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TOC to Volume 3 only

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

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)

DTIC QUALITY INSPECTED 3

"READINESS THROUGH MODERNIZATION"

VOLUME III

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

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 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 1999, 2000 and 2001 time period.

2. Relationship of the FY 2001 Budget Submission to the FY 2000/2001 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 PE/PROJECT	NEW PROJECT TITLE	NEW PE/PROJECT
0601104A/H59	Institute for Creative Technology	0601104A/J08
0602308A/C90	Modeling & Simulation for Training and Design	0602308A/D02
0602618A/H80	Robotics Technology	0602618A/H03
0602720A/895	Pollution Prevention Technology	0603728A/025
0603005A/440	Future Combat Vehicle	0602601A/HH7
Transfer from OMA	Army Distance Learning Program	0605013A/087
Transfer from OMA	SIDPERS-3	0605013A/099
Transfer from OMA	Transportation Coordinator's Automated Information for Movement System II	0605013A/137
Transfer from OMA	Installation Support Module (ISM)	0605013A/184
Transfer from OMA	Army Recruiting Information Support System	0605013A/185
Transfer from OMA	Medical Communications for Combat Casualty Care	0605013A/193

A. Program Element Restructures. (Continued)

OLD PE/PROJECT	NEW PROJECT TITLE	NEW PE/PROJECT
Transfer from OMA	Horizontal Technology Integration (HTI)	0605013A/196
Transfer from OMA	TACMIS	0605013A/252
Transfer from OMA	PM Global Combat Support System – Army Core	0605013A/286
Transfer from OMA	Joint Computer-Aided Acquisition and Logistics Support (JCALS)	0605013A/299
Transfer from OMA	STACOMP	0605013A/316
0708610A (OMA PE)	Army High Performance Computing	0605803A/731
0604280A/152 (BA 3 – FY 1999 only)	Joint Tactical Radio System	0603280A/155
0604802A/D134	Objective Individual Combat Weapon	0603802A/DAS3
0604802A/695	XM982 Projectile	0604814A/708
0604802A/613	Mortar Systems	0603802A/AS4
0603606A/683	Anti-Personnel Landmine Alternatives	0604808A/434
0604808A/434	Anti-Personnel Landmine Alternative (Mixed Systems)	0604808A/443
Transfer from OMA	Global Combat Support System – Army	0303141A/083

B. FY 2001 Developmental Transitions.

FROM PE/PROJECT	PROJECT TITLE	TO PE/PROJECT
0601104A/H59	Modeling & Simulation for Training and Design	0602308A/D02
0603619A/005	Mine Systems – Engineering Development	0604808A/016

C. Establishment of New FY 2001 Program Elements/Projects. One major system new start is associated with the New Army Transformation and is denoted by a diamond. Minor new initiatives for FY 2001, in addition to Congressionally directed initiatives for FY 2000, are shown below with asterisks. The remaining programs listed are outyear initiatives or restructures beyond FY 2000 or were previously funded from other Defense appropriations.

TITLE	PE/PROJECT
Effects Control System	0203726A/324
Global Combat Support System – Army*	0303141A/083
Information Dominance Center – TIARA*	0305128A/H13
Joint Technology Center System Integration Lab*	0305204A/123
Science Base Emerging Infectious Diseases*	0601102A/S20
Counter Terrorism Program*	0601104A/J07
Institute for Creative Technology*	0601104A/J08
Aero-Propulsion Technology*	0602303A/223
Tactical High Energy Laser Technology	0602307A/042
Future Combat Vehicle	0602601A/HH7
21st Century Truck (T21)*	0602601A/T21
Optical Spectroscopy*	0602622A/556
Corrosion Measurement and Control Project*	0602720A/959
Watervliet Arsenal Pollution Projects*	0602720A/960
Vessel Plating Technology*	0602720A/961
Range Safety Technology Demo*	0602720A/F28
Phyto-Remediation in Arid Lands*	0602720A/F29
Polynitroxylated Hemoglobin*	0602787A/962
National Medical Testbed*	0602787A/963
Informatics-Based Medical Emergency Decision (IMED) Tools*	0602787A/964
Dye Targeted Laser Fusion*	0602787A/967
Eye Research*	0602787A/965
Blood Research*	0602787A/966
Synchronization-Based High Energy Radiation Beam Cancer Detection*	0602787A/968
Emerging Infectious Diseases	0602787A/997
Force Project Logistics	0603001A/545
Biosystems Technology*	0603001A/557
Combat Id for Dismounted Soldiers (CIDS)*	0603001A/J51

C. Establishment of New FY 2001 Program Elements/Projects. (Continued)

TITLE	PE/PROJECT
Telemedicine Testbed	0603002A/800
Alcoholism Research*	0603002A/969
Enzymatic Wound Disinfectant*	0603002A/970
HIV Research*	0603002A/971
Laser Vision Correction*	0603002A/972
Recombinant Vaccine Research*	0603002A/973
Smart Aortic Research*	0603002A/974
Protection Against Emerging Infectious Diseases*	0603002A/975
Warhead and Energetics Center of Excellence*	0603004A/244
Robotic Ground Systems*	0603005A/515
Abrams Engine*	0603005A/532
Technology Transfer Center*	0603005A/533
Mobile Parts Hospital*	0603005A/539
Improved HMMWV Research*	0603005A/540
Breast Cancer Stamp	0603002A/945
Medium Armored Vehicle Development◆	0603653A/C03
Collaborative Telemaintenance*	0603772A/285
Tactical Simulation Interface Unit (TSIU)*	0603308A/979
Shoulder-Launched Multipurpose Assault Weapon*	0603802A/066
Objective Individual Combat Weapon (OICW)	0603802A/AS3
Combat Trauma Patient Simulation*	0603807A/853
Modernized Hellfire	0604329A/013
Lightweight Laser Designator Rangefinder Upgrades	0604710A/L76
Horizontal Technology Integration for Tactical Lasers	0604710A/L77
Embedded Diagnostics/Prognostics Development	0604746A/L66
Tactical Exploitation System (TES) (TIARA)	0604766A/957
Aviation Combined Arms Tactical Trainer – WRAP	0604780A/585
Anti-Personnel Landmine Alternatives*	0604808A/434
Anti-Personnel Landmine Alternative (Mixed Systems)*	0604808A/443
Common Software	0604818A/334
Line-of-Sight Anti-Tank (LOSAT) Missile	0604819A/046
Paladin/FAASV	0604854A/516

C. Establishment of New FY 2001 Program Elements/Projects. (Continued)

TITLE	PE/PROJECT
Army Distance Learning Program*	0605013A/087
SIDPERS-3*	0605013A/099
Transportation Coordinators' Automated Information for Movement System II*	0605013A/137
Installation Support Modules (ISM)*	0605013A/184
Army Recruiting Information Support System*	0605013A/185
Medical Communications For Combat Casualty Care*	0605013A/193
Horizontal Technology Integration (HTI)*	0605013A/196
TACMIS*	0605013A/252
PM Global Combat Support System-Army Core*	0605013A/286
Joint Computer-Aided Acquisition and Logistics Support (JCALS)*	0605013A/299
STACOMP*	0605013A/316
Force XXI Experimentation	0605326A/312
Army Explosives Safety Management	0605805A/858
Acquisition Pollution Prevention	0605857A/031

D. FY 2001 programs for which funding was shown in the FY 2000/2001 President's Budget Submit (February 1999), but which are no longer funded.

PE/PROJECT	TITLE	BRIEF EXPLANATION
0203726A/2ET	AFATDS Operational Test	ACAT category changed from ACAT I to ACAT II – funds transferred to 0605712A/001
0203802A/689	ATACMS Block IIIB	Program terminated
0602787A/845	Bone Disease Research Program	Program completed
0602308A/636	Army After Next (AAN) Applied Research	Program terminated
0602720A/895	Pollution Prevention	Restructured to PE 0603728A/02
0604802A/134	Objective Individual Combat Weapon	Funds transferred BA 4 PE 0603802A/AS3 to support the PDDR phase rather than EMD.
0603004A/L94	Electric Gun System Demo	Demonstration program delayed until FY 2006
0603313A/380	Multi-Platform Launcher	Program terminated
0603313A/493	Rapid Force Projection Demo	ACTD Completed

D. FY 2001 programs for which funding was shown in the FY 2000/2001 President's Budget Submit (February 1999), but which are no longer funded (continued).

PE/PROJECT	TITLE	BRIEF EXPLANATION
0604321A/2FT	ASAS Operational Test	ACAT category changed from ACAT I to ACAT II – funds transferred to 0605712A/001
0604645A/022	FSV-Engineering Development	Program terminated in support of the Army Transformation
0604649A/G25	M1 Breacher Development	Program terminated in support of the Army Transformation
0604768A/686	ATACMS Block IIA	Program terminated in support of the Army Transformation
0708045A/E31	National Defense Center for Environmental Excellence (NDCEE)	Funds transferred to BA 4 PE 0603779A/035 as per Congressional direction.

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

0203735A/DC64
0203808A
0301359A
0602104A
0602122A
0602601A/C84
0602786A/AC60
0603003A/D391
0603005A/DC62/DC66
0603009A
0603017A
0603020A
0603122A
0603322A
0603710A/DC65/ DC67
0603851A
0604328A

Department of the Army
FY 2001 RDT&E Program

Exhibit R-1

Summary

Date: Feb 2000

Thousands of Dollars

Summary Recap of Budget Activities	FY 1999	FY 2000	FY 2001
Basic Research	176,737	204,407	200,988
Applied Research	612,641	790,919	602,489
Advanced Technology Development	633,601	684,393	490,905
Demonstration and Validation	488,701	475,627	661,451
Engineering and Manufacturing Development	1,247,140	1,503,189	1,770,357
RDT&E Management Support	1,262,886	739,294	696,943
Operational Systems Development	609,064	827,439	837,213
Total Research Development Test & Eval Army	5,030,770	5,225,268	5,260,346

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Department of the Army
FY 2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 2000

Line No	Program Element Number	Item	Act	Thousands of Dollars FY 1999	FY 2000	FY 2001
1	0601101A	IN-HOUSE LABORATORY INDEPENDENT RESEARCH	1	12,139	14,119	14,459
2	0601102A	DEFENSE RESEARCH SCIENCES	1	122,255	125,918	132,164
3	0601104A	UNIVERSITY AND INDUSTRY RESEARCH CENTERS	1	42,343	64,370	54,365
	Basic Research			176,737	204,407	200,988
4	0602104A	TRACTOR ROSE	2	0	6,743	0
5	0602105A	MATERIALS TECHNOLOGY	2	12,867	16,266	11,557
6	0602120A	SENSORS AND ELECTRONIC SURVIVABILITY	2	16,334	24,850	20,722
7	0602122A	TRACTOR HIP	2	11,603	9,210	7,226
8	0602211A	AVIATION TECHNOLOGY	2	23,854	30,048	31,080
9	0602270A	EW TECHNOLOGY	2	15,569	17,402	17,310
10	0602303A	MISSILE TECHNOLOGY	2	29,234	47,939	47,183
11	0602307A	ADVANCED WEAPONS TECHNOLOGY	2	0	0	993
12	0602308A	ADVANCED CONCEPTS AND SIMULATION	2	20,917	29,677	30,479
13	0602601A	COMBAT VEHICLE AND AUTOMOTIVE TECHNOLOGY	2	38,139	54,776	63,589
14	0602618A	BALLISTICS TECHNOLOGY	2	26,839	42,017	49,750
15	0602622A	CHEMICAL, SMOKE AND EQUIP DEFEATING TECHNOLOG	2	4,660	4,953	3,530
16	0602623A	JOINT SERVICE SMALL ARMS PROGRAM	2	5,008	5,161	5,415
17	0602624A	WEAPONS AND MUNITIONS TECHNOLOGY	2	28,185	36,521	33,761
18	0602705A	ELECTRONICS AND ELECTRONIC DEVICES	2	25,004	36,812	23,869
19	0602709A	NIGHT VISION TECHNOLOGY	2	18,341	20,021	20,465
20	0602712A	COUNTERMINE SYSTEMS DEVELOPMENT	2	10,265	14,380	12,386
21	0602716A	HUMAN FACTORS ENGINEERING TECHNOLOGY	2	16,204	19,681	15,786
22	0602720A	ENVIRONMENTAL QUALITY TECHNOLOGY	2	62,208	78,905	13,994
23	0602782A	COMMAND, CONTROL, COMMUNICATIONS TECHNOLOGY	2	21,597	19,519	23,314
24	0602783A	COMPUTER AND SOFTWARE TECHNOLOGY	2	3,777	5,173	3,987
25	0602784A	MILITARY ENGINEERING TECHNOLOGY	2	51,203	47,639	42,344
26	0602785A	MANPOWER/PERSONNEL/TRAINING TECHNOLOGY	2	8,249	12,005	11,869
27	0602786A	WARFIGHTER TECHNOLOGY	2	18,075	25,831	24,659
28	0602787A	MEDICAL TECHNOLOGY	2	134,002	174,199	75,729
29	0602789A	ARMY ARTIFICIAL INTELLIGENCE TECHNOLOGY	2	1,119	1,267	1,338
30	0602805A	DUAL USE SCIENCE & TECHNOLOGY PROGRAM	2	9,388	9,924	10,154
	Applied Research			612,641	790,919	602,489

Department of the Army
FY 2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 2000

Line No	Program Element Number	Item	Act	FY 1999	FY 2000	FY 2001
				Thousands of Dollars		
31	0603001A	WARFIGHTER ADVANCED TECHNOLOGY	3	30,322	44,831	15,469
32	0603002A	MEDICAL ADVANCED TECHNOLOGY	3	223,999	73,252	16,512
33	0603003A	AVIATION ADVANCED TECHNOLOGY	3	43,509	33,921	28,810
34	0603004A	WEAPONS AND MUNITIONS ADVANCED TECHNOLOGY	3	24,049	58,042	29,738
35	0603005A	COMBAT VEHICLE AND AUTOMATIVE ADVANCED TECH	3	58,706	130,525	148,114
36	0603006A	COMMAND, CONTROL, COMM ADVANCED TECHNOLOGY	3	22,892	27,612	21,505
37	0603007A	MANPOWER, PERSONNEL AND TRAINING ADV TECH	3	2,869	4,981	3,072
38	0603009A	TRACTOR HIKE	3	10,391	12,469	12,217
39	0603013A	TRACTOR DIRT	3	40	0	0
40	0603017A	TRACTOR RED	3	4,420	4,549	984
41	0603020A	TRACTOR ROSE	3	2,427	11,070	10,892
42	0603105A	MILITARY HIV RESEARCH	3	5,497	5,931	5,889
43	0603122A	TRACTOR HIP	3	0	2,414	980
44	0603238A	AIR DEFENSE/PRECISION STRIKE TECHNOLOGY	3	10,236	24,435	21,307
45	0603270A	EW TECHNOLOGY	3	10,911	16,060	15,359
46	0603280A	JOINT TACTICAL RADIO SYSTEM	3	9,405	0	0
47	0603313A	MISSILE AND ROCKET ADVANCED TECHNOLOGY	3	59,366	51,188	25,107
48	0603322A	TRACTOR GEM	3	4,175	2,648	3,083
49	0603606A	LANDMINE WARFARE AND BARRIER ADV TECHNOLOGY	3	22,651	47,117	20,894
50	0603607A	JOINT SERVICE SMALL ARMS PROGRAM	3	12,532	8,760	4,469
51	0603654A	LINE-OF-SIGHT TECHNOLOGY DEMO	3	15,126	37,845	50,727
52	0603710A	NIGHT VISION ADVANCED TECHNOLOGY	3	25,402	42,262	33,341
53	0603728A	ENVIRONMENTAL QUALITY TECHNOLOGY DEVELOPMENT	3	0	1,327	1,616
54	0603734A	MILITARY ENGINEERING ADVANCED TECHNOLOGY	3	16,270	15,762	5,207
55	0603772A	ADV TACTICAL COMPUTER SCIENCE & SENSOR TECH	3	18,406	27,392	15,613
		Advanced Technology Development		633,601	684,393	490,905
56	0603308A	ARMY MISSILE DEFENSE SYSTEMS INTEGRATION	4	37,929	61,528	12,573
57	0603619A	LANDMINE WARFARE AND BARRIER - ADV DEV	4	7,802	10,934	22,803
58	0603639A	ARMAMENT ENHANCEMENT INITIATIVE	4	37,302	56,286	30,139
59	0603653A	ADVANCED TANK ARMAMENT SYSTEM	4	8,464	1,922	118,139
60	0603713A	ARMY DATA DISTRIBUTION SYSTEM	4	16,084	10	17
61	0603747A	SOLDIER SUPPORT AND SURVIVABILITY	4	7,594	12,719	13,574
62	0603774A	NIGHT VISION SYSTEMS ADVANCED DEVELOPMENT	4	2,240	3,164	10,968

Department of the Army
FY 2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 2000

Line No	Program Element Number	Item	Act	FY 1999	FY 2000	FY 2001
				Thousands of Dollars		
63	0603779A	ENVIRONMENTAL QUALITY TECHNOLOGY	4	0	0	4,897
64	0603790A	NATO RESEARCH AND DEVELOPMENT (H)	4	3,843	1,858	1,920
65	0603801A	AVIATION - ADV DEV	4	10,996	8,655	5,848
66	0603802A	WEAPONS AND MUNITIONS - ADV DEV	4	0	4,681	28,679
67	0603804A	LOGISTICS AND ENGINEER EQUIPMENT - ADV DEV	4	21,337	8,428	6,317
68	0603805A	CBT SERVICE SUPPORT CONTROL SYS EVAL & ANALYS	4	14,312	11,017	13,753
69	0603807A	MEDICAL SYSTEMS - ADV DEV	4	11,205	16,566	15,259
70	0603851A	TRACTOR EARL	4	915	1,079	979
71	0603854A	ARTILLERY SYSTEMS DEMONSTRATION/VALIDATION	4	300,429	266,158	355,309
72	0603856A	SCAMP BLOCK II (SPACE)	4	7,449	10,622	20,277
73	0603889A	COUNTERDRUG R&D PROJECTS	4	800	0	0
		Demonstration and Validation		488,701	475,627	661,451
74	0604201A	AIRCRAFT AVIONICS	5	15,027	6,324	42,280
75	0604220A	ARMED, DEPLOY OH-58D	5	0	0	532
76	0604223A	COMANCHE	5	352,217	463,124	614,041
77	0604270A	EW DEVELOPMENT	5	77,557	80,019	61,056
78	0604280A	JOINT TACTICAL RADIO SYSTEM	5	0	36,520	62,218
79	0604321A	ALL SOURCE ANALYSIS SYSTEM	5	35,246	53,248	44,084
80	0604328A	TRACTOR EARL	5	1,834	2,826	2,916
81	0604329A	MODERNIZED HELLFIRE	5	0	0	4,969
82	0604601A	INFANTRY SUPPORT WEAPONS	5	0	0	2
83	0604604A	MEDIUM TACTICAL VEHICLES	5	0	1,958	1,959
84	0604609A	SMOKE, OBSCURANT AND TARGET DEFEATING SYS-ED	5	659	913	3,461
85	0604611A	JAVELIN (AWWS-M)	5	3,996	489	490
86	0604619A	LANDMINE WARFARE	5	23,825	13,218	15,902
87	0604622A	FAMILY OF HEAVY TACTICAL VEHICLES	5	7,992	1,373	0
88	0604633A	AIR TRAFFIC CONTROL	5	1,550	4,911	2,026
89	0604641A	TACTICAL UNMANNED GROUND VEHICLE	5	2,528	4,905	0
90	0604642A	LIGHT TACTICLE WHEELED VEHICLE	5	0	7,441	9,893
91	0604645A	ARMORED SYSTEMS MODERNIZATION (ASM)-ENG DEV	5	4,259	2,877	2,200
92	0604649A	ENGINEER MOBILITY EQUIPMENT DEVELOPMENT	5	69,044	57,880	0
93	0604710A	NIGHT VISION SYSTEMS - ENG DEV	5	19,490	38,266	32,574
94	0604713A	COMBAT FEEDING, CLOTHING, AND EQUIPMENT	5	62,500	60,600	86,321

Department of the Army
FY 2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 2000

Line No	Program Element Number	Item	Act	Thousands of Dollars FY 1999	FY 2000	FY 2001
95	0604715A	NON-SYSTEM TRAINING DEVICES - ENG DEV	5	67,515	72,529	73,295
96	0604716A	TERRAIN INFORMATION - ENG DEV	5	6,320	5,308	6,082
97	0604726A	INTEGRATED METEOROLOGICAL SUPPORT SYSTEM	5	1,901	2,301	1,771
98	0604739A	JTT/CIBS-M (TIARA)	5	4,192	4,519	6,060
99	0604741A	AIR DEFENSE C2I - ENG DEV	5	13,033	7,943	16,462
100	0604746A	AUTOMATIC TEST EQUIPMENT DEVELOPMENT	5	9,423	16,063	12,956
101	0604760A	DISTRIBUTIVE INTERACTIVE SIMULATIONS ENG DEV	5	2,634	7,605	20,689
102	0604766A	TAC EXPLOIT NAT CAP (TENCAP)-EMD (TIARA)	5	42,025	71,879	57,419
103	0604768A	BRILLIANT ANTI-ARMOR SUBMUNITION(BAT)	5	131,940	142,753	96,102
104	0604770A	JOINT SURVEILLANCE/TARGET ATTACK RADAR SYSTEM	5	5,316	25,676	17,898
105	0604778A	POSITIONING SYS DEVEL (SPACE)	5	365	439	2,420
106	0604780A	COMBINED ARMS TACTICAL TRAINER (CATT)	5	21,644	19,775	18,498
107	0604801A	AVIATION - ENG DEV	5	11,056	13,439	7,104
108	0604802A	WEAPONS AND MUNITIONS - ENG DEV	5	39,650	68,464	22,505
109	0604804A	LOGISTICS & ENGINEER EQUIPMENT - ENG DEV	5	26,620	22,844	20,457
110	0604805A	COMMAND, CONTROL, COMMUNICATIONS SYSTEMS - ED	5	19,618	23,836	49,316
111	0604807A	MEDICAL MATERIEL/MED BIO DEFENSE EQUIPMENT ED	5	5,160	9,636	6,318
112	0604808A	LANDMINE WARFARE/BARRIER - ENG DEV	5	37,467	29,893	69,584
113	0604814A	SENSE AND DESTROY ARMOR - ENG DEV	5	30,305	24,128	52,848
114	0604817A	COMBAT IDENTIFICATION	5	15,520	8,566	5,362
115	0604818A	ARMY TACTICAL COMM & CONT HARDWARE & SOFTWARE	5	33,993	38,970	33,420
116	0604819A	LINE-OF-SIGHT ANIT-TANK MISSILE (LOSAT)	5	0	0	26,800
117	0604820A	RADAR DEVELOPMENT	5	6,708	5,089	8,429
118	0604823A	FIREFINDER	5	19,601	39,860	37,363
119	0604824A	COSSI	5	16,351	0	0
120	0604854A	ARTILLERY SYSTEMS - ENGINEERING DEVELOPMENT	5	1,059	4,782	20,105
121	0605013A	ARMY INFORMATION TECHNOLOGY DEVELOPMENT	5	0	0	94,170
		Engineering and Manufacturing Development		1,247,140	1,503,189	1,770,357
122	0604256A	THREAT SIMULATOR DEVELOPMENT	6	12,354	19,683	13,901
123	0604258A	TARGET SYSTEMS DEVELOPMENT	6	12,379	13,298	13,346
124	0604759A	MAJOR TEST & EVALUATION INVESTMENT	6	35,551	39,095	44,019
125	0605103A	RAND ARROYO CENTER	6	16,812	17,523	19,872
126	0605301A	ARMY KWAJALEIN ATOLL	6	127,470	139,322	153,326

Department of the Army
FY 2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 2000

Line No	Program Element Number	Item	Act	Thousands of Dollars FY 1999	FY 2000	FY 2001
127	0605326A	CONCEPTS EXPERIMENTATION	6	16,954	20,785	15,410
128	0605502A	SMALL BUS INV RSCH/SMALL BUS TECH PILOT PROG	6	112,204	0	0
129	0605601A	ARMY TEST RANGES AND FACILITIES	6	120,024	146,485	119,657
130	0605602A	ARMY TECHNOLOGY & SUSTAINING INSTRUMENTATION	6	41,726	31,439	33,156
131	0605604A	SURVIVABILITY/LETHALITY ANALYSIS	6	33,341	34,892	27,248
132	0605605A	DOD HIGH ENERGY LASER SYS TEST FAC (HELSTF)	6	23,131	30,803	14,521
133	0605606A	AIRCRAFT CERTIFICATION	6	2,878	3,010	3,200
134	0605702A	METEOROLOGICAL SUPPORT TO RDT&E ACTIVITIES	6	6,539	6,823	6,927
135	0605706A	MATERIEL SYSTEMS ANALYSIS	6	9,557	8,783	8,737
136	0605709A	EXPLOITATION OF FOREIGN ITEMS	6	3,882	4,112	3,582
137	0605712A	SUPPORT OF OPERATIONAL TESTING	6	64,312	68,659	71,079
138	0605716A	ARMY EVALUATION CENTER	6	26,248	24,163	26,337
139	0605801A	PROGRAMWIDE ACTIVITIES	6	67,210	64,014	73,811
140	0605803A	TECHNICAL INFORMATION ACTIVITIES	6	19,252	15,859	26,749
141	0605805A	MUNITIONS STANDARDZION EFFECTIVENESS & SAFETY	6	10,616	18,800	11,276
142	0605853A	ENVIRONMENTAL CONSERVATION	6	3,117	0	0
143	0605854A	POLLUTION PREVENTION	6	9,427	0	0
144	0605856A	ENVIRONMENTAL COMPLIANCE-RDT&E	6	51,522	4,000	0
145	0605857A	ACQUISITION POLLUTION PREVENTION	6	0	0	5,418
146	0605876A	MINOR CONSTUCTION (RPM) - RDTE	6	4,049	0	0
147	0605878A	MAINTENANCE AND REPAIR (RPM) - RDTE	6	90,568	0	0
148	0605879A	REAL PROPERTY SERVICES (RPS)	6	85,645	0	0
149	0605896A	BASE OPERATIONS-RDT&E	6	233,611	0	0
150	0605898A	MANAGEMENT HEADQUARTERS (RSCH & DEVELOPMENT)	6	21,983	27,746	5,371
151	0909999A	CLOSED ACCOUNT ADJUSTMENT	6	524	0	0
		RDT&E Management Support		1,262,886	739,294	696,943
152	0603778A	MLRS PRODUCT IMPROVEMENT PROGRAM	7	25,083	66,595	59,523
153	0102419A	JOINT LAND ATTACK CRUISE MISSILE DEFENSE (JLENS)	7	12,638	24,722	24,996
154	0203610A	EMERGENCY PREPAREDNESS TRAINING	7	15,000	6,000	0
155	0203726A	ADV FIELD ARTILLERY TACTICAL DATA SYSTEM	7	34,569	40,860	36,816
156	0203735A	COMBAT VEHICLE IMPROVEMENT PROGRAMS	7	89,010	83,271	99,423
157	0203740A	MANEUVER CONTROL SYSTEM	7	28,720	45,776	48,910
158	0203744A	AIRCRAFT MODIFICATIONS/PRODUCT IMPROV PROGRAM	7	23,577	80,786	95,829

Department of the Army
FY 2001 RDT&E Program

Exhibit R-1

Appropriation: 2040 A Research Development Test & Eval Army

Date: Feb 2000

Line No	Program Element Number	Item	Act	Thousands of Dollars FY 1999	FY 2000	FY 2001
159	0203752A	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	7	6,543	3,859	2,929
160	0203758A	DIGITIZATION	7	40,056	29,941	29,671
161	0203759A	FORCE XXI BATTLE CMD, BRIGADE & BELOW	7	56,328	65,176	63,601
162	0203761A	FORCE XXI WARFIGHTING RAPID ACQUISITION PGM	7	0	36,621	6,021
163	0203801A	MISSILE/AIR DEFENSE PRODUCT IMPRV PROGRAM	7	14,452	32,211	12,365
164	0203802A	OTHER MISSILE PRODUCT IMPROVEMENT PROGRAMS	7	1,201	17,687	64,418
165	0203808A	TRACTOR CARD	7	3,780	3,869	3,837
166	0208010A	JOINT TACTICAL COMMUNICATIONS PROG (TRI-TAC)	7	34,086	18,293	38,926
167	0208053A	JOINT TACTICAL GRD STATION (TIARA)	7	11,576	27,849	6,267
168	0301359A	SPECIAL ARMY PROGRAM	7	9,479	18,796	5,215
169	0303140A	INFORMATION SYSTEMS SECURITY PROGRAM	7	14,650	15,247	8,140
170	0303141A	GLOBAL COMBAT SUPPORT SYSTEM - ARMY	7	0	0	71,955
171	0303142A	SATCOM GROUND ENVIRO (SPACE)	7	50,648	35,958	43,229
172	0303150A	ARMY GLOBAL C2 SYS	7	17,455	11,542	14,234
173	0305114A	TRAFFIC CNTL/APPROACH/LANDING SYS (JPALS)	7	0	0	783
174	0305128A	SECURITY AND INTELLIGENCE ACTIVITIES	7	899	6,866	0
175	0305204A	TACTICAL UNMANNED AERIAL VEHICLE	7	50,189	43,087	29,427
176	0305206A	AIRBORNE RECONNAISSANCE ADVANCED DEVELOPMENT	7	7,224	4,895	4,898
177	0305208A	DISTRIBUTED COMMON GROUND SYSTEMS	7	8,585	8,004	7,894
178	0708045A	MANUFACTURING TECHNOLOGY	7	50,532	99,528	57,906
179	1001018A	NATO JSTARS - TIARA	7	2,784	0	0
		Operational Systems Development		609,064	827,439	837,213
		Total Research Development Test & Eval Army		5,030,770	5,225,268	5,260,346

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#1 - BASIC RESEARCH			
1	0601101A	In-House Laboratory Independent Research	1
2	0601102A	Defense Research Sciences	9
3	0601104A	University and Industry Research Centers	67
#2 - APPLIED RESEARCH			
5	0602105A	Materials Technology	89
6	0602120A	Sensors and Electronic Survivability	95
8	0602211A	Aviation Technology	105
9	0602270A	Electronic Warfare (EW) Technology	115
10	0602303A	Missile Technology	123
11	0602307A	Advanced Weapons Technology	129
12	0602308A	Advanced Concepts and Simulations	131
13	0602601A	Combat Vehicle and Automotive Technology	139
14	0602618A	Ballistics Technology	157
15	0602622A	Chemical, Smoke and Equipment Defeating Technology	167
16	0602623A	Joint Service Small Arms Program	171
17	0602624A	Weapons and Munitions Technology	173
18	0602705A	Electronics and Electronic Devices	183
19	0602709A	Night Vision Technology	191
20	0602712A	Countermine Applied Research	197
21	0602716A	Human Factors Engineering Technology	205

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#2 - APPLIED RESEARCH - Continued			
22	0602720A	Environmental Quality Technology	211
23	0602782A	Command, Control, Communications Technology	241
24	0602783A	Information and Communication Technology	249
25	0602784A	Military Engineering Technology	253
26	0602785A	Manpower/Personnel/Training Technology	271
27	0602786A	Warfighter Technology	275
28	0602787A	Medical Technology	287
29	0602789A	Army Artificial Intelligence Technology	327
30	0602805A	Dual Use Science & Technology (DUST) Program	329
#3 - ADVANCED TECHNOLOGY DEVELOPMENT			
31	0603001A	Warfighter Advanced Technology	333
32	0603002A	Medical Advanced Technology	347
33	0603003A	Aviation Advanced Technology	377
34	0603004A	Weapons and Munitions Advanced Technology	389
35	0603005A	Combat Vehicle and Automotive Advanced Technology	397
36	0603006A	Command, Control and Communications Advanced Technology	417
37	0603007A	Manpower, Personnel and Training Advanced Technology	427
42	0603105A	Military Human Immunodeficiency Virus (HIV) Research	429
44	0603238A	Air Defense/Precision Strike Technology	431
45	0603270A	Electronic Warfare (EW) Technology	437

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#3 - ADVANCED TECHNOLOGY DEVELOPMENT - Continued			
46	0603280A	Joint Tactical Radio	443
47	0603313A	Missile and Rocket Advanced Technology	445
49	0603606A	Landmine Warfare and Barrier Advanced Technology	461
50	0603607A	Joint Service Small Arms Program	469
51	0603654A	Line-of-Sight Technology Demonstration	471
52	0603710A	Night Vision Advanced Technology	475
53	0603728A	Environmental Quality Technology Development	483
54	0603734A	Military Engineering Advanced Technology	487
55	0603772A	Advanced Tactical Computer Science and Sensor Technology	493
#4 - DEMONSTRATION AND VALIDATION			
56	0603308A	Army Missile Defense Systems Integration	501
57	0603619A	Landmine Warfare and Barrier - Advanced Development	515
58	0603639A	Tank and Medium Caliber Ammunition	523
59	0603653A	Advanced Tank Armament System	533
60	0603713A	Army Data Distribution System	543
61	0603747A	Soldier Support and Survivability	553
62	0603774A	Night Vision Systems - Advanced Development	565
63	0603779A	Environmental Quality Technology - Dem/Val	573
64	0603790A	NATO Research & Development	575
65	0603801A	Aviation - Advanced Development	583

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#4 - DEMONSTRATION AND VALIDATION - Continued			
66	0603802A	Weapons and Munitions - Advanced Development	597
67	0603804A	Logistics and Engineering Equipment - Advanced Development	611
68	0603805A	Combat Service Support Control Systems Evaluation and Analysis	635
69	0603807A	Medical Systems - Advanced Development	643
71	0603854A	Artillery Systems Advanced Development	661
72	0603856A	SCAMP Block II (Space)	669
#5 - ENGINEERING AND MANUFACTURING DEVELOPMENT			
74	0604201A	Aircraft Avionics	675
75	0604220A	Armed, Deployable OH-58D	683
76	0604223A	Comanche	685
77	0604270A	Electronic Warfare (EW) Development	695
78	0604280A	Joint Tactical Radio	711
79	0604321A	All Source Analysis System (TIARA)	717
81	0604329A	Modernized Hellfire	729
83	0604604A	Medium Tactical Vehicles	733
84	0604609A	Smoke, Obscurant and Target Defeating System - Engineering Development	737
85	0604611A	Javelin	743
86	0604619A	Landmine Warfare	745
87	0604622A	Family of Heavy Tactical Vehicles	749
88	0604633A	Air Traffic Control	753

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#5 - ENGINEERING AND MANUFACTURING DEVELOPMENT - Continued			
89	0604641A	Tactical Unmanned Ground Vehicle	759
90	0604642A	Light Tactical Wheeled Vehicle	765
91	0604645A	Armored Systems Modernization (ASM) - Engineering Development	773
92	0604649A	Engineer Mobility Equipment Development	779
93	0604710A	Night Vision Systems - Engineering Development	785
94	0604713A	Combat Feeding, Clothing, and Equipment	805
95	0604715A	Non-System Training Devices - Engineering Development	833
96	0604716A	Terrain Information - Engineering Development (TIARA)	849
97	0604726A	Integrated Meteorological System (IMETS) (TIARA)	859
98	0604739A	JTT/CIBS-M (TIARA)	867
99	0604741A	Air and Missile Defense Command, Control, Intelligence - Engineering Development	873
100	0604746A	Automatic Test Equipment Development	885
101	0604760A	Distributive Interactive Simulations - Engineering Development	897
102	0604766A	Tactical Exploitation of National Capabilities (TENCAP) - Engineering & Manufacturing Development (TIARA)	911
103	0604768A	Brilliant Anti-Armor (BAT) Submunition	921
104	0604770A	Joint Surveillance/Target Attack Radar System	935
105	0604778A	Positioning Systems Development	941
106	0604780A	Combined Arms Tactical Trainer (CATT)	945
107	0604801A	Aviation - Engineering Development	955
108	0604802A	Weapons and Munitions - Engineering Development	959
109	0604804A	Logistics & Engineer Equipment - Engineering Development	989
110	0604805A	Command, Control, Communications Systems - Engineering Development	1021

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#5 - ENGINEERING AND MANUFACTURING DEVELOPMENT - Continued			
111	0604807A	Medical Materiel - Engineering Development	1053
112	0604808A	Landmine Warfare/Barrier - Engineering Development	1067
113	0604814A	Sense and Destroy Armor Munition - Engineering Development	1081
114	0604817A	Combat Identification	1091
115	0604818A	Army Tactical Command and Control Hardware & Software	1101
116	0604819A	Line-of-Sight Anti-Tank	1115
117	0604820A	Radar Development	1121
118	0604823A	Firefinder AN/TPQ-47	1127
119	0604824A	Commercial Operating & Support Savings Initiative (COSSI)	1133
120	0604854A	Artillery Systems - Engineering Development	1135
121	0605013A	Information Technology Development	1145
#6 - MANAGEMENT AND SUPPORT			
122	0604256A	Threat Simulator Development	1175
123	0604258A	Target Systems Development	1179
124	0604759A	Major Test and Evaluation Investment	1185
125	0605103A	Rand Arroyo Center	1193
126	0605301A	Army Kwajalein Atoll	1197
127	0605326A	Concept Experimentation Program	1201
129	0605601A	Army Test Ranges and Facilities	1207
130	0605602A	Army Test Technology and Sustaining Instrumentation	1213
131	0605604A	Survivability/Lethality Analysis	1223

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#6 - MANAGEMENT AND SUPPORT - Continued			
132	0605605A	DOD High Energy Laser Systems Test Facility (HELSTF)	1239
133	0605606A	Aircraft Certification	1241
134	0605702A	Meteorological Support to Research, Development, Testing & Evaluation Activities	1243
135	0605706A	Materiel Systems Analysis	1247
136	0605709A	Exploitation of Foreign Items	1251
137	0605712A	Support of Operational Testing	1253
138	0605716A	Army Evaluation Center	1261
139	0605801A	Programwide Activities	1263
140	0605803A	Technical Information Activities	1269
141	0605805A	Munitions Standardization Effectiveness and Safety	1287
142	0605853A	Environmental Conservation	1301
143	0605854A	Pollution Prevention	1307
144	0605856A	Environmental Compliance - Research, Development, Testing & Evaluation	1313
145	0605857A	Army Acquisition Pollution Prevention Program	1319
146	0605876A	Minor Construction - Research, Development, Testing & Evaluation	1321
147	0605878A	Maintenance and Repair - Research, Development, Testing & Evaluation	1325
148	0605879A	Real Property Services (RPS)	1329
149	0605896A	Base Operations - Research, Development, Testing & Evaluation	1333
150	0605898A	Management Headquarters (Research and Development)	1339
#7 - OPERATIONAL SYSTEM DEVELOPMENT			
153	0102419A	Joint Land Attack Cruise Missile Defense (JLENS)	1343
154	0203610A	Emergency Preparedness Training	1347
155	0203726A	Advanced Field Artillery Tactical Data System	1349
156	0203735A	Combat Vehicle Improvement Programs	1357
157	0203740A	Maneuver Control System	1377

TABLE OF CONTENTS

Line No.	PE	PROGRAM ELEMENT TITLE	PAGE
#7 - OPERATIONAL SYSTEM DEVELOPMENT - Continued			
158	0203744A	Aircraft Modifications/Product Improvement Program	1383
159	0203752A	Aircraft Engine Component Improvement Program	1399
160	0203758A	Digitization	1405
161	0203759A	Force XXI Battle Command, Brigade and Below(FBCB2)	1413
162	0203761A	Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)	1419
163	0203801A	Missile/Air Defense Product Improvement Program	1423
164	0203802A	Other Missile Product Improvement Programs	1433
166	0208010A	Joint Tactical Communications Program (TRI-TAC)	1443
167	0208053A	Joint Tactical Ground Station (TIARA)	1451
169	0303140A	Information Systems Security Program	1455
170	0303141A	Global Combat Support System - Army (GCSS-Army)	1465
171	0303142A	Satellite Command (SATCOM) Ground Environment	1469
172	0303150A	Army Global Command and Control System (AGCCS)	1491
173	0305114A	Joint Precision Approach Landing System (JPALS)	1497
174	0305128A	Security and Intelligence Activities	1499
175	0305204A	Tactical Unmanned Aerial Vehicles	1505
176	0305206A	Airborne Reconnaissance	1513
177	0305208A	Common Imagery Ground/Surface System (CIG/SS) (JMIP)	1519
152	0603778A	Multiple Launch Rocket System Product Improvement Program	1523
178	0708045A	Army Industrial Preparedness Manufacturing Technology	1537
179	1001018A	NATO Joint STARS	1551

APPHABETICAL LISTING

Program Element Title	PE	PAGE
Advanced Concepts and Simulations	0602308A	131
Advanced Field Artillery Tactical Data System	0203726A	1349
Advanced Tactical Computer Science and Sensor Technology	0603772A	493
Advanced Tank Armament System	0603653A	533
Advanced Weapons Technology	0602307A	129
Air and Missile Defense Command, Control, Intelligence - Engineering Development	0604741A	873
Air Defense/Precision Strike Technology	0603238A	431
Air Traffic Control	0604633A	753
Airborne Reconnaissance	0305206A	1513
Aircraft Avionics	0604201A	675
Aircraft Certification	0605606A	1241
Aircraft Engine Component Improvement Program	0203752A	1399
Aircraft Modifications/Product Improvement Program	0203744A	1383
All Source Analysis System (TIARA)	0604321A	717
Armed, Deployable OH-58D	0604220A	683
Armored Systems Modernization (ASM) - Engineering Development	0604645A	773
Army Acquisition Pollution Prevention Program	0605857A	1319
Army Artificial Intelligence Technology	0602789A	327
Army Data Distribution System	0603713A	543
Army Evaluation Center	0605716A	1261
Army Global Command and Control System (AGCCS)	0303150A	1491
Army Industrial Preparedness Manufacturing Technology	0708045A	1537
Army Kwajalein Atoll	0605301A	1197
Army Missile Defense Systems Integration	0603308A	501
Army Tactical Command and Control Hardware & Software	0604818A	1101
Army Test Ranges and Facilities	0605601A	1207
Army Test Technology and Sustaining Instrumentation	0605602A	1213
Artillery Systems - Engineering Development	0604854A	1135

APPHABETICAL LISTING

Program Element Title	PE	PAGE
Artillery Systems Advanced Development	0603854A	661
Automatic Test Equipment Development	0604746A	885
Aviation - Advanced Development	0603801A	583
Aviation - Engineering Development	0604801A	955
Aviation Advanced Technology	0603003A	377
Aviation Technology	0602211A	105
Ballistics Technology	0602618A	157
Base Operations - Research, Development, Testing & Evaluation	0605896A	1333
Brilliant Anti-Armor (BAT) Submunition	0604768A	921
Chemical, Smoke and Equipment Defeating Technology	0602622A	167
Comanche	0604223A	685
Combat Feeding, Clothing, and Equipment	0604713A	805
Combat Identification	0604817A	1091
Combat Service Support Control Systems Evaluation and Analysis	0603805A	635
Combat Vehicle and Automotive Advanced Technology	0603005A	397
Combat Vehicle and Automotive Technology	0602601A	139
Combat Vehicle Improvement Programs	0203735A	1357
Combined Arms Tactical Trainer (CATT)	0604780A	945
Command, Control and Communications Advanced Technology	0603006A	417
Command, Control, Communications Systems - Engineering Development	0604805A	1021
Command, Control, Communications Technology	0602782A	241
Commercial Operating & Support Savings Initiative (COSSI)	0604824A	1133
Common Imagery Ground/Surface System (CIG/SS) (JMIP)	0305208A	1519
Concept Experimentation Program	0605326A	1201
Countermine Applied Research	0602712A	197
Defense Research Sciences	0601102A	9
Digitization	0203758A	1405
Distributive Interactive Simulations - Engineering Development	0604760A	897

APPHABETICAL LISTING

Program Element Title	PE	PAGE
DOD High Energy Laser Systems Test Facility (HELSTF)	0605605A	1239
Dual Use Science & Technology (DUST) Program	0602805A	329
Electronic Warfare (EW) Technology	0602270A	115
Electronic Warfare (EW) Technology	0603270A	437
Electronic Warfare (EW) Development	0604270A	695
Electronics and Electronic Devices	0602705A	183
Emergency Preparedness Training	0203610A	1347
Engineer Mobility Equipment Development	0604649A	779
Environmental Compliance - Research, Development, Testing & Evaluation	0605856A	1313
Environmental Conservation	0605853A	1301
Environmental Quality Technology	0602720A	211
Environmental Quality Technology - Dem/Val	0603779A	573
Environmental Quality Technology Development	0603728A	483
Exploitation of Foreign Items	0605709A	1251
Family of Heavy Tactical Vehicles	0604622A	749
Firefinder AN/TPQ-47	0604823A	1127
Force XXI Battle Command, Brigade and Below(FBCB2)	0203759A	1413
Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)	0203761A	1419
Global Combat Support System - Army (GCSS-Army)	0303141A	1465
Human Factors Engineering Technology	0602716A	205
Information and Communication Technology	0602783A	249
Information Systems Security Program	0303140A	1455
Information Technology Development	0605013A	1145
In-House Laboratory Independent Research	0601101A	1
Integrated Meteorological System (IMETS) (TIARA)	0604726A	859
Javelin	0604611A	743
Joint Land Attack Cruise Missile Defense (JLENS)	0102419A	1343
Joint Precision Approach Landing System (JPALS)	0305114A	1497

APPHABETICAL LISTING

Program Element Title	PE	PAGE
Joint Service Small Arms Program	0602623A	171
Joint Service Small Arms Program	0603607A	469
Joint Surveillance/Target Attack Radar System	0604770A	935
Joint Tactical Communications Program (TRI-TAC)	0208010A	1443
Joint Tactical Ground Station (TIARA)	0208053A	1451
Joint Tactical Radio	0603280A	443
Joint Tactical Radio	0604280A	711
JTT/CIBS-M (TIARA)	0604739A	867
Landmine Warfare	0604619A	745
Landmine Warfare and Barrier - Advanced Development	0603619A	515
Landmine Warfare and Barrier Advanced Technology	0603606A	461
Landmine Warfare/Barrier - Engineering Development	0604808A	1067
Light Tactical Wheeled Vehicle	0604642A	765
Line-of-Sight Anti-Tank	0604819A	1115
Line-of-Sight Technology Demonstration	0603654A	471
Logistics & Engineer Equipment - Engineering Development	0604804A	989
Logistics and Engineering Equipment - Advanced Development	0603804A	611
Maintenance and Repair - Research, Development, Testing & Evaluation	0605878A	1325
Major Test and Evaluation Investment	0604759A	1185
Management Headquarters (Research and Development)	0605898A	1339
Maneuver Control System	0203740A	1377
Manpower, Personnel and Training Advanced Technology	0603007A	427
Manpower/Personnel/Training Technology	0602785A	271
Materials Technology	0602105A	89
Materiel Systems Analysis	0605706A	1247
Medical Advanced Technology	0603002A	347
Medical Materiel - Engineering Development	0604807A	1053
Medical Systems - Advanced Development	0603807A	643

APPHABETICAL LISTING

Program Element Title	PE	PAGE
Medical Technology	0602787A	287
Medium Tactical Vehicles	0604604A	733
Meteorological Support to Research, Development, Testing & Evaluation Activities	0605702A	1243
Military Engineering Advanced Technology	0603734A	487
Military Engineering Technology	0602784A	253
Military Human Immunodeficiency Virus (HIV) Research	0603105A	429
Minor Construction - Research, Development, Testing & Evaluation	0605876A	1321
Missile and Rocket Advanced Technology	0603313A	445
Missile Technology	0602303A	123
Missile/Air Defense Product Improvement Program	0203801A	1423
Modernized Hellfire	0604329A	729
Multiple Launch Rocket System Product Improvement Program	0603778A	1523
Munitions Standardization Effectiveness and Safety	0605805A	1287
NATO Joint STARS	1001018A	1551
NATO Research & Development	0603790A	575
Night Vision Advanced Technology	0603710A	475
Night Vision Systems - Advanced Development	0603774A	565
Night Vision Systems - Engineering Development	0604710A	785
Night Vision Technology	0602709A	191
Non-System Training Devices - Engineering Development	0604715A	833
Other Missile Product Improvement Programs	0203802A	1433
Pollution Prevention	0605854A	1307
Positioning Systems Development	0604778A	941
Programwide Activities	0605801A	1263
Radar Development	0604820A	1121
Rand Arroyo Center	0605103A	1193
Real Property Services (RPS)	0605879A	1329
Satellite Command (SATCOM) Ground Environment	0303142A	1469

APPHABETICAL LISTING

Program Element Title	PE	PAGE
SCAMP Block II (Space)	0603856A	669
Security and Intelligence Activities	0305128A	1499
Sense and Destroy Armor Munition - Engineering Development	0604814A	1081
Sensors and Electronic Survivability	0602120A	95
Smoke, Obscurant and Target Defeating System - Engineering Development	0604609A	737
Soldier Support and Survivability	0603747A	553
Support of Operational Testing	0605712A	1253
Survivability/Lethality Analysis	0605604A	1223
Tactical Exploitation of National Capabilities (TENCAP) - Engineering & Manufacturing Development (TIARA)	0604766A	911
Tactical Unmanned Aerial Vehicles	0305204A	1505
Tactical Unmanned Ground Vehicle	0604641A	759
Tank and Medium Caliber Ammunition	0603639A	523
Target Systems Development	0604258A	1179
Technical Information Activities	0605803A	1269
Terrain Information - Engineering Development (TIARA)	0604716A	849
Threat Simulator Development	0604256A	1175
University and Industry Research Centers	0601104A	67
Warfighter Advanced Technology	0603001A	333
Warfighter Technology	0602786A	275
Weapons and Munitions - Advanced Development	0603802A	597
Weapons and Munitions - Engineering Development	0604802A	959
Weapons and Munitions Advanced Technology	0603004A	389
Weapons and Munitions Technology	0602624A	173

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604256A Threat Simulator Development

PROJECT: D976

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D976 Army Threat Simulator Program	12354	19683	13901	15929	15880	20439	21027	Continuing	Continuing

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 Test and Evaluation Command (ATEC)-conducted operational tests, and to support 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 US 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 , Operational Test and Evaluation, Office of the Secretary of Defense. These affiliations eliminate any duplication within the U.S. Army or Department of Defense (DoD).

FY 1999 Accomplishments:

- 2433 Completed threat transmissions and communication devices within the command data link structure; installed and integrated fire units and acquisition radar data links; and integrated lower echelon command structure for the Battle Management Network.
- 1782 Completed Proof-of-Principle field test of an eye safe laser/receiver design for XMDEWS Advanced Land Combat Systems.
- 1000 Developed Jamming Simulator for US Army Battle Laboratory (Congressional Plus-up).
- 2529 Completed design and development of embedded instrumentation system for the XM15A Air Defense System.
- 1856 Completed design and development of embedded instrumentation system for the XM43A Air Defense System.
- 2754 Continued development of Advanced Distributed Electronic Warfare Simulation (XMADEWS).

Total 12354

FY 2000 Planned Program:

- 1735 Develop Global Positioning System (XMGPS) receiver jammer.
- 3336 Continue development of XMDEWS Advanced Land Combat System.
- 3615 Initiate instrumentation and fielding of XM70A threat system.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0604256A Threat Simulator Development — PROJECT: D976

FY 2000 Planned Program: (continued)

•	2478	Continue development of regimental elements of XMC3S for the Battle Management Network
•	482	Initiate initial design for XM11S threat system.
•	188	Initiate initial design for XMAPS threat system.
•	1205	Complete development of Advanced Distributed Electronic Warfare Simulation (XMADEWS).
•	1200	Develop Threat Mine Simulator (Congressional Plus-Up).
•	3000	Develop Virtual Threat Simulator (Congressional Plus-Up).
•	2000	Develop Threat EO/IR Simulator (Congressional Plus-Up).
•	444	Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR)
Total	19683	

FY 2001 Planned Program:

•	1694	Complete development and fielding of XMGPS receiver jammer.
•	1828	Complete development of XMDEWS Advanced Land Combat System.
•	3430	Continue development and fielding of XM70A threat system.
•	1293	Continue development of regimental elements of XMC3S for the Battle Management Network.
•	2703	Initiate development of XM18S threat system.
•	2953	Initiate development of XMAPS threat system.
Total	13901	

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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604256A Threat Simulator Development
	PROJECT D976

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	12837	13680	13791
Appropriated Value	12935	19880	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-98		
b. SBIR / STTR	-258		
c. Omnibus or Other Above Threshold Reduction		-68	
d. Below Threshold Reprogramming	-173		
e. Rescissions	-52	-129	
Adjustments to Budget Years Since FY 2000/2001 PB			+110
Current Budget Submit (FY 2001 PB)	12354	19683	13901

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604258A Target Systems Development

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	12379	13298	13346	15101	13637	20549	21402	Continuing	Continuing
D238 Aerial Targets	5279	6417	5915	6327	6036	9106	9479	Continuing	Continuing
D459 Ground Targets	7100	6881	7431	8774	7601	11443	11923	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 ongoing target materiel upgrades to maintain continuity with current weapons technology and trends in modern and evolving Army weapons.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	13038	13397	14423
Appropriated Value	13127	13397	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-89		
b. SBIR / STTR	-337		
c. Omnibus or Other Above Threshold Reductions		-54	
d. Below Threshold Reprogramming	-270		
e. Rescissions	-52	-45	
Adjustments to Budget Years Since FY 2000/2001 PB			-1077
Current Budget Submit (FY 2001 PB)	12379	13298	13346

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604258A Target Systems Development

PROJECT: D238

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D238 Aerial Targets	5279	6417	5915	6327	6036	9106	9479	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 1999 Accomplishments:

- 1518 Completed baseline configuration and initiate update for Hokum-X Rotary Wing Target (Canadian Cooperative Program) to include developmental integration work of Universal Drone System (UDS) Drone kits into the first aircraft.
- 1339 Continued enhancement of the MQM-107 Target system, including updating of obsolete parts to maintain producibility and supportability; manage fabrication; and correct autopilot deficiencies performance and payload capability needed by the Army and the other services (Army assigned Tri-Service lead for MQM-107).
- 381 Integrated and installed the Universal Drone System (UDS) into the Hokum-X target. AH-1 integration and installation scheduled for FY00.
- 782 Initiated Redesign of 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. Continue to maintain current configuration TTCS, to support on-going operations, until redesigned configuration TTCS's are available.
- 794 Continued development, enhancement, maintenance, and storage for all RDT&E aerial targets, towed targets and ancillary devices.
- 465 Initiated development of Unmanned Aerial Vehicle Surrogate (UAV-S) Target.

Total 5279

FY 2000 Planned Program:

- 760 Manage the Army Rotary Wing target program (e.g., QAH-1, QUH-1, QH-50, etc.), including updates for obsolescence, maintenance, and safety to support T&E programs such as Stinger and Medium Extended Air Defense System (MEADS). Continue maintenance and storage of Hokum-X Rotary Wing Target (Canadian Cooperative Program) and complete integration of UDS into the Hokum-X target.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258A Target Systems Development
	PROJECT D238

FY 2000 Planned Program: (continued)

•	1385	Continue enhancement of the MQM-107 Target system, including updating obsolete parts to maintain producibility and supportability, manage fabrication and improve airframe maneuverability to meet the aerodynamic performance and payload capability needed by the Army and Tri-Service customers.
•	515	Continue integration of Universal Drone System (UDS) into additional targets (up to 2 AH-1's) 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.
•	300	Continue development of aerial virtual targets, including models of Hokum-X, and AH-1 variants.
•	1388	Continue design and development of Unmanned Aerial Vehicle Surrogate (UAV-S) Target to support Stinger (FY01-02 baselining and FY04-06 T&E) and Medium Extended Air Defense System (MEADS) T&E.
•	167	Small Business Innovative Research/Small Business Technical Transfer (SBIR/STTR) Program.
Total	6417	

FY 2001 Planned Program:

•	480	Continue management and sustainment of Army Rotary Wing target program (e.g., QAH-1, QUH-1, QH-50, and Hokum-X), includes updates for obsolescence, maintenance, and safety to support T&E programs such as Stinger and Medium Extended Air Defense System (MEADS).
•	1079	Continue enhancement of the MQM-107 Target system, including updating obsolete parts to maintain producibility and supportability, manage fabrication, and improve airframe maneuverability to meet the aerodynamic performance and payload capability needed by the Army and Tri-Service customers.
•	436	Continue integration of Universal Drone System (UDS) into additional targets (additional AH-1's and/or Apaches), and update system for obsolescence, maintenance and safety.
•	920	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.
•	1931	Continue development, fabricate and begin testing four (4) UAV-S prototypes (with control stations), to support Stinger (FY01-02 baselining and FY03 T&E).
Total	5915	

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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0604258A Target Systems Development		PROJECT: D459

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D459 Ground Targets	7100	6881	7431	8774	7601	11443	11923	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 weapon 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 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.

FY 1999 Accomplishments:

- 1753 Managed and provided oversight for Primary Operating Centers operation, storage, maintenance, and configuration management for the repair of existing ground target assets including acquisition of new material and spare parts.
- 2048 Continued development of virtual ground targets to support test and evaluation (e.g., Multiple Launch Rocket System (MLRS), Russian Air Defense System SA6, High Mobility Multipurpose Wheeled Vehicle (HMMWV), etc.). Implemented configuration control and initiated validation efforts. Target models will be utilized in Virtual Proving Ground and other weapon systems T&E and Modeling & Simulation (M&S) activities.
- 863 Completed requirements definition of the Next Mobile Ground Target Surrogate.
- 2436 Completed testing of BMP3-S and began 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 Brilliant Anti-Armor SubMunition (BAT) T&E in the FY00 and FY02 timeframe.

Total 7100

FY 2000 Planned Program:

- 1950 Manage and provide oversight for Primary Operating Centers operation, storage, maintenance, and configuration management for the repair of existing ground target assets including acquisition of new material and spare parts.
- 1578 Develop additional virtual ground targets (e.g., Straight Flush, Russian BMP-1, Russian TZM, etc.) to support test and evaluation. Update current models to add/improve InfraRed (IR) characteristics and improve visual representation. Target models will be utilized in Virtual Proving Ground and other weapon systems T&E and Modeling & Simulation (M&S) activities.
- 639 Begin prototyping of the Next Mobile Ground Target Surrogate (e.g., Transporter-Erector-Launcher (TEL), Multiple Rocket Launcher (MRL)).

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604258A Target Systems Development
	PROJECT D459

FY 2000 Planned Program: (continued)

•	934	Begin development of family of New Generation Army Targetry System (NGATS) programs to include: initiation of Digital Multi-Purpose Range Complex (DMPRC) acquisition (for First Digitized Division, the 4th ID at Fort Hood); prototyping and testing of All Targetry Scoring System (ATSS) to include Doppler Scoring Subsystem; and requirements analysis and program planning for Tank Thermal Target and Evasive targetry.
•	1599	Complete fabrication and begin deployment into the operational fleet, of the first ten (10) Infantry Fighting Vehicle Russian Name BMP3-S Ground Target Surrogates to maintain up-to-date threat representative targets that are required to support Comanche and BAT T&E in the FY00 and FY02 timeframe.
•	181	Small Business Innovative Research/Small Business Technical Transfer (SBIR/STTR) Program.
Total	6881	

FY 2001 Planned Program:

•	2267	Manage and provide oversight for Primary Operating Centers operation, storage, maintenance, and configuration management for the repair of existing ground target assets including acquisition of new material and spare parts.
•	2216	Develop additional virtual ground targets (e.g., Russian Name 2S6, Russian Name 2S-3M, Soviet Multipurpose Tracked Vehicle Russian Name MTLB, Russian Name BPV-80) 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
•	2164	Complete initial 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 (e.g., BAT). (Delivers 1 prototype)
•	784	Complete deployment of Infantry Fighting Vehicle Russian Name BMP3-S into the operational fleet 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	7431	

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 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604759A Major Test and Evaluation Investment

COST (*In Thousands*)	FY 1999 Actual	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	35551	39095	44019	49594	56079	63491	66451	Continuing	Continuing
D983 Major Test & Evaluation - USAKA	4428	7436	8196	7722	8447	14385	9989	Continuing	Continuing
D984 Major Technical Test Instrumentation	28827	27006	29275	33612	39005	38803	44402	Continuing	Continuing
D986 Major User Test Instrumentation	2296	4653	6548	8260	8627	10303	12060	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 (ATEC) and Developmental Test Command (DTC) 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 Operation Test Command (OTC) major field instrumentation. 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 that require these systems. Army testing facilities are also surveyed to determine major testing capability shortfalls.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001PB)	37030	39380	40190
Appropriated Value	37284	39380	
Adjustments to Appropriated Value			
a. a. Congressional General Reductions	-254		
b. b. SBIR/STTR	-937		
c. c. Omnibus or Other Above Threshold Reductions		-155	
d. d. Below Threshold Reprogramming	-394		
e. e. Rescissions	-148	-130	
Adjustments to Budget Year Since FY2000/2001PB			+3829
Current Budget Submit (FY 2001 PB)	35551	39095	44019

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment		PROJECT D983

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D983 Major Test & Evaluation - USAKA	4428	7436	8196	7722	8447	14385	9989	Continuing	Continuing

Mission Description and Justification: **Project D983 - Major Test and Evaluation (T&E) Investment - USAKA:** This project funds the purchase of major Improvement and Modernization (I&M) equipment for 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 radars, 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 Theater Missile Defense (TMD) and National Missile Defense (NDM) test missions as well as reduce USAKA/KMR annual operating costs by $18M per year beginning in FY03. These savings are already reflected in USAKA PE 0605301A.

FY 1999 Accomplishments:

•	4428	Continued KMR Modernization and Remoting (KMAR) – Completed purchase of Advanced Research Project Agency (ARPA) Lincoln C-band Observable Radar (ALCOR) and Millimeter Wave (MMW) radar intermediate frequency (IF) receiver, digital pulse compression, computer, and recording equipment. Began installation of ALCOR transmitter control, antenna control, and radiation monitor interface, and console subsystems. Completed remoting of Gagan Island post-impact telemetry. Completed Super Recording Automatic Digital Optical Tracker (RADOT) optics computer upgrades.
Total	4428	

FY 2000 Planned Program:

•	7236	Continue KMR Modernization and Remoting (KMAR) – Begin installation of remaining IF receiver, digital pulse compression, computer and recording system equipment. After validation and verification testing ALCOR radar modernization is complete. Complete three T3 circuits from Kwajalein to the KREMS radars on Roi-Namur in addition to mission voice circuit upgrades to allow full automation of Kiernan Re-entry Measurement Site radar complex at Roi-Namur as each radar system completes modernization. Relocate Gagan Island 3m antenna to Roi-Namur. Begin installation of MMW modernized radar transmit control, antenna control and radiation monitor interface equipment. Complete mission planning workstation and simulation capabilities to allow for automated mission planning. Update RADOT optics computers.
•	200	Small Business Innovative Research/Small Business Technical Transfer (SBIR/STTR) Program.
Total	7436	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment
	PROJECT D983

FY 2001 Planned Program:

•	7496	Continue KMR Modernization and Remoting (KMAR) – Complete installation of IF receiver, computer, digital pulse compression and recording equipment. After validation and verification MMW radar modernization is complete. Begin installation of ALTAIR radar modernization transmit control, antenna control, radiation monitor interface subsystems. Construct KMR Space Surveillance Center addition to the KMR Mission Control Center and install, verify and validate operation of computer, and consoles prior to relocating spacetrack operators from Roi-Namur Island to Kwajalein Island.
	700	Begin MMW radar 4Khz upgrade in support of NMD testing.
Total	8196	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0604759A Major Test and Evaluation Investment

PROJECT: D984

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D984 Major Technical Test Instrumentation	28827	27006	29275	33612	39005	38803	44402	Continuing	Continuing

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 (ATEC) Developmental Test Command (DTC) 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. Projects are designated major based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (generally greater than $1M/yr or $5M total project) and applicability to other mission areas or services. These projects are technically demanding, pushing the state of the art, unique instrumentation assets or suites to meet the technology shortfalls, and generally result from development programs managed by a professional project management team. The Test Support Network (TSN) at WSMR provides 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 Frequency Surveillance System (FSS) provides 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) conducts 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 imaging infrared and FLIR sensors while installed on the weapon system under test at ATTC.

FY 1999 Accomplishments:

- 10997 Continued WSMR TSN Phase I to include installation and acceptance testing to support IOC. Initiated installation of breakout and feeder sites to support WSMR TSN Phase II.
- 1826 Continued installation of the LCI Automotive Communication Network (ACN) at ATC Churchville test area. Completed Direct Fire Productivity Improvement instrumentation.
- 6377 Purchased, integrated, and initiated factory acceptance testing WSMR FSS equipment at the contractor's site.
- 2925 Continue DIRSP system integration and began preliminary factory acceptance testing at contractor's facility.
- 4667 Continued development of HSTSS instrumentation for YPG and started acceptance testing of key components. Awarded EMD contract for referenced Crystal Oscillator which provides the "clock" for the transmitter timing that gives the IRIG compatibility accuracy required by the T&E ranges.
- 938 Completed RDTS acquisition strategy and Engineering Design Plans to include engineering drawings and site survey report. Completed RDTS telecommunications installation plan and the telecommunications system engineering plan.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment
	PROJECT D984

FY 1999 Accomplishments: (continued)

•	1097	Continue Phase I of the MIRSP project, which develops a risk mitigation prototype for the objective MIRSP (which is Phase II). The prototype will be a full-up infrared scene projector housed in a mobile trailer and will be fielded with the Aviation Technical Test Center, Ft Rucker, Al.
Total	28827	

FY 2000 Planned Program:

•	13190	Continue WSMR TSN Phase II installation effort to include fiber optic service extension and additional network/subnetwork capability. Complete Phase I and achieve IOC.
•	754	Continue installation of ACN instrumentation at ATC.
•	381	Complete integration and final system acceptance test of FSS equipment at WSMR.
•	735	Complete DIRSP system integration and factory acceptance testing at contractor's facility. Complete Site Acceptance testing at Redstone Technical Test Center.
•	6135	Award GPS Sensor Contract for HSTSS. Incorporate HSTSS into TERM-KE tactical configuration. Incorporate HSTSS into MLRS program for stockpile reliability testing.
•	2147	Initiate installation plans and system engineering for all outside digital fiber optic cable and inside plant electronics to support Phase I of RDTS for the YPG West Kofa test ranges to support telecommunications systems.
•	2961	Complete MIRSP Phase I system fabrication, integration and testing at ATTC. Initiate requirements definition and concept development for Phase II Objective MIRSP.
•	703	Small Business Innovative Research/Small Business Technical Transfer (SBIR/STTR) Program.
Total	27006	

FY 2001 Planned Program:

•	18186	Complete WSMR TSN Phase II system integration. Initiate Phase III to include extension of fiber optic service to additional WSMR test sites.
•	901	Continue installation of ACN instrumentation at ATC.
•	3954	Continue development and acceptance testing of HSTSS components.
•	4893	Continue installation of digital fiber optic cable to support YPG RDTS Phase I.
•	1341	Continue development of MIRSP Phase II, (the fullup system).
Total	29275	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment		PROJECT D986

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D986 Major User Test Instrumentation	2296	4653	6548	8260	8627	10303	12060	Continuing	Continuing

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 Test and Evaluation Command's (ATEC) which includes operational test directorates at Fort Hood, TX, Fort Bragg, NC, Fort Sill, OK, Fort Bliss, TX and Fort Huachuca, 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 small and large-scale operations (up to 1830 players). MAIS is the US Army's only RTCA capability and is used to test all current and future U.S. Army weapons and weapon systems in a force-on-force operational environment. The D986 program includes three major thrust areas: MAIS Pre-Planned Product Improvements (P3I), Instrumentation XXI, and Protocol Data Unit (PDU) Gateway. While each of these thrust areas have discrete objectives, sub-programs, and end states, they are extensively intertwined in a complimentary and synergistic manner such that the net effect of the integrated capabilities provides significant leveraging opportunities in terms of system performance and overall capability afforded to the community. Without these capabilities, the Operational Test community will encounter shortcomings in its ability to adequately assess Medium Force Brigade and Army 2010 and Beyond developments. MAIS P3I RDTE develops the instrumentation required, but not funded, under the basic MAIS program. MAIS P3I RDTE develops performance enhancements and technology upgrades to the MAIS C3 Center, Communications Network, weapons system interfaces, and miniaturization of the vest peripherals, GPS System, and Encryption components. These improvements will enable MAIS to measure and record accrued damage, levels of exposure, effects of countermeasures, evasive action, and instrument threat vehicles, while significantly reducing system intrusiveness and increase the safety of current instrumentation for both vehicle and dismounted instrumentation. 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 Instrumentation XXI thrust area of MIAS develops instrumentation that does not presently exist to monitor, record, stress, and analyze the effects of the digital information battlefield in a realistic operational scenarios. Instrumentation XXI is required by the operational test community to integrate digital battlefield data collection and analysis tools into the MAIS. These tools will collect, store and analyze data from this new dimension of digital battlefield warfare. Instrumentation XXI ensures Army 2010 and Beyond communications can be captured and analyzed at various echelons from the tactical vehicle to the command center, in realistic operational scenarios. Personnel and resources cuts have already been taken in the test community predicated upon data reduction/analysis streamlining provided by this MAIS capability. The PDU Gateway thrust area responds to the current OPTEMPO and PERSTEMPO demands to force the US Army to conduct more realistic, more accurate, and comprehensive evaluations at reduced costs by virtually replicating a greater number of troop resources in force-on-force testing and training exercises. PDU Gateway provides MAIS the opportunity to interface the Live component "weapons systems" into the synthetic environment and leverage live tests with simulations. The ability to fully stress the entire battlefield with numerous simulated entities present opportunities for significant cost savings and greater realism than would otherwise be achievable.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0604759A Major Test and Evaluation Investment
	PROJECT D986

FY 1999 Accomplishments:

•	2296	Completed the First Generation Dismounted Troop miniaturization design, development and testing in preparation for production. Completed the design and development of the Javelin interface. Completed the design, development, and implementation of a MAIS-MILES interoperability capability. Initiated the feasibility study and requirements definition of MAIS future miniaturization, specifically Micro Programmable Electronics (MPE). Initiated the design and development 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.
Total	2296	

FY 2000 Planned Program:

•	4550	Complete the design and development of the MAIS Weapons Performance Module (WPM) and the Micro Programmable Electronics (MPE) initiative. Continue MAIS miniaturization, specifically the design, development, and testing of system algorithms. Initiate studies, implementation concepts, and conduct preliminary testing of a new programmable encryption device mandated by the National Security Agency. Initiate the development of core system algorithms and interfaces for existing and emerging weapon systems. Initiate development of a reconfigurable interface/controller that allows MAIS to use the training community's surrogate weapons. Initiate development of player unit Bus Architecture for player unit instrumentation kits to improve performance, safety, and eliminate bulky cabling. Initiate C3 Center upgrade and performance improvement studies. Evaluate and prototype a multi-spectral laser receiver that receives both simulated engagement pairing and tactical laser messages.
•	103	Small Business Innovative Research/Small Business Technical Transfer (SBIR/STTR) Program
Total	4653	

FY 2001 Planned Program:

•	6548	Complete development of the player unit Bus Architecture. Continue MAIS P3I core weapon system interface development for existing and emerging weapon systems. Continue development of the MAIS reconfigurable surrogate interface/controller. Continue MAIS miniaturization, specifically design, development and testing of system algorithms. Initiate the development of core system algorithms and interfaces for existing and emerging weapon systems to include vest peripherals, GPS System and Encryption components. Continue development of a reconfigurable interface/controller that allows MAIS to use the training community's surrogate weapons. Continue development of the MAIS Weapons Performance Module. Initiate After Action Review, Test Officer's Training Station, Combat Identification for Dismounted Soldiers (CIDDS) and the Land Warrior Interface. Implement development of the Weapon System Software Compatibility Upgrade. Initiate design and development of the MAIS P3I Wearable Computer. Implement C3 Center upgrade and performance improvements. Implement new encryption device in conjunction with MPE.
Total	6548	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605103A Rand Arroyo Center

PROJECT: D732

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D732 Arroyo Center Support	16812	17523	19872	20183	20570	21582	21960	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 are 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 (Acquisition, Logistics and Technology). 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 1999 Accomplishments:

- 5990 Researched 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 Asian economic crisis will affect the security environment; 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 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605103A Rand Arroyo Center	PROJECT D732

FY 1999 Accomplishments: (continued)

•	1648	Researched 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.
•	3816	Researched 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.
•	4646	Researched 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; 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.; increasing responsiveness of the repair process; and developing a framework for assessing the viability of the installations the Army will require out to 2020.
•	712	Researched 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	16812	Total

FY 2000 Planned Program:

•	3111	Research addressing the Army's role in national security, including assisting the Army leadership to prepare for high-level strategy, force structure, and resource reviews; assessing the Army's current role in space and how it can be enhanced in the future; examining new concepts, technologies, and doctrine to enhance Army capabilities to conduct operations in urban environments; seeking to explain what did not happen (and why) as well as what did happen and the way in which diplomatic factors and coalition and physical constraints affected operations in the Kosovo campaign; and providing a framework for monitoring the emergence of "peer competitors."
•	4085	Research addressing the creation of a more agile, responsive force, including a quantitative assessment of new rapid-reaction capabilities; determining the effects of deployment policies on personnel readiness; identifying ways to support SSC missions while minimizing impacts on the Army's ability to execute its time-phased force deployment list for an MTW; developing and supporting the implementation of process-improvement initiatives that will help the Army improve the order and ship process; helping the Army size and configure the stocks at the retail echelons to improve supply

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605103A Rand Arroyo Center	PROJECT D732

FY 2000 Planned Program: (continued)

performance and reduce inventory investment; extending the Velocity Management (VM) methodology to the "quality" aspect of Army processes to help understand the sources of quality problems, measure their impact on the logistics system, and help generate corrective solutions; examining alternative unit resource priority-setting methodologies and new concepts for resourcing units to maintain a readiness posture that supports the full range of operational missions; and providing analytic planning and execution support to five Army After Next franchises.

- 2249 Research addressing recapitalization and modernization strategies, including developing measures of effectiveness for evaluating contributions to future capabilities provided by Army modernization programs; using high-resolution simulation to quantify characteristics of future-force concepts and determine their military utility in a system-of-systems context; examining Army programs and investment strategies and recommending alternative strategies that might result in quicker fielding of force capabilities; providing a long-term vision of how spiral development, as applied to information systems, should be incorporated within the Army acquisition, test and evaluation, and training environment; and analyzing the necessary tradeoffs in meeting increasing demands on current forces while preparing to modernize with no or little increases in the acquisition budget.
- 674 Providing analytic support to the QDR effort, including helping the Army leadership evaluate how to best develop and demonstrate capabilities to support domestic authorities in peace and war; and forecasting active duty personnel costs in order to assess whether out-year personnel budget amounts are sufficient to attract and retain the quantity and quality of personnel sought by the Army.
- 3148 Research addressing staffing and shaping the force, including developing designs and plans for conducting Army recruiting market research and evaluating the cost-effectiveness of advertising and marketing programs; addressing the frequency of ARNG rotations to CTCs; analyzing personnel policy issues that arise as the Army implements distance learning; testing and evaluating alternative ROTC staffing programs that could reduce demands for active personnel; and assessing how the Army's new Officer Personnel Management System is affecting long-standing problems in the officer force.
- 3035 Research addressing reshaping support functions, including developing concepts to improve Army depot maintenance processes and provide improved weapon-system maintenance support across all echelons for existing equipment and new technologies; analyzing single stock fund policies to identify implementation issues and recommend policy refinements; applying VM analysis and process improvement techniques to the management of Army training ammunition to improve system responsiveness and reliability; helping the Army improve its strategic responsiveness in small- and mid-size operations; applying the VM define-measure-improve methodology to the procurement process in lead times and order quantities to reduce administrative lead time/production lead time; and developing a blueprint to guide the Army toward its future (2005-2015 and beyond) logistics system.
- 749 Research addressing maintaining the technological edge, including identifying ways the Army can better collaborate and partner with industry by exploiting acquisition reform initiatives to improve the Army's acquisition system; and determining if there are better organizational models for the Army laboratories.
- 472 Small Business Innovative Research/Small Business Technology Transfer

Total 17523

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605103A Rand Arroyo Center / PROJECT: D732

FY 2001 Planned Program:

- 6955 Research addressing the national security debate
- 5763 Research addressing shaping and staffing the force
- 5962 Research addressing reshaping support functions and infrastructure
- 1192 Research addressing exploring technology alternatives

Total 19872 Total

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	16685	17656	17995
Appropriated Value	16718	17656	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-33		
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions		-72	
d. Below Threshold Reprogramming	+127		
e. Rescissions		-61	
Adjustments to Budget Years Since FY 2000/2001 PB			+1877
Current Budget Submit (FY 2001 PB)	16812	17523	19872

Change Summary Explanation: Funding - For FY 2001, the increase supports the QDR and senior leader requirements.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605301A Army Kwajalein Atoll

PROJECT: D614

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D614 US Army Kwajalein Atoll	127470	139322	153326	144715	127949	135831	139560	Continuing	Continuing

A. Mission Description and Justification: The 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). The lean O&M funding for FY 1999 has resulted in the delay of critical repair and replacement of facilities and equipment. The FY99 reductions in this PE and the USAKA/KMR line in PE 0604759A have delayed completion of critical range modernization efforts by over one year, negating savings until FY03 and causing a serious backlog of infrastructure repair and maintenance, as well as contributed to multi- million dollar equipment repair/replacement backlog. Noted funding for FY's 00/01 is 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 $17.7M per year beginning in FY03 as reflected in FY03-05 funding levels above. 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 Advanced Research Project Agency (ARPA) 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 NMD (GBI, GBR, BMC3, IFICS), TMD (THAAD, PAC-3, System Integration of Tests, Family of Systems) Theater Missile Defense Critical Measurements Program, Theater High Altitude Air Defense (THAAD), Patriot, and ground-based radar; NASA's

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605301A Army Kwajalein Atoll
	PROJECT D614

Space 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.

FY 1999 Accomplishments:

•	7899	Provided management support (salaries, training, travel, SMDC matrix, etc.).
•	606	Accomplished maintenance and repair projects, including design.
•	13011	Procured POL and MILSTRIP.
•	4678	Procured other mission operating supplies, equipment, and services.
•	5841	Provided air and sea transportation (cargo to and from continental United States).
•	35693	Continued to support Army, BMDO, NASA, and Air Force developmental and operational missile testing. Continued support to KMAR program).
•	59084	Provided logistical support to self contained islands of USAKA.
•	658	Year 2000 Compliance.
Total	127470	

FY 2000 Planned Program:

•	8474	Provide management support (salaries, training, travel, SMDC matrix, etc).
•	5750	Accomplish maintenance and repair projects, including design.
•	12076	Procure POL and MILSTRIP.
•	3117	Procure other mission operating supplies, equipment, and services.
•	6657	Provide air and sea transportation (cargo to and from continental United States).
•	35012	Continue to support Army, BMDO, NASA and Air Force development and operational missile testing. Continue support to KMR Modernization and Remoting (KMAR).
•	64616	Provide logistical support to self contained islands of USAKA.
•	3620	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program.
Total	139322	

FY 2001 Planned Program:

•	8515	Provide management support (salaries, training, travel, SMDC matrix, etc.).
•	10500	Accomplish maintenance and repair projects, including design.
•	16614	Procure POL and MILSTRIP.
•	5070	Procure other mission operating supplies, equipment, and services.
•	6740	Provide air and sea transportation (cargo to and from continental United States).

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605301A Army Kwajalein Atoll / PROJECT: D614

- 38705 Continue to support Army, BMDO, NASA and USAF development and operational missile testing. Continue support to KMR Modernization and Remoting (KMAR).

FY 2001 Planned Program: (continued)

- 67182 Provide logistical support to self contained islands of USAKA.

Total 153326

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	133027	140344	140958
Appropriated Value	134710	140344	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-1683		
b. SBIR / STTR	-5134		
c. Omnibus or Other Above Threshold Reduction		-554	
d. Below Threshold Reprogramming	+601		
e. Rescissions	-1024	-468	
Adjustments to Budget Years Since FY 2000/2001 PB			+12368
Current Budget Submit (FY 2001 PB)	127470	139322	153326

Change Summary Explanation: Funding – FY 2001: Restores 12368 to continue O&M of USAKA until KMR Modernization and Remoting project is complete.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605326A Concept Experimentation Program

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	16954	20785	15410	91943	60295	67147	54192	Continuing	Continuing
D308 Concept Experimentation Program	13583	18823	8931	9373	9340	9315	9291	Continuing	Continuing
D309 Digital Information Technology Testbed	3371	1962	0	0	0	0	0	0	5333
D312 Force XXI Experimentation	0	0	6479	82570	50955	57832	44901	Continuing	Continuing

A. Mission Description and 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), 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. Force XXI Experimentation (project 312) funds the Army Experimentation Campaign Plan (AECP) in support of transforming the analog Army into a digital Army.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	13948	16990	73006
Appropriated Value	14041	20990	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-93		
b. SBIR / STTR	-370		
c. Omnibus or Other Above Threshold Reductions		-86	
d. Below Threshold Reprogramming	3432		
e. Rescissions	-56	-119	
Adjustments to Budget Years Since FY 2000/2001 PB			-57596
Current Budget Submit (FY 2001 PB)	16954	20785	15410

Change Summary Explanation: FY 2001 – Reprogrammed from Project 308 to OMA PE 122018 for Army Experimentation Campaign Plan (AECP) requirements.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605326A Concept Experimentation Program

PROJECT: D308

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D308 Concept Experimentation Program	13583	18823	8931	9373	9340	9315	9291	Continuing	Continuing

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. 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.

FY 1999 Accomplishments:

- 350 Future Fires Command and Control
- 129 Real time Tactical Video Link
- 97 Helmet Mounted Sniper Detection System
- 136 Own the Night Technologies
- 491 Beyond Line of Sight Communications Support for Aviation and Maneuver Support
- 178 Battle Command Vehicle
- 225 Semi-Autonomous Reconnaissance Operations for Mounted Maneuver II
- 200 Rotocraft Pilots Associate (RPA) Interrogation into Army after Next Platforms
- 437 Weather/Terrain Assessment Tool
- 235 Space Technology to Enhance Information Dominance on the Move
- 56 Configured Load Unit Building
- 248 Manned and Unmanned Aerial Platforms
- 132 Warfighters Information Network (WIN) Space-Based Collection and Reporting
- 500 System Linkages (Force XXI/AECP)
- 672 After Action Reporting Capability (Force XXI/AECP)
- 100 Digital Force Coordination Cell (Force XXI/AECP)
- 3500 Communications Linkages (Force XXI/AECP)
- 120 System Architecture for Joint Contingency Force AWE (Force XXI/AECP)

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

FY 1999 Accomplishments: (continued)

•	118	Network for Tactical Operations Center Radios (Force XXI/AECP)
•	5409	Tactical Operations Centers/Enroute Mission Planning and Rehearsal Tool (TOC/EMPRS) (Force XXI/AECP)
•	250	Army Experiment 6
Total	13583	

FY 2000 Planned Program:

•	5327	Concept experimentation to be determined by CEP Schedule and Review Committee.
•	1909	Experimentation at the Mounted Maneuver Battle Lab (MMBL)
•	677	Battle Command Reengineering CEP
•	323	Air and Missile Defense Maneuver Operations CEP
•	133	Military Police/Engineer Urban Robot CEP
•	336	AECP – System Linkages – CCTT (Division Capstone Exercise)
•	553	AECP – System Linkages (Division Capstone Exercise)
•	2125	AECP – C4I AAR Integration (Division Capstone Exercise)
•	405	AECP - Operational Architecture/Digital Command Post Support (Joint Contingency Force Advanced Warfighting Experiment)
•	1200	AECP – Data Collection (Joint Contingency Force Advanced Warfighting Experiment)
•	5078	AECP - Enroute Mission Planning and Rehearsal System (EMPRS) (Joint Contingency Force Advanced Warfighting Experiment)
•	250	Army Experiment 7 (AE7)
•	507	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program
Total	18823	

FY 2001 Planned Program:

•	8931	Concept experimentation to be determined by Sep 00 CEP Schedule and Review Committee.
Total	8931	

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 D309

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D309 Digital Information Technology Testbed	3371	1962	0	0	0	0	0	0	5333

Mission Description and Justification: The DoD Information Technology Testbed (DITT) is a functional concept exploration, testbed and prototyping program established under charter by the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD C3I) to develop innovative, enterprise wide solutions to information, document, record and knowledge management. The DITT, located at Ft. Leavenworth, KS, develops methodologies to share and utilize information across organizations at the DOD level, develops solutions for emerging issues/problems and prototypes massive archive systems to house and access multimedia databases that can be used to support both Army and Joint operations. The DITT system will be used to conduct operational testing of COTS/GOTS software/hardware IAW the DOD Electronic Document and Record Management (EDRM) Strategic Plan and will perform limited conformance testing of software products against various information management standards for the IEEE.

FY 1999 Accomplishments:

•	190	Multimedia Research Library System – System Test
•	225	Multimedia Research Library System – Video Prototype
•	2956	Multimedia Research Library System – Baseline Operational System
Total	3371	

FY 2000 Planned Program:

•	535	Operational Software Testing (RMA solutions, document management, workflow) (Base)
•	785	Operational Hardware Testing (Hierarchical Storage, Multimedia Capture Systems) (Base)
•	225	Digital Library Community of Interest (COI) Integration/Prototype (Phase 1)
•	240	Medical Community of Interest (COI) Integration/Prototype (Phase 1)
•	124	Multimedia Archive Analyst System (Phase 2)
•	53	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program
Total	1962	

FY 2001 Planned Program: Project not funded in FY 2001

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: D312

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D312 Force XXI Experimentation	0	0	6479	82570	50955	57832	44901	Continuing	Continuing

Mission Description and Justification: The Army Experimentation Campaign Plan (AECP) mission is to experiment with forces enabled with information based command and control, advances in training and leader development, technology enhancements, and joint interoperability to realize improvements in warfighting capability and strategic responsiveness. The objective of experimentation is to increase our Army's strategic responsiveness for an expanded range of missions while preserving our core capability of warfighting. FY01 funds are to be divided amongst the experimental axes: Heavy, Light, and Strike Force. Operational guidelines require new concepts to meet national strategy and anticipate emerging threats; increase interoperability; maintain doctrine, training, leader development, organization, materiel, and soldiers change in balance; and concepts will be subject to rigorous analysis and experimentation to inform senior army leadership decisions. Initiatives include developing system of systems linkages; exploring and developing new training support packages, digital AAR capabilities, system engineering and architecture development, and simulation/stimulation architecture and engineering development.

FY 1999 Accomplishments: Funded in Project D308

FY 2000 Planned Program: Funded in Project D308

FY 2001 Planned Program:

- 6479 Force XXI Experimentation / Advanced Warfighting Experiments per the Army Experimentation Campaign Plan (AECP) Funding Integrated Processing Team priorities.

Total 6479

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605601A Army Test Ranges and Facilities

PROJECT: DF30

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DF30 Army Test Ranges & Facilities	120024	146485	119657	116666	133737	139927	160833	Continuing	Continuing

A. Mission Description and Justification: Effective 1 October 1999, the US Army Operational Test and Evaluation Command (OPTEC) was redesignated as the US Army Test and Evaluation Command (ATEC). The three subordinate commands assigned to ATEC are: the Army Evaluation Center (AEC), the Operational Test Command (OTC) formerly the Test and Experimental Command (TEXCOM), and the Developmental Test Command (DTC) formerly the US Army Materiel Command's Test and Evaluation Command (TECOM). All functions and resources in this PE are managed by the Developmental Test Command.

Project DF30 provides the required test capability for DTC developmental 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 natural environmental testing); Aberdeen Test Center, Aberdeen Proving Ground, MD; and White Sands Missile Range, NM (including the Electronic Proving Ground (EPG), Fort Huachuca, AZ). This program also provides the required developmental test capability at: Aviation Technical Test Center, Fort Rucker AL; Redstone Technical Test Center, Redstone Arsenal, AL; Cold Regions Test Center, Forts Greely and Wainwright, AK; Tropic Regions Test Center at Schofield Barracks HI; 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 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 test facility modernization to support the warfighter's weapons and equipment. It also provides for leverage, integration and use of virtual and synthetic test tools/capabilities for reduction of test 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 Test and Evaluation Board of Directors. This project 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. Direct costs are borne by materiel developers and project/product managers in accordance with DoD Directive 7000.14R. October 1999.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605601A Army Test Ranges and Facilities / PROJECT: DF30

FY 1999 Accomplishments:

- 119547 Performed command-wide test management to include 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 were conducted on both major and non-major acquisition programs/experiments. Some of the major systems tested include:

PATRIOT (PAC3)	High Mobility Multi-Purpose Wheeled Vehicle Prototype
Naval Ship Structures Programs/Experiments	Artillery Systems (CRUSADER)
LONGBOW HELLFIRE	COMANCHE Helicopter Subsystems
Light/Medium Tactical Vehicles (4X4)	Army Tactical Missile System (ATACMS) Block II
Theater Missile Defense (TMD)	Theater High Altitude Area Defense (THAAD)
Brilliant Anti-Armor Submunition (BAT)	Multiple Launch Rocket System (MLRS)
ABRAMS M1A2	Improved Target Acquisition System/TOW
Aircraft Survivability Equipment	Heavy Assault Bridge
Near Term Digital Radio	STINGER Missile
JAVELIN Block II	GUARDRAIL Common Sensor
Advanced Medium Range Air to Air Missile	Advanced Field Artillery Tactical Data System (AFATDS)
Heavy Dry Support Bridge	Navy Standard & Rolling Airframe Missiles
AIR WARRIOR	Secure Mobile Anti-Jam Reliable Tactical – Terminal (SMART-T)
Improved Recovery Vehicle	Improved Cargo Helicopter
BRADLEY Fighting Vehicle System	Force Battle Command, Brigade & Below (FBCB2)

- 477 Airborne Engineering Evaluation Support Activity (AEESA)

Total 120024

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities
	PROJECT DF30

FY 2000 Planned Program:

- 133826 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. Some of the major systems to be tested include:

Brigade Combat Team	Naval ship structures programs/experiments
PATRIOT PAC3	LONGBOW HELLFIRE
Adv Medium Range Air-to-Air Missile	Multipurpose Individual Munition
Unmanned Aerial Vehicles (UAV)	Joint Services Lightweight Integrated Suit Technology (JSLIST)
Theater Missile Defense (TMD)	Theater High Altitude Area Defense (THAAD)
Brilliant Anti-Armor Submunition (BAT)	High Mobility Rocket System (HIMARS)
Single 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
AIR WARRIOR	Force XXI Battle Command Brigade & Below (FBCB2)

- 10000 Congressional add for modernization of test facilities at White Sands Missile Range
- 562 Airborne Engineering Evaluation Support Activity (AEESA)
- 2097 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program.

Total 146485

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605601A Army Test Ranges and Facilities PROJECT DF30

FY 2001 Planned Program:

- 119657 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. Some of the major systems to be tested include:

Brigade Combat Team	Naval ship structures programs/experiments
PATARIOT PAC3	FIREFINDER P3I
Tactical Internet Demonstration	Maneuver Control System (MCS)
Improved Cargo Helicopter	Armored Amphibious Assault Vehicle (AAAV)
Theater Missile Defense (TMD)	Theater High Altitude Area Defense (THAAD)
Brilliant Anti-Armor Submunition (BAT)	High Mobility Rocket System (HIMARS)
Light Armored Vehicle	Tube Launched, Optically Tracked, Wire Guided (TOW) Missile PIP
Multipurpose Individual Munition	Mine Neutralization/Detection
SMART-T	Forward Area Air Defense Command and Control
Soldier Enhancement Program	Objective Individual Combat Weapon
SCAMP Block II	Advanced Field Artillery Tactical Data System (AFATDS)
M1 Breacher	Fire Support Team Vehicle Integration
LAND WARRIOR	Ground Combat Identification
Aircrew Integrated Systems	

Total 119657

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605601A Army Test Ranges and Facilities / PROJECT: DF30

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget: (FY 2000/2001 PB)	118571	137193	134335
Appropriated Value	119553	147193	
Adjustments to Appropriated Value			
a. Congressional General Reduction	-982		
b. SBIR/STTR	-1637		
c. Omnibus or Other Above Threshold Reduction		-321	
d. Below Threshold Reprogramming	3564		
e. Rescissions	-474	-387	
Adjustments to Budget Years Since FY 2000/2001 PB			-14678
Current Budget Submit (FY 2001 PB)	120024	146485	119657

Change Summary Explanation: Funding - FY 2001 - Operational funds for Airborne Engineering Evaluation Support Activity (AEESA) were transferred to PE 0602782A/A779 (-551). Additional funds were realigned to higher priority requirements (-14100); efforts originally planned for FY 2001 that these funds would have supported have been deferred to the outyears.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605602A Army Test Technology and Sustaining Instrumentation

PROJECT: D628

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D628 Test Technology & Sustaining Instrumentation	41726	31439	33156	34678	35175	46244	51283	Continuing	Continuing

A. Mission Description and Justification: Effective 1 October 1999, the US Army Operational Test and Evaluation Command (OPTEC) was redesignated as the US Army Test and Evaluation Command (ATEC). The three subordinate commands assigned to ATEC are: the Army Evaluation Center (AEC), the Operational Test Command (OTC), formerly the Test and Experimentation Command (TEXCOM), and the Developmental Test Command (DTC), formerly the US Army Materiel Command's Test and Evaluation Command (TECOM). All functions and resources in this PE are managed by the Developmental Test Command.

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 DTC, which includes: Aberdeen Test Center (ATC), Aberdeen Proving Ground, MD; White Sands Missile Range (WSMR), NM (including the Electronic Proving Ground (EPG), Fort Huachuca, AZ); Yuma Proving Ground (YPG), AZ (including the Cold Regions Test Center (CRTC), Forts Greely and Wainwright, AK and the Tropic Test Site at Schofield Barracks, HI); Aviation Technical Test Center (ATTC), Fort Rucker, AL; Redstone Technical Test Center (RTTC), Redstone Arsenal, AL; and Dugway Proving Ground (DPG), UT. These capabilities support the streamlined development and fielding cycle of the Medium Brigade as well as Army Vision 2010 and Joint Vision 2010 initiatives. 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. VPG 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 acquisition costs. This initiative is critical to achieving long-term efficiencies not only within the Test and Evaluation (T&E) mission to offset funding and manpower reductions already taken, but also within the acquisition process at large by conforming to the Simulation and Modeling for Acquisition, Requirements, and Training (SMART) and Simulation Based Acquisition (SBA) processes. Sustaining instrumentation maintains existing testing capabilities at DTC 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), Theater High Altitude Area Defense (THAAD), Comanche, Brigade Combat Team and Javelin.

FY 1999 Accomplishments:

- 15686 CONTINUED SUPPORT OF DTC VIRTUAL PROVING GROUND (VPG):
  ATC: Initiated development and integration of High Level Architecture-compliant models and simulations with ground truth data. Continued development of performance databases, direct fire control models to calculate gun-pointing error for the M1 series of tracked vehicles and system

interfaces to support virtual testing of fire control and ground vehicle systems. Continued funding of the cooperative Technology Program Annexes (TPA) with the Army Research Lab to support development and integration of fire control and ground vehicle simulations. Continued development of

FY 1999 Accomplishments: (continued)

an engineering model to support tri-service development and evaluation of common simulation systems. Initiated development of a bridge-crossing simulator to perform bridge performance and endurance testing by simulating heavy vehicle crossings.

ATTC: Initiated development and integration of high fidelity aviation models and simulations required to conduct virtual testing. Completed 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. Continued 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: Initiated procurement of computer workstation and software to conduct virtual testing. Developed a smoke/obscurant model in the visible spectrum to predict dispersion characteristics under various live test conditions. Conducted integration of the 4D Weather System at YPG to perform micro/meso-scale weather analyses and forecasts which provide increased range efficiencies and enhanced range safety. Completed development of a software model to conduct virtual chemical, biological, and aerosol testing.

RTTC: Continued to acquire high resolution, three dimensional, validated terrain, target, cultural features, human and smoke/obscurant models in the visible, mid-wave infrared and long-wave infrared spectrums to develop a virtual component/subsystem test capability for small missile systems with open-loop and closed-loop non-destructive testing of imaging Infrared/Millimeter Wave (IR/MMW) Seekers and small missile systems. Completed development of small missile ground truth databases. Developed a 3-D smoke and obscurant model in the IR spectrum to generate and inject scenes for the Electro-Optics Sensor Flight Evaluation Lab (EOSFEL). Completed support to Project Constellation, a distributed virtual test capability across multiple DTC test centers, which included development of standard architectures, networks, and validation/accreditation procedures. Developed an electromagnetic model to measure the susceptibility parameters of various anti-tank and non-line-of-sight missiles. Continued acquisition of computer hardware and software to conduct virtual testing.

WSMR: Continued acquisition of computer hardware and software required to conduct virtual large missile and C4I testing. Completed development of Command, Control, Communications, Computers and Intelligence (C4I) and Electronic Warfare (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. Continued development of virtual reality mission planning for large missile systems. Completed development of a fiber optic link between the test range and software simulation laboratory. Completed development of an Airblast Survivability Model for Comanche. Completed support for Project Constellation that included development of standard architectures, networks, and validation/accreditation procedures. Acquired software to reconfigure the High Performance Computing (HPC) mainframe computer to servers that will provide real-time control of test resources. Completed development of terrain and ground truth databases. Completed development of software tools to simulate C4I systems and battlefield electromagnetic characteristics.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation PROJECT D628

YPG: Developed a comprehensive virtual desert terrain database that incorporates digital mapping data, soil characteristics, and terrain characteristics. Completed development of aviation fire control and line of sight models to characterize turreted weapon systems in an Air-to-Air firing environment. Developed an enhanced virtual range to support and incorporate multi-weapon test scenarios. Initiated acquisition of computer hardware and software to conduct virtual testing. Developed software models to conduct virtual shock and vibration testing of howitzers.

FY 1999 Accomplishments: (continued)

- 21133 CONTINUED DEVELOPMENT, ACQUISITION AND SUSTAINMENT OF CRITICAL TEST INSTRUMENTATION AND EQUIPMENT.

ATC: Continued development of test site integration which consists of electronically linking test site instrumentation such as Weibel radars, ballistic test site terminals, digital flash x-rays cameras, Hadland high-speed photography cameras, and various types of environmental instrumentation to monitor toxic fumes and gases with an ATC test control facility to conduct test control, monitoring and real-time data analysis and review. Continued development of autonomous vehicle control and test range traffic monitoring systems. Continued acquisition of computer workstations to conduct data processing and analysis. Continued development of a combined Developmental Test (DT)/Operational Test (OT) vehicle instrumentation package. Continued development of vehicle endurance/performance test data analyzers.

ATTC: Acquired inertial measurement units to measure aircraft altitude, angular rates and acceleration rates. Acquired airborne recorder interface units to simultaneously record and reproduce multiple aircraft data channels.

DPG: Acquired gas chromatograph workstations, mini Chemical Agent Monitors and software to conduct real-time monitoring and detection of chemical agents.

RTTC: Completed development of an acoustic flight vibration capability to reduce the number of costly missile test flights. Completed upgrade of the laser tracker hardware and software to provide accurate and reliable Time Space Position Information (TSPI) data. Continued acquisition of power amplifiers that are required to generate Electromagnetic Radiation environments used in physical environments testing. Installed high speed, high bandwidth fiber optic network to link the RTTC test ranges/facilities with the Army Aviation and Missile Command (AMCOM) Research Development Engineering Center (RDEC).

WSMR: Continued to upgrade a single station laser tracker. Continued development of an instrumentation platform to remotely collect, analyze, transmit and log C4I message traffic. Continued software upgrade of the Drone Formation Control System autopilot, control, navigation and guidance systems. Congressional funding was provided to 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 old Range Control Center to the new Cox Range Control Center. Upgraded a suite of optical tracking instrumentation with high-resolution video cameras. Upgraded the Command Destruct System for remote control capability IAW personnel downsizing and safety assurance initiatives. Procured two spare cables, a spare target trolley, and instrumentation to replace damaged equipment at the Aerial Cable Range. Upgraded core radar and telemetry instrumentation to improve missile tracking accuracy and reliability. Congressional funding was provided to continue development of an existing Small Business Innovative Research project which predicts missile debris dispersion and analyzes the impact to commercial aircraft traversing the range.

YPG: Continued acquisition of mobile, portable, and base station trunked land radio units. Developed a scoring sensor suite for turreted gun systems on rotary wing aircraft (munitions from .50 caliber to 30mm). Completed development of a gun pointing vector instrumentation package.

- 795 PROTOTYPE INSTRUMENTATION AND ADVANCED CONCEPTS. Provided quick reaction capability to respond to emergency requirements, provided support for technical committees forging future instrumentation technology developments, and maintained/improved existing capability by

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation
	PROJECT D628

replacement and limited upgrade of worn out, obsolete or unserviceable equipment/instrumentation at Army technical test ranges. Developed prototype instrumentation and performed advanced concept studies for development of new technologies. Continued to develop Test Operations

FY 1999 Accomplishments: (continued)

Procedures (TOPs) and International Test Operations Procedures (ITOPs) to ensure quality and consistency of test results throughout Army and for international cooperative applications.

- 4112 HQDTC: Provided management support for Virtual Proving Ground (VPG) across the command to ensure commonality, conduct strategic planning, and develop roadmaps. Provided command-level oversight and technical management support for the DTC instrumentation program. Technical support included 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. Continued 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. Provided administrative support for the Local Area Network and 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.

Total 41726

FY 2000 Planned Program:

- 11330 CONTINUE SUPPORT OF VIRTUAL PROVING GROUND (VPG):

ATC: Continue development and integration of High Level Architecture-compliant models and simulations with ground truth data. Continue development of performance databases, direct fire control models to calculate gun-pointing error for the M1 series of tracked vehicles and system interfaces to support virtual testing of fire control and ground vehicle systems. Continue funding of the cooperative Technology Program Annexes (TPA) with the Army Research Lab to support development and integration of fire control and ground vehicle simulations. Continue development of an engineering model to support tri-service development and evaluation of common simulation systems. Complete development of a bridge-crossing simulator to perform bridge performance and endurance testing by simulating heavy vehicle crossings.

ATTC: Continue development and integration of 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.

DPG: Continue procurement of computer workstations and software to conduct virtual testing. Conduct integration 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation PROJECT D628

FY 2000 Planned Program: (continued)

RTTC: Continue to acquire high resolution, three dimensional, validated terrain, target, cultural features, human and smoke/obscurant models in the visible, mid-wave infrared and long-wave infrared spectrums to develop a virtual component/subsystem test capability for small missile systems with open-loop and closed-loop non-destructive testing of imaging Infrared/Millimeter Wave (IR/MMW) Seekers and small missile systems. Continue acquisition of computer hardware and software to conduct virtual testing. Initiate development of a standardization process to integrate various software components (synthetic environments, databases, data repositories, models, and interfaces) to support virtual testing. Develop 2-D visible and IR scenes to drive the scene projectors and signal injection interfaces in the Electro-Optics Target Acquisition, Electro-Optics Sensor Flight Evaluation and IR Simulation Test Acceptance test facilities.

WSMR: Continue acquisition of computer hardware and software required to conduct virtual large missile and C4I testing. Continue development of virtual reality mission planning for large missile systems. Develop a system to merge telemetry, optics, radar, Global Positioning Systems (GPS), and TSPI data to support mission analysis of large missile and air defense system test data. Initiate development of an architecture to rehost existing C4I legacy test tools to support Army testing and training requirements. Initiate development of a highly mobile, miniaturized, high speed/high capacity data communications network to support various tactical environments and different tactical vehicles without test personnel intervention.

YPG: Continue acquisition of computer hardware and software to conduct virtual testing. Initiate development of a test control simulation tool which integrates actual field instrumentation data with existing simulations and models to conduct test range management, test setup, simulation model validation and test result validation.

- 13650 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 such as Weibel radars, ballistic test site terminals, digital flash x-ray cameras, Hadland high-speed photography cameras, and various types of environmental instrumentation to monitor toxic fumes and gases with an ATC test 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 computer workstations to conduct data processing and analysis. Continue development of an enhanced DT/OT on-board vehicle instrumentation package. Continue development of vehicle endurance/performance test data analyzers. Initiate development of an acoustic soldier-system instrumentation suite to measure and record field test data. Initiate development of a laser target scoring system to measure supersonic/subsonic projectiles. Initiate development of a 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation PROJECT D628

ATTC: Complete acquisition of airborne recorder interface units to simultaneously record and reproduce multiple aircraft data channels. Initiate upgrade of the helicopter icing spray system by replacing the bleed air and water delivery systems to ensure that the spray level characteristics are identical to natural clouds. Initiate acquisition of pre-flight instrumentation checkout equipment.

FY 2000 Planned Program: (continued)

DPG: Initiate acquisition of aerodynamic particle sizers that are used to measure aerosol clouds that are produced during all field tests of biological agent detectors. Initiate acquisition of portable thermometers to conduct atmospheric boundary layer tests for dispersion field-testing. Acquire a test data storage array to support chemical, biological, smoke and obscurant testing.

RTTC: Continued acquisition of power amplifiers that are required to generate Electromagnetic Radiation environments 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. Acquire 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. Continue acquisition of a high speed, high bandwidth fiber optic network to link the RTTC test ranges/facilities with the AMCOM RDEC.

WSMR: Continue conversion of an optical tracker system to single station laser tracker. Continue development of an instrumentation platform to remotely collect, analyze, transmit and log C4I message traffic. Continue software upgrade of the Drone Formation Control System autopilot, control, navigation and guidance systems. 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 Cox 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. Complete upgrade of a suite of optical tracking instrumentation with high-resolution video cameras. Continue development of 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. Upgrade the MPS-36 radar to provide precision tracking data and to control other down range instrumentation (such as Kineto Tracking Mounts and other short-range radars) near the impact point for artillery and smart munitions testing. Initiate acquisition of data recorders, sensors and telemetry equipment to collect aerodynamic and flight dynamic data for airdrop systems. Acquire transmitters, antennas and repeaters to link remote test sites Cold Regions Test Center (CRTC). Initiate acquisition of data loggers, radios, modems and sensor test equipment at CRTC. Replace old, obsolete computer systems to support high data rate, real-time data collection.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation PROJECT D628

- 700 PROTOTYPE INSTRUMENTATION AND ADVANCED CONCEPTS. Provide quick reaction capability to respond to emergency requirements, 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.

FY 2000 Planned Program: (continued)

- 4990 HQ DTC: Provide management support for VPG across the command to ensure commonality, conduct strategic planning, and develop roadmaps. Provide command-level oversight and management support for the DTC instrumentation program. Technical support includes 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 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.
- 769 Small Business Innovative Research/Small Business Technology Transfer Program.

Total 31439

FY 2001 Planned Program:

- 11100 CONTINUE SUPPORT OF VIRTUAL PROVING GROUND (VPG):

ATC: Continue development and integration of High Level Architecture-compliant models and simulations with ground truth data. Continue development of performance databases, direct fire control models to calculate gun pointing error for the M1 series of tracked vehicles and system interfaces to support virtual testing of fire control and ground vehicle systems. Continue funding of the cooperative Technology Program Annexes (TPA) with the Army Research Lab to support development and integration of fire control and ground vehicle simulations. Continue development of an engineering model to support tri-service development and evaluation of common simulation systems.

ATTC: Continue development and integration of 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 computer workstations and software to conduct virtual testing. Conduct integration of the 4D Weather System at RTTC 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 high resolution, three dimensional, validated terrain, target, cultural features, human and smoke/obscurant models in

the visible, mid-wave infrared and long-wave infrared spectrums to develop a virtual component/subsystem test capability for small missile systems with open-loop and closed-loop non-destructive testing of imaging Infrared/Millimeter Wave (IR/MMW) Seekers and small missile systems. Continue
acquisition of computer hardware and software to conduct virtual testing. Initiate development of a standardization process to integrate various software components (synthetic environments, databases, data repositories, models, and interfaces) to support virtual testing. Complete development

FY 2001 Planned Program: (continued)

of 2-D visible and IR scenes to drive the scene projectors and signal injection interfaces in the Electro-Optics Target Acquisition, Electro-Optics Sensor Flight Evaluation and IR Simulation Test Acceptance test facilities.

WSMR: Continue acquisition of computer hardware and software required to conduct virtual large missile and C4I testing. Continued development of virtual reality mission planning for large missile systems. Develop a system to merge telemetry, optics, radar, GPS, and TSPI data to support mission analysis of large missile and air defense system test data. Initiate development of an architecture to rehost existing C4I legacy test tools to support Army testing and training requirements. Initiate development of a highly mobile, miniaturized, high speed/high capacity data communications network to support various tactical environments and different tactical vehicles without test personnel intervention.

YPG: Continue acquisition of computer hardware and software to conduct virtual testing. Continue development of a test control simulation tool which integrates actual field instrumentation data with existing simulations and models to conduct test range management, test setup, simulation model validation and test result validation. Initiate development of a simulation model to accurately measure shock and vibration characteristics of ammunition stored on-board howitzers.

- 15670 INITIATE/CONTINUE DEVELOPMENT, ACQUISITION AND SUSTAINMENT OF CRITICAL TEST INSTRUMENTATION AND EQUIPMENT.

ATC: Continued development of test site integration which electronically links test site instrumentation such as Weibel radars, ballistic test site terminals, digital flash x-rays cameras, Hadland high-speed photography cameras, and various types of environmental instrumentation to monitor toxic fumes and gases with an ATC test 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 computer workstations to conduct data processing and analysis. Continue development of an enhanced DT/OT on-board vehicle instrumentation package. Continue development of vehicle endurance/performance test data analyzers. Continue development of an acoustic 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. Initiate acquisition of a high-speed digital camera to reduce test costs associated with film processing/reproduction and to eliminate hazardous silver waste by-products generated during the film development process. Initiate development of a gun chamber pressure system. Continue development of a measurement system to measure shock levels generated by munitions on combat vehicles.

ATTC: Continue upgrade of the helicopter icing spray system by replacing the hydraulic pump to ensure that the spray level characteristics are identical to natural clouds. Acquire airborne video recorders, video cameras and a telemetry link to simultaneously record and reproduce multiple aircraft data channels. Initiate acquisition of signal conditioning equipment to ensure safe monitoring of aircraft electrical signals and a high-speed data acquisition equipment to replace old, obsolete equipment. Initiate upgrade and integration of the icing instrumentation system from the U-21 aircraft to the C-12 aircraft.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation PROJECT D628

FY 2001 Planned Program: (continued):

DPG: Continue acquisition of portable thermometers to conduct atmospheric boundary layer tests for dispersion field-testing. Acquire atmospheric dispersion thermometers and process logic controllers to collect field test data from mini-cams. Replace obsolete chemical equipment used to conduct safety air monitoring, hazardous waste characterization, and sample analysis. Replace an old, obsolete fermentor/containment chamber to ensure that highly pathogenic microorganisms are not released into the atmosphere.

RTTC: Continued acquisition of power amplifiers that are required to generate Electromagnetic Radiation environments 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 development of a six degree of freedom motion simulator to perform non-destructive missile testing. Continue acquisition of a high speed, high bandwidth fiber optic network to link the RTTC test ranges/facilities with the AMCOM RDEC. Initiate acquisition of a digital real-time imaging system, which consists of a test item handling system capable of handling ATACMS size motors, a digital real-time x-ray imaging and enhancement system capable of creating 3D computed tomographic images, and a programmable logic controller for automating the motion control of the test item, to inspect missile systems and components to detect defects or lose components.

WSMR: Continue conversion of an optical tracker system to single station laser tracker. Continue development of instrumentation platform to remotely collect, analyze, transmit and log C4I message traffic. Continue software upgrade of the Drone Formation Control System autopilot, control, navigation and guidance systems. 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 Cox 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 portable 406-420MHz radios to comply with the National Telecommunications and Information Administration directive to migrate to 12.5 kHz bandwidth radios. Initiate acquisition of test control and analysis workstations at Launch Complexes 32, 33, 38, and 50. Initiate acquisition of a film to videotape transfer system. Initiate development of an optical data measurement system to provide highly accurate post-test TSPI and miss distance data in support of air defense and large missile testing.

YPG: Continue acquisition of mobile, portable, and base station trunked land radio units. Complete upgrade the MPS-36 to provide precision tracking data and to control other down range instrumentation (such as Kineto Tracking Mounts and other short-range radars) near the impact point for artillery and smart munitions testing. 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 and sensor test equipment at CRTC. Initiate upgrade of two portable Weibel tracking radars that will be used to control optical trackers and provide data for the mobile mission control center.

- 1430 PROTOTYPE INSTRUMENTATION AND ADVANCED CONCEPTS. Provide quick reaction capability to respond to emergency requirements, 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.

FY 2001 Planned Program: (continued):

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605602A Army Test Technology and Sustaining Instrumentation PROJECT D628

- 4956 HQ DTC: Provide management support for VPG across the command to ensure commonality, conduct strategic planning, and develop roadmaps. Provide command-level oversight and management support for the DTC instrumentation program. Technical support includes 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.

Total 33156

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget: FY 2000/2001 PB	43638	30470	33332
Appropriated Value	43939	31670	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-301		
b. SBIR/STTR	-1091		
c. Omnibus or Other Above Threshold Reduction		-118	
d. Below Threshold Reprogramming	-647		
e. Rescissions	-174	-113	
Adjustments to Budget Years Since FY 2000/2001 PB			-176
Current Budget Submit (FY 2001 PB)	41726	31439	33156

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	33341	34892	27248	27406	34304	37381	39601	Continuing	Continuing
D670 Emerging Technology Systems	5552	3738	4330	4476	4621	4868	5216	Continuing	Continuing
D671 Air Defense/Missile Defense Systems	5597	5315	5943	5295	5468	5807	6238	Continuing	Continuing
D672 Aviation Systems	3070	2565	2815	2959	3034	3281	3527	Continuing	Continuing
D675 C4I/IEW Systems	6806	14680	4353	4491	10652	12027	12340	Continuing	Continuing
D677 Ground Combat Systems	6190	3911	4490	4668	4824	5403	5832	Continuing	Continuing
D678 Munitions Systems	5423	4271	4855	5038	5206	5469	5870	Continuing	Continuing
D679 Soldier Systems	703	412	462	479	499	526	578	Continuing	Continuing

A. Mission Description and 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 atmospherics, 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.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	34131	30138	33916
Appropriated Value	34498	35138	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-367		
b. SBIR / STTR	-559		
c. Omnibus or Other Above Threshold Reductions		-103	
d. Below Threshold Reprogramming	-93		
e. Rescissions	-138	-143	
Adjustments to Budget Years Since FY 2000/2001 PB			-6668
Current Budget Submit (FY 2001 PB)	33341	34892	27248

Change Summary Explanation: Funding - FY 01 Funds (-6668) realigned to higher priority requirements; efforts originally planned for FY 2001 that these funds would have supported have been deferred to the outyears.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

PROJECT: D670

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D670 Emerging Technology Systems	5552	3738	4330	4476	4621	4868	5216	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 1999 Accomplishments:

- 2864 Conducted EW vulnerability investigations and analyses which supported integrated survivability and lethality analyses of advanced 2nd and 3rd generation emerging technology and horizontal technology applications.
- 1463 Performed ballistic effects investigations and survivability/lethality analyses of emerging technologies on future system designs, advanced armors (active protection systems), advanced armaments (electric armaments and Electro thermal chemical), advanced propellants, and advanced vehicle propulsion.
- 1225 Conducted vulnerability analysis of Army's digitized battlefield systems to radio frequency (RF) weapons. Identified possible countermeasure to threat RF weapons. Supported the Army E3 program.

Total 5552

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D670

FY 2000 Planned Program:

•	1431	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.
•	850	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.
•	57	Small Business Innovative Research/Small Business Technology Transfer Programs
Total	3738	

FY 2001 Planned Program:

•	1704	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	4330	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

PROJECT: D671

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D671 Air Defense/Missile Defense Systems	5597	5315	5943	5295	5468	5807	6238	Continuing	Continuing

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.

FY 1999 Accomplishments:

- 3379 Conducted electronic warfare vulnerability assessments for developmental U.S. Army air defense and missile defense. Provide interim susceptibility reports. Recommended ECCM enhancements. Completed PATRIOT PAC-3 MSIII ECCM Assessment Support THAAD/NMD Radar HWIL Simulation ECM Investigations. Developed a THAAD System MSII Integrated Survivability/Lethality Assessment. Conducted NMD Radar Far-Term Threat Analysis.
- 990 Conducted chemical, biological, nuclear, and atmospheric effects survivability analysis for U.S. Army air defense and missile defense systems.
- 950 Conducted ballistic survivability/lethality analysis for U.S. Army air defense and missile defense systems. Perform Stinger Block 2 Lethality Analysis.
- 278 Provided integrated survivability/lethality analyses in support of air defense/missile defense program decision milestones. Developed MEADS multi-year survivability strategy.

Total 5597

FY 2000 Planned Program:

- 2400 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis — PROJECT: D671

FY 2000 Planned Program: (continued)

•	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.
•	324	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.
•	91	Small Business Innovative Research/Small Business Technology Transfer Programs
Total	5315	

FY 2001 Planned Program:

•	2758	Analyze ECM experiments in support of PATRIOT post-MS III missile countermeasures experiments. 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.
•	877	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.
Total	5943	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

PROJECT: D672

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D672 Aviation Systems	3070	2565	2815	2959	3034	3281	3527	Continuing	Continuing

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.

FY 1999 Accomplishments:

- 1605 Conducted partial electronic warfare vulnerability assessments of AH-64D Longbow Apache, RAH-66 Comanche, CH-47D Chinook, Suite of Integrated RF Countermeasures, and Suite of Integrated IR Countermeasures. Initiated susceptibility reports. Initiated electronic counter-countermeasures recommendations.
- 798 Conducted a ballistic survivability/lethality analysis for Comanche and ICH.
- 667 Conducted a chemical, biological, nuclear, and atmospheric effects survivability analysis for Comanche and aviation support systems.

Total 3070

FY 2000 Planned Program:

- 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 and Tactical UAV. 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.
- 1702 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). Initiate LFT&E survivability support for UH-60L+ initiative.
- 100 Perform MANPRINT SIRFC Solder Survivability (SSv) analysis and prepare domain report.
- 37 Small Business Innovative Research/Small Business Technology Transfer Programs

Total 2565

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000	
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D672

FY 2001 Planned Program:

•	965	Continue electronic warfare vulnerability assessment for aviation systems (Comanche, CH-47F, tactical UAV) and aviation survivability equipment (SIIRCM, SIRFC) 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 CH-47F (formerly Improved Cargo helicopter) and compare with the CH-47D. Assist Comanche developer with ballistic vulnerability design/development support tests to guide final system design. Continue support CH-47F LFT&E (experiments, damage assessments, preshot predictions, postshot analyses, and input to independent evaluation). Continue support of UH-60L+ LFT&E to include selected ballistic vulnerability analysis and experiments.
Total	2815	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

PROJECT: D675

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D675 C4I/IEW Systems	6806	14680	4353	4491	10652	12027	12340	Continuing	Continuing

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.

FY 1999 Accomplishments:

- 1375 Conducted integrated electronic, information operations and chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army command and control systems. This effort supported 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, and FBCB2 (Applique).
- 3129 Conducted Radio Frequency Directed Energy (RFDE) vulnerability assessments on computer/communication systems of the First Digitized Division (FDD). Conducted IO vulnerability assessments against hackers, malicious codes, unauthorized users, etc., on critical command, control, communications, computers and intelligence (C4I) systems supporting FDD. Provided recommendations to mitigate susceptibilities/vulnerabilities encountered during IO vulnerability investigations. Initiated database of results.
  Established the technical core capability and initiated 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
- 1405 Conducted integrated electronic, and chemical/biological/nuclear/atmospheric effects survivability analysis for Mobile Subscriber Equipment, Single Channel Anti-jam Man Portable radio, Secure Mobile Anti-jam Reliable Tactical Terminal, and the Near Term Digital Radio.
- 776 Conducted integrated electronic, and chemical/biological/nuclear/atmospheric effects survivability analysis of BCIS, Joint Surveillance Target Attack Radar System/Ground Station Module, Second Gen FLIR, and enhanced Firefinder radar.
- 121 Supported C4I/IEW systems program decision milestones.

Total 6806

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D675

FY 2000 Planned Program:

•	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.
•	1871	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.
•	1945	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.
•	5000	Expand the current information warfare vulnerability assessment program to determine exploitable weakness in the Digitized Forces (FDD/FDC) and to recommend mitigating solutions. Focus on components of the FDD/FDC and determines the limitations of system performance in information warfare (IW) threat environment. Provides a holistic, comprehensive approach to assessing the vulnerability of the digitized Army. Includes creating a simulation of FDD decision processes, update of information warfare vulnerability database, and vulnerability analyses of Tactical Internet components to radio frequency directed energy weapons (RFDEW).
•	3000	Conduct integrated chemical/biological/nuclear/atmospheric effects survivability analysis for U.S. Army systems.
•	349	Small Business Innovative Research/Small Business Technology Transfer Programs
Total	14680	

FY 2001 Planned Program:

•	2299	Conduct integrated electronic and information operations 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..
•	2054	Conduct integrated electronic and information operations 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, the Near Term Digital Radio, ARC-220, and SINCGARS ASIP, EPLR-VHSIC, SPITFIRE, GBS, and ISYSCON.
Total	4353	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

PROJECT: D677

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D677 Ground Combat Systems	6190	3911	4490	4668	4824	5403	5832	Continuing	Continuing

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.

FY 1999 Accomplishments:

- 1292 Conducted an electronic warfare vulnerability of Bradley A3, Command and Control Vehicle.
- 2416 Conducted a ballistic survivability/lethality analysis for Bradley A3, Wolverine, Command and Control Vehicle, CRUSADER, and GRIZZLY.
- 1508 Conducted a chemical, biological, nuclear, and atmospheric effects survivability analysis for Bradley A3 and Command and Control Vehicle.
- 974 Initiated preliminary IO vulnerability assessments against hackers, malicious codes, unauthorized users, etc., on weapon platform systems supporting FDD.

Total 6190

FY 2000 Planned Program:

- 1224 Continue analytical support for the restructured Crusader design, development and fabrication program.
- 1870 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 program termination activities. Support Future Scout and Cavalry System (FSCS) ballistic survivability TRAC modeling effort. Support FSCS Ballistic survivability AMSAA Item Level Performance Analysis. Conduct Wolverine Program Termination activities. Conduct C2V program termination activities. Provide support to the Initial Combat Brigade Platform Performance Demonstration.
- 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 (Bradley A3).
- 100 Conduct Bradley A3 and Crusader Soldier Survivability (SSv) Assessment.
- 57 Small Business Innovative Research/Small Business Technology Transfer Programs

Total 3911

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D677

FY 2001 Planned Program:

•	1235	Continue the electronic warfare vulnerability and information operations assessment for U.S. Army ground combat systems as Crusader, Bradley A3.
•	3200	Continue the ballistic survivability/lethality analysis for the initial combat brigade and future combat systems (FCS). Initiate Crusader LFT&E support. Support Abrams LFT&E (damage assessments, post shot analyses and input to Independent Evaluation). Conduct initial HIMARS vulnerability assessments.
Total	4435	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis		PROJECT D678

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D678 Munitions Systems	5423	4271	4855	5038	5206	5469	5870	Continuing	Continuing

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.

FY 1999 Accomplishments:

•	2388	Conducted electronic warfare vulnerability assessments for BAT/IBAT, TOW 2B P3I, WAM PIP, and Tank Extended Range Munition (TERM).
•	2471	Conducted ballistic survivability/lethality analysis of BAT/IBAT, SADARM, TERM, Javelin, Guided MLRS, SuperDragon, and M829.
•	564	Provided integrated survivability/lethality analyses in support of munitions systems program decision milestones.
Total	5423	

FY 2000 Planned Program:

•	2166	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/BAT P3I, TOW Fire & Forget, LOSAT, SADARM, and TERM.
•	1610	Conduct ballistic survivability/lethality analysis for U.S. Army munition systems to include BAT/BAT P3I, TERM, Guided MLRS and M829 and any associated pre-planned product improvement programs.
•	432	Provide integrated survivability/lethality analyses to support scheduled munition systems program decision milestones during FY00.
•	63	Small Business Innovative Research/Small Business Technology Transfer Programs
Total	4271	

FY 2001 Planned Program:

•	3056	Conduct electronic warfare vulnerability assessments for developmental U.S. Army munition systems such as ATACMS with smart payloads such as: BAT P3I, TOW Fire & Forget, SADARM PI, WAM PIP and TERM. Conduct obscurant and atmospheric effects survivability analysis for U.S. Army munition systems.
•	1292	Conduct ballistic survivability/lethality analysis for U.S. Army munition systems to include BAT P3I, TERM, SADARM PI, Guided MLRS and M829.
•	507	Provide integrated survivability/lethality analyses to support scheduled munition systems program decision milestones during FY01.
Total	4855	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605604A Survivability/Lethality Analysis

PROJECT: D679

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D679 Soldier Systems	703	412	462	479	499	526	578	Continuing	Continuing

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.

FY 1999 Accomplishments:

•	516	Initiated preliminary integrated electronic, ballistic, and chemical/biological/nuclear/atmospheric effects survivability analysis of 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	Coordinated preparation and direct execution of MANPRINT Soldier Survivability Assessments and Reports.
•	43	Sustained international soldier activities (NATO); provided chem/bio/physiology expertise for operations other than war and less-than-lethal efforts
Total	703	

FY 2000 Planned Program:

•	175	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.
•	132	Coordinate preparation and direct execution of MANPRINT Soldier Survivability Assessments and Reports.
•	100	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.
•	5	Small Business Innovative Research/Small Business Technology Transfer Programs
Total	412	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605604A Survivability/Lethality Analysis	PROJECT D679

FY 2001 Planned Program:

•	208	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 testing2
•	145	Coordinate preparation and direct execution of MANPRINT Soldier Survivability Assessments and Reports.
•	109	Provide integrated survivability/lethality analyses to support scheduled soldier systems program decision milestones in FY 01
Total	462	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605605A DOD High Energy Laser Systems Test Facility (HELSTF)

PROJECT: DE97

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE97 DoD High Energy Laser Systems Test Facility (HELSTF)	23131	30803	14521	14306	14218	17037	17506	Continuing	Continuing

A. Mission Description and Budget Item Justification: 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). By the end of FY00 the HELSTF will also provide a Solid State Laser (SSL) testbed, a lethality/propagation baseline, and a modeling and simulation baseline. This multiple use facility supports testing of laser effects for targets ranging from scaled laboratory up through full scale flying target.

FY 1999 Accomplishments:

•	14287	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, BMDO and other agencies Missile tracking [e.g. THAAD, PAC3]).
•	8559	Manufactured and integrated modules 2 and 3 of the 3 module SSL device including edge cladding, Amplified Spontaneous Emission control and wavefront distortion measurement/control. This device will be representative in demonstrating the relatively compact, lightweight, high power solid state laser technology. Tested and assessed Hybrid Electric High Mobility Multi-purpose Wheeled Vehicle (HE-HMMWV) power system in support of SSL applications.
•	285	Year 2000 Compliance.
Total	23131	

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

- 13679 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, Air Force Airborne and Space-Based Laser, other laser programs, tracking, and live-fire test programs).
- 9633 Standup the DE Center of Excellence; to include, the development of a SSL pulse shaper, a comprehensive lethality/propagation baseline, a SSL testbed at HELSTF, a modeling and simulation baseline, HELSTF transformation plan, and the initiation of a detailed analysis of the Chemical Oxygen Iodine Laser (COIL) Electro-Chemical technology.
- 6682 Testing of 3 module SSL completed with full characterization. Integration of laser diodes on single subscale disk to form diode pumped disk testbed..
- 809 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program.

Total 30803

FY 2001 Planned Program:

- 14521 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, Air Force Airborne and Space-Based Laser, other laser programs, tracking, and live-fire test programs).

Total 14521

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	23848	14230	14260
Appropriated Value	24022	31230	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-174		
b. SBIR / STTR	-613		
c. Omnibus or Other Above Threshold Reduction		-125	
d. Below Threshold Reprogramming	-10		
e. Rescissions	-94	-302	
Adjustments to Budget Years Since FY 2000/2001 PB			+261
Current Budget Submit (FY 2001 PB)	23131	30803	14521

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605606A Aircraft Certification

PROJECT: DO92

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DO92 Aircraft Certification	2878	3010	3200	3533	3690	3548	3654	Continuing	Continuing

A. Mission Description and Budget Item Justification: This program 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. Since these activities are not allocable to specific R&D missions, this project is appropriately funded in Budget Activity 6.

FY 1999 Accomplishments:

•	919	Executed technical and airworthiness qualification mission for PEO Aviation/force modernization aircraft systems.
•	921	Conducted safety-of-flight investigations/assessments to include PEO Aviation/force modernization aircraft systems.
•	143	Executed the Army Aeronautical Design Standards Program.
•	694	Provided continuing engineering support for technology upgrades to PEO Aviation/force modernization aircraft systems.
•	201	Provided test management capability for PEO Aviation Program/Project/Product Managers.
Total	2878	

FY 2000 Planned Program:

•	990	Manage/execute technical and airworthiness qualification mission for PEO Aviation/force modernization aircraft systems.
•	940	Continue to ensure safety-of-flight investigations/assessments to include PEO Aviation/force modernization aircraft systems.
•	150	Manage/execute the Army Aeronautical Design Standards Program.
•	732	Provide continuing engineering support for technology upgrades to PEO Aviation/force modernization aircraft systems.
•	157	Continue to provide test management capability for PEO Aviation Program/Project/Product Managers.
	41	Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR)
Total	3010	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605606A Aircraft Certification / PROJECT: DO92

FY 2001 Planned Program:

- 1048 Manage/execute technical and airworthiness qualification mission for PEO Aviation/force modernization aircraft systems.
- 1006 Continue to ensure safety-of-flight investigations/assessments to include PEO Aviation/force modernization aircraft systems.
- 171 Manage/execute the Army Aeronautical Design Standards Program.
- 755 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 3200

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	2893	3021	3169
Appropriated Value	2924	3021	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-31		
b. SBIR / STTR	-3		
c. Omnibus or Other Above Threshold Reductions		-6	
d. Below Threshold Reprogramming			
e. Rescissions	-12	-5	
Adjustments to Budget Years Since FY 2000/2001 PB			+31
Current Budget Submit (FY 2001 PB)	2878	3010	3200

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605702A Meteorological Support to Research, Development, Testing & Evaluation Activities
	PROJECT D128

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D128 Meteorological Support to TECOM Activities	6539	6823	6927	6856	7027	9810	10014	Continuing	Continuing

A. Mission Description and Justification: Effective 1 October 1999, the US Army Operational Test and Evaluation Command (OPTEC) was redesignated as the US Army Test and Evaluation Command (ATEC). The three subordinate commands assigned to ATEC are: the Army Evaluation Center (AEC), the Operational Test Command (OTC) formerly the Test and Experimental Command (TEXCOM), and the Developmental Test Command (DTC) formerly the US Army Materiel Command's Test and Evaluation Command (TECOM). All functions and resources in this PE are managed by the Developmental Test Command.

Project D128 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: White Sands Missile Range (WSMR), NM (including the Electronic Proving Ground (EPG), Fort Huachuca, AZ); Dugway Proving Ground (DPG), UT; Aberdeen Test Center (ATC), APG, MD; Redstone Technical Test Center (RTTC), Huntsville, AL; Yuma Proving Ground (YPG), AZ (including the Cold Regions Test Center (CRTC), Fort Greely, AK); Ft Belvoir, VA; Ft A.P. Hill, VA; Cold Regions Research and Engineering Laboratory (FY99), Hanover, NH and Deseret Chemical Depot, 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/weapons developers and project/product managers).

FY 1999 Accomplishments:

- 2258 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 11 Army sites/test ranges and off-range test sites.
- 3245 Modernized operational equipment to meet customer requirements for meteorological support.
  - Installed and maintained Major Range Test Facility Base (MRTFB) Four-Dimensional Weather (4DWX) System at ATC and completed installation at WSMR. 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605702A Meteorological Support to Research, Development, Testing & Evaluation Activities
	PROJECT D128

FY 1999 Accomplishments: (continued)

- Sustained mobile meteorological support systems.
- Installed and evaluated auto-nowcasting (automated and precise forecasting of weather conditions starting "now" and continuing for one hour into the future) at RTTC.

•	1036	Provided program management for meteorological support to RDTE and technical review/assistance to ranges and meteorological teams. - Weather forecast support systems/data: continuing development of meteorological data sets for environmental modules to virtual testing.
Total	6539	

FY 2000 Planned Program:

•	1473	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 off-range test sites.
•	4284	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 and maintain MRTFB 4DWX weather system at YPG and refined the characteristics of the 4DWX at ATC.
•	994	Provide program management for meteorological support to RDTE and technical review/assistance to ranges and meteorological teams. - Weather forecast support systems/data: Improve/modify/increase data sets for environmental modules to virtual testing.
•	72	Small Business Innovative Research/Small Business Technical Transfer (SBIR/STTR) Program.
Total	6823	.

FY 2001 Planned Program:

•	1532	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 off-range test sites.
•	4361	Modernize operational equipment to meet customer requirements for meteorological support. - Evaluate Coherent Laser Light Detection and Ranging (LIDAR) at WSMR. - Evaluate solid state Sonic Detection and Ranging (SODAR) as replacement for meteorological towers. - Upgrade and sustain 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 and begin integration of meteorological instrumentation into WSMR 4DWX. - Complete MRTFB 4DWX Weather System installation at YPG and provide system Sustainment through contract support.

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

- 1034 Provide program management for meteorological support to RDTE and technical review/assistance to ranges and meteorological teams.
  - Weather forecast support systems/data: Improve/modify/increase data sets for environmental modules to virtual testing.
  - Initiate dedicated 4DWX support contract.

Total 6927

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	6628	6843	6952
Appropriated Value	6691		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-63		
b. SBIR / STTR	-56		
c. Omnibus or Other Above Threshold Reduction		-11	
d. Below Threshold Reprogramming	-7		
e. Rescissions	-26	-9	
Adjustments to Budget Years Since FY 2000/2001 PB			-25
Current Budget Submit (FY 2001 PB)	6539	6823	6927

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605706A Materiel Systems Analysis

PROJECT: M541

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M541 Materiel Systems Analysis	9557	8783	8737	6673	6518	6370	6622	Continuing	Continuing

A. Mission Description and Justification: This program element funds the Army Materiel Systems Analysis Activity's (AMSAA) primary mission of materiel systems analysis. AMSAA is the Army's center for item/system level performance analysis and certified data. In accomplishing its materiel systems analysis mission, AMSAA analyzes the performance and combat effectiveness of conceptual, developmental, and existing systems. Unique models and methodologies have been developed to predict critical performance variables, such as, weapon accuracy, target acquisition, rate of fire, probability of inflicting catastrophic damage, and system reliability. AMSAA is responsible for the generation of these performance and effectiveness measures and for ensuring their standard use across Army and Joint studies. AMSAA conducts and supports various 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 Army and Department of Defense (DoD) leadership in making acquisition, procurement, and logistics decisions in order to provide quality equipment and procedures to the soldiers. AMSAA's modeling and simulation (M&S) capabilities support the development, linkage, and accreditation of live, virtual, and constructive simulations, and provide unique tools that support systems analysis of individual systems and the combined-arms environment. AMSAA is the Army's executive agent for the verification, validation, and accreditation (VV&A) of item level performance models. In this role, AMSAA assists model developers with the development and execution of V&V plans to ensure new models and simulations faithfully represent actual systems. As the Army's center for materiel systems analysis, AMSAA provides the technical capability to support Army and DoD decision-makers throughout the entire materiel acquisition process in responding to analytic requirements across the full spectrum of materiel system commodity areas. This PE/Project funds the salaries of civilian employees assigned to the materiel systems analysis mission.

FY 1999 Accomplishments:

- 9557 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: Future Scout and Cavalry System (FSCS), Comanche, Crusader, and Digitization Brigade and Below (DB2). 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: AoAs, 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: Future Combat Vehicle (FCV), FSCS, Crusader, High Mobility Multipurpose Wheeled Vehicle (HMMWV), and Grizzly. Developed, modified, and maintained item level methodologies, models, and simulations to assist in the conduct of systems analysis. Examples of efforts included: Ground Wars Model, Active Protection System/Counter-Active Protection System (APS/CAPS) methodologies, and One Semi-Automated Force (OneSAF). Performed verification and validation of item level performance models and methodologies. Funding supported approximately 100 civilians to include salary, benefits, and all other support costs (e.g., training, TDY, etc.).

Total 9557

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605706A Materiel Systems Analysis	PROJECT M541

FY 2000 Planned Program:

•	8734	Develop and certify system performance data for U.S. and foreign systems to be used to support Army and Joint AoAs, force structure studies and theater level studies. Examples of programs where decisions will be influenced: Initial Brigade, 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, FCV, FSCS, and Comanche. Develop, modify, and maintain item level methodologies, models, and simulations to assist in the conduct of systems analysis. Examples include: Ground Wars Model, APS/CAPS methodology & model development, and infantry model development. Perform verification and validation of item level performance models and methodologies. Funding will support approximately 88 civilians to include salary, benefits, and all other support costs (e.g., training, TDY, etc.).
	49	Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR)
Total	8783	

FY 2001 Planned Program:

•	8737	Develop and certify system performance data for U.S. and foreign systems to be used to support Army and Joint AoAs, force structure studies, and theater level studies. Examples of programs where decisions will be influenced: FCV, 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 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: FCV, FSCS, and Comanche. Develop, modify, and maintain item level methodologies, models, and simulations to be used in the conduct of systems analysis. Perform verification and validation of item level performance models and methodologies. Funding will support approximately 82 civilians to include salary, benefits, and all other support costs (e.g., training, TDY, etc.).
Total	8737	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605706A Materiel Systems Analysis / PROJECT: M541

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	9617	8796	8718
Appropriated Value	9711	8796	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-94		
b. SBIR / STTR	-61		
c. Omnibus or Other Above Threshold Reductions		-7	
d. Below Threshold Reprogramming	+41		
e. Rescissions	-40	-6	
Adjustments to Budget Years Since FY 2000/2001 PB			+19
Current Budget Submit (FY 2001 PB)	9557	8783	8737

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)			DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605709A Exploitation of Foreign Items		PROJECT DC28

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
DC28 Acquisition/Exploitation of Threat Items	3882	4112	3582	3510	3485	3625	5576	Continuing	Continuing

A. Mission Description and Justification: 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).

FY 1999 Accomplishments:

•	792	Acquired threat systems identified and prioritized in the FY 1999 Army Foreign Materiel Program (FMP) Five Year Plan.
•	2198	Initiated, continued, or completed exploitation projects on ground systems of Army interest identified in the FY 1999 Army FMP Exploitation Plan.
•	892	Initiated, continued, or completed exploitation projects on missile systems of Army interest identified in the FY 1999 Army FMP Exploitation Plan.
Total	3882	

FY 2000 Planned Program:

•	1712	Acquire threat systems identified and prioritized in the FY 2000 Army Foreign Materiel Program (FMP) Five Year Plan.
•	2300	Initiate, continue, or complete exploitation projects on ground systems of Army interest identified in the FY2000 Army FMP Exploitation Program.
•	110	Small Business Innovative Research/Small Business Technology Transfer
Total	4112	

FY 2001 Planned Program:

•	1324	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.
Total	3582	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605709A Exploitation of Foreign Items PROJECT DC28

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	4004	4143	3605
Appropriated Value	4031	4143	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-27		
b. SBIR / STTR	-106		
c. Omnibus or Other Above Threshold Reductions		-17	
d. Below Threshold Reprogramming			
e. Rescissions	-16	-14	
Adjustments to Budget Years Since FY 2000/2001 PB			-23
Current Budget Submit (FY 2001 PB)	3882	4112	3582

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605712A Support of Operational Testing

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	64312	68659	71079	72540	77725	77145	78389	Continuing	Continuing
DV02 ATEC Activities	40286	43109	44425	46678	47910	47007	48177	Continuing	Continuing
D001 ATEC IOTE	19190	19650	20492	19311	23168	22574	21898	Continuing	Continuing
D987 ATEC Instrumentation Sustainment & Development	4836	5900	6162	6551	6647	7564	8314	Continuing	Continuing

A. Mission Description and Budget Item Justification: On 1 October 1999, the US Army Operational Test and Evaluation Command (OPTEC) was redesignated as the US Army Test and Evaluation Command (ATEC). The three subordinate commands assigned to ATEC are: the Army Evaluation Center (AEC), the Operational Test Command (OTC), formerly the Test and Experimental Command (TEXCOM), and the Developmental Test Command (DTC), formerly the US Army Materiel Command's Test and Evaluation Command (TECOM). This program finances 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 Command (OTC). The FY 1999 program reflects completed restructure directed by OSD of manpower and funds for the Army Threat Support Activity (ATSA), Test and Evaluation Coordination Offices (TECO's), Test and Evaluation Support Activity and other test support previously programmed and budgeted in the Operation and Maintenance, Army (OMA) appropriation. Project D001 provides for direct operational and joint test costs incurred by OTC including Multi-Service, Army Transformation, First Digitized Division and Automated Information Systems (AIS). Excludes funding for Acquisition Category I (ACAT I) major weapons and Automated Information Systems which are programmed within the PE funding development of each system. 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 weapons advancements.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605712A Support of Operational Testing

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	65460	68946	69038
Appropriated Value	66320	68946	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-860		
b. SBIR / STTR	-977		
c. Omnibus or Other Above Threshold Reductions		-155	
d. Below Threshold Reprogramming	+89		
e. Rescissions	-260	-132	
Adjustments to Budget Years Since FY 2000/2001 PB			2041
Current Budget Submit (FY 2001 PB)	64312	68659	71079

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605712A Support of Operational Testing		PROJECT: DV02

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DV02 ATEC Activities	40286	43109	44425	46678	47910	47007	48177	Continuing	Continuing

Mission Description and Justification:: This project finances recurring costs, including civilian pay, support contracts, temporary duty, supplies and equipment of subordinate elements of the Operational Test Command (OTC), a subordinate command of the US Army Test and Evaluation Command (ATEC). Included are: 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).

FY 1999 Accomplishments:

- 16722 Operational costs including 178 civilian authorizations at Fort Hood, TX Test Directorates (includes Test and Evaluation Support Activity)
- 2683 Operational costs including 27 civilian authorizations at Fort Sill, OK Test Directorate
- 3003 Operational costs including 34 civilian authorizations at Fort Huachuca, AZ Test Directorate
- 2730 Operational costs including 35 civilian authorizations at Fort Bragg, NC Test Directorate
- 3139 Operational costs including 37 civilian authorizations at Fort Bliss, TX Test Directorate
- 10504 Operational costs including 17 civilian authorizations at Army Threat Support Activity, Fort Bliss, TX
- 1505 Operational costs including 18 civilian authorizations at Test and Evaluation Coordination Offices

Total 40286

FY 2000 Planned Program:

- 21809 Operational costs including 177 civilian authorizations at Fort Hood, TX Test Directorates (includes Test and Evaluation Support Activity)
- 2812 Operational costs including 28 civilian authorizations at Fort Sill, OK Test Directorate
- 3147 Operational costs including 34 civilian authorizations at Fort Huachuca, AZ Test Directorate
- 2861 Operational costs including 40 civilian authorizations at Ft. Bragg, NC Test Directorate
- 3290 Operational costs including 37 civilian authorizations at Fort Bliss, TX Test Directorate
- 8000 Operational costs including 18 civilian authorizations at Army Threat Support Activity, Fort Bliss, TX
- 860 Operational costs including 8 civilian authorizations at Test and Evaluation Coordination Offices
- 330 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program.

Total 43109

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing
	PROJECT DV02

FY 2001 Planned Program:

•	24142	Operational costs including 177 civilian authorizations at Fort Hood, TX Test Directorates (includes Test and Evaluation Support Activity)
•	2899	Operational costs including 28 civilian authorizations at Fort Sill, OK Test Directorate
•	3245	Operational costs including 34 civilian authorizations at Fort Huachuca, AZ Test Directorate
•	2950	Operational costs including 40 civilian authorizations at Fort Bragg, NC Test Directorate
•	3302	Operational costs including 37 civilian authorizations at Fort Bliss, TX Test Directorate
•	7000	Operational costs including 18 civilian authorizations at Army Threat Support Activity, Fort Bliss, TX
•	887	Operational costs including 8 civilian authorizations at Test and Evaluation Coordination Offices
Total	44425	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605712A Support of Operational Testing

PROJECT: D001

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D001 ATEC IOTE	19190	19650	20492	19311	23168	22574	21898	Continuing	Continuing

Mission Description and Justification: This project finances 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 Transformation, 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. ATEC provides Army leadership with an independent test and evaluation of effectiveness, suitability, and survivability of the system.

FY 1999 Accomplishments: FORCE XXI BATTLE COMMAND BRIGADE AND BELOW (FBCB2) LUTE, Long Range Advanced Scout Surveillance System (LRAS3) IOTE, Armored Security Vehicle (ASV) IOTE, M270A1 LUTE/IOTE, Advanced Field Artillery Tactical Data System (AFATDS) Pkg 11 LUTE

- 3396 Combat Support operational testing
- 1012 Close Combat operational testing
- 1640 Command, Control, Communications and Computers operational testing
- 562 Intelligence and Electronic Warfare operational testing
- 5043 Fire Support operational testing
- 619 Aviation operational testing
- 2778 Joint Tests operational testing
- 4140 Advanced Concept Technology operational testing

Total 19190

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605712A Support of Operational Testing	PROJECT D001

FY 2000 Planned Program: FBCB2 FDTE/LUTE, SCAMP LUTE, Single Shelter Switch IOTE, Containerized Kitchen (CK) IOTE, Integrated System Control (ISYSCON) LUTE, Joint Warfighter (JWF)

•	5130	Combat Support operational testing
•	3957	Command, Control, Communications and Computers operational testing
•	1085	Intelligence and Electronic Warfare operational testing
•	108	Fire Support operational testing
•	276	Aviation operational testing
•	1310	Joint Tests operational testing
•	7255	Advanced Concept Technology operational testing
•	529	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program
Total	19650	

FY 2001 Planned Program: M270A1 IOTE, Bradley Fire Support Team Vehicle (BFIST) LUTE, Combat Identification for the Dismounted Soldier (CIDDS) IOTE, WARSIM 2000 IOTE, and Joint Warfighter

•	136	Combat Support operational testing
•	3642	Close Combat operational testing
•	1633	Command, Control, Communications and Computers operational testing
•	1311	Intelligence and Electronic Warfare operational testing
•	4079	Fire Support operational testing
•	448	Aviation operational testing
•	7348	Joint Tests operational testing
•	1895	Air Defense Artillery testing
Total	20492	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605712A Support of Operational Testing		PROJECT: D987

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D987 ATEC Instrumentation Sustainment & Development	4836	5900	6162	6551	6647	7564	8314	Continuing	Continuing

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 weapons 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 ATEC 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, and new instrumentation capability in support of Real-Time Casualty Assessment (RTCA) which measures simulated attrition of forces during simulated battlefield engagements. Operational test directorates are located at Fort Hood, TX; Fort Bliss, TX; Fort Huachuca, AZ; Fort Sill, OK; and Fort Bragg, NC.

FY 1999 Accomplishments:

•	1048	Test Tracking Systems (Telemetry and Imaging)
•	3788	Field Data Collection (Collection and Transfer)
Total	4836	

FY 2000 Planned Program:

•	4039	Test Tracking Systems (Telemetry and Imaging)
•	1205	Field Data Collection (Collection and Transfer)
•	497	GPS Modernization
•	159	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Program.
Total	5900	

FY 2001 Planned Program:

•	3697	Test Tracking Systems (Telemetry and Imaging)
•	2115	Field Data Collection (Collection and Transfer)
•	350	GPS Modernization
Total	6162	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605716A Army Evaluation Center

PROJECT: D302

COST (*In Thousands*)	FY 1999 Actual	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	26248	24163	26337	27232	28024	32373	31225	Continuing	Continuing

A. Mission Description and Budget Item Justification: On 1 October 1999, the US Army Operational Test and Evaluation Command (OPTEC) was redesignated as the US Army Test and Evaluation Command (ATEC). The three subordinate commands assigned to ATEC are: the Army Evaluation Center (AEC), the Operational Test Command (OTC), formery the Test and Experimental Command (TEXCOM), and the Developmental Test Command (DTC), formerly the U.S Army Materiel Command's Test and Evaluation Command (TECOM). 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 life-cycle continuous evaluation 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 & 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 1999 Accomplishments:

•	26248	Provided integrated technical and operational evaluations and continuous evaluation 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 Effectiveness, Suitability, and Survivability factors pertinent to the decision process. As the Army lead for Live Fire Test and Evaluation, planned and executed the Army Live Fire Test and Evaluation program for developmental systems. Prepared integrated System Evaluation Plans and conducted integrated technical and operational evaluations for all Army weapon systems including M1A2-SEP (Abrams), MH-47E Aircraft, and Tactical Unmanned Aerial Vehicle (TUAV). Effort included costs for 171 civilian authorizations.
Total	26248	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605716A Army Evaluation Center / PROJECT: D302

FY 2000 Planned Program:

•	23835	Provide integrated technical and operational evaluations and continuous evaluation 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. Prepare integrated System Evaluation Plans and conduct integrated technical and operational evaluations for all Army weapon systems including M1A2 Abrams, Longbow/Apache Modular Missile System, Tactical Unmanned Aerial Vehicle, and C130J-30 Stretch Cargo Aircraft. Includes costs for 171 civilian authorizations.
•	328	Small Business Innovative Research/Small Business Technical Transfer (SBIR/STTR) Program.
Total	24163	

FY 2001 Planned Program:

•	26337	Provide integrated technical and operational evaluations and continuous evaluation 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. Prepare integrated System Evaluation Plans and conduct integrated technical and operational evaluations for all Army weapon systems including M1A2 Abrams, Longbow/Apache Modular Missile System, Tactical Unmanned Aerial Vehicle, and C130J-30 Stretch Cargo Aircraft. Effort includes costs for 171 civilian authorizations.
Total	26337	

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	25313	24255	26362
Appropriated Value	25526	24255	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-213		
b. SBIR / STTR	-376		
c. Omnibus or Other Above Threshold Reductions		-50	
d. Below Threshold Reprogramming	1413		
e. Rescissions	-102	-42	
Adjustments to Budget Years Since FY 2000/2001 PB			-25
Current Budget Submit (FY 2001 PB)	26248	24163	26337

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605801A Programwide Activities

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	67210	64014	73811	62734	72849	68896	58509	Continuing	Continuing
M881 RDTE Command/Center/General	51813	48991	51893	56146	55103	54107	54697	Continuing	Continuing
MM75 Federal Workforce Restructure	14294	13820	20762	5439	16619	13613	2609	Continuing	Continuing
MM76 Armament Group Support	1103	1203	1156	1149	1127	1176	1203	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. Program Change Summary	FY1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	64047	64121	73259
Appropriated Value	64588	64121	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-541		
b. SBIR/STTR	-303		
c. Omnibus or Other above Threshold Reductions	+1133	-59	
d. Below Threshold Reprogramming	+2541		
e. Rescissions	-208	-48	
Adjustments to Budget Years Since FY 2000/2001 PB			+552
Current Budget Submit (FY 2001 PB)	67210	64014	73811

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605801A Programwide Activities		PROJECT M881

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M881 RDTE Command/Center/General	51813	48991	51893	56146	55103	54107	54697	Continuing	Continuing

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.

FY 1999 Accomplishments:

•	39856	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.
•	3502	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.
•	7322	Continued 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.
•	1133	Funded Y2K compliance support.
Total	51813	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605801A Programwide Activities	PROJECT M881

FY 2000 Planned Program:

•	38058	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.
•	3158	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.
•	7433	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.
•	342	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	48991	

FY 2001 Planned Program:

•	41110	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.
•	2951	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.
•	7832	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	51893	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605801A Programwide Activities		PROJECT: MM75

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
MM75 Federal Workforce Restructure	14294	13820	20762	5439	16619	13613	2609	Continuing	Continuing

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), and the 15% 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.

FY 1999 Accomplishments:

- 14294 Funded the transition costs associated with workforce reductions (VERA/VSIP) and required OPM taxes.

Total 14294

FY 2000 Planned Program:

- 13820 Fund the transition costs associated with workforce reductions (VERA/VSIP) and required OPM taxes.

Total 13820

FY 2001 Planned Program:

- 20762 Fund the transition costs associated with workforce reductions (VERA/VSIP) and required OPM taxes.

Total 20762

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605801A Programwide Activities		PROJECT: MM76

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
MM76 Armament Group Support	1103	1203	1156	1149	1127	1176	1203	Continuing	Continuing

Mission Description and Justification: 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.

FY 1999 Accomplishments:

•	353	Funded domestic and international travel linked to scientific and technological exchanges having military application and mutual benefits to the United States and its Allies.
•	750	Funded 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	1103	

FY 2000 Planned Program:

•	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.
•	708	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.
•	33	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	1203	

FY 2001 Planned Program:

•	413	Fund domestic and international travel linked to scientific and technological exchanges having military application and mutual benefits to the United States and its Allies.
•	743	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	1156	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605803A Technical Information Activities

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	19252	15859	26749	26989	27304	28747	29472	Continuing	Continuing
DC16 Field Assistance in Science and Technology	2588	2632	2487	2533	2577	2625	2671	Continuing	Continuing
DC18 Board on Army Science and Technology	677	724	736	745	755	808	847	Continuing	Continuing
M720 Technical Information Functional Activities	5468	2852	3659	3720	3781	4016	4205	Continuing	Continuing
M727 Technical Information Activities	2714	2920	5273	5578	5823	6182	6374	Continuing	Continuing
M729 Youth Science Activities	2010	2213	2089	2127	2168	2209	2252	Continuing	Continuing
D730 Personnel and Training Analysis Activities	1967	2047	2188	2228	2273	2379	2446	Continuing	Continuing
D731 Army High Performance Computing Centers	0	0	6891	6791	6683	6819	6957	Continuing	Continuing
M733 Acquisition Technology Act	3056	1704	2662	2505	2486	2937	2932	Continuing	Continuing
M735 Net Assessment Directorate	772	767	764	762	758	772	788	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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	16006	15973	16330
Appropriated Value	16251	15973	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-245		
b. SBIR / STTR	-400		
c. Omnibus or Other Above Threshold Reductions		-61	
d. Below Threshold Reprogramming	+3710		
e. Rescissions	-64	-53	
f. DoD Internal Reprogramming			
Adjustments to Budget Years Since (FY 2000/2001 PB)			+10419
Current Budget Submit (FY 2001 PB)	19252	15859	26749

Change Summary Explanation: Funding – FY 01: Transfer of funding (+6891) from O&MA accounts to support operations at Army distributed high performance computing centers under Project D731. Increases in Projects M720 (+750), M727 (+2200) and M733 (+578) to enhance independent reviews of Army S&T, conduct Technology Materiel Games, and improve Army S&T management processes..

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605803A Technical Information Activities

PROJECT: DC16

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC16 Field Assistance in Science and Technology	2588	2632	2487	2533	2577	2625	2671	Continuing	Continuing

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. Many of the efforts in this Project are on-going activities to support Army RD&A programs.

FY 1999 Accomplishments:

- 2588 - Conducted research to provide rapid technological solutions to problems identified and prioritized by CINCs worldwide. Specific examples follow.
  - Science Advisors deployed to Bosnia and Macedonia to evaluate Force Protection measures and to Latin America in support of humanitarian and counter narcotics efforts.
  - Exploited numerous technologies to reduce Army O&S costs: battery management, reduction of rust and corrosion, waste oil reutilization, and extending tire life.
  - Increased capabilities to conduct Force Projection Operations by developing the Flyaway Kit (prepackaged computer, data and communications equipment), the Remotely Operated Weather Station, and Machine-Assisted Language Translations.
  - Increased training capabilities by developing the Laser Aimed Scoring System (permits accurate appraisal of Apache helicopter missile practice) and a 40mm Blank Training Round to improve force-on-force infantry training.
  - Provided professional growth opportunity for 20 Army senior science advisors and Army junior scientists and engineers (two- to eight-week Army laboratory tours) through the Field Assistance in Science and Technology (FAST) Program.
  - Provided professional growth opportunity for civilian personnel through the Scientists and Engineers Field Experience with Soldiers (SEFEWS) program, which gives scientists and engineers the opportunity to participate in training events in the field.

Total 2588

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities
	PROJECT DC16

FY 2000 Planned Program:

•	2566	- Provide continuous activity on over 100 FAST projects. Define, test and recommend technological solutions to urgent materiel problems identified by CINCs worldwide and prepare operational needs statements and test results for the highest priority programs. - Deploy Science Advisors with U.S. Task Forces as requested by CINCs. - Provide professional growth opportunity for 20 Army senior science advisors and FAST Program tours for Army junior scientists and engineers. - Provide professional growth opportunity for civilian personnel through the Scientists and Engineers Field Experience with Soldiers (SEFEWS) program, which gives scientists and engineers the opportunity to participate in training events in the field.
•	66	- Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.
Total	2632	

FY 2001 Planned Program:

•	2487	- Provide continuous activity on over 100 FAST projects. Define, test and recommend technological solutions to urgent materiel problems identified by CINCs worldwide and prepare operational needs statements and test results for the highest priority programs. - Deploy Science Advisors with U.S. Task Forces as requested by CINCs. - Provide professional growth opportunity for 20 Army senior science advisors and FAST Program tours for Army junior scientists and engineers. - Provide professional growth opportunity for civilian personnel through the Scientists and Engineers Field Experience with Soldiers (SEFEWS) program, which gives scientists and engineers the opportunity to participate in training events in the field.
Total	2487	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605803A Technical Information Activities

PROJECT: DC18

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC18 Board on Army Science and Technology	677	724	736	745	755	808	847	Continuing	Continuing

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. Most of the efforts in this Project are on-going activities to support Army RD&A programs.

FY 1999 Accomplishments:

•	677	- BAST technical experts supported forecasts of Army science and technology needs and responded to immediate S&T requirements. - BAST experts participated in peer reviews for the annual ILIR and RDA awards review. - Initiated a BAST study to examine opportunities in the biotechnologies area (Biotechnologies for Future Army Applications). - Provide BAST liaisons to the following committees: 1) Review and evaluation of the Army Chemical Stockpile Disposal Program; 2) review of the Non-Stockpile Chemical Material Disposal Program; 3) Deployed Forces Project: Technology and Methods for Detection and Tracking of Exposures to a subset of harmful agents; and 4) Deployed Forces Project: Physical Protection and Decontamination.
Total	677	

FY 2000 Planned Program:

•	705	- 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. - Complete assessments for the Biotechnologies for Future Army Applications study. - Conduct studies for Army S&T issues.
•	19	- Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.
Total	724	

FY 2001 Planned Program:

•	736	- 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. - Complete analysis and documentation of the Biotechnologies for Future Army Applications data.
Total	736	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605803A Technical Information Activities

PROJECT: M720

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M720 Technical Information Functional Activities	5468	2852	3659	3720	3781	4016	4205	Continuing	Continuing

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 Technology Seminar Game; 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 Innovative 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 0605502 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. Most of the efforts in this Project are on-going activities to support Army RD&A programs.

FY 1999 Accomplishments:

- 5468 - Provided managerial, programming, database, clerical and personnel support to process, store, control and report the WUIS, and Form 1498's.
  - Provided Army funding support for Federated Laboratory Consortium as required by Public Law 99-502.
  - Provided administrative and contractual support for the Army Science Board.
  - Provided administrative support for the Army's SBIR and 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 Technology and Materiel Game.
  - Provided funding for Independent Assessment.

Total 5468

FY 2000 Planned Program:

- 2783 - Provide Army funding support for Federated Laboratory Consortium as required by Public Law 99-502.
  - Provide administrative and contractual support for the Army Science Board.
  - Provide administrative support for the Army's SBIR and STTR programs.
  - Provide Army Science and Technology Reports.
  - Provide funding for patent fees and patent legal expenses for AMC commands and laboratories.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities
	PROJECT M720

- Provide funding for Army Science and Technology Summer Study and awards.

FY 2000 Planned Program: (continued)

- Provide funding for Technology and Materiel Game.
- Provide funding for Independent Assessment.

•	69	- Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.
Total	2852	

FY 2001 Planned Program:

•	3659	- Provide Army funding support for Federated Laboratory Consortium as required by Public Law 99-502.
		- Provide administrative and contractual support for the Army Science Board.
		- Provide administrative support for the Army's SBIR and 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 Technology Seminar Game
		- Provide funding for Independent Assessment.
Total	3659	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605803A Technical Information Activities

PROJECT: M727

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M727 Technical Information Activities	2714	2920	5273	5578	5823	6182	6374	Continuing	Continuing

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), including support of the Army Science and Technology Master Plan; 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. Most of the efforts in this Project are on-going activities to support Army RD&A programs.

FY 1999 Accomplishments:

•	2714	- Administered S&T database computer engineering support contract. - Supported Army S&T strategic planning, analysis, and prioritization. - Supported 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.
Total	2714	

FY 2000 Planned Program:

•	2845	- Administer S&T database computer engineering support contract. - Support Army S&T strategic planning, analysis, and prioritization. - Support 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.
•	75	- Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.
Total	2920	

FY 2001 Planned Program:

•	5273	- Administer S&T database computer engineering support contract. - Support Army S&T strategic planning, analysis, and prioritization. - Support AMC database and Defense Reliance management.
Total	5273	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605803A Technical Information Activities

PROJECT: M729

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M729 Youth Science Activities	2010	2213	2089	2127	2168	2209	2252	Continuing	Continuing

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. Most of the efforts in this Project are on-going scientific outreach activities to foster interest in Army RD&A programs.

FY 1999 Accomplishments:

- 2010 - Fostered high school student interest nationally in science, mathematics, engineering and computer science by sponsoring Junior Science and Humanities Symposia (JSHS), International Science and Engineering Fairs (ISEF), International Mathematics Olympiad (IMO), and Research and Engineering Apprenticeship Program (REAP).
  - Co-sponsored joint Army/Navy Washington Regional Area SEAP.
  - Conducted a special tutorial program for Native Americans, African Americans, and Spanish-speaking Americans, known as the United Introduction to Engineering (UNITE) program, designed to increase their chances of attending and completing engineering and/or science curriculum at the university level.
  - Conducted the West Point cadet research internship program to enhance cadet training through field experience within Army research laboratories and centers.

Total 2010

FY 2000 Planned Program:

- 2154 - Foster high school student interest nationally in science, mathematics, engineering and computer science by sponsoring JSHS, ISEF, IMO, and REAP.
  - Conduct the joint Army/Navy Washington Regional Area SEAP and increase Army Laboratory/Research, Development and Engineering Center (RDEC) sponsorship of students.
  - Conduct a special tutorial programs for Native Americans, African Americans, and Spanish-speaking Americans, the UNITE program, designed to increase their chances of attending and completing engineering and/or science curriculum at the university level.
  - Conduct West Point cadet research internship program to enhance cadet training through field experience within Army research labs and centers.
- 59 - Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities
	PROJECT M729

Total 2213

FY 2001 Planned Program:

•	2089	- Foster high school student interest nationally in science, mathematics, engineering and computer science by sponsoring JSHS, ISEF, IMO, and REAP. - Sponsor joint Army/Navy Washington Regional Area SEAP and increase Army Laboratory/RDEC sponsorship of students. - Conduct special tutorial programs for Native Americans, African Americans, and Spanish-speaking Americans, the UNITE program, designed to increase their chances of attending and completing engineering and/or science curriculum at the university level. - Conduct West Point cadet research internship program to enhance cadet training through field experience within Army research laboratories and centers.

Total 2089

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities		PROJECT D730

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D730 Personnel and Training Analysis Activities	1967	2047	2188	2228	2273	2379	2446	Continuing	Continuing

Mission Description and Budget Item 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 training, leadership, and soldier-related (TLS) 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.

FY 1999 Accomplishments:

- 1967 - Completed assembly of data on the backgrounds and enlistment expectations of new recruits as the first step in understanding training-base attrition.
  - Identified key topics of concern and conducted interviews with senior Army leaders on how they have managed change as the Army transitions to the first all-digital division
  - Identified issues and alternative courses of action for distributed training development activities.
  - Completed interviews with Joint Readiness Training Center (JRTC) analysts to examine the feasibility of a centralized training analysis and feedback system to support multiple exercises at separate training sites.
  - Completed interviews with experienced leaders and Observer-Controllers on the benefits of live-fire exercises at JRTC.
  - Completed book on "The Elements of Training Evaluation" which describes the necessary conditions for making valid inferences about the effectiveness of Army training.

Total 1967

FY 2000 Planned Program:

- 1998 - Develop an approach for evaluating the capabilities of virtual simulation to represent the tasks and missions within a given military application.
  - Establish a procedure to map soldiers' required information technology knowledge across a spectrum of career management fields.
  - Design a relational database consisting of commander and key leader insights on managing changes to the Army's first all-digital division.
  - Compare job performance of Battle Staff NCOs completing their job preparation course by distance learning, with a comparable group completing the course by the traditional classroom method.
  - Evaluate the Army's new Enlisted Personnel Allocation System for assigning new recruits to Military Occupational Specialties.
  - Conduct in-depth study to determine reasons why soldiers leave the Army during the initial entry training phase of their enlistment.
  - Determine the impact of the Army Continuing Education System on personnel retention, job proficiency, and career progression.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities	PROJECT D730

- Update database and provide quarterly reports to Army planners on post-service usage of Army College Fund and Montgomery GI Bill programs.

FY 2000 Planned Program: (continued)

•	49	- Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.
Total	2047	

FY 2001 Planned Program:

•	2188	- Conduct studies and analyze training issues identified by Training and Doctrine Command (TRADOC) - Conduct studies and analyze personnel issues identified by the Chief of Staff, Army (CSA), Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA, M&RA), and Deputy Chief of Staff for Personnel (DCSPER)
Total	2188	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605803A Technical Information Activities		PROJECT: D731

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D731 Army High Performance Computing Centers	0	0	6891	6791	6683	6819	6957	Continuing	Continuing

Mission Description and Justification: This project supports collaborative efforts to advance computational science and its application to critical Army technologies. The Centers work with researchers at Army laboratories to develop new tools in the computational sciences to address critical technology issues in advanced armors, advanced artillery, precision air drop and environmental quality. These efforts support the Technology Base Modernization Objectives and focus on streamlining acquisition through Simulation, Modeling, Acquisition, Requirements and Training (SMART). The Centers provide for the sustainment of high performance computing environments and educational outreach as an integral part of their mission.

FY 1999 Accomplishments: This project not funded in FY 1999.

FY 2000 Planned Program: This project not funded in FY 2000.

FY 2001 Planned Program:

- 2355 - Sustain the high performance computing environment and infrastructure in support of the Army Tank and Automotive Research Development and Engineering Center (TARDEC). Conduct technology exchange with PEOs, PMs, and industry in wheeled and tracked vehicle technology.
- 3389 - Sustain the high performance computing environment and infrastructure in support of the Army Research Laboratory Major Shared Research Center (MSRC). This effort also sponsors outreaches to HBCU/MIs and their university partners to collectively develop and improve the state of computational technology in support of critical, Army specific needs to field systems such as the Comanche, Future Combat Vehicle and Joint Heavy Lift Helicopter.
- 1147 - Sustain the high performance computing environment and infrastructure in support of the Army High Performance Computing Research Center's research and educational activities.
  - Conduct technology exchanges with Army researchers in critical computational sciences research areas. Technology transfer activities will include applying improved computational models to support the development of new ceramic materials for use in future armored vehicles, drug/vaccine design, and studies of interior ballistics.

Total 6891

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605803A Technical Information Activities		PROJECT: M733

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M733 Acquisition Technology Act	3056	1704	2662	2505	2486	2937	2932	Continuing	Continuing

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. Most of the efforts in this Project are on-going activities to support Army RD&A programs.

FY 1999 Accomplishments:

•	2022	- Validated simulation and logical modeling test and evaluation environment that provides a prototype development tool in support of technology base initiatives. - Distributed and beta tested application programs and user interface utilities for executive level information systems that offer Standard Query Language (SQL) services to Army Acquisition Corps corporate and global databases. - Analyzed acquisition program financial programming and budgeting requirements. Continued development of Weapon Systems Handbook, long-range planning and policy analysis, resource allocation analysis, cost tracking and analysis, cost-effectiveness and database management/financial analysis, special access required technology application concept research/analysis.
•	1034	- Provided integration and functional analysis support for Army Science and Technology Programs.
Total	3056	

FY 2000 Planned Program:

•	1658	- 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 Science and Technology Programs, long-range planning and policy analysis, resource allocation analysis, cost tracking and analysis, cost-effectiveness and database management/financial analysis, special access required technology application concept research/analysis.
•	46	Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.
Total	1704	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities
	PROJECT M733

FY 2001 Planned Program:

•	2662	- 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, special access required technology application concept research/analysis.
Total	2662	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605803A Technical Information Activities

PROJECT: M735

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M735 Net Assessment Directorate	772	767	764	762	758	772	788	Continuing	Continuing

Mission Description and Justification: The Net Assessment Directorate develops and coordinates net assessments of the standing, trends and future prospects for U.S. military capabilities and military potential in comparison with those of other countries or groups of countries 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 supports preparation of net assessments by the Chairman of the Joint Chiefs of Staff; develops, advises, and consults on the net assessment potion of the Annual Report of the Secretary of Defense to the President and Congress; provides guidance and staff assistance in developing 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. . Many of the efforts in this Project are on-going activities to support Army RD&A programs.

FY 1999 Accomplishments:

- 772 - Developed alternative scenarios for geopolitical future of Eurasia. Drawing on country and functional expertise, identified key actors, trends, and discontinuities that could reshape the character of interstate interactions and pose new challenges or opportunities for US defense policy.
  - Synthesized extensive research program on "transformation strategy," i.e., identifying issues and options for US and foreign country transitions from
  present day military organizations and equipment inventories to a very different military 25 years hence.
  - Analyzed challenges to US military superiority that could stem from eroding US advantages in space, stealth, precision navigation, information operations, biotechnology, and other areas, and developed potential strategies for preserving US superiority in light of such challenges.
  - Supported net assessment of future US power projection capabilities as challenged by "anti-access" strategies and forces of potential opponents.

Total 772

FY 2000 Planned Program:

- 747 - Design and build comparative, time-series databases to support net assessments of military functions of likely increasing importance. Candidates include long-range precision strike systems and anti-access systems.
  - Support net assessment of the military use of space, assessing foreign country and commercial developments that may confer military advantage on potential opponents, and prospect that US space systems' military contribution will be undermined by foreign measures or enhanced by new technologies.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605803A Technical Information Activities	PROJECT M735

- Support DOD efforts to identify promising field experiments to improve understanding of the merits and implications of candidate military innovations suggested in Revolution in Military Affairs war games.
- Conduct analysis of economic trends and asymmetries most likely to affect future military balances.

FY 2000 Planned Program: (continued)

•	20	Small Business Innovative Research / Small Business Technology Transfer (SBIR/STTR) Programs.
Total	767	

FY 2001 Planned Program:

•	764	- Develop functional assessments of the emerging balance of power in key future warfare areas identified in FY 2000; regional net assessments; and/or assessments of political and economic factors that shape the future security environment. - Continue research on foreign country writings, research, organization, and procurement tending to support a Revolution in Military Affairs.
Total	764	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605805A Munitions Standardization Effectiveness and Safety

COST (*In Thousands*)	FY 1999 Actual	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	10616	18800	11276	10604	10453	11458	11644	Continuing	Continuing
DF21 North Atlantic Treaty Organizaion (NATO) Small Arms Evaluation	0	489	490	488	487	488	484	Continuing	Continuing
DF24 Conventional Ammunition Demilitarization	6965	12861	4513	4614	4732	4858	4992	Continuing	Continuing
D293 Field Artillery Ammunition (NATO) Engineering Development	83	0	0	0	0	0	0	0	1672
D297 Munitions Survivability & Logistics	2379	3889	4220	4234	3956	4818	4854	Continuing	Continuing
M296 Pyrotechnic Reliability and Safety	631	788	795	0	0	0	0	0	3521
M857 Explosive Safety Standards	558	773	761	771	782	798	818	Continuing	Continuing
M858 Army Explosives Safety Management Program	0	0	497	497	496	496	496	Continuing	Continuing

A. Mission Description and 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. The Army Explosives Safety Management Program (M858) is a new start for FY 2001. The U.S. Army Technical Center for Explosives Safety will use the funds in this project to evaluate current explosives safety standards, using risk management philosophy to develop new, scientific and risk-based standards to meet U. S. Army explosives requirements.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605805A Munitions Standardization Effectiveness and Safety

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	10422	10537	10814
Appropriated Value	10497	19037	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-75		
b. SBIR / STTR	-241		
c. Omnibus or Other Above Threshold Reductions		-74	
d. Below Threshold Reprogramming	+477		
e. Rescissions	-42	-163	
Adjustments to Budget Years Since FY 2000/2001 PB			+462
Current Budget Submit (FY 2001 PB)	10616	18800	11276

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605805A Munitions Standardization Effectiveness and Safety

PROJECT: DF21

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
DF21 North Atlantic Treaty Organizaion (NATO) Small Arms Evaluation	0	489	490	488	487	488	484	Continuing	Continuing

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.

FY 1999 Accomplishments: Project not funded in FY 1999

FY 2000 Planned Program:

•	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
•	31	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
•	13	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	489	

FY 2001 Planned Program:

•	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
•	130	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
Total	490	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605805A Munitions Standardization Effectiveness and Safety

PROJECT: DF24

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
DF24 Conventional Ammunition Demilitarization	6965	12861	4513	4614	4732	4858	4992	Continuing	Continuing

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.

FY 1999 Accomplishments:

•	2000	Continued to develop cryofracture development for demilitarization of anti-personnel landmines (APL) and other munitions
•	2100	Continued demonstration program for blast chamber technology
•	1700	Completed prototype Supercritical Water Oxidation (SCWO) system installation and start-up for the demilitarization of colored smokes and dyes
•	355	Completed development of explosive rework process for cast loaded munitions
•	610	Continued testing of pilot scale plasma arc technology
•	200	Support of the Joint Ammunition Management Support System (JAMSS)
Total	6965	

FY 2000 Planned Program:

•	1650	Complete testing, evaluation, and prove-out of pilot scale plasma arc technology
•	3900	Complete cryofracture development for demilitarization of APL and other munitions
•	1064	Complete testing and evaluation of SCWO system
•	150	Complete documentation and technical data package (TDP) preparation for explosives rework system
•	125	Initiate development of recycle/reuse technology for magnesium/aluminum
	5500	Continue demonstrations of stationary and transportable contained detonation technology
	125	Initiate development of smoke pot oil recovery technology
	347	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	12861	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety PROJECT DF24

FY 2001 Planned Program:

•	2060	Continue testing, evaluation, and prove-out of pilot scale plasma arc technology
•	500	Continue cryofracture development for demilitarization of APL and other munitions
•	550	Initiate development of recovery/reuse technology for nitramine explosives
•	683	Continue development of recycle/reuse technology for magnesium/aluminum
•	720	Continue development of smoke pot oil recovery technology
Total	4513	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety	PROJECT D297

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D297 Munitions Survivability & Logistics	2379	3889	4220	4234	3956	4818	4854	Continuing	Continuing

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 and compliance, 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. 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 fighting force.

FY 1999 Accomplishments:

- 540 Developed concept and design architecture of prototype munitions storage area planning software tool that allow s soldiers to quickly design survivable and efficient ammunition storage sites
- 278 Completed 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
- 134 Developed manipulator control architecture for a smart munitions handling crane that will leverage the reduced ammunition force structure and facilitate the rapid configuration or reconfiguration of munitions loads in-theater
- 226 Populated database of Army munitions compliance status with DoD 5000.2-R requirement that all munitions be designed to withstand unplanned stimuli
- 241 Completed concept, fabrication, and testing of a barrier system for tank ammunition packaging that makes the tank munition less sensitive to unplanned stimuli. Developed concept for incorporating a propellant fire extinguishing capability into tank ammunition packaging designs
- 171 Evaluated less heat sensitive propellants and designs for 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 Developed and evaluated low melting point ballistic protection material inserts for missile packaging (PAC-3, THAAD, MLRS, etc.) that will 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 Completed testing of THAAD missile propellant to determine tensile strength and burning characteristics and prepared report to baseline future insensitive munitions (IM) propellant development

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety PROJECT D297

FY 1999 Accomplishments: (continued)

- 95 Conducted reviews of munitions in development and production to determine if they meet the DoD 5000.2-R requirement to withstand unplanned stimuli and recommended technical approaches to meet this requirement
- 106 Conducted market survey of corrosion prevention materials suitable for use in munitions packaging and purchased candidates for evaluation
- 208 Selected materials and candidate munition item and completed 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
- 41 Determined Special Operations Forces ammunition requirements and developed man-portable mixed ammunition packaging utilizing standard containers
- 79 Conducted a study of the planned production levels and consumption rates of all Army munitions used for training and identified likely candidates for reduced packaging configurations (to reduce operations and support costs and provide easier disposal of waste packaging)

Total 2379

FY 2000 Planned Program:

- 1187 Complete software design architecture and development of safety and survivability planning information modules for the prototype munitions storage area planning software tool. Develop guidelines for munitions barricade sizing relative to donor stack explosive mass
- 151 Conduct compatibility assessment tests and develop conceptual designs of packaging and mitigation solutions for incompatible munitions SCLs
- 541 Design a manipulator/end effector and develop 3-D and motion simulation models for a smart munitions handling crane
- 250 Identify specific insensitive munitions (IM) technologies that can be applied to individual Army munitions, update database, and identify IM improvement priorities
- 135 Complete the design of ammunition packaging that incorporates a propellant fire extinguishing capability which helps tank ammunition meet the requirement to withstand unplanned stimuli
- 250 Test less heat sensitive propellants and continue design evaluation for alternative projectile venting systems that relieve gas pressure for M915 and XM916 DPICM projectiles
- 200 Complete fragment/bullet mitigation testing and evaluation of low melting point ballistic protection material inserts for missile packaging and prepare final report
- 131 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
- 167 Evaluate alternative ignition concepts and minimum venting requirements for an active venting system for artillery munitions to help minimize the reaction to high levels of heat and fire
- 191 Select low temperature gas generating material that when added to artillery and mortar munitions, will react to heat and fire and generate sufficient pressure to safely split a projectile prior to a violent reaction from high explosive material, thereby helping the munition meet the requirement to withstand unplanned stimuli

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety PROJECT D297

FY 2000 Planned Program: (continued)

•	100	Complete liner redesign, conduct baseline tests and loading evaluation of less sensitive explosives that will replace Comp A-5 in the MLRS M85 grenade
•	180	Conduct engineering testing of candidate corrosion prevention materials 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 **tests** of prototype
•	86	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	3889	

FY 2001 Planned Program:

•	700	Complete development and integration of safety and survivability planning information modules, develop linkage to the Standard Army Ammunition System (SAAS), and conduct engineering testing of a prototype munitions storage area planning software tool
•	755	Conduct initial user evaluation and design multi-layer control software for the smart munitions handling crane
•	150	Complete development of and maintain Army insensitive munitions (IM) compliance status database
•	227	Modify packaging design and conduct engineering testing of ammunition packaging that incorporates a propellant fire extinguishing capability to help tank ammunition meet the requirement to withstand unplanned stimuli
•	200	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
•	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
•	250	Complete design and development of a prototype ignition device for an active venting system for artillery munitions
•	220	Conduct sub scale testing and refine low temperature gas generating material/explosive formulation prior to full scale testing and fabricate prototype projectile with lifting plug for the Low Temperature Gas Generator program
•	1090	Modify and conduct IM testing of less sensitive high explosives for the MLRS M85 grenade. Evaluate 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
•	178	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
Total	4220	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605805A Munitions Standardization Effectiveness and Safety

PROJECT: D297

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M296 Pyrotechnic Reliability and Safety	631	788	795	0	0	0	0	0	3521

Mission Description and Justification: 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.

FY 1999 Accomplishments:

- 120 Developed and investigated merit of substitutes for critical, sole-source and toxic materials. Performed preliminary testing to screen candidate materials.
- 175 Designed safer pyrotechnic munitions/systems for reduced fragmentation effects and tamper resistant configurations.
- 201 Developed alternative to magnesium. Conducted parametric formulations, performance characterization/evaluations and optimization of selected candidates in white, green, and red illuminants.
- 135 Completed technology pyrotechnic shelf life study. Conducted environmental tests under various temperature/humidity conditions. Perform function test and evaluation on conditioned items.

Total 631

FY 2000 Planned Program:

- 236 Complete development of alternative to magnesium. Develop formulations and conduct performance characterization/evaluations. Optimize weapons effects simulator design.
- 301 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
- 21 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 788

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety PROJECT D297

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
•	330	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	795	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605805A Munitions Standardization Effectiveness and Safety

PROJECT: M296

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M857 Explosive Safety Standards	558	773	761	771	782	798	818	Continuing	Continuing

Mission Description and Justification: Supports explosive safety effects research and testing to quantify hazards and to develop techniques to mitigate those 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.

FY 1999 Accomplishments:

•	60	Collected and analyzed airblast/fragment/thermal data for revising DOD, NATO and United Nations hazard classification interpretations for Hazard Divisions 1.1, 1.2 and 1.6
•	140	Developed improved explosives and munitions tests and characterization data
•	338	Developed improved DOD and NATO explosives safety guidelines for munitions storage and explosives operation facilities
•	20	Conducted other hazards analyses and expanded automated explosives safety data bases
Total	558	

FY 2000 Planned Program:

•	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
•	200	Continue development of improved tri-service design procedures and improved computer codes for explosion-resistant structures
•	30	Continue development of improved explosives and munitions tests and characterization data
•	312	Continue to develop improved DOD and NATO explosives safety guidelines for munitions storage, explosives operating and field operation facilities
•	60	Continue to conduct other hazards analyses and expand/automate explosives safety data bases
•	21	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	773	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605805A Munitions Standardization Effectiveness and Safety	PROJECT M296

FY 2001 Planned Program:

•	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
•	211	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
Total	761	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605805A Munitions Standardization Effectiveness and Safety

PROJECT: M857

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M858 Army Explosives Safety Management Program	0	0	497	497	496	496	496	Continuing	Continuing

Mission Description and Justification: This project supports the U.S. Army's explosives safety program. Many existing Army explosives safety standards in manufacturing, testing, transportation, maintenance, storage, and disposal are based on limited accident investigation data. The U.S. Army Technical Center for Explosives Safety will use the funds in this project to support the Army's explosives safety program by conducting research and testing to evaluate current explosives safety standards, using risk management philosophy to develop new, scientific and risk-based standards to meet U. S. Army explosives requirements in AR 385-64 and DA PAM 385-64.

FY 1999 Accomplishments: Project not funded in FY 1999

FY 2000 Planned Program: Project not funded in FY 2000

FY 2001 Planned Program:

•	448	Conduct testing on strategic configured loads (SCL) to assess safety hazards in deployment operations
•	49	Initiate testing of earth-covered magazines with electrically isolated floors to assess lightning hazards to stored ammunition
Total	497	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605853A Environmental Conservation

COST (*In Thousands*)	FY1999 Actual	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	3117	0	0	0	0	0	0	0	0
M0CC Environmental Conservation - AMC Test Ranges	2839	0	0	0	0	0	0	0	0
M1CC Environmental Conservation - AMC Major Subordinate Commands/Laboratories	146	0	0	0	0	0	0	0	0
M5CC Environmental Conservation - USASMDC	132	0	0	0	0	0	0	0	0

A. Mission Description and Justification: This program ensured that resources were 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 focused 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 financed 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 included 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. In FY2000, Environmental Conservation transferred to the Operations and Maintenance, Army (OMA) appropriation.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605853A Environmental Conservation

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	3174	0	0
Appropriated Value	3195		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-21		
b. SBIR/STTR	-83		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming	+38		
c. Rescissions	-12		
Adjustments to Budget Years Since FY2000/2001 PB			
Current Budget Submit (FY 2001 PB)	3117	0	0

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605853A Environmental Conservation

PROJECT: M0CC

COST (*In Thousands*)	FY1999 Actual	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	2839	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in this project ensured 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 were 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.

FY 1999 Accomplishments:

- 2839 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 historic preservation plans. Also funded ecosystem management, wildlife surveys and habitat delineation with 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.

Total 2839

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605853A Environmental Conservation

PROJECT: M1CC

COST (*In Thousands*)	FY1999 Actual	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	146	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in this project ensured 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 1999 Accomplishments:

- 146 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 146

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605853A Environmental Conservation

PROJECT: M5CC

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M5CC Environmental Conservation - USASMDC	132	0	0	0	0	0	0	0	0

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

FY 1999 Accomplishments:

•	132	Continued development of Historic Preservation Plan for management of historic properties to comply with National Historic Preservation Act
Total	132	

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 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605854A Pollution Prevention

COST (*In Thousands*)	FY1999 Actual	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	9427	0	0	0	0	0	0	0	0
M0PP Pollution Prevention - AMC Test Ranges	1203	0	0	0	0	0	0	0	0
M1PP Pollution Prevention - AMC Major Subordinate Commands/Laboratories	148	0	0	0	0	0	0	0	0
M5PP Pollution Prevention - USASMDC	1170	0	0	0	0	0	0	0	0
M8PP Pollution Prevention - Acquisition Pollution Prevention	6906	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: This program funded the non-research portion of the Army's RDTE funded environmental pollution prevention program. The program also funded 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 was 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 addressed the adverse impact of hazardous materials and hazardous waste on the operational readiness of Army weapon systems and facilities. Issues included 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 included 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 met 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 complied 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). In FY2000, Pollution Prevention was transferred to the Operations and Maintenance, Army (OMA) appropriation.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605854A Pollution Prevention

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	10694	0	0
Appropriated Value	10694		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-70		
b. SBIR/STTR	-282		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming	-873		
e. Rescissions	-42		
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	9427	0	0

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605854A Pollution Prevention

PROJECT: M0PP

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0PP Pollution Prevention - AMC Test Ranges	1203	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in this project ensured 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 were critical to the infrastructure and execution of the Army testing mission.

FY 1999 Accomplishments:

- 1203 Funded 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.

Total 1203

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605854A Pollution Prevention

PROJECT: M1PP

COST (*In Thousands*)	FY1999 Actual	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	148	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in this project ensured 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.

FY 1999 Accomplishments:

- 148 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.

Total 148

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605854A Pollution Prevention

PROJECT: M5PP

COST *(In Thousands)*	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M5PP Pollution Prevention - USASMDC	1170	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in this project ensured an adequate level of funding for pollution prevention requirements at the USASMDC.

FY 1999 Accomplishments:

- 1170 Funded pollution prevention programs such as hazardous material satellite areas, recycling of metals, Halon reduction, pollution prevention, etc.

Total 1170

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: September 1998

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605854A Pollution Prevention

PROJECT: M8PP

COST *(In Thousands)*	FY1999 Actual	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	6906	0	0	0	0	0	0	0	0

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 1999 Accomplishments:

- 128 Toxicological Assessment of Alternative New Materials
- 272 Program Management and Oversight
- 1545 Test and Evaluation related to Ammunition/Munition Production
- 1105 Test and Evaluation related to Aviation and Missile Production
- 132 Test and Evaluation related to Electronics Production and Support
- 500 Test and Evaluation related to Track and Wheeled System Production
- 679 Test and Evaluation related to Soldier Systems and Biological, Chemical Defense
- 485 Process Support to Research and Test Activities
- 2060 Joint Group for Pollution Prevention

Total 6906

FY 2000 Planned Program: Project funded in OMA PE 0408854

FY 2001 Planned Program: Project funded in 0605857A

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

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

COST (*In Thousands*)	FY 1999 Actual	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	51522	4000	0	0	0	0	0	0	0
M0VV Environmental Compliance - AMC Test Ranges	33497	0	0	0	0	0	0	0	0
M1VV Environmental Compliance - AMC Major Subordinate Commands/Laboratories	11365	0	0	0	0	0	0	0	0
M4VV Environmental Compliance - Corps of Engineers	4742	4000	0	0	0	0	0	0	0
M5VV Environmental Compliance - USASSDC	1918	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: This program ensured that resources were available to fund legally mandated environmental compliance activities at U.S. Army RDTE installations, laboratories and test ranges. It financed 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. Funded cost of complying with Federal Facility Compliance Agreements (FFCA) and other environmental agreements, and corrected notices of violation. It did not finance construction or repairs unrelated to environmental compliance or Defense Environmental Restoration Account (DERA) funded environmental restoration. In summary, this program provided for environmental quality control of current defense operations and disposal of hazardous waste incident to defense operations funded by the RDTE appropriation. Army defined 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 - supported compliance with legally binding agreements or judgments under applicable federal, state, local or host nation environmental law; corrected deficiencies cited in an inspection or notice of violation by a regulatory agency, or host nation equivalent; corrected 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. In FY2000, Environmental Compliance was transferred to the Operations and Maintenance, Army (OMA) appropriation.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

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

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	48986	0	0
Appropriated Value	49116	4000	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-130		
b. SBIR/STTR	-181		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming	+2745		
e. Rescissions	-28		
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	51522	4000	0

Change Summary Explanation: Funding - FY 2000 Congressional plus up (+4M) will be transferred to OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

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

PROJECT: M0VV

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M0VV Environmental Compliance - AMC Test Ranges	33497	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in the project ensured 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 were critical to the infrastructure of the Army testing program.

FY 1999 Accomplishments:

- 33497 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 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. Included 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.

Total 33497

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

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

PROJECT: M1VV

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M1VV Environmental Compliance - AMC Major Subordinate Commands/Laboratories	11365	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in this project ensured 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 1999 Accomplishments:

- 11365 Funded 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. Funded remaining compliance requirements such as hazardous waste disposal and program management.

Total 11365

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

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

PROJECT: M4VV

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M4VV Environmental Compliance - Corps of Engineers	4742	4000	0	0	0	0	0	0	0

Mission Description and Justification: This Congressional add will fund 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).

FY 1999 Accomplishments:

- 4742 $2.967M supported the Climate Fuel Cell Program. Approximately 13 federal grants were issued to non-Federal entities to purchase and install fuel cell power plants, with priority to those installed at DoD facilities. $2M supported the demonstration of Low NOx Boiler technology at Army installations in coordination with the Army Utility Modernization Program. Funding purchased and installed one Low NOx Boiler and developed thermal and environmental performance criteria from 3 ongoing demonstrations. Funding was added by Congress.

Total 4742

FY 2000 Planned Program: Congressional plus up to be transferred to OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

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

PROJECT: M5VV

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M5VV Environmental Compliance - USASSDC	1918	0	0	0	0	0	0	0	0

Mission Description and Justification: Resources in this project ensured an adequate level of funding for legally mandated environmental compliance requirements at the U.S. Army Space and Missile Defense Command (USASMDC).

FY 1999 Accomplishments:

- 1918 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.

Total 1918

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605857A Army Acquisition Pollution Prevention Program PROJECT M031

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
M031 Acquisition Pollution Prevention	0	0	5418	5322	5374	2844	2774	Continuing	Continuing

A. Mission Description and Justification: This is not a new start. The program represents a zero sum transfer from Program Element OMA 0408854. The Army Acquisition Pollution Prevention Program (A2P3) funds test and evaluation replacement materials and processes to eliminate or reduce hazardous materials and toxic chemicals procured, used, generated and disposed of throughout the weapon system life cycle. Hazardous materials and toxic chemicals used during weapon system design, testing, production, operation and support adversely affect operational readiness and increase total ownership cost. Through the reduction of hazardous materials and toxic chemicals, production, operation and support costs and disposal liability costs for weapon systems and supporting facilities will be reduced. Weapon system cost reduction (with near-term payback) and performance enhancements are major parameters influencing selection and funding of projects. Army participation in the Joint Group for pollution Prevention and development of single process initiatives is included. The A2P3 supports Army compliance with Montreal Protocol, the Clean Air Act, the Pollution Prevention Act and Executive Order 12856 (and others).

FY 1999 Accomplishments: Project funded in 0605854A M8PP.

FY 2000 Planned Program: Project funded in OMA PE 0408854. Army Acquisition Pollution Program (A2P3) RDTE activities suspended until FY01.

FY 2001 Planned Program:

•	136	Toxicological Assessment of Alternative New Materials
•	170	Program Management and Oversight
•	1238	Test and Evaluation related to Ammunition/Munitions Production and Industrial Base Support
•	1145	Test and Evaluation related to Aviation and Missile Production and Support
•	347	Test and Evaluation related to Communication/Electronics Production and Support
•	789	Test and Evaluation related to Track and Wheeled Vehicles Systems and Armaments Production and Support
•	688	Test and Evaluation related to Soldier Systems and Biological, Chemical Defense Production and Support
•	455	Process Support to Research and Test Activities
•	450	Joint Group for Pollution Prevention
Total	5418	

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605857A Army Acquisition Pollution Prevention Program

PROJECT: M031

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	0	0	5452
Appropriated Value			
Adjustments to Appropriated Value			
a. Congressional General Reductions			
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2000/2001 PB			-34
Current Budget Submit (FY 2001 PB)	0	0	5418

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605876A Minor Construction - Research, Development, Testing & Evaluation

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	4049	0	0	0	0	0	0	0	0
M0WW Minor Construction - Test Ranges	2505	0	0	0	0	0	0	0	0
M1WW Minor Construction - AMC Subordinate Commands and Laboratories	1086	0	0	0	0	0	0	0	0
M4WW Minor Construction - Corps of Engineers	458	0	0	0	0	0	0	0	0

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

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	4177	0	0
Appropriated Value	4205		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-28		
b. SBIR/STTR	-112		
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions	-16		
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	4049	0	0

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605876A Minor Construction - Research, Development, Testing & Evaluation — PROJECT: M0WW

COST *(In Thousands)*	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0WW Minor Construction - Test Ranges	2505	0	0	0	0	0	0	0	0

Mission Description and Justification: Financed 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, the project provided 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.

FY 1999 Accomplishments:

- 1122 Funded minor construction projects at Aberdeen Proving Ground, MD
- 315 Funded minor construction projects at Dugway Proving Ground, UT
- 727 Funded minor construction projects at White Sands Missile Range, NM
- 341 Funded minor construction projects at Yuma Proving Ground, AZ

Total 2505

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605876A Minor Construction - Research, Development, Testing & Evaluation

PROJECT: M1WW

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1WW Minor Construction - AMC Subordinate Commands and Laboratories	1086	0	0	0	0	0	0	0	0

Mission Description and Justification: This project financed 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 provided 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.

FY 1999 Accomplishments:

- 647 Funded minor construction projects at ARDEC, Picatinny Arsenal, NJ
- 280 Funded minor construction projects at ARL, Adelphi, MD
- 159 Funded minor construction projects at SBCCOM, Natick, MA.

Total 1086

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605876A Minor Construction - Research, Development, Testing & Evaluation

PROJECT: M4WW

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4WW Minor Construction - Corps of Engineers	458	0	0	0	0	0	0	0	0

Mission Description and Justification: This project financed 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.

FY 1999 Accomplishments:

- 81 Funded minor construction projects at TEC, Alexandria, VA
- 223 Funded minor construction projects at CRREL, Hanover, NH
- 154 Funded minor construction projects at WES, Vicksburg, MS

Total 458

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	90568	0	0	0	0	0	0	0	0
M0YY Maintenance and Repair - AMC Test Ranges	71222	0	0	0	0	0	0	0	0
M1YY Maintenance and Repair - AMC Subordinate Commands/Laboratories	16610	0	0	0	0	0	0	0	0
M4YY Maintenance and Repair - U.S. Army Corps of Engineers	2736	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: This program element financed 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 included 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 provided for modernization of utility systems. These projects substantially prolonged the useful life of the facility, and are all actually facility investments. In FY2000, Maintenance and Repair was transferred to the Operations and Maintenance, Army (OMA) appropriation.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	80059	0	0
Appropriated Value	80233		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-174		
b. SBIR/STTR	-55		
c. Omnibus or Other Above Threshold Reprogramming	+10000		
d. Below Threshold Reprogramming	+576		
e. Rescissions	-12		
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	90568	0	0

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation

PROJECT: M0YY

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0YY Maintenance and Repair - AMC Test Ranges	71222	0	0	0	0	0	0	0	0

Mission Description and Justification: This project financed 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 provided 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.

FY 1999 Accomplishments:

- 29123 Funded sustainment costs at Aberdeen Proving Ground, MD.
- 4681 Funded sustainment costs at Dugway Proving Ground, UT.
- 29776 Funded sustainment costs at White Sands Missile Range, NM.
- 7642 Funded cost at Yuma Proving Ground, AZ.

Total 71222

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation

PROJECT: M1YY

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1YY Maintenance and Repair - AMC Subordinate Commands/Laboratories	16610	0	0	0	0	0	0	0	0

Mission Description and Justification: This project financed 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 provided common service host support to 36 tenants located at these installations. Facilities managed included 8,996 acres of land and 6.4 million square feet of building space with necessary utilities and road systems.

FY 1999 Accomplishments:

- 8710 Funded maintenance and repair projects at Picatinny Arsenal, NJ.
- 3084 Funded maintenance and repair projects at Army Research Laboratory, Adelphi, MD.
- 4816 Funded maintenance and repair projects at Soldier and Biological Chemical Command, Natick, MA.

Total 16610

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605878A Maintenance and Repair - Research, Development, Testing & Evaluation

PROJECT: M4YY

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4YY Maintenance and Repair - U.S. Army Corps of Engineers	2736	0	0	0	0	0	0	0	0

Mission Description and Justification: This project financed 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.

FY 1999 Accomplishments:

- 424 Funded maintenance and repair projects at CERL, Champaign, IL.
- 1633 Funded maintenance and repair projects at CRREL, Hanover, NH.
- 276 Funded maintenance and repair projects at TEC, Alexandria, VA.
- 403 Funded maintenance and repair projects at WES, Vicksburg, MS.

Total 2736

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605879A Real Property Services (RPS)

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	85645	0	0	0	0	0	0	0	0
M0UU Real Property Services - TECOM	57715	0	0	0	0	0	0	0	0
M1UU Real Property Services - AMC MSC/LAB	25293	0	0	0	0	0	0	0	0
M4UU Real Property Services - COE	2637	0	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: The Real Property Services program financed activities and functions necessary for operation of utilities (with the exception of communications). It included purchase of electricity, operations of heating plants and water distribution and sewage systems. This program also financed 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 supported 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. In FY2000, Real Property Services was funded in the Operations and Maintenance, Army (OMA) appropriation.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	86441	0	0
Appropriated Value	87172		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-731		
b. SBIR/STTR	-1359		
c. Omnibus or Other Above Threshold Reductions	+852		
d. Below Threshold Reprogramming	+57		
e. Rescissions	-346		
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	85645	0	0

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605879A Real Property Services (RPS)
	PROJECT M0UU

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0UU Real Property Services - TECOM	57715	0	0	0	0	0	0	0	0

Mission Description and Justification: This project funded 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 provided for the utility costs and system operation of 1400 miles of electric distribution and 600 miles of water and sewer systems. Additionally, this project provided 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 funded 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 1999 Accomplishments:

- 35167 Funded operations of utilities and other engineering at Aberdeen Proving Ground, Maryland.
- 5900 Funded operations of utilities and other engineering at Dugway Proving Ground, Utah.
- 11262 Funded operations of utilities and other engineering at White Sands Missile Range, New Mexico.
- 4534 Funded operations of utilities and other engineering at Yuma Proving Ground, Arizona.
- 852 Funded Y2K compliance support.

Total 57715

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605879A Real Property Services (RPS)	PROJECT: M1UU

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1UU Real Property Services - AMC MSC/LAB	25293	0	0	0	0	0	0	0	0

Mission Description and Justification: Financed 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.

FY 1999 Accomplishments:

- 15825 Armament Research, Development and Engineering Center, Picatinny Arsenal, NJ.
- 6923 Army Research Laboratory, Adelphi, MD.
- 2545 Soldier and Biological Chemical Command, Natick, MA.

Total 25293

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605879A Real Property Services (RPS)

PROJECT: M4UU

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4UU Real Property Services - COE	2637	0	0	0	0	0	0	0	0

Mission Description and Justification: This COE project financed 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 1999 Planned Program:

•	537	Waterways Experiment Station, Vicksburg, MS
•	530	Cold Regions Research and Engineering Laboratories; Hanover, NH
•	560	Construction Engineering Research Laboratory, Champaign, IL
•	1001	Topographic Engineering Center, Alexandria, VA
Total	2637	

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	233611	0	0	0	0	0	0	0	0
M0ZZ Base Operations - Army Materiel Command (AMC) Test Ranges	147428	0	0	0	0	0	0	0	0
M1ZZ Base Operations - AMC Major Subordinate Commands and Laboratories	73768	0	0	0	0	0	0	0	0
M4ZZ Base Operations - Corps of Engineers	12415	0	0	0	0	0	0	0	0

A. <u>Mission Description and Budget Item Justification</u>: The Base Operations (BASEOPS) program financed 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 included: (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. In FY2000, Base Operations was transferred to the Operations and Maintenance, Army (OMA) appropriation.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605896A Base Operations - Research, Development, Testing & Evaluation

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY2000/2001 PB)	229573	0	0
Appropriated Value	230029		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-456		
b. SBIR/STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming	+4038		
e. Rescissions			
Adjustments to Budget Years Since FY2000/2001 PB			
Current Budget Submit (FY2001 PB)	233611	0	0

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605896A Base Operations - Research, Development, Testing & Evaluation

PROJECT: M0ZZ

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M0ZZ Base Operations - Army Materiel Command (AMC) Test Ranges	147428	0	0	0	0	0	0	0	0

Mission Description and Justification: 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.

FY 1999 Accomplishments:

- 77827 Garrison, Aberdeen Proving Ground Support Activity, MD
- 14031 Dugway Proving Ground, UT
- 39802 White Sands Missile Range, NM
- 15768 Yuma Proving Ground, AZ
- Above funding included specific projects below:
  - Civilian Illness and Injury Compensation Costs
  - Defense Finance and Accounting Services (previously operated by Army Installations).
  - Civilian Personnel Operations Center (Regionalized Civilian Personnel Operations).
  - Funded transfer of Materials Technology Laboratory, Watertown, MA to Aberdeen Proving Ground, MD (BRAC Action)
  - Provided 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.
  - Funded minimum essential requirements.
- - Funded Y2K compliance support.

Total 147428

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 6 - Management and Support	PE NUMBER AND TITLE 0605896A Base Operations - Research, Development, Testing & Evaluation PROJECT M0ZZ

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605896A Base Operations - Research, Development, Testing & Evaluation

PROJECT: M1ZZ

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M1ZZ Base Operations - AMC Major Subordinate Commands and Laboratories	73768	0	0	0	0	0	0	0	0

Mission Description and Justification: This project financed 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. Provided for the infrastructure base support along with common service base support to tenants and satellites.

FY 1999 Accomplishments:

- 36535 ARDEC, Picatinny Arsenal, NJ
- 23511 ARL, Adelphi, MD
- 13722 SBCCOM, Natick, MA

Total 73768

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 6 - Management and Support	PE NUMBER AND TITLE: 0605896A Base Operations - Research, Development, Testing & Evaluation — PROJECT: M4ZZ

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M4ZZ Base Operations - Corps of Engineers	12415	0	0	0	0	0	0	0	0

Mission Description and Justification: This project financed 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.

FY 1999 Accomplishments:

- 3034 CERL, Champaign, IL
- 3047 CRREL, Hanover, NH
- 3168 TEC, Alexandria, VA
- 3166 WES, Vicksburg, MS

Total 12415

FY 2000 Planned Program: Project funded in OMA.

FY 2001 Planned Program: Project funded in OMA.

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605898A Management Headquarters (Research and Development)

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	21983	27746	5371	5241	2930	168	172	Continuing	Continuing
MM65 Army Research Laboratory	4649	5185	5371	5241	2930	168	172	Continuing	Continuing
M831 AKAMAI	17334	22561	0	0	0	0	0	Continuing	Continuing

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. This program also provides salaries and related personnel benefits for authorized civilian personnel and the associated administrative support (travel, supplies and equipment).

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	22514	5191	5354
Appropriated Value	22683	28191	
Adjustments to Appropriated Value			
b. Congressional General Reductions	-169		
b. SBIR/STTR	-476		
c. Omnibus or Other Above Threshold Reductions		-97	
d. Below Threshold Reprogramming	+35		
e. Rescissions	-90	-348	
Adjustments to Budget Years Since FY 2000/2001 PB			+17
Current Budget Submit (FY 2001 PB)	21983	27746	5371

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605898A Management Headquarters (Research and Development)

PROJECT: MM65

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
MM65 Army Research Laboratory	4649	5185	5371	5241	2930	168	172	Continuing	Continuing

Mission Description and Justification: 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).

FY 1999 Accomplishments:

- 4649 Funded the operation of ARL headquarters activities which administers the Army laboratory research and development program to sustain technological superiority.

Total 4649

FY 2000 Planned Program:

- 5165 Funds the operation of ARL headquarters activities which administers the Army laboratory research and development program to sustain technological superiority.
- 20 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 5185

FY 2001 Planned Program:

- 5371 Funds the operation of ARL headquarters activities which administers the Army laboratory research and development program to sustain technological superiority.

Total 5371

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

DATE: February 2000

BUDGET ACTIVITY: 6 - Management and Support

PE NUMBER AND TITLE: 0605898A Management Headquarters (Research and Development)

PROJECT: M831

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M831 AKAMAI	17334	22561	0	0	0	0	0	Continuing	Continuing

Mission Description and Justification: 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.

FY 1999 Accomplishments:

•	17334	Conducted management and execution of Congressionally mandated and clinical R&D efforts, including HSDI and telemedicine curriculum development.
Total	17334	

FY 2000 Planned Program:

•	22393	Continue management and execution of Congressionally mandated and clinical R&D efforts, including HSDI and telemedicine curriculum development.
•	607	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	23000	

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 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102419A Joint Land Attack Cruise Missile Defense (JLENS) PROJECT DE55

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE55 Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS)	12638	24722	24996	29303	29267	29198	29124	Continuing	Continuing

A. Mission Description and Justification: 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), 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), Aegis and Advanced Medium Range Air-to-Air Missile (AMRAAM). This project supports upgrades to surveillance and tracking systems.

FY 1999 Accomplishments:

- 7500 Continued Contract Design and Demonstration Options with emphasis on prototype processing station.
- 1844 Other Contracts & OGA.
- 2056 JLENS In-House
- 1238 Test Bed Maintenance and Roving Sands Exercise.

Total 12638

FY 2000 Planned Program:

- 17123 Continue Contract Design and Development Activities.
- 4289 Other Contracts & OGA.
- 2381 JLENS In-House.
- 287 Test Bed Maintenance
- 642 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 24722

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0102419A Joint Land Attack Cruise Missile Defense (JLENS)
	PROJECT DE55

FY 2001 Planned Program:

- 18429 Continue Contract Design and Development Activities.
- 4186 Other Contracts & OGA.
- 2381 JLENS In-House.

Total 24996

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	14572	24903	25141
Appropriated Value	15000	24903	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-428		
b. SBIR / STTR	-1462		
c. Omnibus or Other Above Threshold Reduction		-98	
d. Below Threshold Reprogramming	-98		
e. Rescissions	-374	-83	
Adjustments to Budget Years Since FY 2000/2001 PB			-145
Current Budget Submit (FY 2001 PB)	12638	24722	24996

C. Other Program Funding Summary: Not applicable

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 reduce annual outlays and delay individual radars and final system design . The new strategy requires incremental increases in capabilities and demonstrations leveraged on proven technologies. The program was restructured in October 1999.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2004	FY 2005
Risk Mitigation/Design		1-4Qtr	1-4Qtr					
Preliminary Design Review (PDR)		4Qtr						
Critical Design Review (CDR)			4Qtr					
Development/Test/Demo	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr
Risk Mitigation/Test Bed	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr	1-4Qtr

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0102419A Joint Land Attack Cruise Missile Defense (JLENS)

PROJECT: DE55

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	12053	292		1297		1297		0	14939	
e. Risk Mitigation, Design, Development	CR/CPIF/ CPAF	Raytheon System Co. MA / CA/ FL	29796	7500		17123		18429		CONT	72848	145604
f. SBIR / STTR						642				CONT	642	
g. GFE			1201							CONT	1201	
h. CEC/ SM-2 CEC	MIPR	Navy / Multiple	4219							CONT	4219	
i. Design/Dev/Demo Support	MIPR	CAS / AL	4446	1053		1528		1528		CONT	8555	
j. Misc. Contracts	SS / CPFF	Multiple	1954	206		1126		1023		CONT	4309	
Subtotal Product Development:			59657	9051		21716		22277			112701	

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. Misc Support			2084							0	2084	
b. In-House, JLENS			8343	2056		2381		2381		CONT	15161	
c. OGA Salaries			228	293		338		338		CONT	1197	
Subtotal Support Costs:			10655	2349		2719		2719			18442	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0102419A Joint Land Attack Cruise Missile Defense (JLENS)

PROJECT: DE55

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		287				CONT	2484	
b. Misc. OGA&Contracts	Mul/MPR	AL/TX/NM	1656	1178						CONT	2834	
Subtotal Test and Evaluation:			3793	1238		287					5318	

Remark:

Project Total Cost:			74105	12638		24722		24996			136461	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203610A Emergency Preparedness Training

PROJECT: E33

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
E33 Emergency Preparedness Training	15000	6000	0	0	0	0	0	0	15000

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.

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. In FY 1999, the program raised ten Military Support Detachments (Rapid Assessment and Initial Detection); now known, as of January 2000, WMD Civil Support Teams; and began the enhancement of 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, and security. For FY2000, Congress directed the raising of 17 additional WMD Civil Support Teams for a total of 27.

FY 1999 Accomplishments:

•	7200	Development of 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.
•	5300	National Guard WMD response interoperability with counterpart interagency first responder units, with emphasis on Distance Training Technology. An Advanced Technology Integration Demonstration (ATID) commenced on 12 August. The ATID objectives are to develop and demonstrate distributed learning technology to train the Reserve Component and counterpart interagency first responder forces in WMD response, in order to enhance interoperability and unity of effort. Prove the feasibility of delivering training through a large-scale test, which distributes training modules through existing and advanced communications and computer architecture.
•	500	Military information and research support to the civil authorities.
•	1000	Develop a front-end analysis for advanced CB technological applications.
•	500	Chemical/Biological database improvement.
•	500	Interagency Board for equipment standardization, interoperability, and research and development.
Total	15000	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203610A Emergency Preparedness Training
	PROJECT E33

FY 2000 Planned Program:

- 3000 Continue development and presentation of advanced distributed learning consequence management response courses and conventional courses.
- 3000 Interagency integration, interactive web base instruction, virtual and live simulation, and performance tools for WMD response.

Total 6000

FY 2001 Planned Program: Project not funded in FY 2001

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	15000	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		
g. Congressional Adjustment – Sec 8111		6000	
Adjustments to Budget Years Since FY2000/2001 PB			
Current Budget Submit (FY 2001 PB)	15000	6000	0

Change Summary Explanation: Reflects the provisions of the FY00 Appropriations Conference Report, Sec 8111.

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

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	34569	40860	36816	34330	31379	12755	6299	0	233233
D322 AFATDS Development	30795	38917	36816	34330	31379	12755	6299	0	223369
D2ET AFATDS Operational Test	3774	1943	0	0	0	0	0	0	9864

A. Mission Description and 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 part of the Army Battle Command System (ABCS) architecture, AFATDS will provide automated fire support, 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. This project is a replacement system for the Initial Fire Support Automated System (IFSAS).

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	34646	36222	34528
Appropriated Value	34881	41222	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-235		
b. SBIR / STTR	-898		
c. Omnibus or Other Above Threshold Reductions	+691	-165	
d. Below Threshold Reprogramming	+270		
e. Rescissions	-140	-197	
Adjustments to Budget Years Since FY 2000/2001 PB			+2288
Current Budget Submit (FY 2001 PB)	34569	40860	36816

Change Summary Explanation: Funding – FY 2000: Increase due to Congressional increase to support interface development (+5000).
FY 2001: Increase to support the development of software for FDC IAW the AFATDS System Acquisition Program Baseline (+5900) and Operational Test funds realigned to the ATEC institutional test line due to AFATDS redesignation to ACAT II system (-3600).

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D322

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D322 AFATDS Development	30795	38917	36816	34330	31379	12755	6299	0	223369

Mission Description and Justification: 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).

FY 1999 Planned Program:

•	4441	Support Limited User Test and Materiel Release of AFATDS '98 Software
•	26354	Continue AFATDS software development in support of First Digitized Division/First Digitized Corps (FDD/FDC)
Total	30795	

FY 2000 Planned Program:

•	2256	Support Limited User Test of AFATDS '99 software.
•	2917	Integration/interface development with other FDD systems.
•	32720	Continue AFATDS software development in support of FDD/FDC.
•	1024	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	38917	

FY 2001 Planned Program:

•	2610	Support Test and Materiel Release of AFATDS '99 Software Release
•	34206	Continue AFATDS software development in support of FDD/FDC.
Total	36816	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System PROJECT D322

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
OPA (B28600)	39313	43144	54452	52788	50442	49576	49524	75000	423634
Spares (BS9708)	2071	2674	2637	2815	2533	2601	2599	2700	22250

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 required functionality including full fire support planning, target acquisition support and field artillery mission support. FY05 will support continued efforts to address emerging weapon systems and interoperability requirements. Additionally, the completed software will utilize the Joint Common Operating Environment (JCOE) and the Joint Technical Architecture. AFATDS will support FDD/FDC and other Army Warfighter Experiments through FY 2004.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
AFATDS '97 Materiel Release							
AFATDS '98 Materiel Release		1Q					
AFATDS '99 Materiel Release			2Q				
AFATDS '02 Materiel Release				3Q			
AFATDS '03 Materiel Release					4Q		
AFATDS '04 Materiel Release							1Q

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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)	24639	27920	Jan 99	31384	Feb 00	33177	Jan 01	73343	190463	
b. COE/Common Software/ Common Products	MIPR	DISA/ATCCS/PEO C3S	2078	379	Jan99	2917	Feb 00	200	Jan 01	0	5574	
c. GFE: PSE	C/FFP	Miltope, Litton, GTE	2001	144	Jan99	583	Feb 00	553	Jan 01	1144	4425	
Subtotal Product Development:			28718	28443		34884		33930		74487	200462	

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	200	250		347		366		1486	2649	
b. Software Development Support	MIPR	FSSED/TELOS	690	446		593		417		1510	3656	
Subtotal Support Costs:			890	696		940		783		2996	6305	

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 Management	MIPR	CECOM	100	440		389		390		1575	2894	
b. Test Hardware										0		
c. Test Support	MIPR	Misc										
Subtotal Test and Evaluation:			100	440		389		390		1575	2894	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	729	450		322		317		2451	4269	
b. PROGRAM MANAGEMENT:												
c. PM FATDS			581	446		727		759		1777	4290	
d. MATRIX			734	320		631		637		1477	3799	
e. Misc. Contracts												
f. CECOM			326								326	
g. SBIR/STTR						1024					1024	
Subtotal Management Services:			2370	1216		2704		1713		5705	13708	
Project Total Cost:			32078	30795		38917		36816		84763	223369	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203726A Advanced Field Artillery Tactical Data System PROJECT D2ET

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D2ET AFATDS Operational Test	3774	1943	0	0	0	0	0	0	9864

A. Mission Description and Budget Item Justification: 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 Army Test and Evaluation Command (ATEC). Limited User Tests (LUTs) are planned for AFATDS software releases in FY00, FY02, 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. ATEC provides Army leadership with an independent test and evaluation of effectiveness and suitability of the system. AFATDS LUTs in FY01 and beyond will be funded from the ATEC Institutional Test line due to AFATDS redesignation as ACAT II.

FY 1999 Planned Program:

•	1648	Conduct AFATDS '98 LUT and evaluate test results
•	1308	Prepare for AFATDS '99 LUT
•	818	Prepare for and Support ABCS testing
Total	3774	

FY 2000 Planned Program:

•	1564	Support AFATDS '99 LUT and evaluate test results
•	327	Prepare for and Support ABCS testing
•	52	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	1943	

FY 2001 Planned Program: Funds moved to PE 0605712A, project 001 due to the redesignation of AFATDS to an ACAT II program.

B. Other Program Funding Summary: Not Applicable

C. Acquisition Strategy: Not Applicable

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D2ET

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
AFATDS '97 LUT							
AFATDS '98 LUT	2Q						
AFATDS '99 LUT		4Q					
AFATDS '02 LUT				1Q			
AFATDS '03 LUT					2Q		
AFATDS '04 LUT						3Q	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	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. ATEC			4147	3774		1891					9812	
b. SBIR/STTR						52					52	
Subtotal Test and Evaluation:			4147	3774		1943					9864	

IV. Management Services: Not Applicable

Project Total Cost:			4147	3774		1943					9864	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs

COST (*In Thousands*)	FY 1999 Actual	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	89010	83271	99423	103657	19864	47821	92048	Continuing	Continuing
D2TT Bradley A3 IOTE	2994	0	0	0	0	0	0	0	10064
D330 Abrams Tank Improvement Program	8769	36487	82659	90649	19864	38402	67545	Continuing	Continuing
D344 Fire Support Team Vehicle Integration	6414	11283	2154	0	0	0	0	0	80395
D371 Bradley Base Sustainment Program	57787	24777	0	0	0	9419	24503	Continuing	Continuing
D718 Ground Combat Vehicle HTI	8846	7847	12125	12512	0	0	0	0	41418
DC64 DC64	4200	2877	2485	496	0	0	0	0	85548

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 and Operating and Support (O&S) cost reduction enhancements for the Abrams Tank, through a series of product improvements to the current M1A1 and M1A2 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, and the Abrams tank fleet.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	104000	29544	23938
Appropriated Value	104756	84544	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-756		
b. SBIR/STTR	-3531		
c. Omnibus or Other Above Threshold Reductions	-1623	-346	
d. Below Threshold Reprogramming	-9300		
e. Rescissions	-536	-827	
Adjustments to Budget Years Since FY 2000/2001 PB			+11585
New Army Transformation Adjustment		TBD	+63900
Current Budget Submit (FY 2001 PB)	89010	83271	99423

Change Summary Explanation: Funding – FY 2001: Project D330 was adjusted (+63900) to reflect the New Army Transformation; additional funding (+11585) was realigned to support the common digitization effort.

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs

PROJECT: D2TT

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D2TT Bradley A3 IOTE	2994	0	0	0	0	0	0	0	10064

A. Mission Description and Justification: 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.

FY 1999 Accomplishments:

- 2994 Testing Support [LUT 2 and planning for Initial Operational Test and Evaluation (IOTE)]

Total 2994

FY 2000 Planned Program: Program not funded in FY 2000.

FY 2001 Planned Program: Program not funded in FY 2001.

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Bradley Base Sustainment (G80717)	270102	299225	373270	399607	394328	412440	410157	Cont	Cont

C. Acquisition Strategy: All funding in this project will be executed for Operational Tests by OEC.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2004	FY 2005
LUT 2	4Q							
IOTE		4Q						

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D330 Abrams Tank Improvement Program	8769	36487	82659	90649	19864	38402	67545	Continuing	Continuing

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) was developed for potential future integration into the production M1A2 SEP. A new thermal management system dissipates the heat generated by the electronic components. The M1A2's formidable target acquisition capabilities will also be significantly enhanced with 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) include the improved thermal imaging capabilities of the new FLIR technology.

The first M1A2 SEP production tank was delivered to the Government on 1 Sep 99. 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. A program to digitize the M1A1 tank began in FY 1997. The development effort for this is being funded by PE 0203758A. 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. In support of the new Army vision, a new engine will be developed for production and phased integration into the Abrams tank fleet. The objective is a lighter, more reliable, more fuel efficient, and easier-to-repair engine. The added FY2000 funding by PE 0603005A will allow this project to begin earlier. The Abrams Project Manager and the TRADOC System Manager (TSM) both support a re-capitalization effort that will accelerate development enough to complete the project by FY2003.

FY 1999 Accomplishments:

•	3074	Continued engineering and testing of hardware/software on tank, logistics, quality and other engineering efforts
•	2839	Provided Government Support/GFE
•	2856	Conducted Direct Support Electrical System Test Set (DSESTS) engineering efforts
Total	8769	

FY 2000 Planned Program:

•	4033	Integration of embedded Battlefield Combat Identification System (BCIS) into the M1A2 SEP tank
•	100	M1A2 SEP contract completion costs
•	1400	Provide Government Support
•	500	Begin design of improved engine for the Abrams Family of Vehicles

FY 2000 Planned Program: (continued)

•	6523	Begin M1A2 Abrams Live Fire and Survivability Test, including pre-shot analysis and start of test shots
•	9400	Begin engineering efforts to upgrade the Abrams engine
•	970	Begin lightweight vehicle track development
•	4159	Begin development of M1A2 test program sets, and Abrams 1st and 2nd generation health check system
•	8420	Begin program for redesign of turret and hull network boxes and built-in test embedded diagnostic program for the M1A1 fleet
•	982	Small Business Innovative Research / Small Business Technology Transfer Programs

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs
	PROJECT D330

Total 36487

FY 2001 Planned Program:

- 13820 Continue M1A2 Abrams Live Fire and Survivability Test, including live fire shots, simulation and purchase of system support package
- 4500 Continue design of improved engine for the Abrams Family of Vehicles
- 439 Complete program for redesign of turret and hull network boxes and built-in test embedded diagnostic program for the M1A1 fleet
- 63900 Funds will be used in support of the New Army Vision / Transformation (New Engine)

Total 82659

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Abrams Upgrade Program (GA0750)	689056	633062	512867	580535	471970	372705	189296	453500	
Abrams Vehicle Modification (GA0700)	25997	31645	36098	170945	32131	404998	391168	Cont	
M1A1D Retrofit (GA0720)	0	0	891	11575	12939	6017	24036	Cont	
System Enhancement Pgm: SEP M1A2 (GA0730)	0	0	36149	58343	87184	89808	89749	Cont	
M1A2 Training Devices (GB1302)	13298	8050	10504	11741	12035	12855	5785	Cont	
Training Device Mod (GA5208)	8464	2628	5331	5511	5492	5800	3352	Cont	
Initial Spares (GE0161)	9699	9713	14807	23408	25182	25326	25290	Cont	
PE 0203758A (D374)	13555	0	0	0	0	0	0	0	
PE 0603005A (D532)	0	4773	0	0	0	0	0	0	

C. **Acquisition Strategy:** General Dynamics Land Systems Division (GDLS) is the prime contractor for this development program.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs PROJECT D330

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2004	FY 2005
Complete Government/Contractor Testing	3Q*							
Contract Completion	3Q*							
Begin Live Fire Planning/Testing	1Q*							
Complete Live Fire Testing					4Q			

* Milestone Completed

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	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. 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	115762			100					115862	137900
d. FLIR Integration	C-CPAF	Texas Instruments McKinney, TX	25000								25000	25000
e. BCIS Integration	TBD					4033					4033	
f. Future Contracts	TBD					10870		68839			79709	
SBIR / STTR						982					982	
Subtotal Product Development:			617999			15985		68839			702823	

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	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 Support / GFE	MIPR	TACOM / OGA's	44625	2839		1400					48864	
b. DSESTS Requirements	MIPR	TACOM / OGA's		2856		12579					15435	
Subtotal Support Costs:			44625	5695		13979					64299	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Cost	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 Test Sites	MIPR		40178	3074		6523		13820			63595	
Subtotal Test and Evaluation:			40178	3074		6523		13820			63595	

IV. Management Services: Not applicable

Project Total Cost:			702802	8769		36487		82659			830717	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs

PROJECT: D344

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D344 Fire Support Team Vehicle Integration	6414	11283	2154	0	0	0	0	0	80395

A. Mission Description and Justification: The Bradley Fire Support (BFIST) vehicle program provides an integrated Bradley –based fire support platform that allows company fire support teams to plan, coordinate execute and direct timely, accurate, indirect fires and fire support. The BFIST consists of a Bradley A2 ODS or Bradley A3 vehicle with an integrated mission package designed to provide unique capabilities to the fire support community.

FY 1999 Accomplishments:

- 5594 M3A3 BFIST ECP Development
- 172 M7 ODS BFIST IOTE Planning
- 648 Program Management

Total 6414

FY 2000 Planned Program:

- 8944 M3A3 BFIST ECP Development
- 1450 M7 ODS BFIST IOTE Testing
- 586 Program Management
- 303 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 11283

FY 2001 Planned Program:

- 1468 M3A3 BFIST ECP Development
- 300 M3A3 Testing
- 386 Program Management

Total 2154

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
GZ2300 FIST Vehicle (M7/A3 BFIST)	24513	27115	31898	35706	47052	47318	38019	15013	284701

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs PROJECT D344

C. Acquisition Strategy: The program office accepted the first Low Rate Production (LRIP) M7 ODS BFIST in Mar 99 from United Defense L.P. LRIP awards for years one and two have been awarded for a total of 49 systems. Production Verification Testing was successfully completed in Aug 99, with a combined BFIST/Striker IOTE scheduled for Apr 00. The Third and final LRIP award is planned for Mar 00. A Cost Plus Award fee (CPAF) contract to integrate the M7 BFIST fire support functionality onto the M3A3 chassis was awarded in Jul 99.

D. Schedule Profile	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2004	FY 2005
M7 ODS BFIST										
First A2 ODS BFIST Prototype	4Q*									
LRIP Milestone Decision	4Q*									
LRIP contract Award		2Q*								
First LRIP Vehicle Delivery			2Q*							
Production IPR					1Q					
Production Contract Award					2Q					
First Production Vehicle Delivery						2Q				
M3A3 BFIST										
ECP kit Development Contract Award			4Q*							
ECP Approval					3Q					
ECP Kit Cut-In						1Q				
Vehicle Delivery							3Q			

* Milestone Completed

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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. M7 ODS BFIST EMD	C/CPIF	UDLP, San Jose, CA	35794								35794	
b. BFIST STS	CPFF	UDLP, San Jose, CA	7755								7755	
c. M7 LRIP	SS/FFP	UDLP, San Jose/York	1620								1620	
d. BFIST M3A3	CPAF	UDLP, York, PA		4400	Jul 99	7700	Mar 00	1468	Nov 00		13568	
e. DSESTS	CPFF	PEI, Huntsville, AL	1874								1874	
f. Other Contracts				1194		1244					2438	
Subtotal Product Development:			47043	5594		8944		1468			63049	

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, Ft Sill , OK	11904	648	Oct 98	586	Jan 00	386	Oct 00		13524	
Subtotal Support Costs:			11904	648		586		386			13524	

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	172	Jul 99	1753	Nov 99	300	Nov 00		3779	
Subtotal Test and Evaluation:			1554	172		1753		300			3779	

IV. Management Services: Not applicable

Project Total Cost:			60501	6414		11283		2154			80352	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs

PROJECT: D371

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D371 Bradley Base Sustainment Program	57787	24777	0	0	0	9419	24503	Continuing	Continuing

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. Program has been extended with a current FUE of November 2000 and a MS III of 1 March 2001.

FY 1999 Accomplishments:

- 42251 Continue Design Engineering Effort
- 13422 Complete Live Fire and PQT Testing
- 2114 Project Management

Total 57787

FY 2000 Planned Program:

- 11086 Design closeout
- 986 Combat ID
- 978 Digitization
- 10108 Testing (IOTE)
- 952 Project Management
- 667 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 24777

FY 2001 Planned Program: Program not funded in FY 2001.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs PROJECT D371

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
G80717 Bradley Base Sustainment	270102	299225	373270	399607	394328	412440	410157	Cont	Cont
GE0163 Spares (Initial) BFVS	7070	9132	11516	10665	10896	5143	5136	Cont	Cont
G20900 Bradley FVS Training Devices	12157	23338	12098	2573	3154	2464	2461	Cont	Cont

C. Acquisition Strategy: Milestone I/II 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; ten LRIP vehicles are currently undergoing contractor and government production qualification testing. Low Rate Initial Production (LRIP) procurements were awarded in FY 1997, FY1998 and FY 1999 with a fourth LRIP of 80 vehicles is scheduled for award 2QFY00. Limited User Testing and Live Fire Testing were completed in FY 1999. IOTE will be conducted in 4QFY00. A MS III decision is anticipated 2QFY01.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
LRIP Award (Phased Awards)	1Q*	2Q					
LFTE	1-4Q*						
LOG DEMO	2Q*						
Limited User Test #2	4Q*						
IOTE		4Q					
MS III			2Q				

* Milestone Completed

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs

PROJECT: D371

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. A3 EMD	CPIF	United Defense, San Jose, CA	275707	25485	Jul 99						301192	
b. IBAS EMD	SS/CPIF	Texas Instruments, McKinney, TX	64919								64919	
c. IBAS TPS Development	CPFF	Pentastar, Huntsville, AL	1863	633							2496	
d. Other Contracts			34510	15903	Sep 99	13717	Feb 00				64130	
e. Reprogramming Action – not in database				230							230	
Subtotal Product Dev:			376999	42251		13717					432967	

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. PMO	MIPR	PMO, Warren, MI	7019	787	Sep 99	672	Sep 00				8478	
b. PM CCAWS	MIPR	PMO, Huntsville, AL	17353	500	Jan 99						17853	
c. Other	MIPRs	Various OGAs	4191	827	Sep 99	280	Sep 00				5298	
Subtotal Support Costs:			28563	2114		952					31629	

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. PQT, LUT II, LFTE, IOTE	MIPR	ATC, WSMR, YPG, ARL, DPG, CRTA	6881	13422	Sep 99	10108	Sep 00				30411	
Subtotal Test and Evaluation:			6881	13422		10108					30411	

Project Total Cost:			412443	57787		24777					495007	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203735A Combat Vehicle Improvement Programs		PROJECT D718

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D718 Ground Combat Vehicle HTI	8846	7847	12125	12512	0	0	0	0	41418

A. Mission Description and Budget Item Justification: Project D718, Ground Combat Vehicle Horizontal Technology Integration (HTI), is a project which was initiated in FY97 for the purpose of developing technology improvements which have application to or insertion opportunities across the spectrum of combat systems. These systems include the Abrams Tank, the Bradley Fighting Vehicle, the Crusader and others. This project funded the Suite of Survivability Enhancements Systems (SSES) beginning in FY97, the Flat Panel Display (FPD) program beginning in FY97 and funds the Common Ground Combat and Support Systems Architecture (GSA) program beginning in FY01. Note that efforts for the SSES program actually began in FY96 under project D661 before establishment of D718.

The SSES program is an HTI initiative to develop, produce and apply Hit Avoidance Technology to Army ground combat vehicles. The program was structured to integrate survivability sensors and countermeasures in a multi-phased effort determined by technological maturity and the availability of funding. Testing of Laser Warning Receivers (LWR) on the Bradley A3 vehicles was continued during FY99/00 with successful results. Funding for the SSES initiatives was discontinued in FY00.

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, $12.0M in FY98, $7.0M in FY99 and $8M in FY00.

CGA meets the critical need for a common digitization implementation across PEO GCSS vehicle platforms. The basis for the success of the Army's digitization effort lies with the ability to collect, process, and disseminate a common situational awareness picture throughout the battlefield. This in turn, is facilitated by a set of common digitization components. The CGA will define a common architecture to facilitate development and integration of common digitization components. Building upon the ongoing digitization efforts and lessons learned by PM's Abrams/Bradley/Crusader to integrate embedded and applique command and control products, the CGA will eliminate unnecessary roadblocks, promote development of common capabilities, facilitate integration, and minimize training and maintenance differences among platforms. As a new critical functionality is required to support the digitized force, these components/interfaces will provide a foundation for common and synchronized vehicle upgrades.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs / PROJECT: D718

FY 1999 Accomplishments:

•	280	Government Technical Support – LWR (SSES)
•	1780	Government Test and Testing Support for the LWR to include Limited User Test (LUT) and User Evaluation (IOTE) (SSES)
•	659	Program Management administration (SSES and FED)
•	6127	Design and build high resolution FPD engineering unit (FED)
Total	8846	

FY 2000 Planned Program:

•	120	High Resolution FED Government Evaluation
•	4900	Design & Engineering Improvements
•	120	Government Performance Evaluation
•	966	HTI vehicle insertion design and engineering
•	750	HTI Vehicle insertion evaluation
•	340	Performance Specification/ICD Completion/Government Approval
•	440	Program Management & Administration
•	211	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	7847	

FY 2001 Planned Program:

•	2200	Define performance requirements for the common components to be developed
•	3000	Develop common component specifications for the performance, size, weight, etc. of the common components
•	6925	Design and develop components based on the common component requirements and specifications
Total	12125	

B. Other Program Funding Summary: None

C. Acquisition Strategy: With regard to LWR effort, we used existing aviation programs and Bradley A3 vehicle testing as well as TARDEC and CECOM Tech Base efforts for the LWR performance specification development. In Phase I, the LWR and Commanders Decision Aid (CDA) were funded for production on the Bradley A3 using the aviation LWR production contract. Later, a fully competitive production contract was to be awarded for the A3. The LWR was to be fielded to the Bradley A3 by approval of an ECP to the vehicle system. In Phase II and beyond, as additional technologies matured, new production contracts were to be competitively awarded for their application to the appropriate vehicle platforms (Bradley, Abrams, Crusader, FSCS, etc.) Each phase also was to return to the aviation community the technology improvements appropriate for these platforms.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs / PROJECT: D718

For the FED program, technology development and maturation is executed under an existing DARPA contract. The Army is managing engineering design and hardware fabrication via an option to the DARPA contract. PM-GSI is assessing the HTI suitability for combat vehicles via technology demonstrator and engineering prototype unit evaluations performed by GDLS and UDLP. Evaluation results will be used by platform PMs to determine technology insertion applications. A common FED performance specification is being prepared to support HTI acquisitions.

At this time the CGA Acquisition Strategy is comprised of a Management/PMO Strategy and a Contracting Approach. Since this effort seeks to redesign existing vehicle subsystems/LRUs to incorporate commonality attributes, it is expected that existing PMs Abrams, Bradley, and Crusader contracts will be utilized for the majority of work. When this is not possible, fully competitive contract awards will be used to execute CGA efforts. PM GSI will perform the administration management of the CGA Program. This administration includes oversight of all CGA related efforts to ensure defined milestones are being met. The CGA program will be managed through agreements made between all interested GCSS PMs.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
LWR Technical Tests	2Q						
LWR Vehicle Integration Test	1-4Q						
LWR User Eval (IOTE)	4Q						
Common FED Spec/ICD Dev	1-2Q	1-4Q					
High Resolution Development FED	1-4Q	1-4Q	1-2Q				
FED Tech Evaluation	4Q	1-2Q					
FED evaluation for vehicle HTI		1-4Q	1-4Q				
Transition from PM Digitization Efforts (CGA)			1Q				
Component Requirements Definition (CGA)			1-2Q				
Component Specifications Development (CGA)			2-3Q				
Component Detailed Design (CGA)			2-4Q				
Common Component Development (CGA)				1-4Q			
Component SIL Experimentation and Test				3-4Q			
Component Transition to PMs				4Q			

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	FY2000 Cost	FY2000 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	3741	0	-	0	-	0	3741	
b. LWR Integration	CPIF	UDLP, Santa Clara, CA	3863	0	-	0	-	0	3863	
c. LWR CDA	CPAF	SLM, Nashua, NH	452	0	-	0	-	0	452	
d. FED – Tech Development	Cost/Share	MICRON, Boise, ID	22761	6000	MAR 00	0	-	0	28761	
e. FED – Technology Evaluation	CPIF	GDLS, Sterling Hts, MI	275		-	0	-	0	275	
f. FED-Technology Eval/ Spec Dev	CPIF	UDLP, Santa Clara, CA	729			0	-	0	729	
g. FED-Tech Development	Cost/Share	PIXTECH, Boise, ID	0			0	-	0		
h. CGA Component Requirements Definition	TBD	Contractors TBD	0	0	-	2000	Oct 00	TBD	2000	TBD
i. CGA Specifications Develop CGA	TBD	Contractors TBD	0	0	-	3000	Dec 00	TBD	3000	TBD
j. Component Detailed Design CGA	TBD	Contractors TBD	0	0	-	6925	Feb 01	TBD	6925	TBD
k. CGA Component Development	TBD	Contractors TBD								TBD
l. CGA Component SIL Experimentation	TBD	Contractors TBD								TBD
Subtotal Product Development:			31821	6000		11925			49746	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY2000 Cost	FY2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Eng. Spt – FED	CPIF	GDLS, MI	0	100					100	
b. Engr. Spt. – FED	CPIF	UDLP, CA	0	220					220	
c. Engr. Spt. – FED	MIPR	NVESD	0	20	MAR 00				20	
d. Tech Spt LWR	MIPR	CECOM, NJ	882			0	-	0	882	
e. Tech Spt LWR	MIPR	TARDEC, MI	225	0	-		-	0	225	
f. Support Mgt LWR	CPFF	Sig/Rsch, MI	93	0	-	0	-	0	93	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs

PROJECT: D718

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY2000 Cost	FY2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
g. Engr Spt LWR	CPAF	Camber, MI	513			0	-	0	513	
h. Training Aid Develop LWR	MIPR	STRICOM, FL	308			0	-	0	308	
i. IBAS Display LWR	MIPR	PM CCAWS, AL	30	0	-	0	-	0	30	
j. Engr Test Spt LWR	MIPR	SLAD (OMI), NM	672			0	-	0	672	
k. CGA Vehicle Spt	MIPR	PMs Abrams/Bradley	0	0	-	200	OCT 00	TBD	200	
Subtotal Support Costs:			2723	340	-	200	-		3263	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. FED Perf. Evaluation	CPIF	GDLS, MI	0	120					120	
b. FED Perf. Evaluation	CPIF	UDLP, CA	0	120					120	
c. FED HTI Veh. Evaluation	CPIF	GDLS, MI	0	250					250	
d. FED HTI Veh. Evaluation	CPIF	UDLP, CA	0	500					500	
e. CGA Component Transition to PMs	TBD	Contractors, TBD	0							TBD
f. Field Test LWR	MIPR	RTTC, AL	68	0	-	0	-	0	68	
g. Missile Warning LWR	MIPR	Naval Rsch Wash DC	35	0	-	0	-	0	35	
h. LWR User Eval	MIPR	Eglin AFB, FL	375			0	-	0	375	
i. LWR Tech Test	MIPR	Yuma, AZ	208			0	-	0	208	
j. LWR User Eval	MIPR	Ft. Benning, GA	130			0	-	0	130	
k. LWR User Eval	MIPR	Ft. Knox, KY	50			0	-	0	50	
l. LWR User Eval	MIPR	Other	174	0	-	0	-	0	174	
Subtotal Test and Evaluation:			1040	990			-		2030	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203735A Combat Vehicle Improvement Programs

PROJECT: D718

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total Pys Cost	FY2000 Cost	FY2000 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	699	0	-	0	-	0	699	
b. In House Spt FED	MIPR	PM GSI, MI	895	440	-	0	-	0	1335	
c. SBIR/STTR				77					77	
Subtotal Management Services:			1594	517					2111	
Project Total Cost:			37178	7847		12125			57150	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203740A Maneuver Control System		PROJECT: D484

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D484 Maneuver Control System	28720	45776	48910	14070	14653	13269	3764	Continuing	Continuing

A. Mission Description and Budget Item Justification: 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 an essential component of the Army Battle Command System (ABCS) and provides critical coordination among Battlefield Functional Areas (BFAs) within each echelon. The primary component of Force Level Control is MCS's provision of the Common Tactical Picture (CTP). The CTP depicts information provided by all the Battlefield Functional Areas (BFAs) and includes a 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.

MCS software is based on the OSD-DISA Common Operating Environment (COE) standard architecture with applications to automate C2 operations. The MCS Block IV software uses the Joint Mapping Tool Kit (JMTK), a Defense Information Infrastructure Common Operating Environment (DII COE) product, for terrain analysis, planning and SITMAP graphical displays. The Task Organization (TO) 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. MCS provides the Common Tactical Picture software supporting battlefield situation display for all ATCCS BFAs. MCS provides the Army "ground track" segment of the joint tactical common picture to the Global Command and Control System-Army (GCCS-A).

FY 1999 Accomplishments:

•	28570	Continued MCS Block IV software development
•	150	Began planning for Block IV Initial Operational Test and Evaluation (IOT&E)
Total	28720	

FY 2000 Planned Program:

•	40653	Continue MCS Block IV software development
•	2930	Participate in test events leading to Block IV IOT&E
•	1000	Integrate Tactical Voice Control
•	1193	Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) programs
Total	45776	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203740A Maneuver Control System — PROJECT: D484

FY 2001 Planned Program:

- 33610 Continue MCS Block IV software development
- 15300 Conduct Block IV Initial Operational Test & Evaluation

Total 48910

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	28623	45125	25682
Appropriated Value	28923	46125	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-300		
b. SBIR / STTR	-724		
c. Omnibus or Other Above Threshold Reductions	+1384	-183	
d. Below Threshold Reprogramming	-449		
e. Rescissions	-114	-166	
Adjustments to Budget Years Since FY 2000/2001 PB			+23228
Current Budget Submit (FY 2001 PB)	28720	45776	48910

Change Summary Explanation:

Funding: FY2000 (+1000) Congressional increase for integration of a tactical voice control capability in MCS
FY2001 (+23228) Increase for MCS Block IV software development and conduct of the Block IV IOT&E.

Schedule: OSD Acquisition Decision Memorandum, dated Aug 6, 1999, approved change in the MCS program acquisition strategy. MCS Block III will only be fielded to the Training Base. MCS Block IV will complete its IOT&E in (1Q 02) with a Milestone III decision in BES/Q02.

C. Other Program Funding Summary Other Procurement, Army	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Maneuver Control System - BA9320	12755	24886	22935	31327	33745	43479	43433	Cont'g	Cont'g
MCS Spares - BS9710	0	0	0	1981	4553	1383	1382	Cont'g	Cont'g

D. Acquisition Strategy: Since the initial MCS was introduced in Europe in 1981, this program has been and will continue to be an evolutionary software development program broken out into Blocks. The MCS capability continues to expand in pre-planned, time-phased steps toward the objective system. The MCS acquisition strategy is based on modular development of application software, integrated with the common system software, hosted on the procured commercial off-the-shelf CHS computers and peripheral hardware. The current block of MCS software, Block IV, consists of development of two versions; MCS Version 1(FDD) and MCS Version 2(FDC). MCS

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203740A Maneuver Control System / PROJECT: D484

Version 2(FDC), the Block IV objective software will add applications and stand-alone functionality from MCS Version 1(FDD). 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). MCS is moving to ruggedized commercial workstations and notebook computers to enhance software development, support and training.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Participation in ABCS 5.X testing	3Q-4Q*						
Participation in ABCS 6.X test events		1-4Q					
Participation in FBCB2 Limited Users Test-2		3Q					
MCS Version 1 System Segment Acceptance Test			1Q				
Participate in FBCB2 Limited Users Test-3			3Q				
Complete Block IV IOT&E (Version 1)				4Q			
Block IV Milestone III Decision				1Q			
Initial Operational Capability					1Q		
MCS Version 2 System Segment Acceptance Test					2Q		
Block IV FOTE (Version 2)						1Q	
P3I program							1-4Q

*Milestone Complete

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	17289	2Q	26496	1Q	21700	1Q	20815	111000	See Remark
b. Block III (TKC)	C/CPIF/AF	CSC, Telos, MITRE	58969	0							58969	
c. Other Contracts	C/Various		193174	5645	1Q-3Q	6185	1Q-2Q	3871	1Q-2Q	Cont'g	208875	
d. Technical Support	MIPR	CECOM	11343	838		2148		2255		Cont'g	16584	
e. In-House			23919	1688		1722		1808		Cont'g	29137	
f. PSE H/w &S/W	C/Various		9237	150	3Q	1844	1Q			Cont'g	11231	
g. MITRE Sys Engrg		Eatontown, NJ		1665	1Q	2050	1Q	2255	1Q	Cont'g	5970	
h. SBIR/STTR						1193					1193	
Subtotal Product Development:			321342	27275		41638		31889		20815	442959	

Remark: Total Cost represents Project Manager's current best estimate to completion in FY04 (anticipates two-year extension of contract).

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		Cont'g	17665	
b. Other Contracts	C/Various		16456	502	1Q-2Q	553	1Q-2Q	1040	1Q-2Q	Cont'g	18551	
Subtotal Support Costs:			32155	1132		1208		1721			36216	

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			1500		4500		Cont'g	7761	
b. Other Contracts	C/Various		1452	221	1Q-2Q	730	1Q-2Q	800	1Q-2Q	Cont'g	3203	
c. CHS-1 HW	C/FPP	Miltope Corp	613								613	
d. Operational Test/Planning	MIPR	ATEC	4618	92	1Q	700	1Q	10000	1Q	Cont'g	15410	
Subtotal Test and Evaluation:			8444	313		2930		15300			26987	

IV. Management Services: None

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203740A Maneuver Control System

PROJECT: D484

	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	28720		45776		48910		Cont'g	Cont'g	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program

COST (*In Thousands*)	FY 1999 Actual	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	23577	80786	95829	98634	90032	53438	97404	Continuing	Continuing
D028 Guardrail Common Sensor/Aerial Common Sensor	0	5604	11284	14655	10486	28674	72664	397800	541167
D179 CH-47D Product Improvement	0	0	0	504	0	0	0	0	504
D430 Improved Cargo Helicopter	23577	28229	37196	6581	97	0	0	0	95680
D504 UH-60A/L Black Hawk SLEP/Modernization	0	9809	29915	38506	38281	24764	24740	Continuing	Continuing
D508 Apache 2nd Generation Forward Looking Infrared (FLIR)	0	37144	17434	38388	41168	0	0	0	Continuing

A. Mission Description and Budget Item Justification : This PE provides for development of modifications and improvements for the Guardrail Common Sensor/Aerial Common Sensor, the Improved Cargo Helicopter (ICH), the UH-60A/L Black Hawk SLEP/Modernization, and the Apache 2nd Generation Forward Looking Infrared (FLIR).

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	26628	51644	61033
Appropriated Value	26681	81644	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-53		
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions		-329	
d. Below Threshold Reprogramming	-3051		
e. Rescissions		-529	
Adjustments to Budget Years Since FY 2000/2001 PB			+34796
Current Budget Submit (FY 2001PB)	23577	80786	95829

Change Summary Explanation: Funding – FY 2001 3676 increase for Guardrail Common Sensor fielded systems Sigint enhancements.
30100 increase will initiate the RDTE phase of theUH-60 A/L Black Hawk SLEP/Modernization program.
1020 increase for Improved Cargo Helicopter.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program	PROJECT: D028

COST (*In Thousands*)	FY 1999 Actual	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	5604	11284	14655	10486	28674	72664	397800	541167

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 seamless intelligence 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 Intelligence (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/GRVII will satisfy unique Army/Land Force Commander Intelligence, Surveillance and Reconnaissance (ISR) and targeting requirements, and those of the Land Force Component of Joint and Combined Task Forces (JTF and CTF) across the spectrum of Operations.

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

The FY01 funding supports efforts to identify an airborne platform which best supports the multi-mission role of ACS and begin non-SIGINT Prime Mission Equipment (PME) development and integration efforts. FY01 Funding also supports efforts to extend the useful life/currency of the GRCS fielded systems modifying current system software to incorporate additional signals of interest. In addition to the software modifications, an upgrade implementation plan will be developed along with an Interface Control Document (ICD) that describes the connection and interface requirements for integrating GOTS/COTS hardware into the system architecture and host platform. The plan and ICD will provide a pathway to upgrade the fielded systems to intercept, recognize and locate advanced commercial, digital signals.

FY 1999 Accomplishments: Project not funded in FY 1999

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program PROJECT D028

FY 2000 Planned Program:

- 5045 Prepare, evaluate and award contract(s) for ACS concept exploration (e.g. System design, modeling and simulation.)
- 420 Program office support
- 139 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 5604

FY 2001 Planned Program:

- 6824 Complete initial phase of ACS concept exploration contract(s). Evaluate results and award follow on contract(s) for further development, modeling and simulation of leading design.
- 178 Design evaluation and source selection
- 3395 Award contract(s) for GRCS fielded systems enhancements; modify system software to incorporate additional signals of interest. Develop implementation plan with an Interface Control Document (ICD) for system upgrades.
- 887 Program office support

Total 11284

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Defense Cryptologic Program (DCP)		14725	14130	17694	19635	20678	18476		105338
Joint Airborne SIGINT program Office (JASPO)	700	1000	3000	5800	4500			0	15000
0305206/DK98 Tactical Reconnaissance				6837	4879	4837	5200	Continue	Continue

C. Acquisition Strategy: The Aerial Common Sensor development and integration contract(s) will be awarded on a competitive basis. Requirements will be to analyze/ recommend architecture to include an airframe that integrates SIGINT and non-SIGINT suites, e.g. Moving Target Indicator (MTI)/Synthetic Aperture Radar (SAR), Electro Optic/Infrared (EO/IR), etc. The contractor will be required to provide the integration analysis, modeling and simulation packages and a proposed airframe for a total system recommendation. Following the evaluation of the recommendations, new limited competitive, cost plus contract(s) will be awarded in FY2002 to begin risk reduction efforts. 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 scaled HBSS and LBSS subsystems being developed by the JASPO under separate action with additional enhancements being funded under the ACS DCP program.

The acquisition strategy for the GRCS upgrades will be through task orders against competitive omnibus contracts that team multiple contractors.

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program

PROJECT: D028

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
MS 0 Decision	4Q						
Award initial ACS Concept Exploration contract		2Q					
Award GRCS upgrade contract(s)			1Q				
ACS MS I Decision			4Q				
Award follow-on PDRR contract				1Q			
Field GRCS software modifications					2Q		
Flight test GRCS upgrades					2Q		
ACS Milestone II Decision					2Q		

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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 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-FP	TBD		5045	2Q	6824	1Q	0	11869	11869
c GRCS upgrade contract	C-CPAF	TBD				3395	1Q	Continue	Continue	Continue
d. SBIR/STTR				139						
Subtotal Product Development:				5184		10219				

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Engineering Support	FFP	Sytex; Doylestown PA		70	2Q	175	1Q	Continue	Continue	Continue
Subtotal Support Costs:				70		175				

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Test and Evaluation:										

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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	MIPR	PM, Signals Warfare		240	2Q	415	1Q	Continue	655	Continue
b. Matrix Support	MIPR	HQ, CECOM		110	2Q	475	1Q	Continue	585	Continue
Subtotal Management Services:				350		890			1240	Continue

Project Total Cost:	0	5604		11284		Continue	Continue	Continue

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D430

COST (*In Thousands*)	FY 1999 Actual	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	23577	28229	37196	6581	97	0	0	0	95680

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.

FY 1999 Accomplishments:

- 20953 Awarded Engineering Manufacture Development (EMD)
- 1330 Continued In-house and program management administration
- 1294 Continued Government Test and Evaluation

Total 23577

FY 2000 Planned Program:

- 22377 Continue Engineering Manufacture Development (EMD)
- 1411 Continue In-house and program management administration
- 3700 Continue Government Test & Evaluation
- 741 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 28229

FY 2001 Planned Program:

- 30361 Continue Engineering Manufacture Development (EMD)
- 1860 Continue In-house and program management administration
- 3375 Continue Government Test & Evaluation; 2 EMD Models delivered for Testing
- 1600 TOCR

Total 37196

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program PROJECT D430

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
APA, SSN AA0254, CH-47 ICH	0	0	83830	170426	210234	293092	289934	Cont'g	Cont'g

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. There will be two LRIP lots to ramp up full rate production.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
EMD Contract & Funding Increments	2nd Qtr	1st Qtr	1st Qtr	1st Qtr			
Critical Design Review (CDR)	4th Qtr						
IPF/LL			2nd Qtr				
LRIP I Award				1st Qtr			
Initial Oper Test & Eval (IOTE)				2nd Qtr			
LRIP II Award				2nd Qtr			
MS III						2nd Qtr	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	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	CPIF	Various	28776	20953	Jan 99	23118	Dec 99	30361	Dec 00	Cont	103208	Cont'g
b. TOCR								1600	TBD	Cont	1600	Cont'g
Subtotal Product Development:			28776	20953		23118		31961			104808	Cont'g

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. PMO/OGA	Reimbursable	Various government	7535	1036	Qtrly	1411	Qtrly	1860	Qtrly	Cont	11842	
Subtotal Support Costs:			7535	1036		1411		1860			11842	

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	Reimbursable	Various government	2211	1126	Qtrly	1700	Qtrly	3375	Qtrly	Cont	8412	
b. Live Fire Test & Eval	Reimbursable	Contract/Govt	685	168	Qtrly	2000	Qtrly	0000	Qtrly	Cont	2853	
Subtotal Test and Evaluation:			2896	1294		3700		3375			11265	

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. CAMBER/Westar	SS/FP	Huntsville, AL	3607	294	Dec 98						3901	3901
Subtotal Management Services:			3607	294							3901	3901

Project Total Cost:			42814	23577		28229		37196			131816	Cont'g

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program — PROJECT: D504

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D504 UH-60A/L Black Hawk SLEP/Modernization	0	9809	29915	38506	38281	24764	24740	Continuing	Continuing

A. **Mission Description and Budget Item Justification:** The mission of the UH-60 Black Hawk includes air assault, general support, aeromedical evacuation (MEDEVAC) and command and control. There are currently over 900 UH-60A and over 500 UH-60L model aircraft in the Army today. There will be over 1500 UH-60 Black Hawk aircraft at the end of the current planned buy in fiscal year 2005. A Utility Helicopter Fleet Modernization Analysis was conducted in 1999 to determine the most operationally effective and affordable strategy to modernize the utility helicopter fleet. The General Officer Steering Committee (GOSC) that led the analysis recommended a tiered, evolutionary modernization approach (UH-60L+ and UH-60X aircraft) to meet utility helicopter mission requirements. The UH-60L+ is the near-term evolutionary approach, buying back lift and providing digitization while reducing Operation and Support (O&S) costs and increasing readiness rates of the aging UH-60A/L fleet. The modernization effort will transition from UH-60L+ to UH-60X in FY04. The procurement of the UH-60L+ will start in FY03. Through modification of existing UH-60A/Ls, the UH-60L+ will include airframe structural improvements, a propulsion upgrade (T700-GE-700 to T700-GE-701C for the UH-60A), and a digital cockpit. In addition, the UH-60L+ will provide a common, modernized platform for UH-60Q aeromedical evacuation (MEDEVAC) helicopters by incorporating the medical mission equipment package on these aircraft.

FY 1999 Accomplished Program: Program not funded in FY 1999

FY 2000 Planned Program:

•	5226	Initiate Airframe, Avionics and Engine Prototype Design and Development
•	372	Prepare Depot Compatibility Study
•	2121	Test Planning
•	1826	Initiate Prototype Aircraft Preparation/Teardown
•	264	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	9809	

FY 2001 Planned Program:

•	8631	Conduct Airframe Prototype Design and Development
•	13050	Conduct Avionics Prototype Design and Development
•	3645	Conduct Engine Prototype Design and Development
•	4589	Test Planning
Total	29915	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program

PROJECT: D504

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Comp	Total Cost
APA Budget									
AA0492 UH-60 MODS		12962	3021	38751	54065	99492	164410	Cont	Cont

C. **Acquisition Strategy:** The UH-60L+ modernization is the first step in an evolutionary, tiered approach that will ultimately result in a fully ORD compliant UH-60X aircraft for first-to-fight units. An evolutionary, tiered modernization approach will meet the new requirements of increased lift, range, and survivability; plus, address the challenges of the aging fleet, such as decreasing operational readiness and increasing operating costs. The UH-60L+ will modify the existing Black Hawk to meet digitization/situational awareness requirements. It will also provide a common, modernized platform for the UH-60A/L and the UH-60Q/HH-60L MEDEVAC aircraft. Planned modifications will extend the life of the aircraft, reduce O&S costs and increase operational readiness. A streamlined acquisition strategy has been structured for the UH-60L+ program. The UH-60L+ technical solution will be defined through the development of engineering changes to incorporate airframe structural improvements, a propulsion upgrade and a digitized cockpit. These improvements will take advantage of ongoing technology development programs, the existing UH-60L engine program and the UH-60Q/HH-60L MEDEVAC program. The modified UH-60L+ lays the foundation for the UH-60X development program. Consistent with the evolutionary process, as the integration and qualification of the UH-60L+ is completed; the follow-on development of the UH-60X is initiated.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
Depot Compatibility Study		3-4 Q	2-3 Q					
Airframe Prototype Design and Development		3-4 Q	1-4 Q	1-3Q				
Avionics Prototype Design and Development		3-4 Q	1-4 Q	1-3Q				
Engine Prototype Design and Development		3-4 Q	1-4 Q	1-3Q				
Preliminary Design Review (airframe, avionics, engine)		4 Q						
Early User Demonstration		4 Q	1 Q					
Critical Design Review (airframe, avionics, engine)			2 Q					
Developmental Testing				2-4 Q				
Operational Test					1 Q			
Complete Manuals, Plans and Documents					2 Q			

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program

PROJECT: D504

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Airframe, Avionics and Engine Prototype design	SS/CPAF	Sikorsky Aircraft Co 30 Moffitt Street Stratford, CT 06601		5977	2 Q	20387	2Q	Cont	26364	
b. In House Engineering Support		UH PMO		579	2 Q	1976	1Q	Cont	2555	
c. In House Engineering Support		PATS Contractor		144	2 Q	492	1Q	Cont	636	
Subtotal Product Development:				6700		22855			29555	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Engineering Support	MIPR	AMCOM		361	2 Q	1233	2Q	Cont	1594	
Subtotal Support Costs:				361		1233			1594	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Testing	MIPR	OPTEC		1659	3 Q	3590	2Q	Cont	5249	
b. Testing	MIPR	RTTC		462	3 Q	999	2Q	Cont	1461	
Subtotal Test and Evaluation:				2121		4589			6710	

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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		UH PMO		290	2 Q	989	1Q	Cont	1279	
b. PM Support		PATS Contractor		73	2 Q	249	1Q	Cont	322	
c. SBIR/STTR				264					264	
Subtotal Management Services:				627		1238			1865	

ARMY RDT&E COST ANALYSIS (R-3)		DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203744A Aircraft Modifications/Product Improvement Program	PROJECT D504

	FY 2000 Cost		FY 2001 Cost			Total Cost	
Project Total Cost:	9809		29915			39724	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program; PROJECT: D508

COST (*In Thousands*)	FY 1999 Actual	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	37144	17434	38388	41168	0	0	0	Continuing

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 1999 Accomplishments: Project not funded in FY 1999

FY 2000 Planned Program:

- 32287 Award Engineering & Manufacturing Development (EMD) Contract/PDR for 2nd Generation FLIR.
- 1857 In-house & Program Management Administration/Complete Source Selection Evaluation (SSEB) for EMD Program.
- 2000 Test and Evaluation - Qualification Testing
- 1000 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 37144

FY 2001 Planned Program:

- 15362 Continue EMD Contract for 2nd Generation FLIR Development/CDR/First Prototype Delivery
- 1200 Continue in-house and Program Management Administration
- 872 Test and Evaluation - Qualification Testing

Total 17434

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203744A Aircraft Modifications/Product Improvement Program; PROJECT: D508

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
APA, BA 2, AA6606, AA6607, AA0978, AA6608, Modification of Aircraft	683457	822199	776110	894640	933432	828905	523715	Cont	Cont

C. **Acquisition Strategy:** A cost plus incentive fee (CPIF) type contract (target award date of June 00) 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	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
SSEB				1Qtr						
Receive Proposals				2Qtr						
Contract Award				3Qtr						
PDR/CDR				4Qtr	2Qtr					
Prototype Deliveries					2Qtr	2Qtr	1Qtr			
Qual Testing						4Qtr				
Air Worthiness Release							1Qtr			
Flight Testing							3Qtr			

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. 2nd Gen FLIR Develop	C, CPIF	TBD		32287	June 00	15362	Oct 00	52656	100305	100305
b. SBIR/STTR				1000					1000	1000
Subtotal Product Development:				33287		15362		52656	101305	101305

II. Support Costs: None

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Qual, Air Worth, Demo	C, CPIF	TBD		2000	June 00	1200	Oct 00	23900	27100	27100
Subtotal Test and Evaluation:				2000		1200		23900	27100	27100

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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 & SSEB	NA	PEO AVN		1857	June 00	872	Oct 00	3000	5729	5729
Subtotal Management Services:				1857		872		3000	5729	5729

Project Total Cost:				37144		17434		79556	134134	134134

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203752A Aircraft Engine Component Improvement Program

PROJECT: D106

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D106 Aircraft Component Improvement Program (CIP)	6543	3859	2929	3108	3174	3348	3425	Continuing	Continuing

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.

FY 1999 Accomplishments:

- 1027 **T700 Engine:** Continued development of repair procedures to allow use of scrapped high-dollar hardware. Performed materials analysis of power turbine (PT) disks to develop safe operating life limits. Developed and tested new material for Woodward Governor HMU Temperature sensor to increase service life and reduce O&S costs. Completed LOLA fuel pump effort to improve flight safety and reduce O&S costs.
- 1056 **T55 Engine:** Completed the development and testing of redesigned tailpipe to improve reliability and readiness and extend service life while reducing performance losses and O&S costs. Began development of depot/field level repair techniques for high-dollar hardware to reduce O&S costs and improve readiness. Completed testing of the improved bearings which will increase life and reduce O&S costs. Designed optimized plumbing system to reduce maintenance costs and weight while improving reliability.
- 75 **T53 Engine:** Developed life limits for centrifugal compressor to improve flight safety.
- 400 **GTCP 36 APU:** Continued design of a common dual alloy turbine wheel for use on both Apache and Blackhawk. Initiated investigation of Apache PTO clutch problems, theorizing that overservicing may be the source of the problem. Performed material analysis to identify cause of recent Blackhawk APU compressor wheel failures. Began teardown and analysis of high-time Blackhawk APU to determine cause of premature erosion and labyrinth seal failure and to identify potential component redesign candidates to extend service life and reduce O&S cost. Continued fuel solenoid bracket redesign and testing to eliminate maintainer-induced failure. Continued clutch vent tube redesign to eliminate cold day leakage problem.
- 1800 **SPU/FDU:** Developed a Fuel Delivery Unit (FDU) for the Subsystem Power Unit (SPU) for the RAH-66 Comanche.
- 1800 **FADEC:** Developed a Fully Authority Digital Engine Control (FADEC) training device for the New Training Helicopter (NTH) Engine that will permit manual control of the engine.
- 10 **WESTAR:** Supported SPU/FDU and FADEC
- 110 **CAMBER:** Supported SPU/FDU and FADEC
- 265 **IN-HOUSE:** In-house support for the component improvement program engineers.

Total 6543

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program PROJECT D106

FY 2000 Planned Program:

•	880	**T700 Engine:** Complete materials analysis of PT disks and begin analysis of blisks. Continue development of new repair procedures for high-dollar hardware. Develop an improved stage 1 and 2 damper to increase installed life. Develop and qualify improved –700 and –701C Stage 1 shrouds for reduced wear and O&S costs and improved on-wing life. Begin analysis of TiN compressor coating for improved on-wing life and reduced O&S costs.
•	804	**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. Complete life analysis of GA-714 compressor and turbine sections for improved flight safety.
•	505	**T53 Engine:** Continue development of life limits for critical rotating engine components to improve flight safety. Begin development of program to control turbine tip clearance to improve on-wing life and reduce O&S costs.
•	177	**T62 APU:** Investigate service revealed difficulties arising during the course of the year to improve readiness.
•	910	**LOLA Pump:** Develop and qualify variable-vane LOLA pump.
•	357	**GTCP 36 APU:** Based on candidates identified in FY 1999 Black Hawk erosion / labyrinth seal investigation program, begin component redesign to eliminate premature erosion and labyrinth seal failure. Initiate development of a ceramic turbine nozzle in order to reduce premature and erosion. Investigate service revealed difficulties arising during the course of the year to improve readiness.
•	124	**IN-HOUSE:** In-house support for the component improvement program engineers.
	102	Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR)
Total	3859	

FY 2001 Planned Program:

•	1203	**T700 Engine:** 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. Complete development and qualification of improved –700 and –701C shrouds to improve on-wing life and reduce O&S costs. Begin development of improved stage 3 PT blades to improve on-wing life and reduce O&S costs. Initiate design of improved durability stage 2 nozzle to increase on-wing life.
•	900	**T55 Engine:** Begin development of an improved 1st stage GP nozzle to improve on-wing life and readiness while reducing O&S costs. Begin design of an improved N2 sensor which will reduce parts count and reduce O&S cots while improving readiness. Begin development of an improved EGT measurement system to improve reliability and on-wing life while reducing O&S costs.
•	500	**T53 Engine:** Complete development of life limits on critical rotating parts to improve flight safety. Complete turbine tip clearance control program to improve on-wing life and reduce O&S costs. Initiate design of improved turbine nozzle to reduce O&S costs.
•	50	**T62 APU:** Investigate service revealed difficulties arising during the course of the year to improve readiness.
•	250	**GTCP 36 APU:** Begin 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program PROJECT D106

FY 2001 Planned Program: (continued)

- 26 **IN-HOUSE:** In-house support for the component improvement program engineers.

Total 2929

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	6901	2900	2946
Appropriated Value	6948	3900	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-47		
b. SBIR / STTR	-181		
c. Omnibus or Other Above Threshold Reductions		-16	
d. Below Threshold Reprogramming	-149		
e. Rescissions	-28	-25	
Adjustments to Budget Years Since FY 2000/2001 PB			-17
Current Budget Submit (FY 2001 PB)	6543	3859	2929

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	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
T700 – Perform materials analysis of PT disks, design and qualify new WGC HMU T2 sensor material, complete LOLA pump qualification, develop and test new repair procedures.	4th Qtr						
T700 – Perform materials analysis of blisks, design and test improved –700 and –701C stage 1 shrouds, develop new repair procedures, develop an improved stage 1 and 2 GGT damper.		2nd Qtr					

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203752A Aircraft Engine Component Improvement Program PROJECT D106

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
T700 – Develop improved PT blade, begin development of improved stage 2 nozzle, complete design of improved stage 1 shrouds, complete materials analysis of blisks, continue development of repair procedures			2nd Qtr				
LOLA Pump – Develop and qualify variable displacement vane pump (VDVP)			2nd Qtr				
T55 – Complete qualification of improved plumbing system, complete development of improved tailpipe, complete bearing qualification, develop new repair procedures	4thQtr						
T55 – Complete qualification of optimized plumbing system, continue development of repair procedures for high cost hardware, develop life limits for GA-714 compressor and turbine.		4th Qtr					
T55 - Begin development of improved 1st stage GP nozzle and N2 sensor, start design of improved EGT measurement system			2nd Qtr				
T53 – Develop life limits for centrifugal compressor	4th Qtr						
T53 – Continue development of life limits, begin development of turbine tip clearance control		4th Qtr					
T53 – Complete life limits development, complete qualification of turbine tip clearance control, begin improved turbine nozzle program			4th Qtr				
SPU – Dev. & Qualify a Fuel Delivery Unit (FDU)		3rd Qtr					
FADEC – Dev. & Qualify an advanced reversionary control for Kiowa Warrior and other potential aircraft applications		3rd Qtr					

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203752A Aircraft Engine Component Improvement Program

PROJECT: D106

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
T62 APU – Investigate service revealed difficulties arising during the course of the year to improve readiness	4th Qtr						
GTCP36 APU – Continue design of common dual alloy turbine wheel, initiate investigation of Apache PTO clutch problems, perform Blackhawk material analysis to identify cause of compressor wheel failures, begin teardown and analysis of high-time Blackhawk APU, continue fuel solenoid bracket redesign and testing to eliminate maintainer-induced failure, continue clutch vent tube redesign to eliminate leakage problem.	4th Qtr						
T62 APU – Investigate service revealed difficulties arising during the course of the year to improve readiness.		4th Qtr					
GTCP36 APU – Based on candidates identified in FY 1999 Black Hawk erosion / labyrinth seal investigation program, begin component redesign to eliminate premature erosion and labyrinth seal failure. Initiate development of a ceramic turbine nozzle in order to reduce premature sand erosion. Investigate service revealed difficulties arising during the course of the year to improve readiness.		4th Qtr					
T62 APU – Investigate service revealed difficulties arising during the course of the year to improve readiness.			4th Qtr				
GTCP36 APU – Begin 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.			4th Qtr				

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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. General Electric	SS/CPFF	Lynn, MA	40623	1027	1st Qtr	880		1403		Cont	43933	44821
b. Honeywell	SS/CPFF	Phoenix, AZ	19217	1131	1st Qtr	1486		1200		Cont	23034	22817
c. Air Force	MIPR	Kelly AFB, TX	13200	400	2nd Qtr	357		300		Cont	14257	14100
d. CECOM	MIPR	Ft. Monmouth, NJ	0	3600	3rd Qtr	910					4510	4510
Subtotal Product Development:			73040	6158		3633		2903			85734	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 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. Westar	SS/CPFF	St. Louis, MO	0	10	3rd Qtr						10	10
b. Camber	SS/CPFF	Huntsville, AL	0	110	3rd Qtr						110	90
Subtotal Support Costs:				120							120	100

III. Test and Evaluation: Not Applicable

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 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. ATCOM In-house		St. Louis, MO	10342	0		0		0		0	10342	10342
a. AMCOM In-house		Redstone Arsenal, AL	149	265		226		26		Cont	666	Cont
Subtotal Management Services:			10491	265		226		26			11008	Cont

Project Total Cost:			83531	6543		3859		2929			96862	Cont

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)			DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization		PROJECT D374

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D374 Horizontal Battlefield Digitization	40056	29941	29671	29202	28584	32134	33130	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 FY01 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 1999 Accomplishments:

- 4849 Data engineering evaluation and analysis testing, experimentation and interrelated simulation of hardware/software
- 4029 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 included: database development, operation system architecture development, and Multilateral Interoperability (MIP) Phase I testing and Phase I demonstrations.
- 1417 Analysis (including modeling/simulation) to predict overall digitized system of systems performance.
- 17320 Continued software/hardware integration, prototype development and commencement of testing of FBCB2/Embedded Battle Command (EBC) on Abrams tanks and Bradley fighting vehicles.
- 1118 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security and physical layout.
- 1138 Integration tools, plans, specifications and other training, logistics interface and configuration management products for the 66 TRADOC identified systems.
- 4135 Evaluated emerging interfaces to ensure interoperability across all functional areas including: 1) Studied porting of EBC for aviation, SSAT for Beta version and ADA bindings solutions for the Aviation communications requirements for full tactical internet (TI) connectivity/mobility and support of

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization
	PROJECT D374

FY 1999 Accomplishments: (continued)

integration into each platform; Simulations Testing Operations Rehearsal Model (STORM) stimulator interoperability; TOC server integration; and aviation integration into the TI. 2) Continued work on the electronic interface security issue and the TI interface. 3) Refined the software architecture for the TOC server/BOOT Control/Command and Control Register; supported system integration and interoperability analysis and design/demonstration of capabilities of software modules and the operational architecture. 4) Performed systems engineering analysis of the Joint Tactical Radio System (JTRS) evolving architecture to evaluate its capability to satisfy Army Aviation near term requirements for TI connectivity.

- 1875 Executed Digital Intelligence Situation Mapboard effort.
- 1875 Executed first year University XXI projects including; analysis, research and development of training and simulation tools, the design of prototypes and the investigation of unique/new technologies which will directly support digitized battle staff training and reduce training overhead costs.

Total 40056

FY 2000 Planned Program:

- 5011 Data engineering evaluation and analysis testing, experimentation and interrelated simulation of hardware/software
- 4150 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
- 3040 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).
- 1723 Analysis (including modeling/simulation) to predict overall system of systems performance.
- 2955 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.
- 3637 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems.
- 6289 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.
- 2375 Apply university academic and research resources to Army modeling, simulation and training to support the Army digitization strategy.
- 761 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 29941

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization
	PROJECT D374

FY 2001 Planned Program:

- 5083 Data engineering evaluation and analysis testing, experimentation and interrelated simulation of hardware/software.
- 4300 System/Platform Integration of heavy/light forces, synchronization assessments, battlefield digitization impact studies and system of systems issue resolution.
- 2355 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).
- 1916 Analysis (including modeling/simulation) to predict overall system of systems performance.
- 2914 Thorough validation of digital requirements/architecture to ensure realistic/adequate data flows, mission thread analysis, interoperability, human resource engineering, security, and physical layout.
- 5285 Integration tools, plans, specifications, and other training, logistics, interface, and configuration management products for the 66 TRADOC identified systems. (e.g. BFIST, Linebacker, BCIS, Aviation Platforms, Ground Combat Platforms)
- 6818 Evaluate emerging interfaces to ensure interoperability across all functional areas including: support tactical internet and electronic interfaces required for additional logistic functions; additional 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.
- 1000 Apply university academic and research resources to Army modeling, simulation and training to support Army digitization strategy based upon direction provided by Army.

Total 29671

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	46240	28180	26830
Appropriated Value	47007	30180	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-767		
b. SBIR / STTR	-1881		
c. Omnibus or Other Above Threshold Reductions		-117	
d. Below Threshold Reprogramming	-4013		
e. Rescissions	-290	-122	
Adjustments to Budget Years Since FY 2000/2001 PB			+2841
Current Budget Submit (FY 2001 PB)	40056	29941	29671

Change Summary Explanation: Funding – FY 2001: Funds increased for system integration/interoperability in support of the First Digital Corps (FDC) and the remainder of the force.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization
	PROJECT D374

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.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Army Tactical Cmd & Ctrl Info Sys (ATCCS) National Tests	1Q,4Q						
ATCCIS International Test	1Q,4Q						
ATCCIS Evaluation Cycles	2Q,3Q	1Q					
US/UK Lab Interop Demo	4Q						
Develop ATCCIS International Stds		2Q					
Develop International C2 Op Arch.							
- MIP Phase I Testing	2Q,3Q,4Q	1Q,2Q,3Q,4Q	1Q,2Q,3Q,4Q				
- MIP Phase I Demos	1Q,2Q	1Q,2Q	1Q	1Q,2Q,3Q,4Q			
Develop International (ABCS) Gateway (QIP)	1Q						
Tactical Personal Communications	4Q						
Corps Warfighter Exercises	1Q	2Q		2Q,3Q	2Q,3Q	2Q,3Q	
- Operational Readiness Eval.	2Q,3Q,4Q						
Integrate, test FBCB2 in Abrams tanks and Bradley fighting vehicles	3Q,4Q	1Q	1Q				
- FDD Hardware contract award		2Q					
- Equip First Digitized Division		4Q					
- Limited User Test/ Force Development Test & Evaluation		2Q,3Q	2Q,3Q				
- Initial Operation Test & Evaluation				1Q			
- Initial Operational Capability			1Q				
- EBC Follow-on Tests				3Q			
Evaluate electronic interface to tactical internet and to C2 systems.		1Q,3Q,4Q					

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203758A Digitization

PROJECT: D374

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Conduct analysis to support system design, experimentation and implementation		2Q,3Q					
Light Force Digitization				1Q,2Q,3Q,4Q	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	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	12012	Various	13200	Various	16300	Various		88742	
b. International Digitization	MIPR/PWD	Various	12800	2307	Various	3040	Various	2355	Various		20502	
c. Technical Analysis	MIPR/PWD	MITRE, Pentagon, McLean, VA	4400	657	Oct 98	1091	Oct 99	1091	Oct 00		7239	
d. Tank/Brad	CPFF	GDLS Warren, MI/ UDLP San Jose, CA	73720	17320	IQ						91040	
e. Other Govt. Agencies	MIPR/PWD	Various	22832	1302		3109	Various	2380	Various		29623	
Subtotal Product Development:			160982	33598		20440		22126			237146	

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 Operations	N/A	Pentagon	6504	1876		1904		1200			11484	
h. Digitization Planning, Internet and graphics support	PWD	Signal Corp. Pentagon and Arlington, VA	4200	980	Oct 98	1357	Oct 99	1700	Oct 00		8237	
i. Info Ops, System Eng. Integration & Ops Spt.	PWD	Quantum Res International Pentagon, Ft. Monroe, VA & Ft. Hood, TX	5295	1193	Oct 98	2392	Oct 99	2780	Oct 00		11660	
j. Various	MIPR/PWD	Pentagon	720	180	Oct 98	316	Various	307	Various		1523	
k. SBIR/STTR						761					761	
Subtotal Support Costs:			16719	4229		6730		5987			33665	

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	354		596	Various	558	Various		5068	
b. University XXI Initiatives	MIPR/PWD	Univ. of Texas and Texas A&M		1875		2175	Feb 00	1000	Oct 00		5050	
Subtotal Test and Evaluation:			3560	2229		2771		1558			10118	

ARMY RDT&E COST ANALYSIS (R-3)		DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203758A Digitization	PROJECT D374

IV. Management Services: Not applicable

			Total PYs Cost	FY 1999 Cost		FY 2000 Cost		FY 2001 Cost			Total Cost	
Project Total Cost:			181261	40056		29941		29671			280929	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D120

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D120 Force XXI Battle Command, Brigade & Below (FBCB2)	52003*	65176	63601	37699	29154	12179	0	0	264137

* Database presently shows 56328. Internal reprogrammings totaling 4325 have reduced this total to the current program of 52003. Database will be updated with the next submission.

A. **Mission Description and 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 PM FBCB2 is to develop, acquire, test and field a digital 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, situational awareness and command and control information. This capability will be fielded from brigade down to the soldier/platform level across all Battlefield Functional Areas (BFAs), and include other division and corp elements necessary to support brigade operations. FBCB2 will be integrated into the mounted and dismounted maneuver (divisional, separate, heavy and light) calvary/reconnaissance and armored cavalry, mechanized infantry and aviation units. PM FBCB2 is developing, and delivering the Applique (computer, software, and installations kits) and FBCB2 (software) products which are integrated into various platforms. Battlefield digitization allows the Army's primary weapons and battle command systems to see, acquire and engage threats while sharing the same information with equal clarity, using advanced technologies and digital communications. These platforms are connected through a communications infrastructure called the Tactical Internet. Interoperability is provided through the use of graphics, images common messages and data elements. The FBCB2 system and tactical internet provide the power of the network to share situational awareness (SA) and command and control (C2) information toward the efficient use of resources within the enemy's decision cycle. FBCB2 is integrated with Army Tactical Command and Control Systems (ATCCS) located within the brigade and battalion. The interfaces between FBCB2 and ATCCS systems will provide users at all levels a common picture of their battlespace. This seamless digitization (Computer with graphics display, global positioning system, communications link and command and control software) will be applied across the army.

FY 1999 Accomplishments:

- 13030 System Engineering, and Project Management
- 5259 Contractor System Integration, Testing
- 4221 Integrated Logistics Support, Specialty Engineering and Training
- 788 Site operations
- 14567 Software Development
- 3608 Hardware Design and Management
- 1907 Government Testing, Electronic Proving Ground (EPG, Reliability Development Test RDT, Safety Assessment – Successful "Growth" Demonstrated
- 641 Time & Material Efforts
- 1789 Hardware (174 Applique systems) in support of Field Development Test & Evaluation/Limited User Test 2 (FDT&E/LUT#2)

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203759A Force XXI Battle Command, Brigade and Below(FBCB2)
	PROJECT D120

FY 1999 Accomplishments: (continued)

•	6018	PM FBCB2 Program Management
•	175	Y2K Compliance
Total	52003	

FY 2000 Planned Program:

•	11459	System Engineering, and Project Management
•	7757	Contractor System Integration, Testing
•	4868	Integrated Logistics Support, Specialty Engineering and Training
•	1420	Site operations
•	14133	Software Development
•	2520	Hardware Design and Management
•	11142	Government Testing EPG, Army Test & Evaluation Command (ATEC), LUT 2
•	2133	Central Technical Support Facility (CTSF) - Horizontal Integration, testing and training
•	1600	Time and Materials efforts
•	6389	PM FBCB2 Program Management
•	1755	Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs
Total	65176	

FY 2001 Planned Program:

•	12791	System Engineering, and Project Management
•	8515	Contractor System Integration, Testing
•	5020	Integrated Logistics Support, Specialty Engineering and Training
•	12348	Software Development
•	1117	Hardware Design and Management
•	13643	Government Testing (EPG, ATEC)
•	1339	Site operations
•	2263	CTSF
•	1600	Time & Material efforts
•	4965	PM FBCB2 Program Management
Total	63601	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203759A Force XXI Battle Command, Brigade and Below(FBCB2)
	PROJECT D120

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	52121	44225	28876
Appropriated Value	52469	65925	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-348		
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reduction	+175	-270	
d. Below Threshold Reprogramming	-83		
e. Rescissions	-210	-479	
Adjustments to Budget Years Since FY 2000/2001 PB			+34725
Current Budget Submit (FY 2001 PB)	52003	65176	63601

Change Summary Explanation: Funding - FY 2001 increase of 34725
- 11100 for ATEC testing (LUT3/DCX1, DCX2, IOTE)
- 2000 for Electronic Proving Ground (EPG)
- 1200 CTSF Integration
- 1600 Time and Materials efforts to support numerous events
- 15800 Software development to accomplish functional capability requirements
- 1500 Aviation FBCB2 Development – Digitization of Army Aviation
- 1500 Windows NT Development

C. Other Program Funding Summary	FY1999	FY2000	FY2001	FY 2002	FY 2003	FY2004	FY2005	To Compl	Total Cost
Other Procurement Army Activity 2 SSN W61900		56165	60802	111394	170665	151491	225848	1281.0	2057.4

D. Acquisition Strategy: Spiral development is the overall FBCB2 acquisition strategy. It is based on proving out functional capabilities through numerous incremental testing events over time and incorporating results/feedback into the next "spiral". The current competitive contract, awarded in 1995, is a System Engineering and Integration (SE&I) effort, with cost plus incentive fee, time and materials and firm fixed price orders. The contract is for the development of software version's V1-V3 and appropriate hardware. The follow-on SE&I contract will be awarded in FY01 for software versions V4. A competition for Low Rate Initial Production (LRIP) hardware contractors began in FY99 under the management of the present SE&I contractor. A three year LRIP Firm Fixed Incentive Target Fee

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203759A Force XXI Battle Command, Brigade and Below(FBCB2)
	PROJECT D120

(FFITF) contract is to be awarded in January 2000 and will be OPA funded. The LRIP permits establishment of a robust production base and an orderly increase in the production rate for the

system sufficient to lead to full-rate production upon the successful completion of operation testing. The full rate production contract will be awarded in FY02. FBCB2 is integrated with the Army Tactical Command and Control (ATCCS) located within the brigade and battalion. The interfaces between FBCB2 and ATCCS systems will provide users at all levels a common picture of their battlespace.

Program realigned in March 1999 to support DOTE guidance for "additional functionality" and "maturity" of software. Incorporates additional testing and force effectiveness evaluations.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Version 3.0 FBCB2 Software Delivery	1Q						
Version 3.1 FBCB2 Software Delivery	3Q						
Version 3.2 FBCB2 Software Delivery		1Q					
Production Contract Award (LRIP)		2Q					
Force Development Test & Evaluation/LUT2		3Q					
Version 3.3 FBCB2 Software Delivery		3Q					
Equip 4TH ID		Start 3Q	End 1Q				
Bradley/Abrams IOTE/FOTE			1Q				
Follow on SE&I Contract Award			1Q				
Version 3.3+ FBCB2 Software Delivery			1Q				
Software Development V4.-V...n			1Q				
Limited User Test 3/DCX1			2Q				
DCX II			4Q				
Initial Operational Test & Evaluation (IOTE)				1Q			
Milestones Decision III				3Q			
Full Rate Production Contract Award				3Q			
Version 4.0 FBCB2 Software Delivery				3Q			
Software Development V.4-V...n					1-4Q		
Software Development V4.-V....n						End 4Q	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203759A Force XXI Battle Command, Brigade and 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. SE/SW Development	CPIF	TRW, LA, CA	195840	40295	Nov 98	42992	Nov 99	42730	Nov 00	63396	385253	385253
b. Hardware Development	FFP	TRW, LA, CA.		3608	Jun 99	2520	Jan 00	0		0	6128	6128
c. Inflation Withhold				0								
Subtotal Product Development:			195840	43903		45512		42730		63396	391381	391381

Remark: Prior Years costs shown include funding from the 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		2121	Oct 98	1998	Oct 99	1241	Oct 00	3499	8859	Cont.
b. Matrix Support	MIPR	CECOM, Ft. Monmouth		728	Nov 98	874	Nov 99	575	Nov 00	0	2177	Cont.
c. Misc. Contracts Support	MIPR/PWD	CECOM, Ft. Monmouth		3169	Nov 98	3517	Nov 99	3149	Nov 00	0	9835	Cont.
Subtotal Support Costs:				6018		6389		4965		3499	20871	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. CTSF	MIPR	CTSF				2133	Dec 99	2263	Dec 00	5067	9463	
b. ATEC	MIPR	ATEC		400	Nov 98	4900	Dec 99	11100	Nov 00	7300	23700	
c. EPG	MIPR	EPG		1507	Nov 98	5240	Dec 99	2543	Nov 00	388	9678	
d. Other	MIPR	Misc		175		1002					1177	
Subtotal Test and Evaluation:				2082		13275		15906		12755	44018	

IV. Management Services: None

Project Total Cost:			195840	52003		65176		63601		79650	456270	391381

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP) PROJECT D394

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D394 Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)	0	36621	6021	93813	93510	95345	97197	Continuing	Continuing

A. Mission Description and Justification: Force XXI Initiatives (Warfighting Rapid Acquisition Program) continues as one of the Army's 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. Candidates considered for funding through this program are compelling, mature technologies capable of achieving a milestone III decision in the near future 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). The primary sources for WRAP Initiatives are 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.

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.

FY 1999 Accomplishments: Program funded FY 99 Force XXI Initiative candidates – see reprogramming below in Paragraph B.

FY 2000 Planned Program:

•	36621	To be reprogrammed to support continuing FY 99 WRAP systems and FY 00 Force XXI Initiative candidates
Total	36621	

FY 2001 Planned Program:

•	6021	FY 2001 Force XXI Initiatives candidates
Total	6021	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)

PROJECT: D394

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	26942	55921	66058
Appropriated Value	27168	36621	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-226		
b. SBIR / STTR	-913		
c. Omnibus or Other Above Threshold Reductions			
d. DoD Internal Reprogramming	-26029		
e. Rescissions			
Adjustments to Budget Years Since FY 2000/2001 PB			-37
New Army Vision/Transformation Adjustment			-60000
Current Budget Submit (FY 2001 PB)	0	36621	6021

Change Summary Explanation: Funding - FY 1999: Funds realigned to approved systems: HEMTT-LHS: 4700 to OPA SSN D16203; MEDLOG-D: 600 to OPA BLIN MA8046; RLEM: 2700 to RDTE PE 0604802A and 400 to PAA BLIN46; AVCATT-A: 12400 to PE 0604780A; TPS: 1500 to PE 0604805A and 1200 to OPA BLIN 108; CCTT XXI: 2500 to a non-WRAP PE/Proj.
FY 2000 funds to be realigned to existing PE/projects upon Congressional approval of FY 2000 new candidate systems.
FY 2001 program adjusted to reflect the New Army Transformation (-60000); remaining funds will be realigned to existing PE/projects upon Congressional approval of FY 2001 new candidate systems.

C. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Analysis and Control Team – Enclave (ACT-E) – OPA SSN K28801	6750							0	6750
Air and Missile Defense Planning and Control System (AMDPCS) PE 0604741.169	4938							0	4938
Digital Topographic Support System – Light (DTSS-L) PE 0604716.653	3112							0	3112
Forward Repair System – Heavy (FRS-H) PE 0604622.E51	3658							0	3658
Grenadier Brat (GB) - OPA SSN BA8250	4400							0	4400

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)
	PROJECT D394

C. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
High Speed Multiplexer (HS Mux) - OPA SSN BB1600	2750							0	2750
Tactical Simulator Interface Unit (TSIU) PE 0603308.979	1445							0	1445

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

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203761A Force XXI Initiatives - Warfighting Rapid Acquisition Program (WRAP)

PROJECT: D394

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Force XXI Initiatives candidates			0	36621		6021			Continue	
Subtotal Product Development:			0	36621		6021			Continue	

II. Support Costs: Not applicable

III. Test and Evaluation: Not applicable

IV. Management Services: Not applicable

Project Total Cost:			0	36621		6021			Continue	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203801A Missile/Air Defense Product Improvement Program

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	14452	32211	12365	12078	9995	18804	16207	Continuing	Continuing
D036 Patriot RDT&E	8803	7702	6699	4515	4737	9863	7960	Continuing	Continuing
D038 Avenger Product Improvement Program	0	0	0	2001	0	4185	0	0	6186
D303 Stinger RMP Product Improvement Program	5649	24509	5666	5562	5258	4756	7427	Continuing	Continuing
D633 THAAD P3I	0	0	0	0	0	0	820	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 Air and Missile Defense (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 the Patriot and the Stinger.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	15151	29985	28649
Appropriated Value	15252	32485	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-101		
b. SBIR / STTR	-398		
c. Omnibus or Other Above Threshold Reductions		-133	
d. Below Threshold Reprogramming	-241		
e. Rescissions	-60	-141	
Adjustments to Budget Years Since FY 2000/2001 PB			-1576
New Army Vision/Transformation Adjustment			-14708
Current Budget Submit (FY 2001 PB)	14452	32211	12365

Change Summary Explanation: Funding - FY 2001 Project D303 was adjusted (-14708) to reflect funds migration to support the New Army Transformation.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203801A Missile/Air Defense Product Improvement Program	PROJECT: D036

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D036 Patriot RDT&E	8803	7702	6699	4515	4737	9863	7960	Continuing	Continuing

A. Mission Description and Justification: 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 (Theater 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.

FY 1999 Accomplishments:

- 5435 P3I test program
- 600 Responsive threat analysis
- 2768 Horizontal Battlefield Digitization

Total 8803

FY 2000 Planned Program:

- 2452 RLCEU Link 16 Phase I
- 5042 PDB 5
- 208 Small Business Innovation Research/Small Business Technology Transfer Program

Total 7702

FY 2001 Planned Program:

- 2452 RLCEU Link 16 Phase I
- 4247 Post PDB 5

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program PROJECT D036

Total 6699

B. Other Program Funding Summary Missile Procurement, Army	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Budget Activity 3 - Patriot Mod (C50700)	14188	49630	22929	25943	22600	41195	41150	Cont	750071
Budget Activity 3 – Patriot Mod Initial Spares	4870	3624	2649	726	1452	3926	3922	Cont	98853

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 convenient 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.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
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-Ground		3Q					

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203801A Missile/Air Defense Product Improvement Program

PROJECT: D036

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	3722	
b. DAAH0187CA025		Raytheon/MA	22455							Cont	22455	
c. DAAH0189C0458		Raytheon/MA	23228							Cont	23228	
d. DAAH0192C0036		Raytheon/MA	5000							Cont	5000	
e. Small Contracts			1168							Cont	1168	
f. DAAH0187CA006		General Electric/FL	4824							Cont	4824	
g. DAAH0189C0167		Brunswick/ Martin Marietta	3100							Cont	3100	
h. DAAH0192C0301	SS/CPFF	Lockheed-Martin/AL	4314							Cont	4314	
i. DAAH0191C0602	SS/CPIF	Raytheon/MA	23077							Cont	23077	
j. DAAH0192C0006	SS/CPAF	Raytheon/MA	56460							Cont	56460	
k. DAAH0195C0043	SS/CPAF	Raytheon/MA	16113	400	Dec 98					Cont	16513	
l. DAAH0196C0406		Lockheed Martin/AL	200							Cont	200	
m. DAAH0196C0062		Raytheon/MA	62937							Cont	62937	
n. DAAH0196C0018		Raytheon/MA	5046							Cont	5046	
o. RLCEU Link 16 Phase I						1226	Dec 99	1226	Dec 00	Cont	2452	
p. Horiz Btlfld Digit				2768	Feb 99					Cont	2768	
q. Post PBD 5						2060	Feb 00	1654	Feb 01	Cont	3714	
r. RAM Improvements												
Subtotal Product Development:			231644	3168		3286		2880			240978	

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

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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							3528	
e. In-House Support		RSA/AL	11920	1095		941	Mar 00	858	Mar 01		14814	
f. Matrix Support		RSA/AL	1250	950		800	Feb 00	700	Feb 01		3700	
Subtotal Support Costs:			30578	2836		1741		1558			36713	

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	1309	Jan 99	613	Jan 00	600	Jan 01	Cont	14247	
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	2799		2675		2261			135328	

Project Total Cost:			389815	8803		7702		6699			413019	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program PROJECT D303

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D303 Stinger RMP Product Improvement Program	5649	24509	5666	5562	5258	4756	7427	Continuing	Continuing

A. **Mission Description and Justification:** 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 system performance deficiencies in countermeasures and other engagement conditions, and increases terminal accuracy. The Block II development program was terminated due to higher priority requirements of the New Army Transformation. However, critical evaluation of Block I improvements and performance will continue.

FY 1999 Accomplishments:

•	1400	Built and Evaluated Block II Guidance Sections
•	1773	Hardware-in-the-Loop Flight Simulation Development, Missile Airframe and Missile Simulation Analyses
•	300	Continued Telemetry Development
•	500	Rate Sensor Evaluation
•	1676	Conducted performance prediction, weapon system integration, and preparation for entry into EMD
Total	5649	

FY 2000 Planned Program:

•	3000	STINGER Block II Program Termination & Technology Transition
•	550	AIM9X & RAM Technology Evaluation (Producibility & Obsolescence Reduction)
•	150	Lithium Battery Evaluation (Shelf Life Extension)
•	17653	Support the New Army Transformation
•	2500	Congressional increase erroneously appropriated to this program element. Action pending to correctly reclassify funds for the SWORD program.
•	656	Small Business Innovation Research/Small Business Technology Transfer Program
Total	24509	

FY 2001 Planned Program:

•	910	Dual Detector Aging/Degradation Test, Evaluation and Analysis

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203801A Missile/Air Defense Product Improvement Program PROJECT D303

- 3600 Hybrid Microelectronic Assembly (HMA) Redesign

FY 2001 Planned Program: (continued)

- 125 Lithium Battery Aging Test
- 275 Primary and Secondary Seeker Spin Motor and Squibs Evaluation
- 265 Guidance Section Software Development (HMA Redesign)
- 491 Missile Airframe/Guidance Section Modeling and Simulation Analyses and Performance Predictions

Total 5666

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Missile Procurement, Army									
Budget Activity 3 – Stinger Mods (C21300)	13416	21858	21838	27459	27077	32179	35539	Cont'd	Cont'd

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. A SS/CPFF contract was awarded 1996 for pre-Engineering, Manufacturing and Development (EMD). 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. Due to termination of the Block II development program and redefinition of activities to fund critical evaluation of Block I improvements and performance, a contract for follow-on Stinger Block I improvements will be awarded in 2Q FY2000.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Block II Guidance Section Build/Evaluation	3Q						
Block II Missile Simulation Development	3Q						
Block I Contract Award		2Q					
AIM9X & RAM Technology Evaluation		2-4Q					
Lithium Battery Evaluation/Test		4Q	2-4Q				
Dual Detector Evaluation			2-4Q				
HMA Redesign			2-4Q				

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203801A Missile/Air Defense Product Improvement Program

PROJECT: D303

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	902	2Q					0	17739	
e. DAAH0197C0084	SS-CPFF	Raytheon(Hughes), Tucson,AZ	1000							0	1000	
f. DAAH0197C0099	SS-CPFF	Raytheon, Tucson,AZ	3101	1698	2Q					0	4799	
g. DAAH0199C0170 Transition From Block II to Block I Technology Evaluations	SS-CPFF	Raytheon, Tucson,AZ				1921	2Q	2959	2Q	Cont'd	4880	
h. Block I Aggregate	Various	Various	7025							0	7025	
i. BSFV Aggregate	Various	Various	8569							0	8569	
j. Government Engineering Support	1095	RDEC, Redstone Arsenal, AL	5382	1190	3Q	1175	2Q	1810	1Q	Cont'd	9557	
k. SBIR/STTR						656					656	
l. SWORD (will be re-aligned to PE 0602303A)						2500					2500	
m. Support the New Army Transformation						17653					17653	
n. Other Govt. Agency	MIPR/1095	Various	406	7	1Q			100	1Q	Cont'd	513	
Subtotal Product Development:			69752	3797		23905		4869			102323	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203801A Missile/Air Defense Product Improvement Program

PROJECT: D303

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	

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 Demonstration	MIPR	Eglin AFB, FL	2100	73	2Q	121	3Q	187	2Q	Cont'd	2481	
b. Telemeters	1095	RTTC, Redstone Arsenal, AL	1004	800	4Q					Cont'd	1804	
c. Test Instrumentation	MIPR	NSWC, Dahlgren, VA		30	3Q						30	
d. Test Bed	MIPR	SMDC, Huntsville, AL		170	2Q						170	
Subtotal Test and Evaluation:			3104	1073		121		187			4485	

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	326	1Q	483	2Q	483	1Q	Cont'd	2623	
b. DLA90093D00121	SS-FFP	IITRI,Huntsville,AL	775							0	775	
c. Contracted Services	Various	Various	333	453	3Q			127	1Q	Cont'd	913	
Subtotal Management Services:			2439	779		483		610			4311	

Project Total Cost:			80583	5649		24509		5666			116407	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203802A Other Missile Product Improvement Programs

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	1201	17687	64418	84555	34240	32508	20873	0	502138
D336 TOW Product Improvement Program	1201	17687	52141	66335	34240	0	0	0	418260
D785 Longbow Hellfire PIP	0	0	12277	18220	0	0	0	0	30497
D786 Laser Guided Rocket	0	0	0	0	0	32508	20873	0	53381

A. Mission Description and Justification: The TOW Fire and Forget (F&F) Missile program provides the next generation missile for light, early entry contingency forces equipped with the TOW Improved Target Acquisition System (ITAS). This program provides enhanced survivability to Light Infantry Forces by enabling engagement of enemy threats and immediate movement to safety. This fire and forget technology is required by U.S. Army Infantry School (USAIS) to maintain the infantry's capability to support the U.S. Army mission of crisis response to regionally based threat and allows this technology to be integral to the strategic principal of forward presence. The TOW F&F includes a dual mode of attack with the primary mode being fire and forget and the alternate mode being Command Line-of-Sight (CLOS) guidance to ensure maximum engagement throughout varying battlefield conditions. The TOW F&F offers enhanced range as well as maximum standoff against enemy threats. This program includes improved lethality against new/evolving enemy threats to include Counter Active Protection System (CAPS) and will be launched from the Improved Target Acquisition System (ITAS). This program will utilize modern production processes and technologies with Design for Manufacturing and Affordability (DFMA). The TOW F&F is required to be modular in design for future growth and shelf life extension. 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 countermeasure environments. The Longbow Hellfire Product Improvement Program (PIP) will develop and qualify Home-on-Jam (HOJ)/Anti-Jam (AJ) and demonstrate limited 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. The Advanced Precision Kill Weapon System (APKWS), presently funded in project D786 Laser Guided Rocket, will consist of a laser guidance section that uses existing Hydra-70 rocket components and launch equipment. The APKWS is a highly accurate weapon that will complement the Hellfire missile in precision strike against soft point targets. The APKWS will provide improved accuracy over the current 2.75 rocket used on the AH-64 Apache, OH-58 Kiowa Warrior and the future RAH-66 Comanche helicopters. The APKWS seeker program will develop, test and qualify a laser guidance section for the Hydra-70 rocket. The laser seeker program funding includes system level qualification for APKWS. The APKWS seeker will improve accuracy and is expected to provide four times the number of kills, a substantial reduction in collateral damage to minimize fracticide, and a significant reduction in cost as a result of fewer rockets being required.

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

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	1239	9914	14817
Appropriated Value	1248	17914	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-9		
b. SBIR / STTR	-21		
c. Omnibus or Other Above Threshold Reductions		-73	
d. Below Threshold Reprogramming	-13		
e. Rescissions	-4	-154	
Adjustments to Budget Years Since FY 2000/2001 PB			+49601
Current Budget Submit (FY 2001 PB)	1201	17687	64418

Change Summary Explanation: Funding for FY 2001: Project 336 - TOW PIP (+49677) - Funding increase to support the Army's TOW Fire and Forget EMD Program.

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

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D336 TOW Product Improvement Program	1201	17687	52141	66335	34240	0	0	0	418260

A. Mission Description and Justification: Project D336 -TOW Product Improvement Program Provides the next generation missile for light, early entry contingency forces equipped with the TOW Improved Target Acquisition System (ITAS). Provides enhanced survivability to Light Infantry Forces by enabling engagement of enemy threats and immediate movement to safety. Required to maintain the infantry's capability to support the U.S. Army mission of crisis response to regionally based threat and allows this technology to be integral to the strategic principal of forward presence. The TOW F&F includes a dual mode of attack with the primary mode being fire and forget and the alternate mode being Command Line-of-Sight (CLOS) guidance to ensure maximum engagement throughout varying battlefield conditions. The TOW F&F offers enhanced range as well as maximum standoff against enemy threats. This program will utilize modern production processes and technologies with Design for Manufacturing and Affordability (DFMA). This program includes improved lethality against new/evolving enemy threats to include Counter Active Protection System (CAPS) and will be launched from the Improved Target Acquisition System (ITAS). The TOW F&F is required to be modular in design for future growth and shelf life extension.

FY 1999 Accomplishments:

- 200 Continued efforts on ITAS Indoor Trainer
- 1001 Continued missile enhancement efforts against the evolving threat [to include Counter Active Protection System (CAPS)]
  - -Updated analytical/simulation model based on latest intelligence reports
  - - Tested long stand-off warhead
  - - Tested electrical active/passive measures

Total 1201

FY 2000 Planned Program:

- 1696 Release EMD Request for Proposal; Conduct Source Selection; Complete Milestone II; and Award EMD Contract.
- 11417 Initiate Component Design, Simulation, and System Engineering Analysis for Preliminary Design Review (PDR).
- 3500 Complete PDR.
- 598 Prepare for Early User Assessment.
- 476 Small Business Innovative Research/Small Business Technology Transfer Programs

Total 17687

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

FY 2001 Planned Program:

- 6724 Complete Critical Design Review (CDR) and update TOW F&F Simulations.
- 24533 Continue System Engineering Analysis and Design; Pilot Line Development and Preparation; Procure Sub-Vendor Prototype Hardware and Test Equipment.
- 20884 Initiate Procurement of Hardware for Pre-Production Test; Initiate Testing; Conduct Early User Assessment; Prepare and Update Missile Design Documentation.

Total 52141

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Missile Procurement, Army									
C61700 ITAS/TOW Mods	62998	67704	64562	67408	59847	63539	59954	Cont	Cont
TOW 2 C59300					14494	78275	89561	Cont	Cont

B. Acquisition Strategy: The TOW F&F missile program is a technology insertion program utilizing the latest seeker and guidance technology to provide a high performance and reliable fire and forget missile. The TOW F&F program will be an Acquisition Category II program based upon DOD 5000.2-R guidelines. The Request for Proposal (RFP) was released 1st quarter FY00 and EMD contract award is scheduled for 3rd quarter FY00. The TOW F&F program includes a 42 month competitive EMD phase, followed by Low Rate Initial Production (LRIP) and Full Rate Production (FRP).

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
Release TOW F&F RFP		1st Qtr			
Award TOW F&F EMD contract		3rd Qtr			
Conduct TOW F&F PDR		4th Qtr			
Conduct TOW F&F CDR			3rd Qtr		
Conduct TOW F&F PPT			4th Qtr	4th Qtr	
Conduct TOW F&F PPQT					1st Qtr
Conduct TOW F&F Limited User Test (LUT)					1st Qtr

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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			145427								145427	
b. ITAS EMD	C/CPIF/AF	Raytheon, McKinney, TX	59724								59724	
c. ITAS Training Development	MIPR	STRICOM, Orlando, FL	9128			50	Apr	151	Dec	310	9639	
d. Misc.	Various	Various	4197	448	Dec	1104	Mar	2020	Dec	3650	11419	
e. TOW F&F EMD	CPIF	TBD				13603	Jun	44807	Dec	81560	139970	
Subtotal Product Development:			218476	448		14757		46978		85520	366179	

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. Program Mgt Support	PO	PM CCAWS, RSA	2827	247	Qtrly	2179	Qtrly	2168	Qtrly	6571	13992	
c. Functional Gov't Support	PO	MICOM, RSA, AL	14993	223	Qtrly						15216	
c. Misc.	Various	Various	2683								2683	
Subtotal Support Costs:			67415	470		2179		2168		6571	78803	

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. Program Test Support	MIPR	TECOM, APG, MD	15836					15	Qtrly	166	16017	
c. Program Test Support	MIPR	TEXCOM, Ft. Bliss, TX	1557								1557	
d. Misc.	Various	Various	1726			359	Qtrly	554	Qtrly	2877	5516	
e. Program Test Support	MIPR	TECOM, RTTC		283	Qtrly	392	Qtrly	2426	Qtrly	16525	19626	

ARMY RDT&E COST ANALYSIS (R-3)			DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0203802A Other Missile Product Improvement Programs		PROJECT: D336

Subtotal Test and Evaluation:			61340	283		751		2995		19568	84937	

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	1201		17687		52141		111659	529919	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203802A Other Missile Product Improvement Programs

PROJECT: D785

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D785 Longbow Hellfire PIP	0	0	12277	18220	0	0	0	0	30497

A. Mission Description and Justification: Expanding regional power threats require an evolutionary improvement program to maintain the effectiveness of the Hellfire, Army Tactical Missile System (ATACMS), TOW and Hydra-70 systems. The Longbow Hellfire missile provides a fire-and-forget capability, greatly increasing the Longbow weapon system's effectiveness and aircraft survivability. The Longbow system is deployable by day or night, in adverse weather, and in countermeasures environments. The Longbow Hellfire Product Improvement Program (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 Hellfire Missile System's low vulnerability and susceptibility to existing and future "hard kill" Active Protection System (APS) threats and battlefield jammer threats.

FY 1999 Accomplishments: Project not funded in FY 1999.

FY 2000 Planned Program: Project not funded in FY 2000.

FY 2001 Planned Program:

- 10294 Product Development
- 744 Support Costs
- 621 Test and Evaluation Support (includes 5 prototype test articles)
- 618 Management Services Support

Total 12277

B. Other Program Funding Summary Missile Procurement Army	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
C70300 Longbow Hellfire/LBHF	343294	292851	285363	222722	184037	26117	22178	Cont	Cont

C. Acquisition Strategy: Development of the Longbow Hellfire HOJ/AJ and CAPS will be done jointly with the prime contractor, Longbow Limited Liability Company (LLLC). The U.S. Army Aviation and Missile Command (AMCOM) labs will provide assistance/technical expertise during the development effort.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0203802A Other Missile Product Improvement Programs PROJECT D785

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Concept formulation/acquisition strategy LBHF PIP			1st Qtr				
LLLC contract award LBHF PIP			1st Qtr				
Requirements definition LBHF PIP			1st Qtr				
Complete detailed design LBHF PIP				1st Qtr			
Integration and testing LBHF PIP				2nd Qtr			
Missile firings LBHF PIP				4th Qtr			
Engineering Change Proposal LBHF PIP				4th Qtr			

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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. LLLC	LC/CPFF	TBD						10014	Nov	13705	23719	
b. RDEC Spt Contracts	TBD	TBD						280	Dec	296	576	
Subtotal Product Development:								10294		14001	24295	

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								205	Qtrly	422	627	
b. RDEC Support								539	Qtrly	912	1451	
Subtotal Support Costs:								744		1334	2078	

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								621	Qtrly	1968	2589	
Subtotal Test and Evaluation:								621		1968	2589	

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.

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0203802A Other Missile Product Improvement Programs

PROJECT: D785

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	917	1535	
Subtotal Management Services:								618		917	1535	

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

Project Total Cost:											
							12277		18220	30497	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)
	PROJECT D107

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D107 Integrated System Control (ISYSCON) Development	34086	18293	38926	33520	7700	8759	10786	Continuing	Continuing

A. Mission Description and Budget Item Justification: A requirement exists to automate Signal Corps units' 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 V(4) is also being developed to do network planning and management of the Tactical Internet at Brigade and Below (EPLRS, SINCGARS, FBCB2, etc), as well as the TOC LAN. The Joint Network Management System (JNMS) is a commander in Chief (CINC), Commander, Joint Forces (CJF) communications planning and management tool. It provides the capability to conduct high level planning (war planning); detailed planning and engineering; monitoring; control and reconfiguration; spectrum planning and management; and security of networks supporting joint operations. The JNMS will be developed in phases, System Architecture, Key Performance Parameter (KPP) Threshold, Threshold and Objective. **FY 2000** ISYSCON supports the development of P2 Increment 2 software, operational test, training, and software release of P2 Increment 1. ISYSCON V(4) will be issued to the First Digitized Division, support FQT of Release 2 software, accomplish NET Training and support Operational Assessment of Release 1 & 2 software (participate in FBCB2 test events). **FY 2001** ISYSCON completes the development of P2 Increment 2 software, initiates development of P2 Increment 3 software, and supports operational test, training, and software release of P2 increment 2. ISYSCON (V) 4 will continue integration of EPLRS Network Manager functions, pursue Information Assurance Management integration, begin SINCGARS Network Manager integration, and initiate integration on New Tactical Internet components (e.g. Fire Support, Air Defense and Land Warrior). JNMS supports the development of the KPP Threshold requirements for initial fielding in FY03 to meet Defense Planning Guidance and continue remaining Threshold requirements. This program element also supports any network management development required for PM, Warfighter Information Network – Terrestrial (WIN-T).

FY 1999 Accomplishments:

- 1656 ISYSCON Conduct Post Test Support & Report Preparation for IOT&E Phase II
- 3062 ISYSCON Continue Software Requirements Analysis Phase 2 Inc 1
- 3391 ISYSCON Conduct Software Coding for P2 Inc 1 Baseline
- 1750 ISYSCON Deliver & Support P2 Inc 1 BETA Delivery
- 2750 ISYSCON Conduct Unit Test System Test for P2 Inc 1 Baseline
- 2400 ISYSCON Migration to COE Compliance – Level 6
- 2700 ISYSCON Initiate Concept Requirement Review for P2 Inc 2
- 3100 ISYSCON Initiate Software Requirements Analysis for P2 Inc 2
- 2200 ISYSCON Initiate System Design for P2 Inc 2 Baseline

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)
	PROJECT D107

FY 1999 Accomplishments: (continued)

•	3104	TI (V)4 Initiate Software & Requirement Analysis for ISYSCON V4 (Block 1 & 2)
•	3002	TI (V)4 Initiate System Design for ISYSCON V4 (Block 1 & 2)
•	2175	TI (V)4 Conduct Software Coding for ISYSCON V4(Block 1 & 2)
•	1137	TI (V)4 Integration on FBCB2 platform (Block 1 & 2)
•	1659	TI (V)4 Lab Development, test and report (Block 1 & 2)
Total	34086	

FY 2000 Planned Program:

•	1600	ISYSCON Conduct P2 Inc 1 Training V&V
•	2150	ISYSCON Conduct P2 Inc 1 FQT
•	1500	ISYSCON Conduct P2 Inc 1 Confidence Testing
•	1551	ISYSCON Conduct P2 Inc 1 LUT Training
•	2000	ISYSCON Conduct P2 Inc 1 LUT Testing
•	1200	ISYSCON Conduct P2 Inc 1 Software Release
•	2800	ISYSCON Initiate Software Coding for P2 Increment 2
•	2300	ISYSCON Conduct Unit Test, System Test for P2 Increment 2
•	1000	TI (V)4 Continue Lab Development, test and report (Block 1 & 2)
•	200	TI (V)4 Conduct Operational Assessment Test (Block 1 & 2)
•	1000	TI (V)4 Initiate Fielding and Training Block 2
•	500	TI (V)4 Initiate Field Support Block 2 (Interim Contractor Support)
	492	Small Business Innovation Research (464)/Small Business Technology Transfer Program (28)
Total	18293	

FY 2001 Planned Program:

•	2355	ISYSCON Conduct P2 Inc 2 Training V&V
•	2750	ISYSCON Conduct P2 Inc 2 FQT
•	1932	ISYSCON Conduct P2 Inc 2 Confidence Test
•	2400	ISYSCON Conduct P2 Inc 2 OT&E Training
•	2000	ISYSCON Initiate Concept Requirement Review for P2 Inc 3
•	2900	ISYSCON Initiate Software Requirements Analysis for P2 Inc 3
•	2511	ISYSCON Initiate System Design for P2 Inc 3

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)
	PROJECT D107

FY 2001 Planned Program: (contiuned)

- 2578 ISYSCON Initiate Software Coding for P2 Inc 3
- 750 TI (V)4 Complete Fielding and Training Block 2
- 1500 TI (V)4 Complete Field Support Block 2
- 500 TI (V)4 Initiate Software Requirements Analysis Block 3
- 1000 TI (V)4 Initiate Software Design Block 3
- 1750 TI (V)4 Conduct Software Coding Block 3
- 1000 TI (V)4 Integrate on FBCB2 Block 3
- 1500 TI (V)4 FQT Block 3
- 1000 TI (V)4 Field exercise and LUTs (synchronized with FBCB2 Test events)
- 2475 JNMS Initiate Concept Requirement and Analysis
- 4025 JNMS Initiate System Design
- 3591 JNMS Initiate Software Integration
- 409 JNMS Initiate Training for User Evaluation

Total 38926

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	35664	18432	19666
Appropriated Value	35941	18432	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-277		
b. SBIR / STTR	-945		
c. Omnibus or Other Above Threshold Reductions		-75	
d. Below Threshold Reprogramming	-489		
e. Rescissions	-144	-64	
Adjustments to Budget Years Since FY 2000/2001 PB			+19260
Current Budget Submit (FY 2001 PB)	34086	18293	38926

Change Summary Explanation: FY 2001 plus up funds TI Manager (V) 4 ($9M), JNMS ($10.5M).

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0208010A Joint Tactical Communications Program (TRI-TAC)
	PROJECT D107

E. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Other Procurement, Army-2, BX0007	15829	14646	26558	19062	15765	4646	1977	Cont'd	Cont'd

D. Acquisition Strategy: **ISYSCON** Competitive Engineering & Manufacturing Development (EMD) contract was awarded to GD in September 1992. ISYSCON LRIP decision received May 1995. IOT&E I conducted Mar 98. IOT&E II conducted/completed in Oct 98. LRIP systems supported IOT&E. Received successful MS III FEB 99 for ISYSCON (V)1 and (V)2. ISYSCON P2 Inc 1 software will support fielding of production systems starting with ECB units. ISYSCON Production systems will include acquisition of GFE (CHS/SICPS) hardware for the integration into system assemblages and fielding. **TI Manager (V) 4** developed from Army Warfighter Experiments that showed tactical network management and planning to be extremely time consuming. A DD2028 change to the ISYSCON ROC identified the need for Tactical Internet and TOC LAN management. In March 99, PM WIN-T signed a delivery order under the PM FBCB2 contract with TRW, and another with Raytheon under the PM TRCS contract, in response to the DD-2028 requirements. Raytheon is under contract to develop an EPLRS Network Manager (ENM) capability while TRW will develop the remaining TI Mgr functionality (TOC LAN Mgt, Router Configurations, TIC/TIDs, etc) and integrate the ENM software onto a single platform. The TI Mgr is closely coupled to FBCB2 program events, and the Project Manager diverted $2.7M from ISYSCON V1/V2 to TI Manager (V) 4 to continue its development to support the FBCB2 "System of Systems" test requirements (a congressional item of interest). Block 1 of TI Mgr SW will be formally tested at the contractor's facility prior to the FBCB2 LUT 2 (April 00). Final Block 2 will be issued to FDD in SEP 00. IOT&E and MS III decision will be synchronized with FBCB2 in FY02. Anticipate LRIP decision in OCT 00. **JNMS**: A competitive contract will be awarded on a best value basis for the development and integration of the JNMS software. The emphasis for the development will be the use of integration of commercial off the shelf (COTS) and government off the shelf (GOTS) control and management software to fulfill the JNMS requirement. TRADOC approved ORD dated 25 Oct 99.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
ISYSCON Phase 1+ / IOT&E II	1Q						
ISYSCON Milestone III	2Q						
ISYSCON Production Contract Award	2Q						
ISYSCON Phase 2 – Increment 1 FQT		2Q					
ISYSCON LUT P2 Inc 1		3Q					
ISYSCON Phase 2 – Increment 2 FQT			4Q				
ISYSCON OT&E for P2 Inc 2				2Q			
ISYSCON Phase 2 – Increment 3 FQT					1Q		
ISYSCON OT&E for P2 Inc 3					4Q		
ISYSCON Phase 3 – Increment 1						1Q	
ISYSCON Phase 3 – Increment 2							1Q
TI MANAGER (V)4 EPLRS Net Mgr Prototype	2Q						
TI MANAGER (V)4 Block 1 Release		1Q					

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D107

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
TI MANAGER (V)4 Milestone I/II		2Q					
TI MANAGER (V)4 Block 2 Release		4Q					
TI MANAGER (V)4 Milestone IIIa LRIP			1Q				
TI MANAGER (V)4 IOT&E				1Q			
TI MANAGER (V)4 Milestone IIIb Production				4Q			
JNMS Milestone I/II		2Q					
JNMS Contract Award			1Q				
JNMS OT&E				4Q			
JNMS Milestone III				4Q			

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	GD, Raleigh, NC	70856	18210	DEC 98	11532	DEC 99	13366	DEC 00	Cont'd.	Cont'd.	
b. ISYSCON Award Fee Contingencies	CPAF	GD, Raleigh, NC	2909	1101	AUG 99	1480	AUG 00	1631	AUG 01	Cont'd.	Cont'd.	
c. ISYS GFE	FFP	GD, Taunton, Mass	2239			-0-		-0-			2239	
d. TI Manager (V4)												
(1) Software Dev	IDIQ	Raytheon, Fullerton, CA		650	JAN 99	0		1500	NOV 00	Cont'd.	Cont'd.	
(2) Software Dev	CPIF	TRW, Carson, CA	48	9198	JAN 99	1682	MAR 00	5950	NOV 00	Cont'd.	Cont'd.	
e. (3) GFE	FFP	GSA		733	FEB 99	200	MAR 00	250	DEC 00	Cont'd.	Cont'd.	
f. JNMS Development	CPIF	TBD						8922	MAR 01	Cont'd.	Cont'd.	
g. SBIR(464)/STTR(28)						492					492	
Subtotal Product Development:			76052	29892		15386		31619		Cont'd.	Cont'd.	

Remark:

I.a Supports ongoing ISYS (V1-2) 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 ISYSCON prototype hardware requirements in support of IOT&E.

I.d. Supports V4 TI Manager Software Development (FBCB2 & EPLRS Network Mgt).

I.e. Supports ongoing JNMS software development to produce phased products. TRADOC ORD dated 25 Oct 99.

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. ISYS Test Support	N/A	TEXCOM/APG/EPG	1352	750	NOV 98	273	JAN 00	200	NOV 00	Cont'd.	Cont'd.	
b. ISYS SIG CTR	TBD											
c. TI Manager (V)4	TBD	TBD				381	MAR 00	500	DEC 00	Cont'd.	Cont'd.	
d. JNMS Accreditation	TBD	TBD						400	DEC 00	Cont'd.	Cont'd.	
Subtotal Test and Evaluation:			1352	750		654		1100		Cont'd.	Cont'd.	

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.

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	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 Contractor Engr	See remarks		14640	1922	NOV 98	937	NOV 99	2285	NOV 00	Cont'd.	Cont'd.	
b. ISYS Government Engr	NA		10305	744	NOV 98	456	OCT 99	1484	OCT 00	Cont'd.	Cont'd.	
c. ISYS PM Support-CORE	NA		715	217	OCT 98	274	OCT 99	300	OCT 00	Cont'd.	Cont'd.	
d. ISYS Travel	NA		655	170	FY99	165	FY00	160	FY01	Cont'd.	Cont'd.	
e. TI MGR Contractor Engr	TBD					246	JAN 00	300	NOV 00	Cont'd.	Cont'd.	
f. TI MGR Govt Engr	NA			391	NOV 98	175	JAN 00	445	OCT 00	Cont'd.	Cont'd.	
g. TI MGR/JNMS-CORE	NA							110	OCT 00			
h. JNMS Contractor Engr	TBD					0		493	NOV 00	Cont'd.	Cont'd.	
i. JNMS Govt Engr	NA					0		630	OCT 00	Cont'd.	Cont'd.	
Subtotal Management Services:			26315	3444		2253		6207		Cont'd.	Cont'd.	

Remark:
IV.a. Contractor engineering includes PM Support contractor [Nations (T&M)], software development support contractors [MITRE (FFDRC-CPFF) & JSC (CPAF 8%)], and FY01 includes $2M Post Deployment SW Support (PDSS).
IV.d. Travel will be expended throughout the year for Program Management Support.

Project Total Cost:			103719	34086		18293		38926			195024	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)			DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0208053A Joint Tactical Ground Station (TIARA)		PROJECT: M635

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
M635 Joint Tactical Ground Station P3I (TIARA)	11576	27849	6267	5203	3063	2719	3712	4100	71346

A. Mission Description and 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.

FY 1999 Accomplishments:

•	682	Continued Phase I JTIDS and Sensor Fusion development
•	266	Completed Year 2000 (Y2K) development
•	6000	Continued Phase II M3P development
•	336	Provided Phase II M3P Management support
•	4292	Provided Phase II M3P Integrated Product & Process Development (IPPD) Support
Total	11576	

FY 2000 Planned Program:

•	20372	Continue Phase II M3P development
•	6284	Continue Phase II M3P IPPD support
•	343	Continue Phase II M3P Management support
•	100	Complete Phase I development
•	750	Small Business Innovation Research / Small Business Technology Transfer Program
Total	27849	

FY 2001 Planned Program:

•	4611	Continue Phase II M3P IPPD support
•	1341	Continue Phase II M3P development
•	315	Continue Phase II M3P Management support
Total	6267	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0208053A Joint Tactical Ground Station (TIARA)

PROJECT: M635

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	12148	28061	6306
Appropriated Value	12229	28061	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-81		
b. SBIR / STTR	-322		
c. Omnibus or Other Above Threshold Reductions	-202	-115	
d. Below Threshold Reprogramming			
e. Rescissions	-48	-97	
Adjustments to Budget Years Since FY 2000/2001 PB			-39
Current Budget Submit (FY 2001 PB)	11576	27849	6267

C. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	To Compl	Total Cost
Other Procurement Army, OPA-2										
BZ8420 Joint Tactical Ground Station Mods	2607									2607

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.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Conduct Phase II Preliminary Design Review	4Q 99						
Continue P3I Phase II Development		1Q 99					
Complete P3I Phase I Development		1Q 99					
Begin M3P Acceptance Test			2Q 01				
Conduct M3P Certification Test				2Q 02			
Conduct Ground Certification Test					2Q 03		
Complete M3P Acceptance Test					3Q 03		
Conduct P3I Phase II IPR					4Q 03		
Initiate P3I Phase III Program						1Q 03	
Continue P3I Phase III Development							1Q 04

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0208053A Joint Tactical Ground Station (TIARA)

PROJECT: M635

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	6000	Oct 98	20372	Oct 99	1341	Oct 00	4998	33071	
b. Engineering Services	C/CPFF	Aerojet / Azusa, CA	1517	948		100					2565	
c. In-House IPPD Support	N/A	Various	2077	1800	Oct 98	1813	Oct 99	1884	Oct 00	8038	15612	
d. Contractor Engineering IPPD Support	C/CPFF	Various	2145	1320	Oct 98	1241	Oct 99	1178	Oct 00	2888	8772	
e. Government Engineering IPPD Support	N/A	Various	758	1172	Oct 98	1003	Oct 99	1549	Oct 00	1934	6416	
f. Government Furnished Equipment	N/A	Various				2227					2227	
g. SBIR / STTR	N/A	N/A				750					750	
Subtotal Product Development:			6857	11240		27506		5952		17858	69413	

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	315	Oct 00	939	1933	
Subtotal Management Services:				336		343		315		939	1933	

Project Total Cost:			6857	11576		27849		6267		18797	71346	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	14650	15247	8140	8839	9243	9590	10325	Continuing	Continuing
D491 Information Assurance Development	9624	13954	6854	7708	7973	8203	8869	Continuing	Continuing
D501 Army Key Management System (AKMS)	5026	1293	1286	1131	1270	1387	1456	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 that can manage, protect, detect and react to C2 system vulnerabilities, threats, reconfigurations, and reconstitution. The Army's Research Development Test and Evaluation (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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	11338	9426	8178
Appropriated Value	11433	15426	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-95		
b. SBIR / STTR	-281		
c. Omnibus or Other Above Threshold Reductions		-59	
d. Below Threshold Reprogramming	+3639		
e. Rescissions	-46	-120	
Adjustments to Budget Years Since FY 2000/2001 PB			-38
Current Budget Submit (FY 2001 PB)	14650	15247	8140

Change Summary Explanation: Funding - FY1999 funds increased (+3900) in project D501 for Electronic Key Management System (EKMS) Tier 1 – A joint effort with NSA and the Navy.
FY2000 funds increased (+6000) in Project D491 for initiating deployment of defense healthcare information assurance system.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program		PROJECT D491

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D491 Information Assurance Development	9624	13954	6854	7708	7973	8203	8869	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 as well as efforts on tactical networks. Results of this effort are also leveraged into and complement the Tactical C2 Protect ATD in PEs 0602782A and 0603006A.

FY 1999 Accomplishments:

- 700 Completed the development of TACLANE/FASTLANE Internet Security Manager (TISM).
- 200 Provided support to NSA TACLANE program.
- 408 Completed KY-100 AIRTERM Type Classification and design of installation kits; started Type Classification action on TACLANE; performed Evaluation on latest NSA Information Security (INFOSEC) crypto chips.
- 3347 Supported development and evaluation of Common Protect Tools as follows:
  - Investigated and evaluated Commercial-off-the-Shelf (COTS)/Government-Off –the-Shelf (GOTS) of host systems in the areas of purge tools and user identification and authentication. Developed and exercised scripts to stress protect tools during evaluation process to validate true functionality.
  - Investigated and evaluated COTS/GOTS products for Security Management.
  - Developed, integrated, tested and evaluated Tactical Internet Intrusion Detection System tool.
  - Developed first generation graphical interface for security management.
- 3969 Executed Demonstration Program for Military Health Care Information Protection.
- 1000 Army Electronic Key Management System (EKMS) support.

Total 9624

FY 2000 Planned Program:

- 1097 Perform in-house evaluations and integration of INFOSEC Non-Developmental Item (NDI) equipment into both trusted and untrusted computer platforms and secure applications.
- 470 In-house support for TACLANE/FASTLANE thru doing development of installation kits and providing engineering support during system fielding.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303140A Information Systems Security Program
	PROJECT D491

FY 2000 Planned Program: (continued)

- 250 Perform in-house study/evaluation for Secure Gateway (SEGAT) providing seamless, secure connectivity between major Army tactical communications networks and different security levels.
- 3964 Develop and evaluate C2 Protect Common Tools as follows:
  - Select and adapt COTS/GOTS Security Management tools, and develop for use in First Digitized Division (FDD) and beyond.
  - Investigate and evaluate COTS/GOTS C2 protect tools for tactical and/or sustaining base security requirements to include updates to currently selected tools in the areas of vulnerability assessment, host and network based intrusion detection, and firewall.
  - Stress and evaluate commercial or developmental protect tools being considered for use in Army tactical networks.
  - Conduct code analysis of C2 protect tools for weaknesses, Trojan Horses and vulnerabilities that can render systems and networks vulnerable to attack.
- 1949 Support for Army Electronics Key Management System (EKMS) Tier One
- 5873 Support for Defense Health Care Information Assurance Program, continue development of two-phased program for the protection of sensitive data integral to the military healthcare information system.
- 351 Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs

Total 13954

FY 2001 Planned Program:

- 950 Support development efforts on Secure Gateway program.
- 1000 Support in-house evaluations of NDI and NSA INFOSEC devices and chips, provide engineering/fielding support to TACLANE and Asynchronous Transfer Mode (ATM) encryption program with development of necessary installation kits.
- 4904 Support the development and evaluation of C2 Protect Common Tools as follows:
  - Ensure remote monitoring and host agent operation.
  - Extend security management concept for framework that can manage echelons, corps and below.
  - Tie in protect tools at sustaining base.
  - Support sync events to verify robustness of network tools.

Total 6854

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Comp	Total Cost
OPA TA0600	34157	57187	54374	45578	25006	19261	19242	cont'd	cont'd

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0303140A Information Systems Security Program / PROJECT: D491

C. **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 FDD. FY 1999 and beyond focuses on completing development and evaluation of C2 Protect tools for the FDD and beyond 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. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
AIRTERM (KY-100)							
• OEC Test							
• 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							
• Laboratory Testing	4QTR						
Secure Gateway							
• Study		3QTR					
• Prototype Development Initiation			3QTR	3QTR	3QTR	3QTR	
C2 Protect							
• Network Access Control	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR
• Intrusion Detection Control	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR
• Host Machine Vulnerabilities	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR
• Risk Management	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR
• Anti-Viruses	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR
• Purge Tools	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR
• Audit Analysis	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR	4QTR

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0303140A Information Systems Security Program

PROJECT: D491

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	5618	640	11/20/98					0	6258	
b. System Engineering	PO	CECOM, RDEC	10149	2406	1/1/99	4676	01/01/00	5254	01/01/01	Cont'd	Cont'd	
c. TACLANE	MIPR	NSA	2452							0	2452	
d. SEGAT	CPFF	TBA				250	01/01/00	980	01/01/01	Cont'd	Cont'd	
e. EKMS	MIPR	Navy, Washington		1000	1/1/99	1949	01/01/00			0	2949	
f. Contracted Services												
(1)	C-CPFF	Booz, Allen & Hamilton , Linthicum MD	1197	598	2/4/99	375	02/04/00	375	02/04/01	2250	4795	
(2)	C-CPFF	SYTEX, Inc Tinton Falls, NJ	937			245	02/10/00	245	02/10/01	1470	2897	
(3)	C-Reimb.	Mitre, McLean, VA		540	12/16/98	513	12/03/99				1053	
(4)	CPAF	Telos, Tinton Falls, NJ		471	3/15/99						471	
g. DHIAP	TBD	Army Medical Command	6307	3969		5946				TBD	TBD	
Subtotal Product Development:			26660	9624		13954		6854		Cont'd	Cont'd	

II. Support Costs: Not applicable

III. Test and Evaluation: Not applicable

IV. Management Services: Not applicable

Project Total Cost:			26660	9624		13954		6854		Cont'd	Cont'd	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0303140A Information Systems Security Program / PROJECT: D501

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D501 Army Key Management System (AKMS)	5026	1293	1286	1131	1270	1387	1456	Continuing	Continuing

A. Mission Description and Budget Item Justification: 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.

FY 1999 Accomplishments:

- 1126 Provided software development upgrades to the AKMS Workstation development environment that allows continued support of emerging and future weapons systems. Funding for development of "modules" for specific weapon systems was provided by the respective weapon system.
- 3900 Supported Electronic Key Management System (EKMS) Tier One.

Total 5026

FY 2000 Planned Program:

- 1258 Continue software development upgrades to the AKMS Workstation development environment that allows continued support of emerging and future weapons systems. Funding for development of "modules" for specific weapon systems is provided by the respective weapon system.
- 35 Small Business Innovation Research (33) /Small Business Technology Transfer Program (2)

Total 1293

FY 2001 Planned Program:

- 1286 Develop next set of software tools for the AKMS Workstation development environment. Funding for development of "modules" for specific weapon systems is provided by the respective weapon system.

Total 1286

B. Other Program Funding Summary		FY 1999	FY 2000	FY2001	FY 2002	FY 2003	FY 2004	FY 2005	To Comp	Total Cost
OPA BA1201		10194	10988	11051	12154	10126	3756	3970	cont'd	cont'd

C. 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). Milestone III was conducted in June 1999 and the acquisition strategy and type classification for LCMS were approved. The IOC for LCMS is scheduled for 3Q00 and the IOC for ACES is scheduled for 2Q01.

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0303140A Information Systems Security Program

PROJECT: D501

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
PEO IPR							
Critical Design Review	2Q						
Milestone III (LCMS)	3Q						
ACES Software Functional Testing		1Q					
Materiel Release (LCMS)		2Q					
LCMS IOC		2Q					
FOT&E		3Q					
Materiel Release (ACES)			4Q				
ACES IOC			1Q				
AKMS Materiel Release for new Army Acquisition Programs				1-4Q	1-4Q	1-4Q	1-4Q

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	1126	1/99	1293	2/00			Cont'd	Cont'd	Cont
b. Software development	C/T&M	TBD						1286	1/01	Cont'd	Cont'd	Cont
c. EKMS	MIPR	Navy, Washington		3900	1/99						3900	
Subtotal Product Development:			19013	5026		1293		1286		Cont'd	Cont'd	Cont

II. Support Costs: Not applicable

III. Test and Evaluation: Not applicable

IV. Management Services: Not applicable

Project Total Cost:			19013	5026		1293		1286		Cont'd	Cont'd	Cont

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0303141A Global Combat Support System - Army (GCSS-Army)

PROJECT: 083

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
083 Global Combat Support System - Army (GCSS-Army)	0	0	71955	92453	42464	81853	75104	Continuing	Continuing

A. Mission Description and Budget Item Justification: Premier logistics information system being developed to support the logistics management capability for Army 2010 and beyond. Integrates and consolidates 13 legacy system baselines now supporting Army tactical logistics. Consists of six major modules - Supply/Property, Maintenance, Supply Support Activity, Integrated Materiel Management (IMM), Management and Ammunition Supply. Implemented in three Tiers. Tier I is modernization and integration of the current 13 legacy system baselines. Tier 2 integrates wholesale and retail levels of CSS. Tier III implements interfaces with Joint community, national sustaining base and applicable allied systems. This project is not a new start.

FY 1999 Accomplishments: Project funded in O&M, Army

FY 2000 Planned Program: Project funded in O&M, Army

FY 2001 Planned Program:

- 41255 Continue software development, system engineering and testing of Tier I modules resulting in Milestone III for Maintenance Module (Dec 00) and Integrated Materiel Management (IMM) and Management Modules (Mar 01)
- 30700 Funds will be used in support of the New Army Transformation. This begins development to incorporate new functionalities into Tier I and also initiates development and integration of Tiers II and III.

Total 71955

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0303141A Global Combat Support System - Army (GCSS-Army)

PROJECT: 083

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	0	0	0
Appropriated Value			
Adjustments to Appropriated Value			
a. Congressional General Reductions			
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2000/2001 PB			+41255
New Army Transformation Adjustment			+30700
Current Budget Submit (FY 2001 PB)	0	0	71955

Change Summary Explanation: Funding – FY 2001 funding realigned from the O&M, A to the RDTE, A appropriation.

C. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
OPA SSN: W00800	3924	27751	31284	52306	48649	49524	50886		
OMA APE: 432612	19923	43072	10900	16900	19900	15000	15000		

D. Acquisition Strategy: The process owner is Deputy Chief of Staff for Logistics. GCSS-Army is managed by Project Manager, GCSS-Army. PM GCSS-Army is assigned to the PEO, STAMIS, who reports directly to the Army Acquisition Executive. The contracting office for the GCSS-Army acquisition is the Veterans Administration, Dallas, TX. Integrated Process Teams (IPT) were used to formally manage the acquisition process and continue to be used for requirements definition through the Joint Application Development (JAD). The software developers hold numerous JAD meetings bringing the users to a central location, to discuss user needs and develop system requirements. The Army Corporate Information Officer (CIO) has oversight of the GCSS-Army project. The acquisition Program Baseline documents all cost, schedule and technical performance criteria. Performance goals are defined in performance of Mission Essential Tasks (METs) and non-METs. Controls are in place to monitor the technical performance of matrix support organizations, including periodic reviews at all management levels. Reports are used to monitor program cost and schedules. Development, system qualification, and operational and evaluation testing is conducted. The TEMP established management oversight over the testing program. GCSS-Army has developed a Risk Management Plan that identifies risk descriptions, their initiating events and appropriate mitigation/contingency strategies.

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0303141A Global Combat Support System - Army (GCSS-Army)

PROJECT: 083

E. Schedule Profile	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
Milestone III Tier I, Maintenance Module					1Q					
Milestone III Tier I, Integrated Materiel Mgt and Mgt Modules *					2Q					
Milestone III Tier I, Supply Support Activity Module						1Q				
Milestone III Tier I, Integrated Materiel Mgt and Mgt Modules **						2Q				
Milestone III Tier I, Ammunition Supply Module							1Q			

* Milestone III for Release 2 replacing SAMS-2 functionality.
** Milestone III for Release 4 replacing SARSS-2AD, SARSS-2AC, SARSS-Gateway and ILAP functionalities.

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0303141A Global Combat Support System - Army (GCSS-Army)

PROJECT: 083

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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 Dev, Engineering, Testing, Program Management	C/FP	GRCI, McLean, VA				32400	Dec-00		Cont	
b. New Functionalities	C/FP	TBS				30700	Various		Cont	
c. Integrated Concept Team	MIPR	CASCOM, Ft Lee, VA				1400	Dec-00		Cont	
d. Software Dev	MIPR	SDC-L, Ft Lee, VA				2300	Dec-00		Cont	
Subtotal Product Development:						66800			Cont	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	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 Services	C/FP	SRC, Petersburg, VA				2100	Dec-00		Cont	
b. PMO Operations	NA	NA				500			Cont	
c. Engrg, Security & Testing	NA	NA				1255			Cont	
Subtotal Support Costs:						3855			Cont	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. ATEC	MIPR	TEXCOM, Ft Hood, TX				1300	Various		Cont	
Subtotal Test and Evaluation:						1300			Cont	

IV. Management Services: Not applicable

Project Total Cost:						71955			Cont	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	50648	35958	43229	37087	37454	47180	51662	Continuing	Continuing
D253 Defense Satellite Communications Systems-Defense Communications Systems (DSCS-DCS)(Phase II)	15192	8916	9885	11318	11481	13528	13494	Continuing	Continuing
D384 SMART-T	23355	13828	17331	14960	14345	7141	6821	0	298852
D456 MILSATCOM System Engineering	4216	6250	8907	10809	11628	10938	9708	Continuing	Continuing
D559 Automated Communications Management System (ACMS)	7885	5963	6089	0	0	0	0	0	28848
D561 Military Individual Communicator (MIC)	0	1001	1017	0	0	0	0	0	2018
D562 Multiband Integrated Satellite Terminal (MIST)	0	0	0	0	0	9734	14844	Continuing	Continuing
D566 Transit Case MDR (TRAM)	0	0	0	0	0	5839	6795	Continuing	Continuing

A. Mission Description and Justification: Military Satellite Communications (MILSATCOM) systems are joint program/project efforts to satisfy ground mobile requirements for each Service, Joint Chiefs of Staff (JCS), National Command Authority, Commanders-In-Chief (CINCs), National Security Agency and Office of the Secretary of Defense and other governmental, non-DoD users. 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. As the lead service for MILSATCOM Ground Subsystems, the Army is responsible for developing, and procuring satellite terminals; satellite control subsystems; communications subsystems and all related equipment. This also includes maintaining the life cycle logistics support, 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.

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

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	52447	36230	47743
Appropriated Value	53897	36230	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-1450		
b. SBIR / STTR	-1394		
c. Omnibus or Other Above Threshold Reductions		-148	
d. Below Threshold Reprogramming	-193		
e. Rescissions	-212	-124	
Adjustments to Budget Years Since FY 2000/2001 PB			-4514
Current Budget Submit (FY 2001 PB)	50648	35958	43229

Change Summary Explanation: Funding - FY 2001: The funding decreases to projects D456 MILSATCOM Systems Engineering (-3306) and D559 ACMS (-3102), and a funding increase to project D253 DSCS (+2003) are to realign project funding with current estimates and program priorities.

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D253

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D253 Defense Satellite Communications Systems-Defense Communications Systems (DSCS-DCS)(Phase II)	15192	8916	9885	11318	11481	13528	13494	Continuing	Continuing

A. **Mission Description and Budget Item Justification:** **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.

FY 1999 Accomplishments:

•	473	Completed the Replacement BATSON (RBATSON) program
•	3610	Continued the DSCS Integrated Management System (DIMS) Interface Software program
•	3700	Initiated the Common Network Planning Software (CNPS) program
•	5554	Developed test bed, test link, and engineering and installation standards in support of the Defense Information System Network - Europe
•	1855	Continued SATCOM Engineering Lab (SEL), PM Admin, and SETA efforts
Total	15192	

FY 2000 Planned Program:

•	3000	Continue the DIMS Interface Software program
•	4278	Continue CNPS program
•	1398	Continue SEL, PM Admin and SETA efforts
•	240	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	8916	

FY 2001 Planned Program:

•	3617	Continue the DIMS Interface Software program
•	5001	Continue CNPS program
•	1267	Continue SEL, PM Admin and SETA efforts
Total	9885	

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

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
OPA 2 - SSN: BB8500	93896	68489	72034	62733	55610	78708	79723	Cont	Cont

C. **Acquisition Strategy:** The Replacement BATSON (RBATSON) program will be followed by a competitive firm fixed price procurement program that contain a basic production year followed by one option year of production. 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. PM DCATS also developed a test bed, test link, and engineering and installation standards in support of the Defense Information System Network - Europe. 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.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Complete RBATSON Testing	4Q						
Award CNPS Contract	3Q*						
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			4Q				

*Denotes Milestone Completion

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	4115	3152	Jan 99	2637	Feb 00	3142	Jan 01	14644	27690	
b. CNPS	C / FFP	Logicon, Winter Park, FL		3000	Apr 99	3654	Mar 00	4301	Mar 01	10704	21659	
c. Microwave Test Link	C / FFP	Alcatel, Plano, TX		5554	Feb 99						5554	
Subtotal Product Development:			4115	11706		6291		7443		25348	54903	

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		1155		621		750		Cont	2526	
b. SETA Support	C / CPFF	Fort Monmouth, NJ		276		266		325		Cont	867	
c. Engineering Support	SS / CPFF	JHU/APL, Laurel, MD		200		100		100		Cont	400	
d. Core Support	Various	Fort Monmouth, NJ		300		300		300		Cont	900	
Subtotal Support Costs:				1931		1287		1475			4693	

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	741		325		193		Cont	2009	
Subtotal Test and Evaluation:			750	741		325		193			2009	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D253

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		814		773		774		Cont	2361	
b. SBIR/STTR						240					240	
Subtotal Management Services:				814		1013		774			2601	
Project Total Cost:			4865	15192		8916		9885		25348	64206	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0303142A Satellite Command (SATCOM) Ground Environment — PROJECT: D384

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D384 SMART-T	23355	13828	17331	14960	14345	7141	6821	0	298852

A. Mission Description and Budget Item Justification: 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 as the Division front expands. 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) and the Navy Fleetsatcom EHF satellite packages 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. In order to maintain proficiency with the terminal given limited satellite access for training, a new EHF payload simulator is being developed for use at Fort Hood. The SMART-T provides mobile anti-jam reliable communications for the warfighter.

FY 1999 Accomplishments:

•	10503	Continued development of Demand Assigned Multiple Access (DAMA), and begin development of Packet DAMA
•	8030	Completed Network Control development efforts and complete Advanced Extremely High Frequency (AEHF) test bed feasibility efforts
•	4822	Continued payload specification change development work
Total	23355	

FY 2000 Planned Program:

•	4781	Complete development of DAMA and continue development of Packet DAMA
•	3650	Begin EHF satellite payload simulator development efforts for a new simulator at Fort Hood
•	2731	Continue payload specification change development work
•	1300	Operate interim EHF "lab configured" payload simulator at Fort Hood
•	1000	Begin initial AEHF component efforts
•	366	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	13828	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment
	PROJECT D384

FY 2001 Planned Program:

- 8397 Continue AEHF development efforts and continue payload specification change development work
- 4950 Continue Packet DAMA development efforts
- 3984 Complete development of satellite payload simulator at Fort Hood

Total 17331

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Other Procurement Army 2 - SSN: BC 4002	56128	31761	48594	19606	12675	32832	20140	12305	33280
Other Procurement Army 4 - SSN: BS 9720	1726	0	5196	2553	1967	1363	1167	0	16356

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 occurred in Jan 99. The FRP contract will include a block implementation of RDTE-funded terminal Baseline modifications for Demand Assigned Multiple Access (DAMA), Packet 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 were procured during LRIP (base year plus one option). The Air Force procured 9 terminals during LRIP. The Full Rate Production (FRP) quantities (166 Army terminals) are awarded as fixed price options to the LRIP/FRP contract. Additional quantities (i.e., 100) will be procured for the Air Force, Marine Corps, JCSE, and other DoD.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
MS III	1Q*						
FRP Award	2Q*						
FOT&E			1Q				
Complete DAMA Development		2Q					
Begin Development of Remaining Block Mods for Packet DAMA and Advanced EHF	2Q*						
IOC			2Q				
Complete Network Control Development Efforts	4Q*						

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D384

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Begin New EHF Simulator (Fort Hood)		2Q*					
Complete New EHF Simulator			4Q				
Complete Development of Remaining Block Mods						2Q	
Complete Payload Specification Change Development							4Q

*Denotes Milestone Completion

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D384

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 b. Contracts	C / CPIF	Rockwell Richardson, TX Raytheon Marlborough, MA	117173								117173	
c. Baseline Mods	SS / CPAF	Raytheon Marlborough, MA	26852	17825	Jan 99	6762	Jan 00	11397	Jan 01	39367	102203	
d. Govt Support	MIPR	Various	12239	450		450		550		1500	15189	
e. GFP	MIPR	Various	149								149	
Subtotal Product Development:			156413	18275		7212		11947		40867	234714	

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			3650	Feb 00	3984	Jan 01		20144	
b. DT&OT Test Support	MIPR	Lincoln Labs Lexington, MA	6700								6700	
c. Test Bed Development	MIPR	Lincoln Labs Lexington, MA		2980	Feb 99						2980	
Subtotal Test and Evaluation:			19210	2980		3650		3984			29824	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D384

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			1300					7900	
b. SBIR/STTR						366					366	
Subtotal Management Services:			6600			1666					8266	
Project Total Cost:			201071	23355		13828		17331		43267	298852	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D456

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D456 MILSATCOM System Engineering	4216	6250	8907	10809	11628	10938	9708	Continuing	Continuing

A. **Mission Description and Budget Item Justification:** **Project D456 - MILSATCOM System Engineering:** The 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.

FY 1999 Accomplishments:

•	1437	Conducted various development efforts or analysis to provide enhanced terminal capability
•	750	Continued Battlefield Digitization architecture efforts for 4ID
•	1036	Advanced SATCOM architecture development (Advanced EHF (AEHF) and Wideband Gap Filler System (WGS)))
•	993	AEHF waveform development
Total	4216	

FY 2000 Planned Program:

•	2174	Conduct various development efforts or analysis to provide enhanced terminal capability
•	1743	Continue Battlefield Digitization architecture efforts for 4ID and IIICorps
•	1200	Advanced SATCOM architecture development and System Engineering Support (AEHF and WGS)
•	964	AEHF waveform development
•	169	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	6250	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303142A Satellite Command (SATCOM) Ground Environment
	PROJECT D456

FY 2001 Planned Program:

- 3706 Conduct various development efforts or analysis to provide enhanced terminal capability (EHF, SHF and Commercial Bands)
- 2560 Continue Battlefield Digitization architecture efforts for IIICorps
- 1100 Advanced SATCOM architecture development and System Engineering Support (AEHF and AWB)
- 941 AEHF waveform development
- 600 Initial Ka Band (STAR-T)

Total 8907

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
Other Procurement Army 2 - SSN: K77200	2887	6547	3475	499	2298	599	0	0	13907
Other Procurement Army 2 - SSN: BB8417	6896	498	1489	1486	5019	4848	4842	Cont	Cont
Other Procurement Army 2 - SSN BA9350	25034	13936	38307	76566	65681	56003	55944	Cont	Cont
Other Procurement Army 2 - SSN BC4002	56128	31761	48594	19606	12675	32832	20140	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	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Comm-On-The-Move (COTM) Integration for 4ID	2Q*						
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*						
Complete UHF/EHF Terminal Integration with Tactical Internet		4Q					
Conduct Advanced EHF and Wideband System		1Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	
Complete Advanced EHF and Wideband System							4Q

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D456

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Initiate Design of Ka Band into STAR-T			1Q				
Conduct Integration of SATCOM Systems into Digitized Architecture	1Q - 4Q*	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	

*Denotes Milestone Completion

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	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 Upgrades	Various	Various	174	450	Jan 99	900	Jan 00	3125	Jan 01	Cont	4649	
Subtotal Product Development:			174	450		900		3125			4649	

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. Engineering (In-House)	MIPR	Various	571	1140	Jan 99	1323	Jan 00	2009	Jan 01	Cont	5043	
b. Engineering (Contract)	Various	Various	747	797	Jan 99	1266	Jan 00	1228	Jan 01	Cont	4038	
Subtotal Support Costs:			1318	1937		2589		3237			9081	

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	650	Jan 00	658	Jan 01	Cont	2708	
b. Test Support	Various	Various	343	336		642		628		Cont	1949	
Subtotal Test and Evaluation:			1143	936		1292		1286			4657	

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. Advanced EHF & Architecture	MIPR	Lincoln Labs Lexington, MA	1200	893	Jan 99	1300	Jan 00	1259	Jan 01	Cont	4652	
b. SBIR/STTR						169					169	
Subtotal Management Services:			1200	893		1469		1259			4821	

Project Total Cost:	3835	4216		6250		8907			23208	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D559

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D559 Automated Communications Management System (ACMS)	7885	5963	6089	0	0	0	0	0	28848

A. Mission Description and Budget Item Justification: **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 is the joint network planning and control tool for MILSTAR and UFO/E satellite communication. The Army will integrate the ACMS into the WIN SYSCON environment to provide EHF planning and network control capabilities to the tactical users. All Services (USAF, Army, and Navy) are funding for their unique software and hardware requirements.

FY 1999 Accomplishments:

•	6473	Continued development, integration, test and fielding of incremental control capability (includes Interim Control System)
•	576	Participated in MILSTAR Intersegment Testing
•	836	Participated in Joint Technical Reviews, System Requirement Reviews, Management Reviews, Technical Interchange Meetings, and Technical Demonstrations
Total	7885	

FY 2000 Planned Program:

•	5040	Continue development, integration, test and fielding of incremental control capability (includes Interim Control System)
•	463	Support terminal test programs
•	300	Participate in Joint Technical Reviews, Management Reviews, Technical Interchange Meetings, and Technical Demonstrations
•	160	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	5963	

FY 2001 Planned Program:

•	5350	Complete development, integration, test and fielding of incremental control capability
•	412	Support terminal test programs
•	327	Participate in Joint Technical Reviews, Management Reviews, Technical Interchange Meetings, and Technical Demonstrations
Total	6089	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0303142A Satellite Command (SATCOM) Ground Environment / PROJECT: D559

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. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2004	FY 2005
Complete ACMS Build 2 INC 1		4Q						
Complete ACMS Build 2 INC 2			4Q					
Initiate Interim Support of Terminal Deployments	1Q*							
Participate in MST-8000		4Q	1Q					
Complete SYSCON Integration / ACMS Build 2 Capability			4Q					
Fielding of Interim Capability in Progress			3-4Q					

*Denotes Milestone Completion

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D559

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	Dec 98	750	Nov 99	750	Nov 00	0	3500	
b. ACMS Development	MIPR	NRAD San Diego, CA	2000	0		2000	Jan 00	2000	Jan 01	0	6000	
c. ACMS Development	Various	Ft. Monmouth, NJ	0	800	Jul 99						800	
d. MCPT-I Development and Training	SS / CPAF	CSC/Lincom Eatontown, NJ	2977	3173	Dec 98	1044	Jan 00	663	Jan 01	0	7857	
Subtotal Product Development:			5977	4973		3794		3413			18157	

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					0	1400	
b. Test Support	Various	Various	560	847	Jan 99	805	Jan 00	772	Jan 01	0	2984	
c. Test Support	MIPR	APL, Laurel, MD				300	Jan 00	600	Jan 01		900	
Subtotal Test and Evaluation:			1360	1447		1105		1372			5284	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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						160					160	
Subtotal Management Services:			1200	900		610		900			3610	
Project Total Cost:			8911	7885		5963		6089			28848	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D561

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D561 Military Individual Communicator (MIC)	0	1001	1017	0	0	0	0	0	2018

A. Mission Description and Budget Item Justification: **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.

FY 1999 Accomplishments: Project not funded in FY 1999

FY 2000 Planned Program:

- 428 Conduct market survey to identify/assess industry interest and capability for development/production of MIC
- 546 Conduct engineering analysis to determine feasibility of achieving miniaturization to hand-held configuration
- 27 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 1001

FY 2001 Planned Program:

- 812 Conduct equipment demonstrations for industry participants with existing or emerging MIC capabilities
- 205 Conclude engineering analysis and feasibility study

Total 1017

B. Other Program Funding Summary: Not applicable

C. Acquisition Strategy: This project funds advanced systems engineering, research, development, test and evaluation of commercial technologies for the realization of one-way miniaturized communications capability in a hand-held configuration. The initial feasibility analysis will include market survey and industry equipment demonstrations.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Initiate Market Survey and Studies		1Q - 4Q					
Test & Evaluation			1Q – 4Q				

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	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. MIC	C / CPFF	TBD	0	0		770	Feb 00	812	Dec 00	Cont	1582	
Subtotal Product Development:						770		812			1582	

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. Systems Engineering	Various	Ft Monmouth, NJ	0	0		81	Dec 99	80	Dec 00	Cont	161	
Subtotal Support Costs:						81		80			161	

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	Ft Monmouth, NJ	0	0		50	Mar 00	50	Mar 00	Cont	100	
Subtotal Test and Evaluation:						50		50			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. Core Support	MIPR	Ft Monmouth, NJ	0	0		73	Feb 00	75	Feb 00	Cont	148	
b. SBIR/STTR						27					27	
Subtotal Management Services:						100		75			175	

Project Total Cost:						1001		1017			2018	

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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150A Army Global Command and Control System (AGCCS)
	PROJECT DC86

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DC86 Army Global Command and Control System	17455	11542	14234	14070	13105	5621	7723	9000	158899

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). AGCCS provides automated command and control tools for Army Strategic and Theater Commanders to enhance warfighter capabilities throughout the spectrum of conflict during joint and combined operations in support of the National Command Authority (NCA). 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 1999 Accomplishments:

- 2414 Performed Systems Engineering
- 11800 Continued Prime Mission Software Development
- 511 Performed Data Engineering
- 1121 Conducted Systems Test and Evaluation
- 1609 Performed Program Support and Management Efforts

Total 17455

FY 2000 Planned Program:

- 2472 Perform Systems Engineering
- 5115 Continue Prime Mission Software Development
- 670 Perform Data Engineering
- 1373 Conduct Systems Test and Evaluation
- 1685 Perform Program Support and Management Efforts
- 227 Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) programs

Total 11542

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150A Army Global Command and Control System (AGCCS)
	PROJECT DC86

FY 2001 Planned Program:

- 2739 Perform Systems Engineering
- 7474 Continue Prime Mission Software Development
- 939 Perform Data Engineering
- 1049 Conduct Systems Test and Evaluation
- 2033 Perform Program Support and Management Efforts

Total 14234

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	17339	11606	14295
Appropriated Value	17543	11606	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-204		
b. SBIR / STTR	-363		
c. Omnibus or Other Above Threshold Reduction	+73	-35	
d. Below Threshold Reprogramming	+474		
e. Rescissions	-68	-29	
Adjustments to Budget Years Since FY 2000/2001 PB			-61
Current Budget Submit (FY 2001 PB)	17455	11542	14234

C. Other Program Funding Summary Procurement OPA-2	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
BA8250 Army Global Cmd & Cont Sys (AGCCS)	20406	12903	10355	7717	8271	8292	8283	81000	221334

D. Acquisition Strategy: The AGCCS software integration and development effort is a multi-year incrementally funded spiral development effort. Spiral development will ensure interoperability with Joint and ABCS Systems as well as continuing development of objective Operational Requirements Document (ORD) capabilities. 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

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0303150A Army Global Command and Control System (AGCCS)
	PROJECT DC86

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	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
AGCCS Delivery 3 Complete	2Q					
Incremental Enhancements Start	2Q					
AGCCS Delivery 4 Start		3Q				
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			

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	FY1999 Cost	FY1999 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	10400	27 Oct 98	6523	3 Nov 99	5835	Nov 00		67136	76571
b. COE Support	MIPR	Various	1450	316	27 Oct 98						1766	
c. GFE	MIPR	Various	1089	375	27 Oct 98					3634	5098	
d. TBD	TBD	TBD						3378	30 Mar 01	25516	28894	
e. SBIR/STTR						227					227	
Subtotal Product Development:			46917	11091		6750		9213		29150	103121	

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 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	20 Nov 98	573	8 Nov 99	573	Nov 00	1548	4291	
b. Vitro/FCBS/Sytex	MIPR/Del Ord	Various	2125	264	21 Apr 99	723	9 Apr 00	723	Apr 01	2798	6633	
c. SAIC	MIPR/Del Ord	Various	1545	846	15 Dec 98	1245	5 Nov 99	1245	Dec 00	1850	6731	
Subtotal Support Costs:			4875	1502		2541		2541		6196	17655	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 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	27 Oct 98						2155	
b. EPG	MIPR	Various	786								786	
c. OPTEC	MIPR	Various	202	100	15 Dec 98	100	27 Jan 00	100	Dec 00		502	
Subtotal Test and Evaluation:			2944	299		100		100			3443	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: DC86

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY1999 Cost	FY1999 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 ATCCS	N/A	Various	11345	4563	27 Oct 98	2151	22 Oct 99	2380	Oct 00	14241	34680	
Subtotal Management Services:			11345	4563		2151		2380		14241	34680	
Project Total Cost:			66081	17455		11542		14234		49587	158899	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305114A Joint Precision Approach Landing System (JPALS)

PROJECT: D711

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D711 Joint Precision Approach Landing System (JPALS)	0	0	783	781	975	973	1942	Continuing	Continuing

A. Mission Description and Budget Item Justification: 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 operations missions including those operating from fixed base, ship, tactical and austere environments. Effort develops the 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. Project in this Program Element supports research efforts in the Architecture and Requirements Definition phase of the modified acquisition life cycle approved by the Defense Acquisition Executive in September of 1998.

FY 1999 Planned Program: Project not Army funded in FY 1999, Air Force funded.

FY 2000 Planned Program: Project not Army funded in FY 2000, Air Force funded.

FY 2001 Planned Program:

•	783	Support the joint effort by providing system engineering, logistics and technical documentation for JPALS Development effort.
Total	783	

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	0	0	788
Appropriated Value			
Adjustments to Appropriated Value			
a. Congressional General Reductions			
b. SBIR / STTR			
c. Omnibus or Other Above Threshold Reductions			
d. Below Threshold Reprogramming			
e. Rescissions			
Adjustments to Budget Years Since FY 2000/2001 PB			-5
Current Budget Submit (FY 2001 PB)	0	0	783

C. Other Program Funding Summary: JPALS is a joint program with the Air Force (lead service) funding FY99/00: PE 0603860F, Project 644652.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305114A Joint Precision Approach Landing System (JPALS)
	PROJECT D711

D. **Acquisition Strategy:** The acquisition strategy is to support the joint research and development effort leading to production of a joint system

E. Schedule Profile	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Supports JPALS efforts					1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305128A Security and Intelligence Activities

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	899	6866	0	0	0	0	0	0	8284
H12 Intelligence Support to Force XXI	899	0	0	0	0	0	0	0	1418
H13 Information Dominance Center (IDC)	0	6866	0	0	0	0	0	0	6866

A. Mission Description and 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. This program element also provides funding for the Information Dominance Center (IDC). The IDC is a beta development and demonstration facility, which uses advanced indigenously developed software and architectures for harvesting, visualizing, displaying, sharing across organizations, analyzing, fusing, and developing courses of action for commanders and decision makers in a real-time environment. The center can address both a tactical or strategic threat across a wide array of transnational and asymmetrical foes.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	944	0	0
Appropriated Value	950	7000	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-6		
b. SBIR / STTR	-25		
c. Omnibus or Other Above Threshold Reductions		-29	
d. Below Threshold Reprogramming	-16		
e. Rescissions	-4	-105	
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	899	6866	0

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305128A Security and Intelligence Activities

PROJECT: H12

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
H12 Intelligence Support to Force XXI	899	0	0	0	0	0	0	0	1418

A. Mission Description and Justification: This project 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

FY 1999 Planned Program:

- 899 Transition technology horizontally to Corps/Divisions continuing Proofs of Concept test with quarterly integration tests

Total 899

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: 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.

D. Schedule Profile	FY1999	FY2000	FY2001	FY 2002	FY 2003	FY 2004	FY 2005
Proofs of Concept	1-4 Q						

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)			DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305128A Security and Intelligence Activities		PROJECT H13

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
H13 Information Dominance Center (IDC)	0	6866	0	0	0	0	0	0	6866

A. Mission Description and Justification This PE is used to develop a prototype for intelligence analysis and counter-intelligence operations supporting information operation missions. Denying, disrupting, and suppressing the adversary's information flow and his ability to effectively command and control his operations is the Army's goal of waging information age warfare. The IDC is a beta development and demonstration facility, which uses advanced indigenously developed software and architectures for harvesting, visualizing, displaying, sharing across organizations, analyzing, fusing, and developing courses of action for commanders and decision makers in a real-time environment. The center can address both a tactical or strategic threat across a wide array of transnational and asymmetrical foes.

The IDC will play a critical role in Army's development of a full spectrum information operations capability that spans both the offensive and protect arenas. Key to waging an information war against and enemy will be gaining and maintaining full spectrum battlefield visualization, comprehension of enemy and friendly centers of gravity, knowledge of battlefield deception, PSYOP, public affairs, civil affairs, electronic warfare, OPSEC, and understanding of impact upon destruction or disruption of critical nodes (regional and local). The IDC will support Force Protection/anti-terrorism operations by providing predictive analysis and indications and warnings of attacks on our soldiers or infrastructure. The IDC also will be employed in support of peacekeeping and humanitarian aid missions. The IDC will demonstrate and test methodologies and Science and Technology tools that can provide operational plans to fight asymmetric and asynchronous warfare against transnational and non-aligned threats. This new capability would provide the unique collaborative environment to rapidly acquire diverse information, dynamically achieve situational awareness through advanced fusion and visualization techniques, and provide tailored courses of action to warfighters and DA decision-makers.

The IDC will correlate data from local and international media as well as operational and intelligence sources. The center will perform evaluation and prototyping of how threat mapping of political, military, economic, and social fabrics will aid in force protection/facilities protection for U.S. forces on the ground now or that might be sent in later. The IDC will be the prototype for fused battlefield visualization picture of the affects of air war at one location on a big screen display—collateral damage; infrastructure damage; location of paramilitary and military forces (Freedom fighters and Serbs); and dislocation of refugees and resultant humanitarian aid issues. The IDC will demonstrate a fused battlefield visualization picture of foreign and U.S. centers of gravity in support of contingency operations such as \Kosovo and SFOR Operations to help support diplomatic initiatives. It will prototype a fused, object oriented, GIS-oriented, visualization picture of the major political and economic players at international, national, regional, local levels in Serbia and surrounding regions. In addition, the IDC will leverage an ability to analyze a tactical view of the conflict enabling Army to conduct offensive information operations (PSYOP, computer attack, deception and denial, media influence, cover operations) that could be used to compliment the air strikes.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305128A Security and Intelligence Activities
	PROJECT H13

FY 1999 Accomplishments: Project not funded in FY 1999

FY 2000 Planned Program:

•	2687	Core IDC Software/Hardware Integration Contractor Support: This is the key team for integration and prototyping of leading edge technologies into the IDC. In addition, this team prior to integration will perform continuous prototyping of novel solutions. They are fundamentally responsible for overall architectural control and evolution of the composable architecture, which is the foundation for LIWA's operational uniqueness.
•	3995	TUAV Source Selection/System Capabilities Demo Data Storage and Support: This money enables a state of the art 200 Terabyte storage, retrieval, backup and querying capability for a distributed architecture. The IDC is based on a database centric paradigm enabling state of the art business enterprise applications to be incorporated.
•	184	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	6866	

FY 2001 Planned Program: Project not funded in RDTE in FY 2001. Continued development and sustainment will take place using OMA funding-Program BA411128.

B. Other Program Funding Summary: Not applicable

C. Acquisition Strategy: The Army strategy is to add emerging command and control information technology to existing information and decision support architectures. Systems will largely off-the-shelf procurements. A Time and materials contracts, awarded to Sterling Software, are used for software and hardware integration. A time and materials contract awarded to SYTEX, Inc. is used for development of intelligence modeling support.

D. Schedule Profile	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Award of Delivery Order under existing IDIQ Time and Materials contracts	1Q-4Q					
Completion of initial design	1Q-4Q					
Facility Modification Work Begins	1Q-4Q					
Basic Facility Modifications Complete	1Q-4Q					
Initial Capabilities Demonstration	1Q-4Q					
In-Progress Review	1Q-4Q					
First Operational Test of Base Level Analytical systems	1Q-4Q					
Develop Establish Data warehousing/Data mining capability	1Q-4Q					
Develop Establish Connectivity/Collaboration Capability	1Q-4Q					

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305128A Security and Intelligence Activities

PROJECT: H13

D. Schedule Profile	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Develop Information Visualization Capability	1Q-4Q					
C2 Development/Improvements	1Q-4Q					

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305204A Tactical Unmanned Aerial Vehicles

COST (*In Thousands*)	FY 1999 Actual	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	50189	43087	29427	11871	10110	21892	24541	Continuing	Continuing
D114 Tactical Unmanned Aerial Vehicles	50189	43087	27141	11871	10110	21892	24541	Continuing	Continuing
D123 Joint Technical Center Systems Integration Lab	0	0	2286	0	0	0	0	Continuing	Continuing

A. Mission Description and Justification: The Brigade 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, launch and recovery equipment, remote video terminal, Highly Mobile Multi Wheeled Vehicles with trailer(s), and one mobile maintenance facility capable of supporting up to three TUAV systems. This TUAV development effort provides systems in the hands of the brigade operational users as quickly as possible, systems for use in demonstrations/Initial Operational Test & Evaluation (IOT&E) and continues development of TUAV system improvements. Tactical Control System (TCS) software will be integrated with the TUAV system when available and validated. The JTC/SIL is a joint integration center that develops simulations of tactical UAVs and strategic reconnaissance and imagery. It also utilizes the Modernized Imagery Exploitation System (MIES), the Enhanced Tactical Radar Correlator (ETRAC), and a variety of C4I systems and interfaces, namely the Tactical Control System. The MUSE system provides for the development of real-time, interoperable hardware and operator in-the-loop simulations of multiple intelligence systems that may be integrated with larger simulations in support of Service exercises. MUSE development provides a realistic operational environment that supports a wide range of information efforts.

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	53224	3866	4309
Appropriated Value	53636	43866	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-412		
b. SBIR / STTR	-1732		
c. Omnibus or Other Above Threshold Reduction		-179	
d. Below Threshold Reprogramming	-1041		
e. Rescissions	-262	-600	
Adjustments to Budget Years Since FY 2000/2001 PB			25118
Current Budget Submit (FY 2001 PB)	50189	43087	29427

Change Summary Explanation: FY00 and FY01 funding was increased to fully fund the TUAV planned program in accordance with the Army Position of Cost.

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

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D114 Tactical Unmanned Aerial Vehicles	50189	43087	27141	11871	10110	21892	24541	Continuing	Continuing

A. **Mission Description and Budget Item Justification:** The Brigade 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, launch and recovery equipment, remote video terminal, Highly Mobile Multi Wheeled Vehicles with trailer(s), and one mobile maintenance facility capable of supporting up to three TUAV systems. This TUAV development effort provides systems in the hands of the brigade operational users as quickly as possible, systems for use in demonstrations/Initial Operational Test & Evaluation (IOT&E) and continues development of TUAV system improvements. Tactical Control System (TCS) software will be integrated with the TUAV system when available and validated.

FY 1999 Accomplishments:

- 17800 Tactical UAV Low Rate Initial Production (LRIP) Program
- 7200 TUAV Source Selection/System Capabilities Demo
- 4900 Development of TUAV Ground Control Station Architecture (3 Prototypes)
- 350 Army Apache/UAV Interoperability Demonstration
- 10600 Outrider Advance Concept Technology Demonstration (ACTD) Bridge Contract
- 250 Tactical Common Data Link Integration
- 4140 Hunter UAV non-recurring (e.g. Enhanced Mission Payloads) to support JRTC (Joint Readiness Training Center) requirements.
- 4279 Program Management Support
- 200 Improved EO/IR Payload Modification/Integration Assessment for Demo on Hunter
- 270 Advanced Payload Development Support
- 200 Tactical Control System Integration

Total 50189

FY 2000 Planned Program:

- 19944 Tactical UAV Low Rate Initial Production (LRIP) Program
- 3236 Government Furnished Equipment for 4 LRIP TUAV systems for development and IOT&E
- 1500 Tactical Control System Integration
- 3600 Program Management Support
- 5821 Risk Reduction Testing/ST&E/IOT&E Preparation

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

FY 2000 Planned Program: (continued)

- 400 Heavy Fuel Engine Program/Demo Preparation for Shadow 200 UAV
- 2200 ACTD Contract Close-out
- 2226 Advanced Payload Development / Modification / Integration
- 1000 Tactical Common Data Link Integration
- 500 Objective Capability Assessment for Block Upgrades
- 1500 SIL/MUSE
- 1160 Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR)

Total 43087

FY 2001 Planned Program:

- 4058 Complete Tactical UAV Low Rate Initial Production (LRIP) Program
- 1500 Tactical Control System Integration
- 2000 Heavy Fuel Engine Program/Demo for Shadow 200 UAV
- 1660 Tactical Common Data Link Integration
- 2200 Program Management Support
- 6973 Risk Reduction Testing/ST&E/IOT&E
- 750 Site Activation for Fielding LRIP Systems
- 4550 Objective Capability Development of Block Upgrades such as Extended Range/Endurance, TCS, TCDL, Advanced Sensor Payloads and Increased Weight, Space and Power Capacity for Payloads.
- 3450 Advanced Payload Development / Modification / Integration

Total 27141

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
TUAV Procurement (BA0330)	0	796	37789	44670	57356	63064	51350	Continue	Continue

Note: Other related Navy dollars fund the development of TCS software for integration into the TUAV under this project.
Other related DARPA dollars fund the development of the TCDL for integration into the TUAV under this project

C. **Acquisition Strategy:** The Army strategy is to quickly field a TUAV system to meet the Brigade Commander's needs. The system will be largely off the shelf, meeting Key Performance Parameters of the 12 March 1999 Operational Requirements Document (ORD), with other ORD requirements treated as prioritized trade space. Growth to objective requirements will be accomplished using block upgrades. A TUAV Request for Proposal was issued in April 1999 including a Fixed Price Incentive Fee option for Low Rate Initial Production (LRIP) Systems, a full rate production option and various support options. Initial offers were screened and a System Capabilities Demonstration (SCD) was conducted with four contractors. The results from the SCD in conjunction with proposal evaluations resulted in the competitive down select of a Best Value TUAV system. A successful Milestone II ASARC was conducted on 21 December 1999, and a TUAV LRIP contract was awarded to the AAI Corporation on 27

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

December 1999. A successful LRIP program will lead to a MS III decision and award of full rate production. In addition, PEO IEW&S is assessing prudent approaches to accelerating fielding of the TUAV systems following a successful system OPTEMPO demonstration. Continued development of the selected TUAV system will be accomplished through a series of block upgrades to incorporate improvements such as extended range and endurance, increased payload weight space and power capability, TCS, TCDL and advanced sensor payloads as they mature and are operationally proven.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
DAB meeting on ACTD Program Transition Plan	2Q						
Milestone I	3Q						
Conduct System Capabilities Demonstration	4Q	1Q					
Milestone II / LRIP Decision & LRIP Award		1Q					
First LRIP System Delivery			1Q				
Field LRIP Systems to Training Base			2Q				
OPTEMPO Demonstration			2Q				
Special In-Process Review/Decision to Accelerate			2Q				
Award FY01 Production Ramp-Up portion of LRIP			2Q				
IOT&E Preparation and IOT&E		4Q	1-3Q				
Field IOT&E LRIP system to IOT&E User			4Q				
Milestone III / Production Decision			4Q				
Award Full Rate Production				1Q			
Follow-On Limited User Test				4Q			
TUAV First Unit Equipped					1Q		
Complete Development/Demo Block 2 Upgrades				4Q			
Payload Development/Improvements		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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. TUAV LRIP Program	Comp / FPIF	AAI Corporation		17800	1Q 00	19944	2Q	4058	1Q		41802	
b. Objective Capability Assessment/Development	Comp / FPIF	AAI Corporation				500	2Q	4550	1Q	Continue	5050	
c. TUAV Ground Control Station Architecture	Comp / FPIF	Sys Integration Lab, AMCOM, Redstone		4900	1Q 00					Continue	4900	
d. TCDL Integration	MIPR	Sys Integration Lab, AMCOM, Redstone		250	1Q00						250	
e. TCDL Integration	Comp / FPIF	To Be Selected				1000	3Q	1660	1Q	Continue	2660	
f. Payload Modification/ Integration Assessment	Comp / Opt	AMCOM RDEC, Redstone, AL		200	4Q						200	
g. Payload Development/ Mod/ Integration Spt	MIPR	PM TESAR		270	4Q	2226	2Q	3450	1Q	Continue	5946	
h. Heavy Fuel Engine/Demo	Comp / FPIF	To Be Selected				400	3Q	2000	1Q	Continue	2400	
i. Army Apache/UAV Interoperability Demo	MIPR	AMCOM RDEC, Redstone, AL		350	3Q					Continue	350	
j. SSEB/Flyoff	Various Methods/Type	Various Activities/Locations		7200	3Q 99 -1Q 00					Continue	7200	
k. Outrider ACTD Bridge	SS / FPIF	Alliant Techsystems Hopkins, MN		10600	1Q					Continue	10600	
l. Outrider Contract Closeout	SS / FPIF	Alliant Techsystems Hopkins, MN				2200	2Q			Continue	2200	
m. Hunter Residuals (JRTC non-recurring)	SS / FPIF	TRW Sierra Vista, AZ		4140	3Q					Continue	4140	
n. GFE	MIPR	Depot/PM To Be Determined				3236	2Q			Continue	3236	
o. TCS Integration	MIPR	AMCOM RDEC, Redstone, AL		200	4Q	1500	2Q	1500	1Q	Continue	3200	
p. Site Activation	MIPR	IOT&E Unit						750	1Q	Continue	750	
q. SIL/MUSE	MIPR	Sys Integration Lab, AMCOM, Redstone				1500	2Q			Continue	1500	
r. SBIR/STTR						1160					1160	
Subtotal Product Development:				45910		33666		17968			97544	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305204A Tactical Unmanned Aerial Vehicles

PROJECT: D114

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		1020	1Q	1400	2Q	691	1Q	Continue	3111	
b. Government Engr Spt	MIPR	AMCOM Redstone		1026	1Q	1000	2Q	650	1Q	Continue	2676	
Subtotal Support Costs:				2046		2400		1341			5787	

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. Risk Reduction Testing/ST&E/IOT&E	MIPR	OPTEC/PM/Various AMCOM Contractors				5821	3Q	6973	1Q	Continue	12794	
Subtotal Test and Evaluation:						5821		6973			12794	

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		2233	1Q	1200	1Q	859	1Q	Continue	4292	
Subtotal Management Services:				2233		1200		859			4292	

Project Total Cost:				50189		43087		27141			120417	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305204A Tactical Unmanned Aerial Vehicles

PROJECT: D123

COST (*In Thousands*)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
D123 Joint Technical Center Systems Integration Lab	0	0	2286	0	0	0	0	Continuing	Continuing

A. Mission Description and Budget Item Justification: The Joint Technology Center / System Integration Laboratory (JTC/SIL) is a joint integration center that develops simulations of tactical UAVs and strategic reconnaissance and imagery. It also utilizes the Modernized Imagery Exploitation System (MIES), the Enhanced Tactical Radar Correlator (ETRAC), and a variety of C4I systems and interfaces, namely the Tactical Control System. The MUSE system provides for the development of real-time, interoperable hardware and operator in-the-loop simulations of multiple intelligence systems that may be integrated with larger simulations in support of Service exercises. MUSE development provides a realistic operational environment that supports a wide range of information efforts. This project funds the management of the JTC/SIL and MUSE enhancements.

FY 1999 Accomplishments: Project not funded in FY 1999

FY 2000 Planned Program: Program funded in project D114.

FY 2001 Planned Program:

•	2286	JTC/SIL MUSE
Total	2286	

B. Other Program Funding Summary: None

C. Acquisition Strategy: Not applicable

D. Schedule Profile	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
JTC/SIL MUSE Enhancement and Management					1Q-4Q					

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305204A Tactical Unmanned Aerial Vehicles

PROJECT: D123

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. JTC/SIL MUSE Enhancement & Mgmt	MIPR	Sys Integration Lab, AMCOM, Redstone				2286	1Q			
Subtotal Product Development:						2286				

II. Support Costs: Not applicable

III. Test and Evaluation: Not applicable

IV. Management Services: Not applicable

Project Total Cost:						2286				

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305206A Airborne Reconnaissance

PROJECT: DK98

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DK98 Tactical Reconnaisance Sensors	7224	4895	4898	6837	4879	4837	5200	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project continues development of advanced tactical reconnaissance and surveillance sensor technologies that were developed from the Defense Airborne Reconnaissance Office and develops technology for the on-board fusion of multidiscipline intelligence sensors, i.e. SIGINT, MTI/SAR Radar, MASINT. 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 (CECOM) 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 Signals Warfare Project Office will leverage and continue the development of the MASINT/IMINT technologies for the Aerial Common Sensor. 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). This data will be used in the generation of high-resolution digital terrain databases to support crisis response and force projection operations within the timelines required by the joint force commander. The IFSAR development supports the Rapid Terrain Visualization (RTV) Advanced Concept Technology Demonstration Future efforts will be directed toward the development of advanced multi-mode EO/IR, multi-mode SAR/MTI radar, foliage penetration radar, multi-spectral/hyperspectral imageries, MASINT on-board fusion, and registered MTI/SIGINT cueing of EO/IR/SAR/HSI imaging sensors.

FY01 Funds completes the development and test of the Long Wave Infrared (LWIR) Hyperspectral sensor (HSS) and the collection, measurement and evaluation of IFSAR data sets. (FY00 and prior this PE was reported under OSD/DARPA)

FY 1999 Accomplishments:

- 3773 -Completed development of near-real time IFSAR
  -Modified deHavilland DHC-7 aircraft for integration of IFSAR system.
- 3451 -Awarded contract for the development of a small lightweight Long Wave Infrared hyperspectral sensor.
  -Demonstrated real time Hyperspectral detection and high resolution imagery cueing of military targets.
  -Participated in joint data collections and exercises.

Total 7224

FY 2000 Planned Program:

- 932 -Demonstrate near real time DTED Level III-IV capability.
  -Demonstrated very fine resolution geographically accurate IFSAR imagery for 3-D earth-centered targeting.
- 3832 -Complete design of LWIR HSS system and initiate integration on testbed aircraft.
  -Develop and integrate multiple algorithm fusion processing techniques of advanced spectral detection software.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305206A Airborne Reconnaissance PROJECT DK98

FY 2000 Planned Program: (continued)

-Conduct ASRP data collection activities of various terrain and environmental backgrounds.
-Conduct real time test of fusion algorithms processed Hyperspectral Imaging (HSI) data.

•	131	Small Business Innovative Research/Small Business Technology Transfer Program
Total	4895	

FY 2001 Planned Program:

•	2003	-Complete integration and test of the LWIR Hyperspectral Sensor (HSS) system on testbed aircraft for the adaptive spectral reconnaissance program (ASRP) -Conduct data collection and real time demonstrations with LWIR HSS testbed aircraft for ASRP -Conduct data analysis of advanced HSS utility for future airborne reconnaissance applications.
•	2895	-Collect IFSAR data and develop/process high-resolution data sets -Complete evaluation of military utility of IFSAR sensor, data, RTV process and products with XVIII ABN and III Corp
Total	4898	

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	7451	4932	4928
Appropriated Value	7500	4932	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-49		
b. SBIR / STTR	-197		
c. Omnibus or Other Above Threshold Reductions		-20	
d. Below Threshold Reprogramming			
e. Rescissions	-30	-17	
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	7224	4895	4898

C. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
0305206D00000 DARPA (ASRP)	1150	1150							
63734/DT12 Rapid Terrain Visualization	14082	12016							

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0305206A Airborne Reconnaissance / PROJECT: DK98

D. Acquisition Strategy: ASRP has established sensor development as a major thrust towards understanding the technical underpinnings of spectral technology for military applications. This DARPA managed program, which began in FY 1997 includes cooperation from multi-services including US Army, CECOM, NVESD for execution of data collections and the LWIR HSS system development. The LWIR HSS system acquisition strategy provides for the award of a 24-month effort to begin in FY 1999 under best value full and open competition procedures. Data collection efforts to support analytic studies began in FY 1998 using existing sensor and hardware integrated on an NVESD testbed aircraft.

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
DTED III – IV Demonstration (IFSAR)	2Q						
DTED V – Demonstration (IFSAR)	4Q						
XVIII Airborne Corps WFX (IFSAR)		3Q					
Functional Capability Demo at JPSD IEC (IFSAR)		4Q					
End to End Demonstration (IFSAR)			3Q				
Provide Leave Behind Support (IFSAR)			1-4Q				
Conduct data collections and real-time algorithm operations (ASRP)	1-4Q	1-4Q					
Develop LWIR HSS	3-4Q	1-4Q	1Q				
Demonstrate LWIR HSS			3Q				

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305206A Airborne Reconnaissance

PROJECT: DK98

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. Labor [1]	FF/SS/MIPR	Sandia Nat'l Labs	294	600	2Q	147	1Q	442	1Q	Continue	Continue	
b. Travel [1]	FF/SS/MIPR	Sandia Nat'l Labs	26	50	2Q	13	1Q	38	1Q	Continue	Continue	
c. Systems Management [1]	FF/SS/MIPR	Sandia Nat'l Labs	397	800	2Q	198	1Q	595	1Q	Continue	Continue	
d. Systems Engineering [1]	FF/SS/MIPR	Sandia Nat'l Labs	499	1000	2Q	182	1Q	749	1Q	Continue	Continue	
e. Software Engineering [1]	FF/SS/MIPR	Sandia Nat'l Labs	64	110	2Q	32	1Q	96	1Q	Continue	Continue	
f. Development Support [2]	C/CPFF	Lockheed Martin Fairchild Systems, NY		2030	3Q	3007	1Q	1553	1Q	Continue	Continue	
g. SBIR/STTR						131				Continue	Continue	
Subtotal Product Development:			1280	4590		3710		3473		Continue	Continue	

Remark: Note: 1. IFSAR Project
2. ASRP Project
*Program funded in DOD PE 035206D in prior years

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. Systems Engineering [1]	MIPR	Sandia Nat'l Labs	400	0		0					400	
b. Testing Support [1]	MIPR	Sandia Nat'l Labs		60	2Q	15	1Q	0	1Q	Continue	Continue	
c. Technical Support [1]	MIPR	Sandia Nat'l Labs		60	2Q	15	1Q	45	1Q	Continue	Continue	
d. Configuration Mgt. [1]	MIPR	Sandia Nat'l Labs		60	2Q	15	1Q	45	1Q	Continue	Continue	
e. Equipment [1]	MIPR	Sandia Nat'l Labs		420	2Q	105	1Q	45	1Q	Continue	Continue	
f. System Engineering [2]	C/T&M	EOIR, Fredricksburg VA		704	1Q	300	1Q	300	1Q	Continue	Continue	
g. Technical Support [2]	C/T&M	SAIC Corp, San Diego, CA		150	1Q	150	1Q	150	1Q	Continue	Continue	
Subtotal Support Costs:			400	1454		600		585		Continue	Continue	

Remark: Note: 1. IFSAR Project
2. ASRP Project
*Program funded in DOD PE 035206D in prior years

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305206A Airborne Reconnaissance

PROJECT: DK98

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. Systems Evaluation	MIPR	Sandia Nat'l Labs	280	560	1Q	140	1Q	420	1Q	Continue	Continue	
Subtotal Test and Evaluation:			280	560		140		420		Continue	Continue	

Remark: IFSAR Project
*Program funded in DOD PE 035206D in prior years

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost *	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Program Management	MIPR	Sandia Nat'l Labs	48	280	1Q	70	1Q	70	1Q	Continue	Continue	
b. Government Engineering Support	MIPR	CECOM, NVESD		340	1Q	375	1Q	350	1Q	Continue	Continue	
Subtotal Management Services:			48	620		445		420		Continue	Continue	

Remark: IFSAR Project
*Program funded in DOD PE 035206D in prior years

Project Total Cost:			2008	7224		4895		4898		Continue	Continue	

Program funded in DOD PE 035206D in prior years

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305208A Common Imagery Ground/Surface System (CIG/SS) (JMIP)

PROJECT: D956

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D956 Common Imagery Ground/Surface System	8585	8004	7894	8212	8288	8445	8676	Continuing	Continuing

A. Mission Description and Budget Item Justification: 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 the Enhanced Tactical Radar Correlator (ETRAC), Modernized Imagery Exploitation System (MIES), and the imagery portion of the Tactical Exploitation System (TES). ETRAC is a C-130 drive on/off capable system that receives Advanced Synthetic Aperture Radar (ASAR) data inputs from various platforms, converts the SAR data to exploitable images, and is capable of stand-alone operations. MIES receives and exploits imagery from national and theater sources and provides intelligence reports and exploited imagery products to the field commander. ETRAC and MIES functionality are combined in the Tactical Exploitation System (TES) to be fielded beginning in FY00. Specific details are provided in the Tactical Intelligence and Related Activities (TIARA) Congressional Budget Justification Book, Volume II and the Joint Military Intelligence Programs (JMIP) Congressional Budget Justification Book, Vol. II.

FY 1999 Accomplishments:

•	6794	Continued CIG/SS elements sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (ETRAC and MIES).
•	1791	Continued development/enhancements/integration of CIG/SS components into TES systems. (TES)
Total	8585	

FY 2000 Planned Program:

•	1940	Continue CIG/SS elements sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (ETRAC and MIES).
•	4664	Continue development/enhancements/integration of CIG/SS components into TES systems. (TES)
•	1400	Modify TES systems for interoperability with the U-2 after Advanced Synthetic Aperture Radar System (ASAR) Improvement Program (AIP) upgrade.
Total	8004	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0305208A Common Imagery Ground/Surface System (CIG/SS) (JMIP)
	PROJECT D956

FY 2001 Planned Program:

- 1160 Continue CIG/SS elements sustaining engineering to implement software upgrades and enhancements to maintain compatibility with changing national and tactical interfaces (MIES).
- 6734 Continue development/enhancements/integration of CIG/SS components into TES systems. (TES).

Total 7894

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	8853	8066	7943
Appropriated Value	8912	8066	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-59		
b. SBIR / STTR	-234		
c. Omnibus or Other Above Threshold Reductions		-34	
d. Below Threshold Reprogramming			
e. Rescissions	-34	-28	
Adjustments to Budget Years Since FY 2000/2001 PB			-49
Current Budget Submit (FY 2001 PB)	8585	8004	7894

C. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
RDTE, A Budget Activity 5									
PE 0604766A TENCAP (TIARA)	42025	71879	57419	76674	71545	65355	65395	Cont	Cont
Other Procurement Army, OPA-2									
BZ7315 TENCAP (TIARA)	6033	4350	12853	3839	4382	1977	1975	Cont	Cont
BZ7316 CIG/SS (JMIP)	248	2778	2833	2599	2610	2653	2714	Cont	Cont
BZ7317 Tactical Surveillance System (TIARA)				22228	11166	31744	9969	Cont	Cont

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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0305208A Common Imagery Ground/Surface System (CIG/SS) (JMIP) — PROJECT: D956

E. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Defield MIES		4th QTR	4th QTR				
Defield ETRAC		1st QTR	4th QTR				
Complete Eng. Development of TES-Forward	4th QTR						
Complete Eng. Development of TES-Main		4th QTR					
Field TES *		4th QTR	4th QTR	4th QTR		4th QTR	4th QTR

* Majority of TES development is funded under PE 0604766A.

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0305208A Common Imagery Ground/Surface System (CIG/SS) (JMIP)

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	*	5117	2/99	420	1/00			0	5537	
b. MIES CIG/SS	SS/CPFF	DBA, Melbourne FL	*	1677	1/99	1520	1/00	1160	1/01	0	4357	
c. TES CIG/SS *	C/CPFF	Classified	*	1791	3/99	6064	12/99	6734	11/00	** Cont	14589	
Subtotal Product Development:				8585		8004		7894			24483	

Remark:

* Prior to FY 1999 these efforts were funded under PE 0305208,D.

** Majority of TES development is funded under PE 0604766A.

II. Support Costs: Not applicable

III. Test and Evaluation: Not applicable

IV. Management Services: Not applicable

Project Total Cost:				8585		8004		7894			24483	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	25083	66595	59523	49475	4422	0	0	0	287640
D027 MLRS ILMS	1050	0	0	0	0	0	0	0	70025
D090 MLRS HIMARS	4815	36302	41835	30906	3933	0	0	0	117791
D093 MLRS Army Technical Architecture	3159	2145	0	0	0	0	0	0	5426
D784 Guided MLRS	16059	28148	17688	18569	489	0	0	0	94398

A. Mission Description and 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 Launcher Mechanical System (ILMS), Guided MLRS Rocket (GMLRS), Joint Technical Architecture-Army (JTA-A) and High Mobility Artillery Rocket System (HIMARS). 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. 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 JTA-A will implement dual protocol capability and Force XXI Situational Awareness in M270A1 launchers and trainers. 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.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY **7 - Operational System Development**	PE NUMBER AND TITLE **0603778A Multiple Launch Rocket System Product Improvement Program**

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	25159	36540	58591
Appropriated Value	25244	67440	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-85		
b. SBIR / STTR	-195		
c. Omnibus or Other Above Threshold Reductions		-276	
d. Below Threshold Reprogramming	+149		
e. Rescissions		-569	
Adjustments to Budget Years Since FY 2000/2001 PB	-30		-4068
New Army Vision/Transformation Adjustment			+5000
Current Budget Submit (FY 2001 PB)	25083	66595	59523

Change Summary Explanation: Funding – FY 01: Project D090 was adjusted to reflect the New Army Transformation (+5000).

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D027

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D027 MLRS ILMS	1050	0	0	0	0	0	0	0	70025

A. Mission Description and Justification: The MLRS Improved Launcher Mechanical System (ILMS) project provides for the Engineering and Manufacturing Development (EMD) of the ILMS. The ILMS decreases the stow to aim point timeline, enhances effectiveness in engaging and supporting the force, and increases MLRS platform survivability. The ILMS replaces selected hydraulic and mechanical components of the MLRS M270 launcher mechanical drive system. The time required for movement of the Launcher Loader Module from the stowed position to first rocket away is reduced from 93 seconds to 16 seconds. Reload operations for twelve rockets are reduced from 260 seconds to 160 seconds. These improvements allow faster engagement of short dwell time targets and increase crew survivability on the firing point and reload area. Reduced operation and support costs are expected with this design. When combined with the Improved Fire Control System (IFCS), the launcher is designated as M270A1.

FY 1999 Accomplishments:

- 1050 System Integration

Total 1050

FY 2000 Accomplishments: Project not funded in FY 2000

FY 2001 Accomplishments: Project not funded in FY 2001

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Missile Procurement, Army									
Budget Activity 2:									
MLRS Launcher (C65900)	121134	137507	188689	203700	175884	160262	160087	Continuing	4025393
Budget Activity 4:									
MLRS Initial Spares (CA0257)	4792	6196	6456	12249	13059	13541	9276	Continuing	296329

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program PROJECT D027

C. **Acquisition Strategy:** The MLRS ILMS is an ACAT III program with an EMD phase ending 2QTR FY00 and fielding beginning in 4QTR FY01. A sole source contract for EMD was awarded to Lockheed Martin Missile & Fire Control System (LMMFCS) in August 1995. Originally planned to be completed in FY 98, this program was extended to 2QTR FY00 due to schedule impacts resulting from IFCS program delays.

D. Schedule Profile	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
M270A1 IOT&E (Low Risk Proposed Plan)			2QTR				

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D090

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D090 MLRS HIMARS	4815	36302	41835	30906	3933	0	0	0	117791

A. Mission Description and Justification: The High Mobility Artillery Rocket System (HIMARS) 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 consist of the MLRS Improved Fire Control System (IFCS), a wheeled carrier, an on-board reload capability, and a Launcher Loader Module (LLM) portion 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 1999 Accomplishments:

- 2364 Risk Reduction Tasks including Reloader/Hydraulic Robustness/Reliability Efforts
- 1000 OGA Support
- 541 Technical Assessments/Evaluations, Simulation Support
- 295 Development Testing
- 335 Maturation Preparation: Milestone Documentation
- 280 Minor Tasks Including In-House

Total 4815

FY 2000 Planned Program:

- 25310 System Design
- 3556 Government Furnished Equipment (GFE), Communication & Trucks
- 1899 OGA Support
- 1632 Maturation Preparation: Milestone Documentation, Technical Assessments
- 1580 Development Testing
- 1348 Minor Tasks Including In-House
- 977 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 36302

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0603778A Multiple Launch Rocket System Product Improvement Program / PROJECT: D090

FY 2001 Planned Program:

- 29477 System Design, Test & Integration and Technical Assessments
- 836 GFE, Communication & Trucks
- 2885 Development Testing (6 Test Articles)
- 1438 Technical Assessments and Milestone Documentation
- 1056 OGA Support
- 1143 Minor Tasks Including In-House
- 5000 Funds will be used to accelerate HIMARS development in support of the New Army Transformation (Sys Design, Test and Intg. Tech Assessments)

Total 41835

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Missile Procurement, Army									
Budget Activity 2:									
HIMARS Launcher (C03000)	0	0	0	0	130138	115523	164264	Continuing	1189567
Budget Activity 4:									
Initial Spares, HIMARS (CA0288)	0	0	0	0	0	7657	3634	Continuing	68145

C. **Acquisition Strategy:** HIMARS designated an ACAT II program with the Maturation phase beginning in FY00. The First Unit Equipped (FUE) is planned for FY05. The contracting strategy will be sole source.

D. Schedule Profile	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005
Risk Reduction Contract Award		2QTR						
Maturation IPR, Maturation Contract Award (36 Months)			1QTR					
Critical Design Review (CDR)				1QTR				
6 Launchers, Integrated Developmental Test/Operational Test (DT/OT)					1QTR			
LRIP IPR						1QTR		

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	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. Risk Reduction/ Maturation Contract	SS/CPIF & CPAF	*LMMFCS TX		2364	3rd QTR	26287	1st QTR	34477	1st QTR	17580	80708	
b. Cab Improv./ OGA	N/A	TACOM (S&S)		1000	4th QTR	1899	As Req.	1056	As Req.	563	4518	
c. GFE,Comm,Trks & Trls	SS/CPFF	* S&S SEALY TX				3556	2nd QTR	836	1st QTR	1190	5582	
d. Government Support	N/A	RDEC*,IMMC*, RSA		541	As req.	1432	As Req.	1288	As Req.	3707	6968	
Subtotal Product Development:				3905		33174		37657		23040	97776	

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

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		335	3rd qtr	200	1QTR	150	1st QTR	250	935	
Subtotal Support Costs:				335		200		150		250	935	

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	APG MD*, WSMR NM* & RTTC RSA*		295	2nd QTR	1580	As Req.	2885	As Req.	10082	14842	
Subtotal Test and Evaluation:				295		1580		2885		10082	14842	

Remark: *APG MD – Aberdeen Proving Ground, Maryland
*WSMR NM – White Sands Missile Range, New Mexico
*RTTC RSA – Redstone Technical Test Center, Redstone Arsenal, AL
*LMMFCS.– Lockheed Martin Missile & Fire Control Systems
*S & S – Stewart & Stevenson

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D090

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		280	QTRLY	1348	QTRLY	1143	QTRLY	1467	4238	
Subtotal Mgmt Services:				280		1348		1143		1467	4238	
Project Total Cost:				4815		36302		41835		34839	117791	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D093

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D093 MLRS Army Technical Architecture	3159	2145	0	0	0	0	0	0	5426

A. Mission Description and Justification: 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 Joint Variable Message Format (JVMF) for M270A1 launchers. The JTA-A hardware and software development effort will provide Force XXI, First Digitized Division, message processing capability for M270A1 launchers.

FY 1999 Accomplishments:

- 2813 Develop VMF and Dual Protocol Logic Software
- 106 Development Testing
- 240 Minor Tasks Including In-House

Total 3159

FY 2000 Planned Program:

- 1467 Develop Engineering Design Test (EDT) Units
- 365 Development Testing
- 256 Minor Tasks Including In-House
- 57 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)

Total 2145

FY 2001 Planned Program: Project not funded in FY 2001

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Missile Procurement, Army									
Budget Activity 2:									
MLRS Launcher (C65900)	121134	137507	188689	203700	175884	160262	160087	Continuing	4025393
Budget Activity 3:									
MLRS Mods(C67500)	2767	6596	16499	24297	25178	23417	17430	Continuing	534707

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0603778A Multiple Launch Rocket System Product Improvement Program PROJECT D093

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
Budget Activity 4:									
MLRS Initial Spares (CA0257)	4792	6196	6456	12249	13059	13541	9276	Continuing	296329
MLRS Mod Spares (CA0265)	27	477	838	856	5717	1364	5973	Continuing	77312

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

D. Schedule Profile	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005
Industry Search, Cost/ Performance Trades	2QTR							
Prototype Hardware, Sys Integration & Test			3QTR					
Production Decision, Procurement Award				3QTR				
Initial M270A1 fielding				4QTR				

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0603778A Multiple Launch Rocket System Product Improvement Program / PROJECT: D093

A. Mission Description and Justification: The Guided Multiple Launch Rocket System (GMLRS) project provides for US participation in a Multinational Engineering and Manufacturing Development (EMD) of a guided rocket 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.

FY 1999 Accomplishments:

•	14734	Assembly of Components, Components Lab Testing and Static Tests
•	338	Development Testing
•	987	Minor Tasks Including In-House
Total	16059	

FY 2000 Planned Program:

•	25204	EDT Flight Tests, Production Qualification Testing (PQT) Ground Tests, Hardware Assembly and Integration
•	120	Technical Assessments/Evaluations and Simulation Support
•	1459	Development Testing (3 Test Articles)
•	607	Minor Tasks Including In-House
•	758	Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)
Total	28148	

FY 2001 Planned Program:

•	10866	PQT Ground and Flight Tests, Hardware Assembly and Prove-out, Test Results Analysis
•	250	Preparation of LRIP IPR Documentation
•	5536	Development Testing (85 Test Articles)
•	1036	Minor Task Including In-House
Total	17688	

COST *(In Thousands)*	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
D784 Guided MLRS	16059	28148	17688	18569	489	0	0	0	94398

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

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

PROJECT: D784

B. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY2002	FY2003	FY2004	FY2005	To Complete	Total Cost
Missile Procurement, Army									
Budget Activity 2:									
ER-MLRS (C65402)	0	3747	9413	40425	71419	80911	80823	Continuing	3490859

C. Acquisition Strategy: The GMLRS acquisition strategy is a streamlined product improvement program which permits entering Low Rate Initial Production (LRIP) 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 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 Missile & Fire Control Systems (LMMFCS), with maximum competition of non-developmental item (NDI) components at the vendor level.

D. Schedule Profile	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005
Advanced Technology Development Flt Test, MS II, EMD Contract, Sys Design	2-4QTR							
System Design, PDR		1- 4 QTR						
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			
LRIP II Option, Production Validation Test (PVT) Grd & Flt Test, 1st LRIP Rkt Del, Initial Operational Test (IOT) Grd & Flt Test						1-3QTR		
MS III, FRP Contract, Initial Operational Capability (IOC)							1-4QTR	

ARMY RDT&E COST ANALYSIS (R-3)

DATE: February 2000

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	LMMFCS Dallas, TX	9168	12759	QTRLY	22429	QTRLY	7830	QTRLY	8975	61161	
b. Government Support	N/A	RDEC*, IMMC*, RSA*	2543	1975	QTRLY	2775	QTRLY	3036	QTRLY	2559	12888	
Subtotal Product Development:			11711	14734		25204		10866		11534	74049	

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

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			120	1st QTR	250	1st QTR	768	1810	
Subtotal Support Costs:			672			120		250		768	1810	

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 NM & TBD	256	338	As Req	1459	As Req	5536	As Req	5744	13333	
Subtotal Test and Evaluation:			256	338		1459		5536		5744	13333	

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	806	987	QTRLY	1365	QTRLY	1036		1012	5206	
Subtotal Mgmt Services:			806	987		1365		1036		1012	5206	

Project Total Cost:			13445	16059		28148		17688	75340	19058	94398	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0708045A Army Industrial Preparedness Manufacturing Technology

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	50532	99528	57906	57474	61923	65267	67121	Continuing	Continuing
DE25 Manufacturing Technology (MANTECH)	36552	48642	29345	29315	32240	35157	36585	Continuing	Continuing
DE27 Reliability, Maintainability and Supportability (RM&S)	9247	15636	18623	18070	19441	19661	19874	Continuing	Continuing
DE31 National Defense Center for Environmental Excellence (NDCEE)	4733	4895	0	0	0	0	0	0	9685
DE32 Commercial Operations and Support Savings Initiative (COSSI)	0	30355	9938	10089	10242	10449	10662	Continuing	Continuing

A. Mission Description and Justification: This program element comprises four projects: Manufacturing Technology (MANTECH); Reliability, Maintainability and Supportability (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. 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 RM&S program funds projects that reduce operations and support costs through reliability, maintainability, and/or supportability improvements to fielded weapons systems or major end items. RM&S was initially funded in fiscal year 1997 under the Other Procurement Army 3 - Depot Maintenance and Other End Items. 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 PE 0708045A DE27. The NDCEE is a Congressionally directed 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; 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. NDCEE will transfer to BA4 PE 0603779A starting in FY01. COSSI is funded under this program element (PE 0708045A) 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.

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 0708045A Army Industrial Preparedness Manufacturing Technology

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	52501	66167	66306
Appropriated Value	52861	100667	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-360		
b. SBIR / STTR	-1324		
c. Omnibus or Other Above Threshold Reductions		-401	
d. Below Threshold Reprogramming	-435		
e. Rescissions	-210	-738	
Adjustments to Budget Years Since FY 2000/2001 PB			-8400
Current Budget Submit (FY 2001 PB)	50532	99528	57906

Change Summary Explanation: Funding – FY 2001: Decrease due to transfer (-4927) of Project DE31 to BA 4 PE 0603779A per Congressional direction; remaining funding (-3141) reprogrammed to support other higher priority requirements after inflation adjustments (-332).

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0708045A Army Industrial Preparedness Manufacturing Technology — PROJECT: DE25

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE25 Manufacturing Technology (MANTECH)	36552	48642	29345	29315	32240	35157	36585	Continuing	Continuing

A. Mission Description and Justification: The goal of the Army Manufacturing 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. Other factors considered for project selection include cost share with both industry and the program managers as well as return on investment. Major programs are identified as Manufacturing Technology Objectives (MTOs).

FY 1999 Accomplishments:

- 1530 Air Defense - Developed new manufacturing processes and work cells for the manufacturing of Patriot PAC3 traveling wave tubes; developed methods for the automated tuning of filters within the master frequency generator for the Patriot PAC3 system.
- 17461 Ammunition - Demonstrated 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; as part of Totally Integrated Munitions Enterprise, addressed issues in controllers, system architecture, electronics, composites energetics, Objective Individual Combat Weapon (OICW) Tungsten Warhead, M829E3 processes, combustible cartridges and XM982 rotating band processing for accelerated munitions MANTECH insertion.
- 4232 Aviation - Developed and demonstrated the technical feasibility and economic benefits of a robotic automated deburring system which is currently being applied to production of the Comanche and continued projects to reduce inspection and finishing costs of gears and related complex precision metal components at the Instrumented Factory for Gears; demonstrated a statistical process control expert system for shop-floor management at Corpus Christi Army Depot.
- 561 Command and Control - Demonstrated the thin film ferroelectric properties required for extremely high frequency comm-on-the-move applications.
- 204 Combat Service Support - Developed assembly process for reduced manufacturing costs of ceramic plates used in next generation of body armor which PM soldier type-classified, thereby guaranteeing implementation.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE25

FY 1999 Accomplishments (continued):

•	6116	Fire Support - Demonstrated 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; demonstrated computer aided design and computer aided engineering tools for millimeter wave transceivers by building demonstration hardware for BAT P31, and fabricated, integrated, assembled, and tested five Longbow cost reduction program transceivers on the flexible work cell pilot production line; demonstrated 5X reduction in multichip module substrate and assembly cost through participation in Georgia Tech Packaging Research Center; developed and established industry, academia and government partnerships for the development of advance manufacturing processes of printed circuit boards and initiated tasks to develop next generation electrical test system, high density photolithography system, low cost high frequency card materials, and low cost substrates for direct chip attachment.
•	3161	Intelligence and Electronic Warfare - For the Cooled and Uncooled Staring Sensors MTO, developed manufacturing process improvements of ferroelectric material deposition of uncooled focal plane arrays used in weapon sights and staring sensors, demonstrated improved yield, reduce pixel size, and vacuum packaging of these focal plane arrays; competitively selected the contractor team for the development of coating materials and processes for low cost, high reliability Plastic Encapsulated Microcircuits MTO and initiated efforts in material selection, process development, and metrics baseline; demonstrated advanced finishing processes for optics components; developed digital data extraction technology and an automated reverse engineering fixture for remanufacturing capability of printed wiring boards; assessed printed wiring board technologies at Tobyhanna Army Depot and developed a demonstration of a rapid response manufacturing system for small quantity production of a wide variety of boards.
•	3058	Maneuver - Demonstrated models for optimal fabrication, process control and resin flow simulation accuracy with applications to Crusader and Comanche structures as part of the MTO for Knowledge and Process Tools for manufacturing of affordable composite structures.
•	229	Nuclear, Biological, Chemical - Completed process optimization and demonstrated manufacturing capability for decontamination enzymes.
Total	36552	

FY 2000 Planned Program:

•	20894	Ammunition - Develop architecture for totally integrated munitions enterprise systems to include product data management, resource planning systems, change control systems and logistics systems; address munitions manufacturing technology to include electronics, composites energetics, M829E3 processes, combustible cartridges, and explosively formed penetrator warheads.
•	6074	Aviation - Develop technology and demonstration equipment for increasing manufacturing yield of filter materials used in advanced threat/countermeasures/common missile warning systems; demonstrate Instrumented Factory for Gears for Comanche, Apache, and Blackhawk to include automated robotic deburring, face hobbing gears, and near-net shape gears; create and institutionalize a depot life cycle repair environment for rotary wing aircraft sustainment to reduce repair cycle time and costs.
•	531	Command and Control - Demonstrate prototype large bulk ceramics and supporting components of X-band phase shifters for the manufacture of electronic scanning antennas to reduce size of radar by a factor of 5 with a 50% weight reduction.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE25

FY 2000 Planned Program (continued):

- 2100 Combat Service Support - Complete cost reduction process enhancements for the manufacturing of ceramic plates used in next generation body armor; demonstrate reduced costs through a sustainment center targeted at supportability issues within weapons systems to reduce repair and remanufacturing requirements.
- 5706 Fire Support - Demonstrate modeling process for increased performance and decreased cost of weapon system gun barrels to meet a Tantalum Sputtering MTO with the goal to increase barrel life by 600%; develop, through an MTO, improvements in the warhead and fuze to reduce the cost of the Objective Individual Combat Weapon (OICW) and Objective Crew-Served Weapon (OCSW); develop 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 MTO for plastic and encapsulated microcircuits.
- 6922 Intelligence and Electronic Warfare - Develop the manufacturing technologies required to meet the MTO for Cooled and Uncooled Infrared Staring Sensors with improvements in processes for 480x640 mid-wave and long-wave infrared focal plane arrays that will reduce size, weight and costs to manufacture; develop manufacturing processes for electro-optical materials; develop and demonstrate an automated reverse engineering system that will non-destructively extract information necessary to remanufacture obsolete printed wiring assemblies for mobile subscriber equipment, AH-64 Apache, Stinger Missile, Guardrail and ground communication systems; demonstrate rapid response system for the reverse engineering of printed wiring assemblies at Tobyhanna Army Depot.
- 3226 Maneuver - Automate pre-form technologies for large, light-weight composite structures for new tactical vehicles, determine process capabilities through simulation of Comanche, and develop non-proprietary cost models and process models for thin section resin transfer moldings to reduce manufacturing costs by 30% for the MTO focusing on knowledge and process tools for manufacturing affordable composite structures.
- 1944 Science and Technology - Develop and demonstrate a natural gas engine drive air compressor for military use.
- 1245 Funds reprogrammed for SBIR/STTR programs in accordance with the Small Business Innovation Research Reauthorization Act of 1992.

Total 48642

FY 2001 Planned Program:

- 1337 Aviation - Demonstrate 30% to 60% component cost reduction of thin wall castings for auxiliary power units and propulsion systems; demonstrate reduced manufacturing cost of sensor element material used in advanced threat/countermeasures/common missile warning systems.
- 2473 Command and Control - Fabricate test phase shifters for electronic scanning antennas and demonstrate 20X reduction in power requirements for phase shifters; demonstrate active matrix electro-luminescent display manufacturing and process improvements and cost reductions early in the fielding cycle; demonstrate low-cost, high resolution active matrix liquid crystal display with reduced manufacturing cost through improved material alignment and processing steps.
- 388 Combat Service Support - Interface with tentage and machine manufacturers for seam-sealing technology to reduce manufacturing costs and reduce seam leakage of tents.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE25

FY 2001 Planned Program (continued):

•	14593	Fire Support - Demonstrate increased performance and decreased cost of weapon system gun barrels with specific subtasks to include the manufacture and installation of sputtering targets and development of manufacturing processes for large caliber gun barrels in support of the MTO in tantalum sputtering; insert special coated integrated circuits into selected military systems for demonstration and validation in support of the MTO in plastic encapsulated microcircuits to demonstrate a 78% improvement in resistance to internal corrosion and improve fabrication and packaging yields by 5%; develop manufacturing processes for inertial measurement units utilizing micro-electro-mechanical systems and model process flow of the assembly process for this MTO; conduct bore mapping and controlled process technologies for cannon tube restraightening to improve hit probability and reduce cannon tube straightening time for this MTO; demonstrate affordable advanced tungsten warhead and steel warhead designs through an MTO for the OICW and OCWS; utilize commercial digital signal processors and alternative design guidance and control modules to reduce new upgrade procurement costs by 25% for Army TACMS 2000 and Patriot PAC3 guidance and control modules.
•	7325	Intelligence and Electronic Warfare - Fabricate and integrate 480x640 mid-wave infrared and long-wave infrared focal plane array and dewar to achieve the MTO focused on cooled and uncooled infrared staring sensors; demonstrate an Advanced Asphere Optic MTO for the applications to reduce weight and cost of the optical subsystem; demonstrate improved manufacturing processing for short-wave infra-red gated camera tube used for target detection.
•	3229	Maneuver - Implement investment strategy for risk reduction, knowledge base development, and tooling for the MTO in knowledge and process tools for manufacturing affordable composite structures.
Total	29345	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0708045A Army Industrial Preparedness Manufacturing Technology / PROJECT: DE27

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE27 Reliability, Maintainability and Supportability (RM&S)	9247	15636	18623	18070	19441	19661	19874	Continuing	Continuing

A. Mission Description and Justification: The Reliability, Maintainability and Supportability (RM&S) program supports innovative, state-of-the-art projects to reduce Operations and Support (O&S) costs by replacing or improving components of fielded weapon systems with more reliable, maintainable and/or supportable items. The RM&S program is limited to improvements that reduce the cost of ownership for fielded systems and equipment. RM&S funds may not be used to modify a weapon system currently in development, until the weapon system has satisfied all supportability requirements defined in the Operational Requirements Document (ORD) or system specification. The RM&S program uses Research, Development, Test and Evaluation (RDT&E) funding, which allows the pursuit of complex technology insertion projects.

FY 1999 Accomplishments:

- 9247 Aviation - Completed software development and testing, system verification and acceptance testing of a prototype universal computer controlled static balance fixture that can balance any DoD main rotor blade; replaced the Hunter System Unmanned Aerial Vehicle Short Range (UAV-SR) wooden propeller with a composite propeller that has a life expectancy ten times greater than the wooden propeller and will lower the annual consumption rate of propellers from 169 to 17; developed a preventive and predictive maintenance expert system for real time monitoring and tracking of sources of machine deterioration for Corpus Christi Army Depot's (CCAD's) whirl tower, autoclave, and engine and transmission test cells; released funds and awarded contract to design a new CH-47 Chinook helicopter rotor hub.

Total 9247

FY 2000 Planned Program:

- 8177 Aviation - Perform analytical design, prepare modification drawings, and procure or develop smart orifices for a high performance scalable landing gear shock strut that is less susceptible to damage; complete and implement a preventive and predictive maintenance expert system for real time monitoring and tracking of sources of machine deterioration for CCAD's automatic test equipment; design a new CH-47 rotor hub to eliminate wet bearings and replace the bearings with elastomeric bearings which require no additional lubrication; establish an aggressive fleet maintenance management capability composed of process, policy, and hardware improvements significantly reduce support costs and improve operational readiness for the CH-47 fleet.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE27

FY 2000 Planned Program (continued):

- 5601 Combat Service Support - Establish, correlate and validate data on accelerated, short term, high temperature storage of packaged ration products (Meals, Ready-to-Eat (MREs)), acquire and prepare product for storage, conduct lab microbiological evaluation, perform sensory evaluation, review prior data, and determine data correlation and protocols; redesign the current commercially based rechargeable lithium battery technology into a format that fully meets the technical and operational requirements of the military, and is technically superior and more cost effective than the silver zinc battery currently used for the Improved Target Acquisition System (ITAS) and the small cell lithium ion battery technologies currently available for use with the Land Warrior system.
- 1065 Maneuver - Demonstrate system parameters that meet requirements to automate balancing of turbine engine components that will reduce cycle time by 80% over manual balancing; demonstrate a mobile seven axis machining system to improve the repair and overhaul capabilities of Anniston Army Depot (ANAD), to include designing and developing the machining system, designing the base, and optimizing the system to meet ANAD mobile machining requirements; develop a low cost corrosion mitigating technique for components such as frame rails found on tactical wheeled vehicles that have corrosion problems resulting in costly premature failures.
- 372 Nuclear, Biological, Chemical - Replace and test the testing agent for the Joint Lightweight Integrated Suit Technology (JLIST) from a live chemical agent to a simulant to yield a much more reliable, quicker and more economic means for the maintenance and evaluation of chemical overgarments.
- 421 Funds reprogrammed for SBIR/STTR Programs in accordance with the Small Business Innovation Research Reauthorization Act of 1992.

Total 15636

FY 2001 Planned Program:

- 555 Ammunition - Fabricate and test the less expensive .50 caliber training cartridge for the long range sniper rifle and transition to procurement.
- 9743 Aviation - Fabricate prototype hardware, install smart orifices, and conduct design support tests for the high performance scalable landing gear shock strut for the Apache; develop and demonstrate process changes and model process flow enhancements through the Rotary Wing Aircraft Sustainment Project (RWASP); complete development and prototyping and prepare for test and evaluation of the new CH-47 rotor hub that will have 75% fewer parts and 70% fewer special tools required to maintain the system; integrate and test directional/vertical gyroscope system and complete acquisition requirements package; qualify universal common automatic recovery system and implement system on Hunter system to reduce repair requirements.
- 648 Command and Control - Re-establish a production capability for new AN/PRC-112 radios, enabling the production of new modules to be used as spares and repair parts at the depot level repair facilities, so that AN/PRC-112 radios already deployed can continue to be supported.
- 478 Combat Service Support - Complete correlation and validation of data on accelerated, short term, high temperature storage of packaged ration products (Meals, Ready-to-Eat (MREs)), complete product tests and shelf stability evaluations, complete technical data and provide to vendors, and transition to the Defense Logistics Agency (DLA) for procurement; optimize the MRE's packaging providing a significant reduction in the amount of materials that are required to package the MRE, thus lowering production costs and sustainment costs associated with shipping, handling, storage and disposal, and simplifying the MRE entree heating process as a side benefit.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE27

FY 2001 Planned Program (continued):

•	297	Fire Support - Validate radial forging procedures for gun barrel performs and demonstrate extended wear of clad M240 gun barrels.
•	3809	Intelligence and Electronic Warfare - Demonstrate reduced maintenance and supportability costs by upgrading the Improved Bradley Acquisition System - Missile Control Subsystem (IBAS MCS) hardware design; replace the TROJAN SPIRIT II's old electrospace antenna control unit with the new proven commercial fully integrated PC-based antenna controlled unit, harvesting commercial technology advancements to reduce the system maintenance costs while improving overall system reliability and overall maintainability; rewire and test upgraded Sentinel signal data processor upgrades and transition to the Sentinel processor family.
•	879	Maneuver - Conduct fatigue testing, metallurgical evaluation, and final demonstration for an automated system to simultaneously balance and laser machine components; demonstrate a low cost corrosion mitigating technique for epoxy-coated High Mobility Multipurpose Wheeled Vehicle (HMMWV) frame rails to prevent costly premature failures through treatment of test vehicles, testing treated vehicles on the Army test center accelerated corrosion / durability test track, preparing final report, and training personnel for transition to field units and treatment implementation.
•	1954	Mobility - Demonstrate inspection equipment and techniques capable of producing new track vehicle rubber formulations to increase the life of rubber track components to 5000 miles by validating accelerated aging tests and life-service predictive models and finalizing production and field evaluation methods.
•	260	Nuclear, Biological, Chemical - Implement the replacement testing agent for the Joint Lightweight Integrated Suit Technology (JLIST) from a live chemical agent to a simulant to yield a much more reliable, quicker and more economic means for the maintenance and evaluation of chemical overgarments through vapor testing at high relative humidity, completing technical data, and transitioning to DLA for procurement.
Total	18623	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE31

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE31 National Defense Center for Environmental Excellence (NDCEE)	4733	4895	0	0	0	0	0	0	9685

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). NDCEE program was transferred to BA 4 PE 0603779A per Congressional Direction for FY01 and beyond. 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 1999 Accomplishments:

•	4733	- Assisted the needs of Army/DoD pollution prevention and the Joint Logistic Commanders in use of Joint Group for Pollution Prevention (JG-PP) methodology to aid the acquisition and sustainment communities (original equipment manufacturers and depots). - Maintained Environmental Technology Facility and demonstrated environmentally acceptable technologies of DoD components and conducted technology transfer activities (requirements determination, technology selection, equipment selection, installation de-bugging, training) for Army and DoD facilities. Feasibility studies conducted on Army/DoD components to validate environmentally acceptable processes. - Supported pollution prevention efforts in acquisition through development of joint test protocols, multi-service needs identification, regulatory analysis and prediction, formal environmental cost analyses, risk assessments, life cycle environmental assessments and incorporation of environmental management standards and principles. Standardized Cost Analysis (Environmental Cost Analysis Methodology) and Risk (Industrial Risk Health Assessment) tools developed and verified for DoD use.
Total	4733	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE31

FY 2000 Planned Program:

•	4764	- Support the needs of Army/DoD pollution prevention. - Maintain the Environmental Technology Facility. - Support Pollution Prevention efforts in acquisition. - Support Army/DoD initiatives for environmental management systems. - 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.
•	131	Funds reprogrammed for SBIR/STTR Programs in accordance with the Small Business Innovation Research Reauthorization Act of 1992.
Total	4895	

FY 2001 Planned Program: NDCEE program transferred to BA 4 PE 0603779A per Congressional Direction.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE: February 2000
BUDGET ACTIVITY: 7 - Operational System Development	PE NUMBER AND TITLE: 0708045A Army Industrial Preparedness Manufacturing Technology	PROJECT: DE32

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DE32 Commercial Operations and Support Savings Initiative (COSSI)	0	30355	9938	10089	10242	10449	10662	Continuing	Continuing

Mission Description and Justification: 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 I 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. For FY01 Solicitation proposer must cost share, but the 25% minimum has been waived. 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. Army further requires Stage II funding identification prior to approval of Stage I. COSSI was funded in DoD PE 0603805E through FY1998, transferred to Army PE 0604824A in FY1999, and was transferred to this PE in FY2000. FY00 Project DE32 (COSSI) funds have been realigned to fund MANTECH projects in the amount of $11059, and Reliability, Maintainability, and Supportability (RM&S) projects in the amount of $16137, due to insufficient response to the FY00 COSSI solicitation. FY 2001 funding will be for new Stage I COSSI projects. The FY2001 COSSI CBD announcement was released in January 2000, and proposals are due in April 2000. General topic areas include AH64 primary hydraulic manifold, utility man drive shaft; Bradley Sentinel system communications equipment, electronics, man-machine interface, power supplies, embedded removable data logger/storage device and generator; Bradley Hunter system automated maintenance and preflight, enhance mission planner, heavy fuel engine, generator/alternator; Abrams program power train, suspension system and fire control/armament.

FY 1999 Accomplishments: Program funded in Army PE 0604824A.

FY 2000 Planned Program:

- 1042 Intelligence and Electronic Warfare - Insert a video/imagery hypercompression transceiver and a relay module to improve generations three and four of the Guardrail Common Sensor Replacement Receivers (GCSRR) by replacing obsolete VHF receiver equipment with a package based on commercially available receiver technology. This replacement will provide significant cost savings and improve system readiness for the weapon system.
- 1300 Maneuver - Apply a patented, low cost, commercial metal injection molding into first and second stage compressor blades for the AGT1500 gas turbine engine on the US Army M1 Abrams Tank. This will enable the use of commercial practices and technologies to develop a lower cost compressor blade and vane manufacturing process to lower O&S costs.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE32

FY 2000 Planned Program (continued):

The following tasks will be transitioned to Project DE25, Manufacturing Technology (MANTECH) for funding in FY 2001 and beyond:

- 583 Aviation - Develop thin wall casting manufacturing technique for demonstration on Apache 36-155 auxiliary power unit.
- 1928 Command and Control - Scale-up manufacturing capabilities and develop manufacturing improvements for active matrix electro-luminescent displays; improve production yield of active matrix liquid crystal displays by reducing defects during manufacturing.
- 350 Combat Service Support - Develop and demonstrate seam-sealing technology to reduce a two-step manufacturing process into a one-step process that will reduce labor costs and prevent likelihood of leakage in tents.
- 5520 Fire Support - Develop affordable inertial guidance units for air-to-ground missile systems using micro-electro-mechanical systems for this MTO; demonstrate uniform cannon tube reshaping system though an MTO to reduce cannon tube straightening time and improve target hit probability; demonstrate manufacturing technologies for improved digital signal processing systems for guidance and control packages used in fire support.
- 2678 Intelligence and Electronic Warfare - Continue optics manufacturing development for weapons systems affordability; develop manufacturing technologies to demonstrate an affordable short-wave infra-red gated camera tube devoted to target detection.

The following tasks will be transitioned to Project DE27 Reliability, Maintainability and Supportability (RM&S) for funding in FY 2001 and beyond:

- 589 Ammunition - Develop a less expensive .50 caliber cartridge for the long range sniper rifle for use by the Army Sniper School and other units assigned snipers when conducting training.
- 5786 Aviation - Baseline a process to establish and institutionalize a depot life cycle repair environment for combat equipment through technology upgrades within the framework of establishing cost effective methods and procedures for efficient workload routing, planning and scheduling, material resource planning, and supply chain management through the Rotary Wing Aircraft Sustainment Project (RWASP); replace current mechanical gyros used in cargo and utility helicopters with strapdown fiber optic attitude heading reference system utilizing direction/vertical gyroscopes; integrate a universal common automatic recovery system into the Hunter system to reduce atrition of air vehicles and reduce level of repair required after crashes.
- 2097 Command and Control – Reverse engineer the obsolete parts for AN/PRC-112 radios, ensuring that the basic, proven radio can continue to serve as the backbone of the search and rescue system.
- 244 Combat Service Support - Modify the Meal, Ready-to-Eat (MRE) packaging and assembly process to reduce the Army's procurement, operations and support costs.
- 1462 Fire Support - Develop an interface device that will provide digital linkage from the fire control panel tactical proficiency trainer to the single-channel ground and airborne radio system, which will enhance the training value of the trainer by allowing it to fully emulate the Multiple Launch Rocket System (MLRS) launcher fire control panel; fabricate and test clad gun barrels for M240 system and test cladding procedure to double the barrel life; develop and test, and provide a fielding strategy for an improved system to contain tritium gas and tritiated water from damaged radioluminescent light sources.

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0708045A Army Industrial Preparedness Manufacturing Technology PROJECT DE32

FY 2000 Planned Program (continued):

•	3892	Intelligence and Electronic Warfare - Develop and test a common upgrade to the existing Improved Target Acquisition System - Fire Control Subsystem (ITAS FCS) hardware design by leveraging the latest computer hardware and software technological developments, thereby eliminating unacceptably high production, maintenance and supportability costs; replace key SATCOM components of the TROJAN SPIRIT II to increase the efficiency of existing satellite bandwidth utilization and prepare for the migration to the emerging Warfighter Information Network (WIN); develop for retrofit upgraded signal data processor cards for Sentinel system utilizing commercial grade parts.
•	2067	Mobility - Conduct service life assessments of extended range track systems, establish new rubber track component performance baselines, optimize performance of new rubber compounds, and identify wear/failure mechanisms in candidate materials to extend the life of rubber track components for ground vehicles.
•	817	Funds reprogrammed for SBIR/STTR Programs in accordance with the Small Business Innovation Research Reauthorization Act of 1992.
Total	30355	

FY 2001 Planned Program:

•	9938	Develop, manufacture and deliver cost savings initiatives in the area of product re-engineering, information technology, training, automation, and rapid prototyping for spares.
Total	9938	

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

DATE: February 2000

BUDGET ACTIVITY: 7 - Operational System Development

PE NUMBER AND TITLE: 1001018A NATO Joint STARS

PROJECT: C35

COST (*In Thousands*)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
C35 NATO Alliance Ground Surveillance System (AGS) - TIARA	2784	0	0	0	0	0	0	0	10038

A. Mission Description and Budget Item Justification: 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.

FY 1999 Accomplishments:

- 152 NATO Command, Control and Consultation Agency (NC3A) Support
- 2632 US Advanced Radar Sensor (ARS) (NATO Version of the US Enhanced Radar)

Total 2784

FY 2000 Planned Program: Project not funded in FY 2000

FY 2001 Planned Program: Project not funded in FY 2001

B. Program Change Summary	FY 1999	FY 2000	FY 2001
Previous President's Budget (FY 2000/2001 PB)	2980	0	0
Appropriated Value	3000		
Adjustments to Appropriated Value			
a. Congressional General Reductions	-20		
b. SBIR / STTR	-78		
c. Omnibus or Other Above Threshold Reduction			
d. Below Threshold Reprogramming	-106		
e. Rescissions	-12		
Adjustments to Budget Years Since FY 2000/2001 PB			
Current Budget Submit (FY 2001 PB)	2784	0	0

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 1001018A NATO Joint STARS	PROJECT C35

C. Other Program Funding Summary	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Compl	Total Cost
BA1080 Joint STARS (TIARA)	82326	94818	66415	20941	0	10779	6261	Continue	Continue
BS9724 Joint STARS Spares	5894	6131	6179	6864	4367	0	0	0	57721
64770/D202 Joint Stars(TIARA)	5316	25676	17898	17713	12833	14372	11527	Continue	Continue

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 Sole Source 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	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
Complete Architectural Study	4Q*						
Conduct Systems Requirements Analysis	4Q*						
Complete Tests and Demonstrations	4Q*						

*Denotes completed milestone