLY	1145	QTRL	1145	5428	
Subtotal Mgmt Services:			940	1053		1145		1145		1145	5428	

Project Total Cost:			12815	17784		28362		21497		15503	95961	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology						
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	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	60044	52501	66167	66306	67254	70511	68834	70595	Continuing	Continuing
DE25 Manufacturing Science & Technology (ManTech)	30711	36607	14895	15491	17075	20716	23039	23866	Continuing	Continuing
DE26 Weapon Systems Modernization Software Maintenance	29333	0	0	0	0	0	0	0	0	29333
DE27 Reliability, Maintainability and Sustainability (RM&S)	0	10927	15754	15401	14957	14602	14902	15205	Continuing	Continuing
DE31 National Defense Center for Environmental Excellence (NDCEE)	0	4967	4932	4927	4922	4920	0	0	0	24668
DE32 Commercial Operations and Support Savings Initiative (COSSI)	0	0	30586	30487	30300	30273	30893	31524	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program element comprises five projects: Manufacturing Technology (ManTech); Weapon Systems Modernization Software Maintenance; Reliability, Maintainability and Sustainability (RM&S); the National Defense Center for Environmental Excellence (NDCEE); and Commercial Operations and Support Savings Initiative (COSSI). The goal of the Army ManTech program is to provide essential manufacturing technologies that will enable affordable production and sustainment of future weapon systems. Objectives include development of advanced manufacturing processes, equipment and systems; enhancement in quality while achieving reduction in cost of Army materiel; and transferring improved manufacturing technologies to the industrial base. The ManTech program is especially important in the current environment because of the large decline in weapon system production investments. Most manufacturing technology was formerly accomplished within individual production programs. Projects selected to be funded under this program have the potential for high payoff across the spectrum of Army weapon systems as well as significant impact on national manufacturing issues and the U.S. industrial base. The Weapon Systems Modernization Software Maintenance project provides funding for modernization programs in which post-production embedded weapon system software must be upgraded and/or enhanced, as well as life cycle software engineering in the areas of tactical and satellite communications, intelligence and electronic warfare (IEW), avionics command and control (C2), fire support (FS), maneuver control (MC), and tactical fusion (TF). The Reliability, Maintainability and Sustainability (RM&S) program funds projects that reduce cost through reliability, maintainability or other improvements to fielded weapons systems and/or major end items. RM&S was funded in fiscal year 1997 under the Other Procurement, Army appropriation. Funding was eliminated by Congress in fiscal year 1998 because projects appeared to be research and development rather than depot maintenance. For fiscal year 1999 and out-years, funding is transferred to this PE. The National Defense Center for Environmental Excellence (NDCEE) is a Congressionally directed

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 1999																																																							
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology																																																								
<p>project which has the mission to demonstrate and export new environmentally-acceptable technology to the industrial base; train the industrial base on the use of the new technology;</p> <p>perform research and development, where necessary, to mature a new technology prior to demonstrating and exporting the new technology to the industrial base; and assist DoD in technology transfer. The Center's goal is to resolve the environmental technology and management requirements of the DoD community and commercial industrial base. The commercial operations and support savings initiative (COSSI) will be funded under this program element beginning in FY 2000. The mission of the COSSI program is to reduce operations and support costs by developing, testing, and implementing a method to insert commercial items into fielded military systems on a routine and expedited basis.</p>																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">B. Program Change Summary</th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget (FY 1999 PB)</td> <td style="text-align: center;">64278</td> <td style="text-align: center;">30511</td> <td style="text-align: center;">31487</td> <td style="text-align: center;">31759</td> </tr> <tr> <td>Appropriated Value</td> <td style="text-align: center;">66326</td> <td style="text-align: center;">52861</td> <td></td> <td></td> </tr> <tr> <td>Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>a. Congressional General Reductions</td> <td style="text-align: center;">-2048</td> <td style="text-align: center;">-360</td> <td></td> <td></td> </tr> <tr> <td>b. SBIR / STTR</td> <td style="text-align: center;">-1611</td> <td></td> <td></td> <td></td> </tr> <tr> <td>c. Omnibus or Other Above Threshold Reductions</td> <td style="text-align: center;">-532</td> <td></td> <td></td> <td></td> </tr> <tr> <td>d. Below Threshold Reprogramming</td> <td style="text-align: center;">-2091</td> <td></td> <td></td> <td></td> </tr> <tr> <td>e. Rescissions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Adjustments to Budget Years Since <u>FY 1999 PB</u></td> <td></td> <td></td> <td style="text-align: center;">+34680</td> <td style="text-align: center;">+34547</td> </tr> <tr> <td>Current Budget Submit (FY 2000 / 2001 PB)</td> <td style="text-align: center;">60044</td> <td style="text-align: center;">52501</td> <td style="text-align: center;">66167</td> <td style="text-align: center;">66306</td> </tr> </tbody> </table>			B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	Previous President's Budget (FY 1999 PB)	64278	30511	31487	31759	Appropriated Value	66326	52861			Adjustments to Appropriated Value					a. Congressional General Reductions	-2048	-360			b. SBIR / STTR	-1611				c. Omnibus or Other Above Threshold Reductions	-532				d. Below Threshold Reprogramming	-2091				e. Rescissions					Adjustments to Budget Years Since <u>FY 1999 PB</u>			+34680	+34547	Current Budget Submit (FY 2000 / 2001 PB)	60044	52501	66167	66306
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<p>Change Summary Explanation: Appropriated value in FY 1999 reflects Congressional add (+22350). RM&S and NDCEE were transferred to PE 0708045A from other Army accounts starting in FY1999. Also, COSSI was transferred from PE 0604824A to PE 0708045A starting in FY2000. The cumulative transfer effect of these three programs accounts for most of the change in FY2000 and FY2001.</p>																																																									

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology				PROJECT DE25		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE25 Manufacturing Science & Technology (ManTech)	30711	36607	14895	15491	17075	20716	23039	23866	Continuing	Continuing

A. Mission Description and Justification: The goal of the Army Manufacturing Science & Technology (ManTech) Program is to provide essential manufacturing technologies that will enable the affordable production and sustainment of future weapon systems. Objectives include development of advanced manufacturing processes, equipment and systems; enhancement in quality while achieving reduction in cost of Army materiel; and transferring improved manufacturing technologies to the industrial base. The ManTech program is especially important in the current environment because of the large decline in weapon system production investments since most manufacturing technology was formerly accomplished within individual production programs. Projects selected to be funded under this program have the potential for high payoff across the spectrum of Army weapon systems as well as significant impact on national manufacturing issues and the U.S. industrial base.

FY 1998 Accomplishments:

- 1000 Initiated the first phase of a five year major effort to develop manufacturing technologies required for cooled and uncooled infrared staring sensors by developing processes for uncooled 288x384 focal plane arrays. .
- 125 Ground Vehicles: A Titanium welded box design was tested against ballistic threats at ARL Weapon Technology Directorate at Aberdeen Proving Grounds. This test quantified weld failure mechanisms for thick section titanium welds.
- 3910 Air Vehicles: For the Instrumented Factory for Gears, continued development of improved heat treatment processing, conducted final demonstration of prediction and control of heat treatment distortion of gears, demonstrated automated deburring of spiral bevel gears and demonstrated digital optical-based inspection system for gears; continued development and demonstration of improved airframe manufacturing technology using advanced composite manufacturing processes for helicopter primary structures; successfully completed first phase of improved rotary wing aircraft sustainment with focused efforts on three processing areas to include remanufacturing of rotor blades, and static balance fixture for CH-47 and UH-60 main rotor blade leading edge surfaces at Corpus Christi Army Depot.
- 17093 Munitions: Continued processing technology development for pyrotechnic materials, optimized process parameters for manufacture of fine particle explosives and coated energetics, and completed process development efforts for Modular Artillery Charge System (MACS); continued manufacturing development of the Objective Individual Combat Weapon System; prototyped and proved out a second generation Computer Numerically Coded (CNC) machine for Magnetorheological Finishing (MRF) of optics and precise correction of non-symmetric errors; accelerated munitions manufacturing technology in the areas of composites, electronics and energetics; organized the demonstration plan for totally integrated munitions engineering through process scheduling and shop floor management tools.

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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology	PROJECT DE25
<p>FY 1998 Accomplishments: (continued)</p> <ul style="list-style-type: none"> • 6235 Missiles: Developed and implemented Computer-Aided Design/Computer-Aided Engineering (CAD/CAE) millimeter-wave (MMW) design tools and demonstrated manufacturing improvements for MMW transceivers on the Longbow missile transceiver; completed development of manufacturing process/testing improvements for multi-chip modules and produced a microjet cooling device for compact, high-density microelectronics through participation in the Ga. Tech. Packaging Research Center; completed development of advanced tools for missiles; demonstrated flexible production of PAN based, ultra high modulus, high strength carbon fibers for light weight, high performance, and stealthy structural applications; and continued cost reduction process improvements for traveling wave tube manufacturing; baselined processes and initiated process development for the manufacture of filters within the master frequency generator for the Patriot PAC-3 system; initiated the first phase in the establishment of a circuit board center for the strengthening of the U.S. Printed Circuit Board (PCB) Industrial Base and its ability to support military needs through an integrated program of research, education, and industrial extension. Began manufacturing research efforts in low cost PCB interconnections, high density micro-via registration, PCB substrates for direct chip attachment, multi-layer board compensation factors, and advanced frequency operation PCB. • 350 Electronics: Completed demonstration of linear drive coolers used in 2nd generation forward looking infra-red horizontal technology integration, reducing cooler production cycle time by over 70% for systems to include Javelin, Abrams, and Comanche. • 1998 Materiel and Support Systems: Demonstrated remanufacturing capabilities using robotic welding; established improved methodology for producing semi-dry rations for the warfighter; completed first phase of reverse engineering system for the manufacturing of printed wiring boards at Tobyhanna Army Depot; Implemented a High Velocity Oxygenated Fuel Spray metallizing spray system that replaces hard chrome coatings for selected components at Anniston Army Depot. <p>Total 30711</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 1000 For the cooled and uncooled staring sensors manufacturing technology objective, demonstrate 35% yield for 288 x 460 uncooled monolithic focal plane arrays with reduced pixel size and improved vacuum packaging; initiate manufacturing process improvement in integration controls and testing of cooled focal plane arrays. • 1700 For the manufacturing technology objective to develop Plastic Encapsulated Microcircuits Coatings for military applications, investigate and select coating material and develop coating application process for selected material. The coatings will be used during manufacturing of military application integrated circuits subjected to long term unpowered missile storage environments, and are projected to increase the yield by 5%. 		
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<ul style="list-style-type: none"> • 3500 Automate pre-form technologies for Crusader, determine process capabilities through simulation of Comanche, and develop non-proprietary cost models and process models for thin section resin transfer moldings for the manufacturing technology objective focusing on knowledge and process tools for manufacturing affordable composite structures. Directly address the need for process risk reduction and technology deployment in design, analysis, intelligent processing such as continuously fused sensors, modeling, control algorithm data, and shop floor practices. The goal of this manufacturing technology objective is to reduce costs 30% by simplifying assembly operations through an increased use of bonding versus costly mechanical fasteners and by using analysis tools to reduce part count while making the overall structure more efficient. <p>FY 1999 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 4000 Air Vehicles: Continue instrumented factory for gears to transition advanced development and manufacturing processes to industry. • 600 Ground Vehicles: Demonstrate a titanium gun mount and cradle for the Crusader vehicle to include weldments, automated/laser welding, low cost castings and forgings, and battle damage repair. • 4800 Missiles: Demonstrate Computer Aided Design and Computer Aided Engineering tools for Millimeter Wave transceivers and fabricate, integrate, assemble, and test five Longbow Cost Reduction Program Integrated Product and Process Design (IPPD) transceivers on the flexible work cell pilot production line; demonstrate 5X reduction in multichip module substrate and assembly cost through participation in Georgia Tech Packaging Research Center, and insert smart FPA and dual-color technology into Stinger Block II missile production; implementation testbeds will be extended to demonstrate advanced integrated process team tools to the missile sector; complete and demonstrate the development of the new manufacturing processes and work cells for the manufacturing of Patriot PAC-3 traveling wave tubes; complete and demonstrate methods for the manufacture of filters within the master frequency generator for the Patriot PAC-3 system; continue development of advance manufacturing processes for printed circuit boards and develop industry, academia and government partnerships to demonstrate technology. • 18260 Munitions: Demonstrate technology to minimize seasonal variations of the solvent and thermal content of the propellant blocks, providing for more uniform products, greater yields and less rework; demonstrate advanced finishing processes for optics components; as part of totally integrated munitions enterprise, address issues in controllers, system architecture, electronics, composites energetics, OICW Tungsten Warhead, M829E3 processes, combustible cartridges and XM982 rotating band processing for accelerated munitions MANTECH insertion. • 1843 Materiel and Support Systems: Complete process optimization and demonstrate manufacturing capability for decontamination enzymes; develop digital data extraction technology and an automated reverse engineering fixture for remanufacturing capability of printed circuit boards; assess printed wiring board technologies at Tobyhanna Army Depot and develop a demonstration rapid response manufacturing system for small quantity production of a wide variety of boards; complete ceramic body armor assembly process for next generation body armor; develop large scale process parameters of bulk ceramics for the manufacturing of electronic scanning antennas. • 904 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.. <p>Total 36607</p> <p>FY 2000 Planned Program:</p>		
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BUDGET ACTIVITY 7 - Operational System Development		February 1999
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<ul style="list-style-type: none"> • 1840 Demonstrate modeling process for increased performance and decreased cost of Crusader and Abrams weapon system gun barrels to meet a tantalum sputtering manufacturing technology objective. The goal is to increase barrel life by 800%. • 3000 Develop the manufacturing technologies required to meet the manufacturing technology objective for cooled and uncooled infrared staring sensors. Improvements in processes for 480x640 mid-wave and long-wave infrared focal plane arrays will reduce size, weight and costs to manufacture. • 3100 Demonstrate models for optimal fabrication, closed loop cure process control, and resin flow simulation accuracy to ultimately reduce labor costs by 30% for selected components of Comanche, Apache, Crusader and munitions in support of the manufacturing technology objective focusing on knowledge and process tools for manufacturing affordable composite structures. <p>FY 2000 Planned Program: (continued)</p> <ul style="list-style-type: none"> • 2100 Development of coating process that will be used during manufacturing of military application integrated circuits subjected to long term unpowered storage environments common to missiles, and increasing the manufacturing yield by 5% in support of this manufacturing technology objective for plastic encapsulated microcircuits. • 1000 Munitions: Develop initial components and processes for low cost detectors and optics for the precision guided mortar munition to reduce costs by 40% for all laser detectors. • 3855 Materiel and Support Systems: Demonstrate prototype large bulk ceramics and supporting components of X-band phase shifters for the manufacture of electronic scanning antennas on the Firefinder weapon system to reduce size of radar by a factor of 5 with a 50% weight reduction; demonstrate rapid response system for the reverse engineering of printed wiring boards at Tobyhanna Army Depot; complete cost reduction process enhancements for the manufacturing of ceramic plates used in next generation body armor. <p>Total 14895</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 3000 Demonstrate increased performance and decreased cost of Crusader and Abrams weapon system gun barrels with specific subtasks to include the manufacture and installation of sputtering targets and development of manufacturing processes for 120mm gun barrels in support of the manufacturing technology objective in tantalum sputtering. • 3000 Fabricate and integrate 480x640 mid-wave infrared and long-wave infrared focal plane array and dewar to achieve the manufacturing technology objective focused on cooled and uncooled infrared staring sensors. Weapon systems impacted include the Javelin seeker, drivers vision enhancer, thermal weapon sights, and future combat vehicles. • 2900 Implement investment strategy for risk reduction, knowledge base development, and tooling for the manufacturing technology objective in knowledge and process tools for manufacturing affordable composite structures. The objective is to reduce cost and time to manufacture large scale composite components for rotary wing vehicles, ground vehicles and munitions to ultimately reduce labor costs by 30%. • 2000 Insert special coated integrated circuits into selected military systems for demonstration and validation in support of the manufacturing technology objective in plastic encapsulated microcircuits. Technology targets weapon systems subjected to long term unpowered storage environments common to missiles. Demonstrate a 78% improvement in resistance to internal corrosion and improve fabrication and packaging yields by 5%. 		
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology	
		PROJECT DE25
•	1000 Missiles: Establish the basis for the elimination of the hermeticity requirement and select more available coating technologies on the sensor systems of submunitions through design for manufacturing and assembly tools.	
•	1400 Munitions: Demonstrate a simplified overall optical seeker sensor design for the precision guided mortar munition; demonstrate the manufacturing capability to make aspheric lenses affordable for military optical systems through process development and machine demonstration and transfer technology to industry; develop automated shaped charge linear manufacturing loading technology to reduce acquisition cost as well as improve safety and munition quality.	
FY 2001 Planned Program: (continued)		
•	2191 Materiel and Support Systems: Complete manufacturing demonstration of electronic scanning antennas on firefinder radar and transfer technology to other potential application such as Comanche; demonstrate advanced electronics processing and fabrication, advanced welding and metals processing technology for weapons systems.	
Total	15491	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology	PROJECT DE26
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COST <i>(In Thousands)</i>	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE26 Weapon Systems Modernization Software Maintenance	29333	0	0	0	0	0	0	0	0	29333

A. Mission Description and Justification: The Weapon Systems Modernization Software Maintenance project provides funding for modernization efforts in which post-production embedded weapon system software must be upgraded and/or enhanced. This project provides life cycle software engineering support for weapon systems in the areas of tactical and satellite communications, intelligence and electronic warfare (IEW), avionics command and control (C2), fire support (FS), maneuver control (MC), and tactical fusion (TF). The project provides the capability to enhance or improve system software interoperability, integration and testing for command, control, communications, computer, intelligence, electronic warfare, and sensor (C4IEWS) functions in a continuous life cycle evaluation/certification process. Software changes funded under this project expand or upgrade the performance of the selected weapon systems, as well as ensure system interoperability. The project is managed by the Army Materiel Command (AMC). Prior to FY1998 the work performed in project DE26 was funded in the Operations and Maintenance, Army appropriation. The mission and associated funding for all software maintenance that provides performance enhancements and upgrades to weapons systems were transferred to the RDT&E, Army appropriation in FY 1998. Beginning in FY1999, the funding for DE26 was distributed into the appropriate RDT&E accounts of those specific systems requiring performance enhancements and upgrades in software.

FY 1998 Accomplishments:

- 29333 -Modified fire support command and control system software to accommodate new munitions and/or doctrine.
- Modified navigation and position reporting weapon system software to accommodate changes in mapping reference grids supplied by the National Imagery and Mapping Agency (NIMA).
- Modified terrain dependent weapon system software platforms to accommodate changes in electronic terrain data supplied by the NIMA.
- Modified software and/or databases in selected weapons systems to identify and defeat new, different, or re-deployed electronic threats employed by adversaries in particular regions of the world, such as laser or radar engagement systems used by enemy munitions and missiles, or communications jammers.
- Modified weapon system application software in existing systems to accommodate upgrades of Commercial Off-The-Shelf (COTS) products required by obsolescence of older products no longer supported by vendors. Accommodated upgrades of COTS to ensure continuation of COTS vendor maintenance contracts necessary to sustain weapon system reliability.
- Modified weapon system software as required to ensure integrity of operations when the systems are re-deployed to new and unfamiliar or unanticipated regions of the world in which the original software and data was not designed to operate.
- Modified weapon systems software to accommodate interfaces with new and/or re-deployed NATO and Allied systems.

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0708045A Army Industrial Preparedness Manufacturing Technology	DE26
<p>- Modified weapon systems software to accommodate short term critical user needs to increase capability and/or lethality required to meet operational mission needs and combat readiness.</p> <p>FY 1998 Accomplishments: (continued)</p> <ul style="list-style-type: none"> - Incorporated weapon systems software enhancements which will provide the ability to manage data exchange between planning, monitoring and controlling subsystems, and which will provide a common integrated Man-Machine Interface (MMI) spanning these subsystems to achieve desired level of interoperability. - Modernized, and/or developed new software interfaces between weapon system platforms to accommodate or improve interoperability for force multiplication; installed and demonstrated new capabilities as required. - Incorporated weapon systems software enhancements which will provide the ability to manage data exchange between planning, monitoring and controlling subsystems, and which will provide a common integrated Man-Machine Interface (MMI) spanning these subsystems to achieve desired level of interoperability. - Incorporated enhancements into selected weapon systems software that will provide the ability to communicate information over secure network environments and increase the capability of existing secure communications links. - Modified Commander Tact Terminal, Air ReconLow, EPLARS, JTIDS, and Army Integration Network (AIN). <p>Total 29333</p> <p>FY 1999 Planned Program: Project not funded in FY 1999.</p> <p>FY 2000 Planned Program: Project not funded in FY 2000</p> <p>FY 2001 Planned Program: Project not funded in FY 2001</p>		
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology				PROJECT DE27		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE27 Reliability, Maintainability and Sustainability (RM&S)	0	10927	15754	15401	14957	14602	14902	15205	Continuing	Continuing
<p>A. <u>Mission Description and Justification:</u> The Reliability, Maintainability and Sustainability (RM&S) program funds projects that reduce the cost of ownership through weapon system or equipment modifications to yield improvements in RM&S. Projects are evaluated for funding based on recognized principles of economic analysis, including principally the use of Savings-to-Investment analysis.</p> <p>FY 1998 Accomplishments: RM&S program previously funded in the Other Procurement, Army appropriation.</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 8900 Develop a CH-47 Chinook helicopter rotor hub with a new composite structure hub utilizing elastomeric bearing design features previously demonstrated on the Boeing-Vertol 360. The new hub will have 75% fewer parts with a corresponding reduction in special tooling. • 1738 Redesign the Avenger Remote Control Unit System and Cable to improve the reliability and survivability, and replace the current cable and connector with more reliable and less bulky fiber optic cable; redesign other components of the Avenger that have high maintenance to include the remote charger and feed chute. • 289 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.. <p>Total 10927</p> <p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 6685 Complete CH-47 dry rotor hub design and conduct qualification and flight testing. • 650 Demonstrate an automated preventive and predictive maintenance expert system focused on whirl towers, engine and transmission test cells and automatic test equipment for UH-60 and CH-47 components; demonstrate universal static balance system for helicopter rotor blades to include AH-64, UH-60, CH-47, UH-1, AH-1 and OH-58 which will reduce cycle times by 15%. • 4400 Demonstrate improved sealed lead-acid battery technology for the UH-60 helicopter to increase battery reliability and decrease operations and support costs. • 4000 Improve the collar reliability in the SADA II linear drive technology. This life cycle improvement will decrease the number of failures, thus reducing O&S costs. • 19 Identify and investigate high failure rate for fuel pressure switch 5930-00771-8119. Evaluate design and failure mode, and test to effect corrective action. This effort will reduce O&S costs and increase readiness. <p>Total 15754</p>										
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
7 - Operational System Development	0708045A Army Industrial Preparedness Manufacturing Technology	DE27
FY 2001 Planned Program:		
•	2300	Replace UH60 nickel cadmium battery with sealed lead-acid battery (SLAB). This will be a maintenance free battery, which will increase readiness rate and decrease costs.
•	13101	Reduce the O&S costs for fielded systems top cost drivers that are identified in the operations and support management information system (OSMIS). These top 10 cost drivers include redesign of Abrams, Bradley, Paladin and Apache components and subsystems that will significantly improve reliability, maintenance and sustainability.
Total	15401	
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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology	PROJECT DE31
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COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE31 National Defense Center for Environmental Excellence (NDCEE)	0	4967	4932	4927	4922	4920	0	0	0	24668

A. Mission Description and Justification: This Congressionally mandated project is managed by the Army on behalf of the Office of the Deputy Under Secretary of Defense for Environmental Security (DUSD-ES). The mission of the NDCEE is four-fold: (1) Demonstrate and export new environmentally-acceptable technology to the industrial base; (2) train the industrial base on the use of the new technology; (3) perform research and development, where necessary, to mature a new technology prior to demonstrating and exporting the new technology to the industrial base and (4) assist DoD in technology transfer. The NDCEE, which is located in Johnstown, Pennsylvania, has the goal of resolving the environmental technology and management requirements of the DoD community and commercial industrial base. The primary in-house development agency is the U.S. Army Materiel Command's Armament Research, Development, and Engineering Center, Picatinny Arsenal, NJ.

The NDCEE has positioned itself as a critical resource for the Deputy Under Secretary of Defense for Environmental Security for environmental management and technology validation and integration. Major programs supported by the Center include the Joint Group on Acquisition Pollution Prevention, Toxics Reduction Investment & Management (TRIM), environmental cost accounting standards development supporting the DOD sustainment community and the DoD fuel cell program.

FY 1998 Accomplishments: Program funded in PE0602720A.

FY 1999 Planned Program:

- 4836 - Support the needs of Army/DOD pollution prevention. Assist Joint Logistic Commanders in use of Joint Group for Acquisition Pollution Prevention (JG-APP) methodology to aid depots.
 - Maintain Environmental Technology Facility and continue demonstration of environmentally acceptable technologies on DOD components and conduct of technology transfer activities (requirements determination, technology selection, equipment selection, installation, de-bugging, training) for DoD facilities.
 - Support pollution prevention efforts in acquisition through development of joint test protocols, multi-service needs identification, regulatory analysis and prediction, environmental cost analyses, risk assessments, life cycle environmental assessments and incorporation of environmental management standards and principles.
- 131 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs..

Total 4967

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology	PROJECT DE31
<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 4932 - Support the needs of Army/DOD pollution prevention. <ul style="list-style-type: none"> - Maintain the Environmental Technology Facility. - Support Pollution Prevention efforts in acquisition. - Increase emphasis and market penetration in energy conservation and management focusing on fuel cell applications. - Expand capabilities in corrosion protection through surface modification technologies in support of the services and DOD. - Increase capabilities in Brownfield remediation and management. - Increase emphasis on biotechnologies such as phyto-remediation in support of Army needs. <p>Total 4932</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 4927 - Support the needs of Army/DOD pollution prevention. <ul style="list-style-type: none"> - Maintain Environmental Technology Facility and continue demonstration of environmentally acceptable technologies. - Support pollution prevention efforts in acquisition. - Evaluate and transition as appropriate sustainable manufacturing technologies such as structural composite materials produced from renewable sources. - Increase capabilities in modeling using existing capabilities in visualization and 3D modeling. - Investigate and transition next generation finishing and coatings removal technologies. - Increase emphasis on water treatment and DOD-specific waste stream recovery and treatment. <p>Total 4927</p>		
Project DE31	<i>Page 13 of 15 Pages</i>	Exhibit R-2A (PE 0708045A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology				PROJECT DE32		
COST (In Thousands)	FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE32 Commercial Operations and Support Savings Initiative (COSSI)	0	0	30586	30487	30300	30273	30893	31524	Continuing	Continuing
<p>A. <u>Mission Description and Justification:</u> The mission of Commercial Operations and Support Savings Initiative (COSSI) is to develop and test a method for reducing Army Operations and Support (O&S) costs by routinely inserting commercial items into fielded military systems. The insertion of commercial items is expected to reduce O&S costs by reducing the costs of parts and maintenance, reducing the need for specialized equipment, increasing reliability, and increasing the efficiency of subsystems. Selected proposals will develop, manufacture, and deliver prototype "kits" to the military for installation into fielded Army systems. COSSI is a two-stage process. In Stage 1 of each selected project, COSSI and the chosen proposer will share the costs of developing and testing the kit, with the proposer contributing at least 25% of the estimated costs of Stage I. If Stage I is successful, Stage II will be initiated. In Stage II, the military customer may then purchase reasonable production quantities of the kit. COSSI was funded in DOD PE 0603805E through FY1998, transferred to Army PE 0604824A in FY1999, and will be transferred to this PE in FY2000.</p> <p>FY 1998 Accomplishments: Program funded in DoD PE 0603805E.</p> <p>FY 1999 Planned Program: Program funded in Army PE 0604824A.</p> <p>FY 2000 Planned Program: FY 2000 funding will be for new Stage I COSSI projects. Some examples of possible Stage I efforts are improved inspection/testing techniques, information processing and distribution, automated software change distribution, automated condition assessment and reporting, inventory tracking/asset visibility, interactive electronic technical manuals, embedded training/distance learning, component refurbishing techniques, equipment power reduction, calibration and measurement techniques, modeling and simulation, and voice activation.</p> <ul style="list-style-type: none"> • 30586 Develop, manufacture and deliver cost savings initiatives in the area of product re-engineering. <li style="padding-left: 20px;">Develop, manufacture and deliver cost savings initiatives in the area of information technology. <li style="padding-left: 20px;">Develop, manufacture and deliver cost savings initiatives in the area of training. <li style="padding-left: 20px;">Develop, manufacture and deliver cost savings initiatives in the area of automation. <li style="padding-left: 20px;">Develop, manufacture and deliver cost savings initiatives in the area of rapid prototyping for spares. <p>Total 30586</p>										
Project DE32			Page 14 of 15 Pages				Exhibit R-2A (PE 0708045A)			

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology	PROJECT DE32
<p>FY 2001 Planned Program: FY 2001 funding will be for new Stage I COSSI projects. Some examples of possible Stage I efforts are improved inspection/testing techniques, information processing and distribution, automated software change distribution, automated condition assessment and reporting, inventory tracking/asset visibility, interactive electronic technical manuals, embedded training/distance learning, component refurbishing techniques, equipment power reduction, calibration and measurement techniques, modeling and simulation, and voice activation.</p> <ul style="list-style-type: none"> • 30487 Develop, manufacture and deliver cost savings initiatives in the area of product re-engineering. Develop, manufacture and deliver cost savings initiatives in the area of information technology. Develop, manufacture and deliver cost savings initiatives in the area of training. Develop, manufacture and deliver cost savings initiatives in the area of automation. Develop, manufacture and deliver cost savings initiatives in the area of rapid prototyping for spares. <p>Total 30487</p>		
Project DE32	Page 15 of 15 Pages	Exhibit R-2A (PE 0708045A)

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 1001018A NATO Joint STARS				PROJECT C35			
COST (In Thousands)		FY1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
C35 NATO Alliance Ground Surveillance System (AGS) - TIARA		10147	2980	0	0	0	0	0	0	0	10269
<p>A. <u>Mission Description and Budget Item Justification:</u> The United States is a major participant in a cooperative venture to select and procure a ground surveillance capability for NATO forces. Initial efforts to evaluate various potential solution sets for the NATO Alliance Ground Surveillance System (NAGS) commenced in May 1995. A NAGS Project Office was established at SHAPE Technical Center (STC) and will continue to operate until the final NAGS configuration is selected. Under this PE/Project, the Army will conduct and support interoperability experimentation and demonstrations between the Joint Surveillance Target Attack Radar System (Joint STARS) Ground Station and various Allied weapon systems. These funds are to be used for the US Advanced Radar System (ARS) system requirements analysis, system design and interoperability demonstrations with the US CGS systems involving the principle NATO participants.</p> <p>FY 1998 Accomplishments:</p> <ul style="list-style-type: none"> • 4467 Conducted NATO Architectural Design Study • 1000 Provided Support for NATO Interoperability Demonstrations and Experimentation at (NC3A) • 1822 Prepared Concept Definition • 2858 Will be reprogrammed to Joint Tactical Radio System (reprogramming approved by Congress in December 1998). <p>Total 10147</p> <p>FY 1999 Planned Program:</p> <ul style="list-style-type: none"> • 152 NATO Command, Control and Consultation Agency (NC3A) Support • 2750 US Advanced Radar Sensor (ARS) (NATO Version of the US Enhanced Radar) • 78 Small Business Innovative Research /Small Business Technology Transfer Program <p>Total 2980</p> <p>FY 2000 Planned Program: No Planned Program in FY2000</p> <p>FY 2001 Planned Program: No Planned Program in FY2001</p>											
Project C35			Page 1 of 2 Pages				Exhibit R-2 (PE 1001018A)				

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 1999
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BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 1001018A NATO Joint STARS	PROJECT C35
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B. Program Change Summary	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 1999 PB)	10225	6405	0	0
Appropriated Value	13500	3000		
Adjustments to Appropriated Value				
a. Congressional General Reductions	-417	-20		
b. SBIR / STTR	-328			
c. Omnibus or Other Above Threshold Reduction	-108			
d. Below Threshold Reprogramming	-2500			
e. Rescissions				
Adjustments to Budget Years Since FY 1999 PB				
Current Budget Submit (FY 2000/2001 PB)	10147	2980	0	0

Change Summary Explanation: FY 1998 – funds reprogrammed out to support higher priority requirements (-2500).

C. Other Program Funding Summary	<u>FY 1998</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>
BA1080 Joint STARS (TIARA)	89276	86895	82176	57773	13510	4184	14226	26881	Cont	Cont
BS9724 Joint STARS Spares	6108	8709	6166	6224	6929	4414	0	0	Cont	Cont
64770/D202 Joint Stars(TIARA)	6464	5463	11535	26871	25227	10752	16437	130	Cont	Cont

D. Acquisition Strategy: All hardware has been procured. The concept definition effort was awarded to the CGS contractor based on their extensive knowledge of the system and their continuous involvement in the NATO program. This is a S/S FFP type contract. Participation in the concept definition is vital to ensure US Government and Army mandates are satisfied and to protect US interests in the development of the full AGS program plan. Once approved by NATO, the participating nations will share in the full cost of the AGS system acquisition.

E. Schedule Profile	<u>FY 1998</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 2004</u>	<u>FY 2005</u>
Complete Architectural Study		1Q							
Conduct Systems Requirements Analysis		2Q							
Complete Tests and Demonstrations		4Q							

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1	USD(A&T), Mailroom, Pentagon, Room 3D139, Washington, DC 20310
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- * US Army Cost And Economic Analysis Center, ATTN: SFFM-CA-PI, 5611 Columbia Pike, Falls Church, VA 22041-5050
- * BMDO/RM, Pentagon, Room 1E1037, Washington, DC 20310
- * HQDA, (JDRS-PBD), Pentagon, Room 1E610, Washington, DC 20310
- * HQ, PACOM, R&D Requirements (J531), BOX 15, USPACOM Staff, Camp H.M. Smith, HI, 96861
- * Commander, US Army Intelligence and Security Command, ATTN: IARM-PB, Fort Belvoir, VA 22060-5370
- * Commander, US Army Nuclear and Chemical Agency, ATTN: MONA-OPS, Bldg 2073, Backlick Road, Springfield, VA 22150
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- * Commander, US Army Training and Doctrine Command, ATTN: ATCD-E, Fort Monroe, VA 23651-5000
- * CMDT, Army Field Artillery School, ATTN: ATSF-CSI-P, ATSF-CBL, Ft. Sill, OK 73503-5600
- * CDR, Army Aviation Ctr & Ft. Rucker, ATTN: ATZS-CDI, Ft. Rucker, AL 36362-5000

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- * Commander, US Army Aviation and Troop Command, ATTN: AMSAT-D-C, 4300 Goodfellow Blvd, St. Louis, MO 63120-1798
- * Program Manager, Instrumentation, Targets and Threat Simulators, ATTN: AMCPM-ITTS, 12350 Research Parkway, Orlando, FL 32826
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