

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY		PE NUMBER AND TITLE								
5 - System Development and Demonstration		0604746A - Automatic Test Equipment Development								
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	2160	8046	18025	23728	15737	14686	15041	15447	Continuing	Continuing
L59 DIAGNOST/EXPERT SYS DE	2160	5390	14538	20126	12070	10943	11347	11675	Continuing	Continuing
L65 Test Equipment Development		2656	3487	3602	3667	3743	3694	3772	Continuing	Continuing

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

This PE 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 and to ensure the operational readiness, accuracy, effectiveness, and safety of Army combat and combat support systems. Modular, reconfigurable automatic and semi-automatic systems are developed under this program to satisfy weapon system test and diagnostics requirements. The Next Generation Automatic Test System (NGATS), also known as the Base Shop Test Facility (BSTF) (V)6, currently under development will provide state-of-the-art test and diagnostic capabilities to support current and future weapon systems. The NGATS 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 measurement 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 maintaining Army combat systems in wartime and contingency operations. Artificial intelligence and anticipatory maintenance applications are being developed to support the integration of self-diagnostic capabilities in Army weapons and support systems. The goal of these efforts is to reduce logistics burdens and improve readiness by minimizing the need for external testers and improving the troubleshooting abilities of soldiers in the field.

The Army's participation in the Agile Rapid Global Combat Support (ARGCS) Advanced Concept Technology Demonstration (ACTD) is being funded under this PE. The ARGCS ACTD 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.

FY2008/2009 funding for this program continues to support development in accordance with DoD and Army policies of the Army Standard Next Generation Automatic Test System which will improve deployability and mobility of test and diagnostic equipment and replace automated equipment currently supporting the Abrams and Bradley. It will also develop or significantly modify test equipment to satisfy modular force and homeland security support requirements that cannot be accommodated with test equipment currently available in the commercial marketplace.

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<u>B. Program Change Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	2221	8136	4986	11792
Current BES/President's Budget (FY 2008/2009)	2160	8046	18025	23728
Total Adjustments	-61	-90	13039	11936
Congressional Program Reductions		-90		
Congressional Rescissions				
Congressional Increases				
Reprogrammings	-61			
SBIR/STTR Transfer				
Adjustments to Budget Years			13039	11936

FY2008/2009: Funding increased to avoid delays in evolutionary development of the Next Generation Automatic Test System.

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COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
L59 DIAGNOST/EXPERT SYS DE	2160	5390	14538	20126	12070	10943	11347	11675	Continuing	Continuing

A. Mission Description and Budget Item Justification: This project funds development of and system enhancements for the Next Generation Automatic Test System (NGATS). The NGATS, also known as the Base Shop Test Facility (BSTF) (V)6, is a general-purpose automatic test system that will provide test and diagnostic capabilities required to support current and future weapons and combat support systems and will facilitate retirement of aging and obsolete test equipment that is imposing increasing logistics and operations and support cost burdens. This project provides for continuing efforts to upgrade and improve general-purpose automatic test equipment to satisfy test and diagnostic requirements of the Army's new and upgraded weapon systems; development and adaptation of automatic test equipment required to overcome existing deficiencies and voids in organic test and diagnostic capabilities; development and testing of common procedures utilizing existing test program sets and software applications; and market surveys of commercially available test equipment, methods, and procedures to determine applicability to Army requirements. The test and diagnostic systems and procedures developed under this project are essential for ensuring the operational readiness, accuracy, and effectiveness of the Army's warfighting systems. This project also funds the Army's participation in the Agile Rapid Global Combat Support (ARGCS) Advanced Concept Technology Demonstration (ACTD) 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.

<u>Accomplishments/Planned Program:</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
FY06-FY09: Develop and test a Joint Services compliant, rapidly deployable, general-purpose automatic test system (ATS)	2160	4756	5000	1500
FY07-FY09: Further develop and test system to implement planned spiral development and increase supported weapons platforms		500	5000	9500
FY08-FY09: Develop and test new hardware and software required to consolidate all ATS support requirements in this single test system			3000	5000
FY08-FY09: Develop and evaluate new software applications to increase Integrated Family of Test Equipment capability			1538	4126
FY07: Small Business Innovative Research/Small Business Technology Transfer Programs		134		
Total	2160	5390	14538	20126

<u>B. Other Program Funding Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
OPA3, MB4000, Integrated Family of Test Equipment (IFTE)	20619	55197	36516	46449	101890	109591	90665	53945	Continuing	Continuing

Comment:

C. Acquisition Strategy This developmental project consists of cooperative in-house and competitive and sole-source contractual actions. When the necessary expertise and

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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 developmental projects is obtained by contract from the commercial supplier. Developmental efforts for the Next Generation Automatic Test System (NGATS) are being completed under a sole-source contract awarded to the prime contractor for the Integrated Family of Test Equipment off-platform testers. NGATS will follow an evolutionary acquisition strategy using spiral development. The NGATS Increment 1 will replace the Direct Support Electrical Systems Test Set (DSESTS). Increments 2 and 3 will replace the Base Shop Test Facility (BSTF) (V)3 and BSTF (V)5 systems respectively.

ARMY RDT&E COST ANALYSIS (R3)

February 2007

BUDGET ACTIVITY			PE NUMBER AND TITLE									PROJECT		
5 - System Development and Demonstration			0604746A - Automatic Test Equipment Development									L59		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Prototype Development	SS/CPFF	Northrop Grumman, Rolling Meadows, IL	11512	1960	2Q	1604	2Q						15076	15116
Hardware Development	Various	Various	47000			901	2Q	4299	2-3Q	6654	2-3Q	Cont.	Cont.	Cont.
Software Development/ Verification/Validation	Various	Various	4239			861	2Q	8414	2-3Q	11982	2-3Q	Cont.	Cont.	Cont.
Subtotal:			62751	1960		3366		12713		18636		Cont.	Cont.	Cont.
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Project Management		Various	43390	200	1-4Q	465	1-4Q	525	1-4Q	600	1-4Q	Cont.	Cont.	Cont.
Other Direct		Various	1390			446	1-4Q	500	1-4Q	500	1-4Q	Cont.	Cont.	Cont.
Subtotal:			44780	200		911		1025		1100		Cont.	Cont.	Cont.
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Operational Testing	Various	Various	2814			579	2Q	800	1-3Q			Cont.	Cont.	Cont.
Developmental Testing	Various	Various	597			400	2Q			390	2Q	Cont.	Cont.	Cont.
Subtotal:			3411			979		800		390		Cont.	Cont.	Cont.
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract

ARMY RDT&E COST ANALYSIS (R3)

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BUDGET ACTIVITY 5 - System Development and Demonstration				PE NUMBER AND TITLE 0604746A - Automatic Test Equipment Development							PROJECT L59		
SBIR/STTR						134	2Q					134	
Subtotal:						134						134	

Project Total Cost:				110942	2160		5390		14538		20126		Cont.	Cont.	Cont.
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Schedule Profile (R4 Exhibit)

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BUDGET ACTIVITY
5 - System Development and Demonstration

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0604746A - Automatic Test Equipment Development

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Event Name	FY 06				FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
BSTF (V)6 Prototype Development (Increment 1)																																
BSTF (V)6 System Development and Demonstration (SDD) (Increment 1)																																
BSTF (V)6 Testing (Increment 1)																																
BSTF (V)6 SDD (Increment 2)																																
BSTF (V)6 Testing (Increment 2)																																
BSTF (V)6 SDD (Increment 3)																																
BSTF (V)6 Testing (Increment 3)																																
BSTF (V)6 TPS Compatibility Testing																																

Schedule Detail (R4a Exhibit)

February 2007

**BUDGET ACTIVITY
5 - System Development and Demonstration**

**PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development**

**PROJECT
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<u>Schedule Detail</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>
BSTF (V)6 Prototype Development (Increment 1)	1Q - 4Q	1Q - 4Q						
BSTF (V)6 System Development and Demonstration (SDD) (Increment 1)		1Q - 4Q	1Q - 4Q	1Q - 2Q				
BSTF (V)6 Testing (Increment 1)		2Q - 4Q	1Q - 3Q					
BSTF (V)6 SDD (Increment 2)			4Q	1Q - 4Q	1Q - 4Q			
BSTF (V)6 Testing (Increment 2)						1Q - 3Q		
BSTF (V)6 SDD (Increment 3)						1Q - 4Q	1Q - 4Q	
BSTF (V)6 Testing (Increment 3)							1Q - 4Q	1Q - 2Q
BSTF (V)6 TPS Compatibility Testing		1Q - 4Q						

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BUDGET ACTIVITY 5 - System Development and Demonstration		PE NUMBER AND TITLE 0604746A - Automatic Test Equipment Development							PROJECT L65	
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
L65 Test Equipment Development		2656	3487	3602	3667	3743	3694	3772	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 product improvements (P3I), development and validation of test 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 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.

Accomplishments/Planned Program:	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
FY07-FY09: Develop hardware via preplanned product improvements to enhance TMDE systems' performance capabilities		560	580	600
FY07-FY09: Test and integrate hardware developed for preplanned product improvements		730	775	827
FY07-FY09: Develop, evaluate, and integrate test and measurement equipment		900	1067	1100
FY07-FY09: Continue development and evaluation of test and calibration procedures		190	200	210
FY07-FY09: Perform market research and evaluation of commercial equipment, and develop performance specifications for acquisitions		201	865	865
FY07: Small Business Innovative Research/Small Business Technology Transfer Programs		75		
Total		2656	3487	3602

B. Other Program Funding Summary	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
OPA3, N10000, Calibration Sets Equipment		2018	10644	9755	10647	12646	12475	20350	Continuing	Continuing
OPA3, N11000, Test Equipment Modernization	6164	11768	19302	22530	22607	19230	13160	5855	Continuing	Continuing

Comment:

C. Acquisition Strategy Projects are focused on use of commercial and nondevelopmental item technologies. When programmatic and engineering expertise and capability are

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available within the Department of Defense, services required for the individual development projects are acquired from the government source; otherwise, commercial services contracts are used to provide these capabilities. 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.

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BUDGET ACTIVITY			PE NUMBER AND TITLE									PROJECT		
5 - System Development and Demonstration			0604746A - Automatic Test Equipment Development									L65		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	Various	Various	5948			915	1-2Q	1525	1-2Q	1595	1-2Q	Cont.	Cont.	Cont.
Procedures Development and Evaluation	Various	Various	1918			190	1-3Q	200	1-3Q	210	1-3Q	Cont.	Cont.	Cont.
Government Engineering		Various	1340			330	1-4Q	515	1-4Q	515	1-4Q	Cont.	Cont.	Cont.
Subtotal:			9206			1435		2240		2320		Cont.	Cont.	Cont.
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Technical Support Services	Various	Various	738			229	2Q	300	2Q	310	2Q	Cont.	Cont.	Cont.
Subtotal:			738			229		300		310		Cont.	Cont.	Cont.
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Testing	Various	Various	1052			579	1-2Q	597	1-2Q	612	1-2Q	Cont.	Cont.	Cont.
Subtotal:			1052			579		597		612		Cont.	Cont.	Cont.
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Program Management Personnel		Various	544			338	1-4Q	350	1-4Q	360	1-4Q	Cont.	Cont.	Cont.
SBIR/STTR						75	2Q						75	

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BUDGET ACTIVITY 5 - System Development and Demonstration				PE NUMBER AND TITLE 0604746A - Automatic Test Equipment Development					PROJECT L65				
Subtotal:				544		413		350		360	Cont.	Cont.	Cont.
Project Total Cost:				11540		2656		3487		3602	Cont.	Cont.	Cont.

Schedule Profile (R4 Exhibit)

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BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604746A - Automatic Test Equipment Development

PROJECT
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Event Name	FY 06				FY 07				FY 08				FY 09				FY 10				FY 11				FY 12				FY 13			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Test and Measurement Equipment - Development	[Redacted]																															
Test and Measurement Equipment - Testing	[Redacted]																															
Market research and evaluation of comm equipment/development of performance spec	[Redacted]																															

Schedule Detail (R4a Exhibit)

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<u>Schedule Detail</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>
Test and Measurement Equipment - Development		2Q - 4Q	1Q - 4Q					
Test and Measurement Equipment - Testing		2Q - 4Q	1Q - 4Q					
Market research and evaluation of comm equipment/development of performance spec		2Q - 4Q	1Q - 4Q					