ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost		12647	11316	4713	7514	7893	11034	11252	Continuing	Continuing
L59	DIAGNOST/EXPERT SYS DE	5104	10275	3579	5036	5294	7730	7882	Continuing	Continuing
L65	TEST EQUIPMENT DEVELOPMENT	935	1041	1134	2478	2599	3304	3370	Continuing	Continuing
L66	EMBEDDED DIAGNOSTICS/PROGNOSTICS DEVELOPMENT	6608	0	0	0	0	0	0	0	20532

A. Mission Description and Budget Item Justification: This program element (PE) provides for the development and testing of general-purpose on- and off-platform automatic test equipment; advanced technology calibration techniques, standards, and systems; and common embedded diagnostics/prognostics technology, software, and systems to support increasingly complex electronic weapon systems. It focuses on implementation of commercial state-of-the-art test technologies across multiple weapon platforms to minimize the cost of troubleshooting and maintenance of Army equipment in the field.

This program element funds development and evolution of general-purpose automatic test and diagnostic equipment and the enhancements required to overcome deficiencies and voids in organic test and diagnostic capabilities to ensure the operational readiness, accuracy, effectiveness, and safety of Army combat systems. Modular, reconfigurable automatic and semi-automatic systems are developed under this program to satisfy weapon system test and diagnostic requirements. The Next Generation Automatic Test System (NGATS), Base Shop Test Facility(BSTF)(V)6, is under development to provide test capabilities required to support current and future weapon systems. This system will replace several aging automatic test systems which are becoming prohibitively expensive to operate and maintain. This program also provides for continued development and improvement of calibration equipment with emphasis on incorporation of digital electronics and tailoring of configurations to improve deployability, mobility, and survivability of the support equipment and to reduce the logistics burdens associated with supporting Army combat systems in wartime and contingency operations. Artificial intelligence, embedded diagnostics, and anticipatory maintenance applications are being developed to support the integration of self-diagnostic capability in Army weapon systems. The goal of these efforts is to reduce the logistics burden and improve readiness through minimizing the need for external testers and to improve the troubleshooting abilities of soldiers in the field.

The Army's participation in development of a Joint Service Automatic Test System Next Generation Test (NxTest) architecture is being funded under this program element. The goal of the NxTest project is to reduce Department of Defense equipment, personnel, and funding burdens by allowing all Services' test program sets to execute on a common test system architecture. The Joint Service system will reduce proliferation of Service-specific automatic test systems in a theater.

These projects support the Current to Future transition path of the Transformation Campaign Plan (TCP).

B. Program Change Summary	FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 2004)	12899	4634	4707
Current Budget (FY 2005 PB)	12647	11316	4713
Total Adjustments	-252	6682	6
Congressional program reductions		-107	
Congressional rescissions			
Congressional increases		6800	
Reprogrammings	-252	-11	
SBIR/STTR Transfer			
Adjustments to Budget Years			6

FY04 funds reflect a Congressional increase of $6,800,000 for Project L59 to support the Electro-Optic Test Facility (EOTF) and the Base Shop Test Facility (BSTF) (V) 6.

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

February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604746A - Automatic Test Equipment Development**	**L59**

COST (In Thousands)	FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
L59 DIAGNOST/EXPERT SYS DE	5104	10275	3579	5036	5294	7730	7882	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project funds development of and system enhancements for general-purpose automatic test equipment and development/refinement of common embedded diagnostics and prognostics techniques and systems. The equipment and diagnostic processes developed under this project are required to overcome existing deficiences and voids in organic test and diagnostic capabilities and to ensure the operational readiness, accuracy, and effectiveness of the Army weapons and combat support systems. The Next Generation Automatic Test System (NGATS), Base Shop Test Facility (BSTF) (V)6, currently under development will provide test and diagnostic capabilities required to support current and future combat systems. Projects are also underway to demonstrate an embedded health and usage monitoring system for implementation on Army helicopters and to provide prognostics capability through use of an anticipatory maintenance system. This project provides for continuing efforts to improve general-purpose automatic test equipment required to satisfy test and diagnostic requirements of new and upgraded Army weapon systems; development and validation of test and diagnostic software; development and testing of common procedures, software applications, and hardware devices that can be embedded in weapon systems; development of added prognostic capabilities through expansion of anticipatory maintenance systems; and market surveys of commercially available test equipment, methods, and procedures to determine applicability to Army requirements. This project also funds the Army's participation in the Joint Service Next Generation Test (NxTest) Technical Working Group which is developing a common automatic test systems architecture that will enhance portability of all Services' test program sets and reduce Defense expenditures for test equipment and personnel.

This project supports the Current to Future transition path of the Transformation Campaign Plan (TCP).

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Evaluate new electro-optic technologies for the Integrated Family of Test Equipment (IFTE).	303	310	207
Develop and evaluate new software applications for the IFTE.	689	794	625
Develop prototype for a more rapidly deployable automatic test system.	4112	8887	2747
Small Business Innovative Research/Small Business Technology Transfer Programs.	0	284	0
Totals	5104	10275	3579

B. Other Program Funding Summary	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
OPA3, MB4000, Integrated Family of Test Equipment (IFTE)	72354	35487	4054	3196	78341	127080	132408	Continuing	Continuing

C. Acquisition Strategy: This developmental project consists of cooperative in-house and competitive and sole-source contractual actions. When the necessary expertise and capability are available within the Department of Defense (DoD), services required for the individual development projects are ordered from the government source: otherwise, commercial contracts are used. Equipment required for developmental projects is obtained by contract from the commercial supplier. Developmental efforts for the Next Generation Automatic Test System and the Electro-Optics Test Facility software applications are being completed under a sole-source contract awarded to the prime contractor for the Integrated Family of Test Equipment off-platform testers.

ARMY RDT&E COST ANALYSIS(R3)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L59

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Systems Engineering - Next Generation ATS BSTF(V)6	SS/CPFF	Northrop Grumman, Rolling Meadows, IL	4365	4096	2-4Q	9356	1-3Q	2947	2Q	Continue	20764	0
b . Software Development - IFTE	SS/CPFF	Northrop Grumman, Rolling Meadows, IL	2147	0		0		0		0	2147	0
c . Systems Engineering - IFTE	Various	Various	37067	0		0		0		0	37067	0
d . Software Development - IFTE	Various	Various	24901	0		300	3-4Q	0		0	25201	0
e . Government Engineering - IFTE		Various	7962	614	2Q	225	1-2Q	227	1-3Q	Continue	Continue	0
Subtotal:			76442	4710		9881		3174		Continue	Continue	0

ARMY RDT&E COST ANALYSIS(R3)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L59

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Contractor Technical Services - IFTE	Various	Various	1167	105	1-2Q	112	1-2Q	116	1-2Q	Continue	Continue	0
Subtotal:			1167	105		112		116		Continue	Continue	0

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Electro-Optic Test Facility Customer Test	Various	Various	1430	0		0		0		0	1430	0
b . BSTF (V)6	Various	Various	481	0		0		0		Continue	Continue	0
Subtotal:			1911	0		0		0		Continue	Continue	0

ARMY RDT&E COST ANALYSIS(R3)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L59

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Management Personnel		Various	7565	289	1-4Q	282	1-4Q	289	1-4Q	Continue	Continue	0
Subtotal:			7565	289		282		289		Continue	Continue	0
Project Total Cost:			87085	5104		10275		3579		Continue	Continue	0

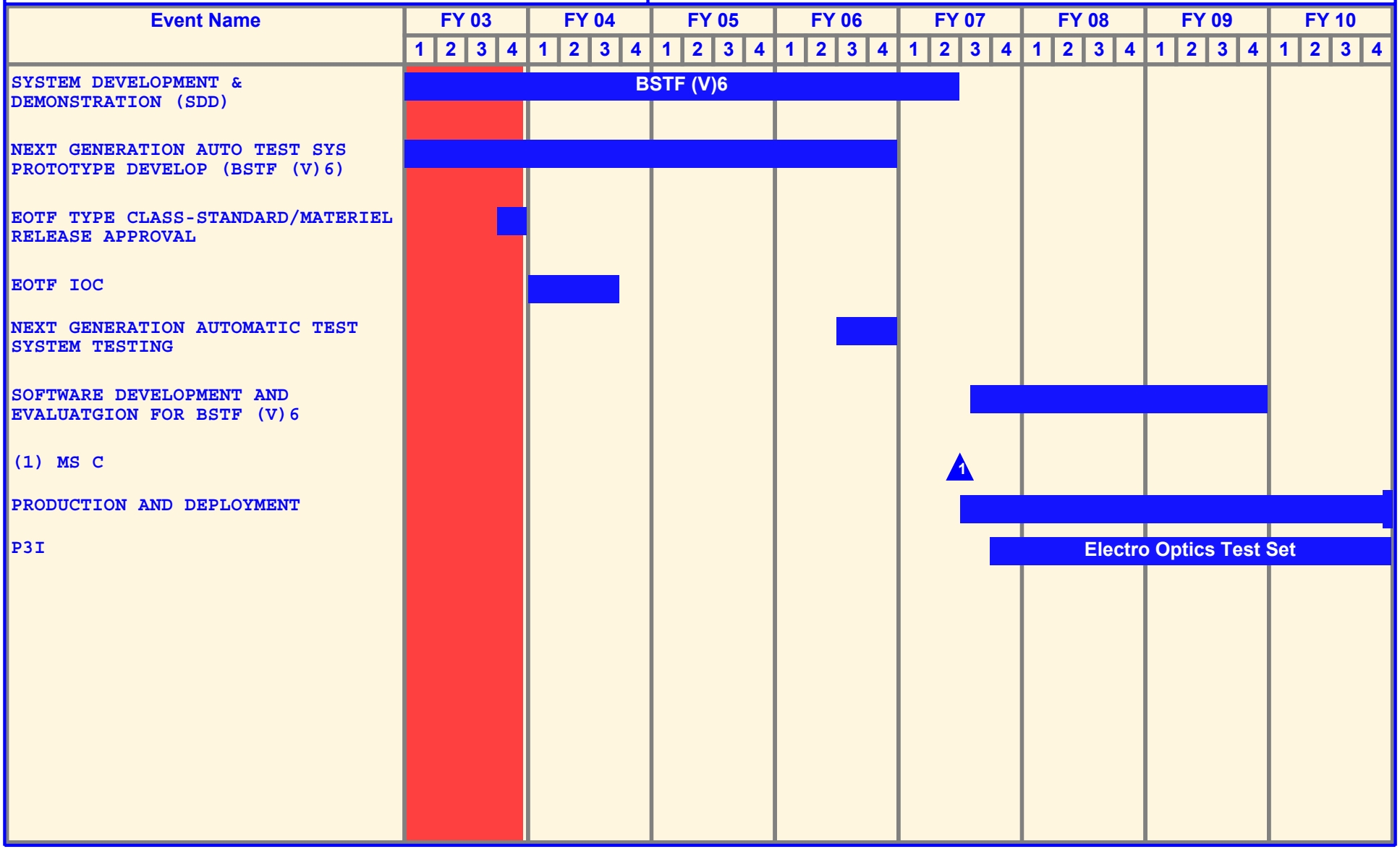
Schedule Profile (R4 Exhibit)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L59



Schedule Detail (R4a Exhibit)

February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604746A - Automatic Test Equipment Development**	**L59**

Schedule Detail	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
EOTF Type Classification-Standard/Materiel Release Approval	4Q						
EOTF Initial Operational Capability		1-3Q					
Next Generation Automatic Test System Prototype Development (BSTF (V)6)	1-4Q	1-4Q	1-4Q	1-4Q			
Next Generation Automatic Test System (BSTF (V)6) Testing				3-4Q			
Next Generation Automatic Test System (BSTF (V)6) Milestone C					2Q		
Software Development and Evaluation for BSTF(V)6					3-4Q	1-4Q	1-4Q

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

February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604746A - Automatic Test Equipment Development**	**L65**

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
L65	TEST EQUIPMENT DEVELOPMENT	935	1041	1134	2478	2599	3304	3370	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project supports development and demonstration of state-of-the-art general-purpose test, measurement, and diagnostic equipment (TMDE), and it provides for feasibility studies, market research, inventory analyses, bid sample testing, and prototyping to support TMDE acquisitions. Primary efforts under this project include improvement of test and measurement equipment performance envelopes via preplanned project improvements (P3I), development and validation of test and calibration procedures, evaluation of commercial and nondevelopmental TMDE with potential to meet weapon system maintenance requirements, and development and evaluation of advanced technology and higher reliability electronic test and calibration equipment. Preplanned product improvements are underway to current test and measurement systems to overcome deficiencies and voids in existing organic capabilities and to ensure the operational readiness, accuracy, effectiveness, and safety of Army weapons and combat support systems. These improvements will employ reconfigurable open electronics architecture and computer-based instrumentation wherever feasible and will be focused on reducing test equipment footprints to improve deployability and mobility in the area of operations.

This project supports the Current to Future transition path of the Transformation Campaign Plan (TCP).

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Develop hardware via preplanned product improvements to enhance TMDE systems' performance capabilities.	560	270	236
Test and integrate hardware developed for preplanned product improvements.	165	130	320
Initiate study and develop prototype plans for an enhanced diagnostic repair capability.	50	0	0
Develop, evaluate, and integrate test and measurement equipment.	0	461	408
Develop and evaluate test and calibration procedures.	60	50	70
Perform market research and evaluation of commercial equipment and develop performance specifications for acquisitions.	100	100	100
Small Business Innovative Research/Small Business Technology Transfer Programs	0	30	0
Totals	935	1041	1134

B. Other Program Funding Summary	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
OPA3, N10000, Calibration Sets Equipment	15924	18168	0	0	0	0	0	0	49911
OPA3, N11000, Test Equipment Modernization	16328	14609	5214	9722	9398	9682	21653	Continuing	Continuing

C. Acquisition Strategy: Projects are focused on use of commercial and nondevelopmental item technologies. When expertise and capability are available within the Department of Defense, services required for the individual development projects are ordered from the government source; otherwise, commercial contracts are used. Equipment required for development projects is obtained from the commercial supplier. Candidate commercial equipment and nondevelopmental items are identified and evaluated through market research and government testing and evaluation.

ARMY RDT&E COST ANALYSIS(R3)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L65

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Systems Engineering	Various	Various	4632	436	1-2Q	534	1-2Q	422	1-2Q	Continue	6024	0
b . Procedures Development and Evaluation	Various	Various	1738	60	2Q	50	2Q	70	1-3Q	Continue	Continue	0
c . Government Engineering		Various	912	144	1-4Q	140	1-4Q	145	1-4Q	Continue	Continue	0
Subtotal:			7282	640		724		637		Continue	Continue	0

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Technical Support Services	Various	Various	438	100	2Q	100	2Q	100	2Q	Continue	Continue	0
Subtotal:			438	100		100		100		Continue	Continue	0

ARMY RDT&E COST ANALYSIS(R3)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L65

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Testing	Various	Various	662	65	1-2Q	75	1-2Q	250	1-2Q	Continue	Continue	0
Subtotal:			662	65		75		250		Continue	Continue	0

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Management Personnel		Various	125	130	1-4Q	142	1-4Q	147	1-4Q	Continue	Continue	0
Subtotal:			125	130		142		147		Continue	Continue	0

Project Total Cost:			8507	935		1041		1134		Continue	Continue	0

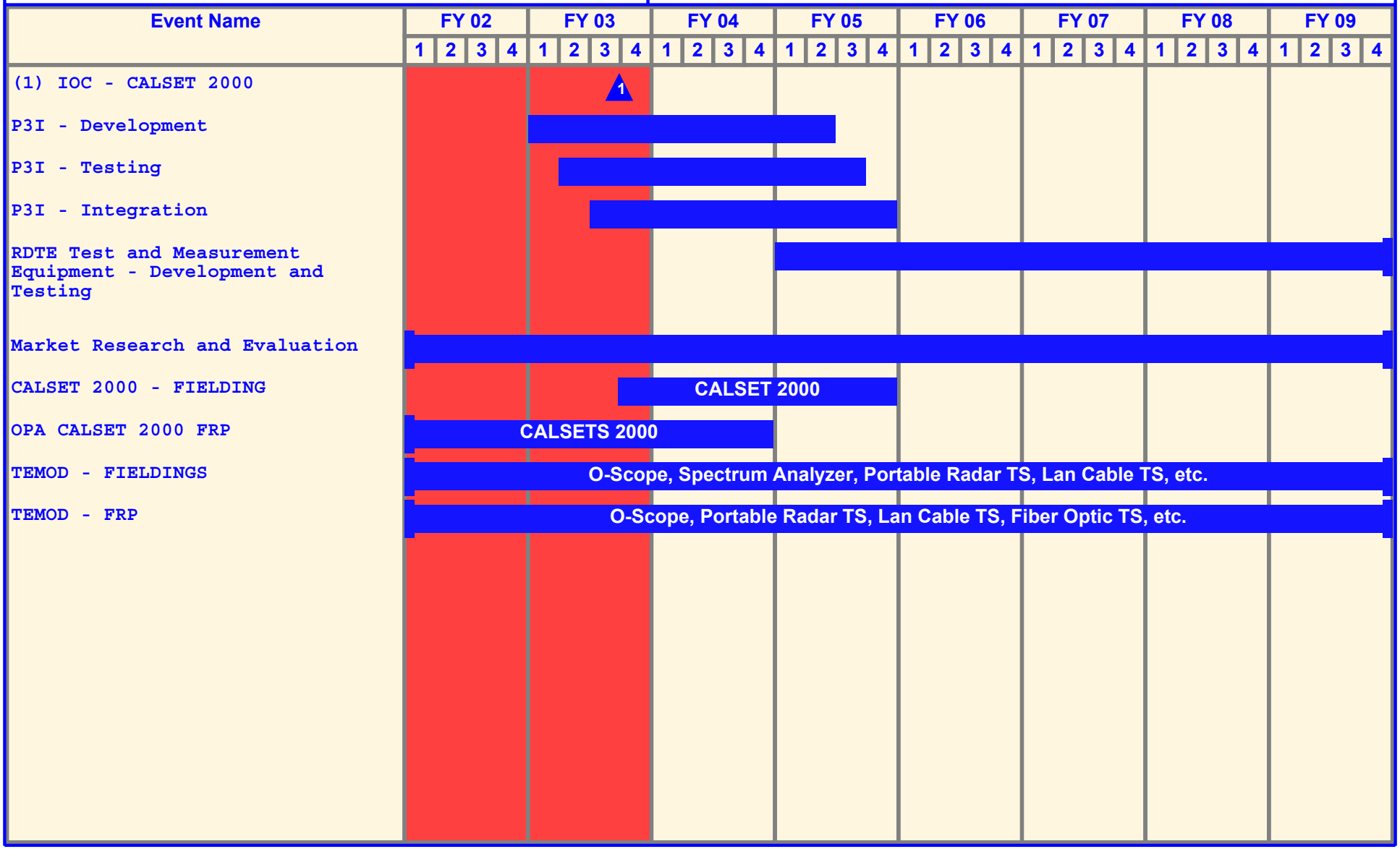
Schedule Profile (R4 Exhibit)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L65



Schedule Detail (R4a Exhibit)

February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604746A - Automatic Test Equipment Development**	**L65**

Schedule Detail	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
CALSET 2000 Initial Operational Capability	3Q						
P3I TMDE Development	1-4Q	1-4Q	1-2Q				
P3I Testing	1-4Q	1-4Q	1-3Q				
P3I - Integration	3-4Q	1-4Q	1-4Q				
Test and Measurement Equipment - Development			1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Test and Measurement Equipment - Testing			1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Market research and evaluation of commercial equipment; development of performance specifications	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q

This is a continuing program of developmental activities to provide a means for satisfying test and diagnostic support requirements of Army weapons and support systems. It consists of a number of similar and related efforts, many of which do not entail distinct major milestones. Major milestones for the test and calibration systems being developed under this project are shown in the table above.

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

February 2004

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - System Development and Demonstration	**0604746A - Automatic Test Equipment Development**	**L66**

COST (In Thousands)		FY 2003 Actual	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	Cost to Complete	Total Cost
L66	EMBEDDED DIAGNOSTICS/PROGNOSTICS DEVELOPMENT	6608	0	0	0	0	0	0	0	20532

A. Mission Description and Budget Item Justification: This project funded the development and demostration efforts of the Army Diagnostics Improvement Program (ADIP). ADIP developed and tested common procedures, software applications, and hardware devices that could be embedded in weapon systems. Included in this effort were a common Health and Usage Monitoring System (HUMS) for Army helicopters. A similar system is being explored for ground-based systems. The ADIP system was terminated at the end of FY03.

Accomplishments/Planned Program	FY 2003	FY 2004	FY 2005
Began and continued demonstration of Digital Source Collector (DSC) on UH-60L and CH-47D.	2856	0	0
Continued evaluation of predictive maintenance operating capability for Brigade Combat Team ground vehicles.	2213	0	0
Continued helicopter-based anticipatory data collection and data analysis.	1242	0	0
Continued investigation of new embedded diagnostics technologies and their application to Army systems.	297	0	0
Totals	6608	0	0

B. Other Program Funding Summary	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Compl	Total Cost
OPA3, N11103, Army Diagnostics Improvement Program	6594	0	0	0	0	0	0	0	22041

C. Acquisition Strategy: When the necessary expertise and capability were available within the Department of Defense, services required for the individual initiatives under this project were ordered from the government source; otherwise, existing or new commercial contracts were used. Equipment required for developmental projects was obtained by contract from the commercial supplier. Candidate equipment and maintenance methods were identified and evaluated through market research and government testing and evaluation.

ARMY RDT&E COST ANALYSIS(R3)

February 2004

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
L66

I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Systems Engineering	Various	Various	3996	1909	1-2Q	0		0		0	5905	0
b . Software Development/ Engineering	Various	Various	5160	1863	1-2Q	0		0		0	7023	0
c . Government Engineering		Various	989	402	1-2Q	0		0		0	1391	0
Subtotal:			10145	4174		0		0		0	14319	0

II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Contractor Technical Services	Various	Various	292	425	1-4Q	0		0		0	717	0
Subtotal:			292	425		0		0		0	717	0

ARMY RDT&E COST ANALYSIS(R3)

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BUDGET ACTIVITY
5 - System Development and Demonstration

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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Digital Source Collector Demonstration	Various	Various	1197	1652	2-4Q	0		0		0	2849	0
b . Paladin Embedded Diagnostics Test	Various	Various	130	0		0		0		0	130	0
c . Health and Usage Monitoring System Test	Various	Various	1530	0		0		0		0	1530	0
Subtotal:			2857	1652		0		0		0	4509	0

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2003 Cost	FY 2003 Award Date	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Management Personnel & Support		Various	630	357	1-4Q	0		0		0	987	0
Subtotal:			630	357		0		0		0	987	0

Project Total Cost:			13924	6608		0		0		0	20532	0