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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	10.685	8.960	8.813	-	8.813	10.362	11.572	9.790	9.974	Continuing	Continuing
L59: <i>Diagnost/Expert Sys</i>	-	6.830	4.699	6.034	-	6.034	6.440	6.720	5.792	5.948	Continuing	Continuing
L65: <i>Test Equipment Development</i>	-	3.855	4.261	2.779	-	2.779	3.922	4.852	3.998	4.026	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) provides for development and testing of general-purpose test equipment, state-of-the-art diagnostics and prognostics technologies, and 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.

Modular, reconfigurable automatic and semi-automatic systems are being developed under this program to satisfy weapon system test and diagnostics requirements. The Next Generation Automatic Test System (NGATS), currently under development, provides state-of-the-art test and diagnostic capabilities to support current and future weapon systems. It is the platform for transitioning Agile Rapid Global Combat Support System (ARGCS) technologies into the Army weapon system support structure, and it will replace several aging automatic test systems (ATS) that are becoming prohibitively expensive to operate and maintain.

This PE also provides for continued development and improvement of general-purpose test equipment and calibration standards with emphasis on the incorporation of digital electronics and tailoring of configurations to improve deployability, mobility and survivability of the support equipment. It includes development, demonstration and testing of calibration standards and techniques to support new Army test equipment requirements. It also includes feasibility studies, market research, inventory analyses, bid sample testing and prototyping to support acquisition of calibration systems and general-purpose test and diagnostics equipment.

FY 2017 Base funding for this program continues development of the Army's standard NGATS which will improve deployability and mobility of test and diagnostic equipment. The NGATS provides state-of-the-art test and diagnostic capabilities and a means for reducing the Army's test equipment operating and support costs and the costs for supporting a number of the Army's vital warfighting systems. The FY 2017 funding will 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 such as radio frequency (RF) and electro-optic (EO) testing capability. It will also provide for technology enhancements to the Army's standard at-system tester to meet test and diagnostic requirements of the supported weapon systems, develop/redesign test program sets and hardware for support of legacy and emerging weapon systems, develop a network centric software framework for NGATS, and develop and test general-purpose test equipment and calibration standards to meet Army weapon system support requirements.

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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	11.079	8.960	11.014	-	11.014
Current President's Budget	10.685	8.960	8.813	-	8.813
Total Adjustments	-0.394	0.000	-2.201	-	-2.201
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.394	-			
• Adjustments to Budget Years	-	-	-2.201	-	-2.201

Change Summary Explanation

FY 2017, \$2.201 million reduction to support higher priority projects

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>				Project (Number/Name) L59 / <i>Diagnost/Expert Sys</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
L59: <i>Diagnost/Expert Sys</i>	-	6.830	4.699	6.034	-	6.034	6.440	6.720	5.792	5.948	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds development of and system enhancements for the Next Generation Automatic Test System (NGATS) and the Maintenance Support Device (MSD). The NGATS is a general-purpose automatic test system (ATS) that provides 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. It is the platform for transitioning Agile Rapid Global Combat Support System (ARGCS) Advanced Concept Technology Demonstration (ACTD) technologies into the Army weapon system support structure. The ARGCS ACTD initiative was sponsored by the Department of Defense, and all Services are expected to transition demonstrated technologies into their ATS programs. The MSD is the Army's standard at-system tester and requires continuing upgrades to support technology advancements in the supported weapon systems. This project funds development projects to incorporate the most current relevant technology into the next generation MSD, supports capability enhancement of a wireless at-platform test set (WATS) connectivity, develops capabilities to minimize or eliminate Army dependency on expensive proprietary software to support tactical vehicles, integrates MSD into the Brigade Combat Team information structure as the at-platform data collection device for the Army's condition-based maintenance plus (CBM+) initiative and maintains compatibility with emerging aviation platform hardware bus technology and aviation notebook software interface requirements. This project also provides for continuing efforts in the 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.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: NGATS Radio Frequency (RF) Test Capability	1.000	0.500	1.000	-	1.000
Description: Develop and integrate NGATS RF test capability					
FY 2015 Accomplishments: Completed development of stand-alone commercial off-the-shelf RF test asset for NGATS.					
FY 2016 Plans: Initiate RF Interface Unit development, prototyping and integration of the entire RF test asset into the NGATS.					
FY 2017 Base Plans: Continue prototyping and integration of RF subsystem into the NGATS.					
Title: NGATS Increment 2	1.100	0.885	0.500	-	0.500

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development	Project (Number/Name) L59 / Diagnost/Expert Sys			
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Description: Develop and test hardware and software for NGATS Increment 2 support capability</p> <p>FY 2015 Accomplishments: Continued development and testing of hardware and software for support of Increment 2 systems (Avenger, Multiple Launch Rocket System, TOW Missile System, Paladin and Common Remotely Operated Weapons Station (CROWS II)).</p> <p>FY 2016 Plans: Continue development and testing of hardware and software for support of Increment 2 systems (Avenger, Multiple Launch Rocket System, TOW Missile System, Paladin and CROWS II).</p> <p>FY 2017 Base Plans: Continue development and testing of hardware and software for support of additional Increment 2 systems (Counter RCIED (Radio-Controlled Improvised Explosive Device) Electronic Warfare (CREW) Duke, Precision Fires, Armored Multi-Purpose Vehicle (AMPV), Stryker Mobile Gun System (MGS), and Joint Assault Bridge (JAB)).</p>					
<p>Title: NGATS Electro-Optics (EO) Subsystem</p> <p>Description: Develop and test hardware and software for NGATS electro-optics (EO) subsystem (to include the capability to support new ground and aerial sensors for unmanned air and ground vehicles)</p> <p>FY 2015 Accomplishments: Completed development, prototyping and testing of stand-alone EO subsystem for NGATS.</p> <p>FY 2016 Plans: Initiate hardware and software integration/testing of the EO subsystem into the NGATS for use by test program set (TPS) developers and depots.</p> <p>FY 2017 Base Plans: Continue integration/testing of EO subsystem into NGATS for use by Modified Table of Organization and Equipment (MTOE) locations.</p>	0.500	0.200	0.500	-	0.500
<p>Title: Developmental and Operational Follow-on Testing of NGATS Increment 1 Capability (Provides Abrams/Bradley/Stryker Support Capability)</p> <p>Description: Complete developmental and operational follow-on testing activities</p>	-	1.000	0.800	-	0.800

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B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
FY 2016 Plans: Initiate developmental and operational follow-on testing activities to include Reliability Testing, Logistics Demonstration/TM Verification and Transportability Testing in support of a production decision. Includes also the assessment/verification of the development of remaining, needed capability of existing systems to operate with all existing test program sets used with legacy automatic test equipment.						
FY 2017 Base Plans: Continue and complete remaining required testing, assessment and verification events.						
Title: Additional Software Capabilities for Use with NGATS		0.250	0.250	0.270	-	0.270
Description: Develop software capabilities to incorporate common logistics operating environment (CLOE)/ netcentric and embedded diagnostics data collection and analysis for closed loop diagnostic maintenance in support of condition-based maintenance						
FY 2015 Accomplishments: Continued development of a network centric software framework to facilitate message communication.						
FY 2016 Plans: Continue development of a network centric software framework to facilitate configuration status accounting.						
FY 2017 Base Plans: Continue development of a network centric software framework to facilitate data exchange with other components of the global information grid (GIG).						
Title: NGATS Performance Enhancement		0.217	0.300	0.730	-	0.730
Description: NGATS core instrument/software modifications to increase NGATS performance						
FY 2015 Accomplishments: Initiated development of NGATS core instrument/software modifications to increase NGATS performance to include redesign of the Automatic Test Equipment (ATE) interface perimeter engagement system.						
FY 2016 Plans: Continue development of NGATS core instrument/software modifications to increase NGATS performance to include redesign of the ATE interface perimeter engagement system.						
FY 2017 Base Plans:						

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Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>		Project (Number/Name) L59 / <i>Diagnost/Expert Sys</i>	
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Complete prototype and evaluation of the redesigned perimeter engagement system and initiate development of increased processor speed with NGATS controller to add additional capabilities.					
Title: Smart TPSs/Enhanced Self Test					
Description: Develop enhanced smart TPS hardware and software and enhanced self test					
FY 2015 Accomplishments: Initiated development of enhanced self test strategy for NGATS.					
	0.508	-	-	-	-
Title: Abrams/Bradley TPS Design					
Description: Design, test and evaluate Abrams/Bradley TPSs to utilize modern core NGATS instrumentation vice continuing to execute on single-purpose instrumentation specifically developed to emulate Abrams/Bradley legacy test equipment (i.e., Direct Support Electrical System Test Set (DSESTS))					
FY 2015 Accomplishments: Continued design, test and evaluation of Abrams/Bradley TPSs to include analysis of Abrams/Bradley TPSs against NGATS resources and incorporation of health monitoring into the instrumentation required for testing Abrams/Bradley line replaceable units (LRU).					
FY 2017 Base Plans: Redesign Abrams/Bradley TPSs to execute on core commercial NGATS instrumentation versus continuing to execute on single purpose instrumentation specifically developed for testing Abrams/Bradley LRUs.					
	0.500	-	0.750	-	0.750
Title: Electro-Optic (EO) TPS Development					
Description: Develop Increment 2 and 3 EO TPSs for use with NGATS EO asset to utilize (Army standard) core NGATS instrumentation vice legacy automatic test systems such as DSESTS and Base Shop Test Facility (BSTF)(V)5					
FY 2016 Plans: Initiate development of re-hosted EO TPSs to include 4 each Abrams/Bradley.					
FY 2017 Base Plans: Continue development of re-hosted EO TPSs to include 2 each CROWS and 2 each Stryker Remote Weapons Station.					
	-	0.200	0.750	-	0.750
Title: NGATS System Level Calibration/Verification Program					
	1.200	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: Develop and test the NGATS system level calibration/verification program					
FY 2015 Accomplishments: Continued development and testing of the NGATS system level calibration/verification program.					
Title: NGATS Logistics Support Products					
Description: Develop NGATS initial logistics support products (including provisioning, technical manuals and calibration)					
FY 2015 Accomplishments: Continued development of initial logistics support products for the core NGATS.					
FY 2016 Plans: Initiate development of initial logistics support products for the NGATS EO and RF subsystems.					
FY 2017 Base Plans: Continue development of NGATS EO and RF logistics products.					
	0.750	0.500	0.500	-	0.500
Title: MSD Technology Enhancements					
Description: Incorporate current relevant technology into the next-generation MSD and support capability enhancement of the wireless at-platform test set (WATS). Develop capabilities to minimize or eliminate Army dependency on proprietary software to support tactical vehicles, integrate MSD into the Brigade Combat Team information structure as the at-platform data collection device for the Army's CBM+ initiative, and maintain compatibility with emerging aviation platform hardware bus technology and aviation notebook software interface requirements.					
FY 2015 Accomplishments: Initiated development of the architectural software shell for WATS diagnostic software to accept modular platform testing software insertions. Continued enhancement of WATS radio technology and common electronics package augmentation to provide at-platform wireless test support for Army vehicle and weapon systems platforms. Devised methods to minimize or eliminate Army dependency on proprietary software to support current and future tactical vehicles.					
FY 2016 Plans:					
	0.805	0.864	0.234	-	0.234

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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Complete enhancement of WATS radio technology, the common electronics package augmentation and WATS architectural software shell to provide at-platform wireless test support for Army vehicle and weapon systems platforms. Continue to devise methods to minimize or eliminate Army dependency on proprietary software to support current and future tactical vehicles.					
<i>FY 2017 Base Plans:</i> Incorporate enhanced WATS radio technology, the common electronics package augmentation and new WATS software architecture into WATS prototype, conduct developmental testing, and develop draft Technical Data Package for at-platform wireless testing of Army vehicle and weapon systems platforms. Continue to investigate new methods to minimize or eliminate Army dependency on proprietary software to support current and future tactical vehicles.					
Accomplishments/Planned Programs Subtotals	6.830	4.699	6.034	-	6.034

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• ∴ OPA3, SSN MB4000, Integrated Family of Test Equipment (IFTE)	37.482	34.487	29.781	-	29.781	26.752	26.745	27.502	34.446	Continuing	Continuing

Remarks

None.

D. Acquisition Strategy

This developmental project consists of organic and contractual actions. When the necessary 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 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 number of contracts awarded to the prime contractor for the Integrated Family of Test Equipment off-platform testers and other contractors with automatic test equipment (ATE) and test program set development capabilities. NGATS is following an evolutionary acquisition strategy using incremental development to satisfy Army depot and field testing requirements for new and existing systems. It will replace existing legacy Army ATE (i.e., Base Shop Test Facility (BSTF)(V)3, BSTF(V)5, and Direct Support Electrical System Test Set) as well as Army depot system-specific ATE.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)							
2040 / 5				PE 0604746A / Automatic Test Equipment Development					L59 / Diagnost/Expert Sys							
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Project Management	Various	Various : Various	0.000	-		0.150	Jan 2016	0.200	Nov 2016	-		0.200	Continuing	Continuing	Continuing	
Subtotal			0.000	-		0.150		0.200		-		0.200	-	-	-	
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Software Development/ Verification/Validation	Various	Various, : Various	33.703	2.112	Aug 2015	1.101	May 2016	1.435	Feb 2017	-		1.435	Continuing	Continuing	Continuing	
Hardware/Support Items Development	Various	Various, : Various	61.252	3.668	Aug 2015	1.591	May 2016	2.899	Feb 2017	-		2.899	Continuing	Continuing	Continuing	
Subtotal			94.955	5.780		2.692		4.334		-		4.334	-	-	-	
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Technical Support	Various	Various, : Various	48.528	0.850	Mar 2015	0.657	May 2016	0.450	Dec 2016	-		0.450	Continuing	Continuing	Continuing	
Other Direct	Various	Various, : Various	3.790	0.200	Mar 2015	0.200	May 2016	0.200	Dec 2016	-		0.200	Continuing	Continuing	Continuing	
Subtotal			52.318	1.050		0.857		0.650		-		0.650	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Developmental/ Operational Testing	Various	Various, : Various	1.046	-		1.000	Jul 2016	0.850	Nov 2016	-		0.850	Continuing	Continuing	Continuing	
Subtotal			1.046	-		1.000		0.850		-		0.850	-	-	-	
Remarks																
Test program set (TPS) and contractor developmental test and evaluation are included in the product development cost.																

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army							Date: February 2016				
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development				Project (Number/Name) L59 / Diagnost/Expert Sys				
	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	148.319	6.830	4.699	6.034	-	6.034	-	-	-		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development	Project (Number/Name) L59 / Diagnost/Expert Sys
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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) Full Materiel Release									FMR																			
(2) First Unit Equipped									2 FUE																			
(3) Full Rate Production Decision Review									3 FRP-DR																			
NGATS Testing (Increment 1 Follow-On DT/OT)																												
NGATS Full-Rate Production (Increment 1)																												
NGATS System Development and Demonstration (SDD) (Increment 2)																												
NGATS Testing (Increment 2)																												
(4) FOT&E Completed (DT)									4																			
NGATS Development (EO Subsystem)																												
NGATS Development (RF Subsystem)																												
NGATS EO Integration																												
NGATS RF Integration																												
NGATS Testing (EO & RF Subsystems)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development	Project (Number/Name) L59 / Diagnost/Expert Sys
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
NGATS Product Improvements - Netcentric																												
New Systems Test Capability																												
MSD Technology Enhancements																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Full Materiel Release	3	2017	3	2017
First Unit Equipped	4	2017	4	2017
Full Rate Production Decision Review	3	2017	3	2017
NGATS Testing (Increment 1 Follow-On DT/OT)	1	2016	3	2016
NGATS Full-Rate Production (Increment 1)	3	2017	4	2021
NGATS System Development and Demonstration (SDD) (Increment 2)	4	2009	4	2017
NGATS Testing (Increment 2)	4	2010	4	2017
FOT&E Completed (DT)	2	2017	2	2017
NGATS Development (EO Subsystem)	4	2010	4	2015
NGATS Development (RF Subsystem)	1	2015	4	2017
NGATS EO Integration	3	2016	4	2018
NGATS RF Integration	3	2017	4	2018
NGATS Testing (EO & RF Subsystems)	4	2012	4	2018
NGATS Product Improvements - Netcentric	4	2011	4	2021
New Systems Test Capability	2	2011	4	2021
MSD Technology Enhancements	2	2015	4	2021

Note

Test program set (TPS) compatibility testing runs continually throughout the product development process

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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
L65: <i>Test Equipment Development</i>	-	3.855	4.261	2.779	-	2.779	3.922	4.852	3.998	4.026	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports development and demonstration of state-of-the-art calibration standards and techniques, and upgrades/improvements to existing Army calibration systems. It provides feasibility studies, market research, inventory analyses, bid sample testing, and prototyping to support calibration systems and general-purpose test, measurement and diagnostic equipment (TMDE) acquisitions. Primary efforts under this project include development of calibration software, calibration capability for chemical and biological agent detection systems, and improvement of test and measurement equipment performance envelopes. This project provides for product improvements and development/evaluation of advanced technologies to increase reliability of calibration systems and general-purpose TMDE. The product improvements eliminate gaps in existing organic capabilities and ensure operational readiness, accuracy, effectiveness, and safety of Army weapons and combat support systems. These improvements employ reconfigurable open-electronics architecture and computer-based instrumentation where feasible and focus on reduced test equipment footprint to improve deployability and mobility in areas of operation.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Calibration Sets (CALSETS) Software Environment and Calibration	1.004	1.368	0.785	-	0.785
Description: Develop and test an Army automated calibration environment and develop calibration procedures. Test efforts in support of DoD Information Assurance Certification and Accreditation Process (DIACAP).					
FY 2015 Accomplishments: Developed and evaluated calibration procedures. Developed, tested and evaluated enhanced calibration software environment. Developed and tested DIACAP for calibration instrument controllers.					
FY 2016 Plans: Continue development and evaluation of automated calibration procedures. Evaluate feasibility of incorporating commercial procedures and calibration system performance monitoring within the software environment. Test and evaluate prototype calibration procedure development engine.					
FY 2017 Base Plans: Initiate addition of ISO 17250 accreditation reporting to calibration software environment and calibration procedures. Develop and evaluate automated calibration procedures.					
Title: Physical Instruments	1.258	1.236	0.833	-	0.833

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Description: Research, develop, and test physical parameter calibration instrumentation to support areas such as chemical/biological agent detection systems, night vision testers, small arms gages, pneumatic pressure systems, temperature, etc.</p> <p>FY 2015 Accomplishments: Completed development and test of hydrocarbon flow calibration and test standards. Continued development, automation, and test of prototype small arms gage calibration standards. Initiated development and test of chemical agent detectors and protective equipment testers and calibrators. Initiated development of pneumatic standards to support avionic systems.</p> <p>FY 2016 Plans: Continue development and test of prototype small arms gage calibration standards. Continue development and test of calibration systems for biological agent detectors and protective equipment. Continue development of pneumatic standards to support avionic systems. Perform market research, evaluate commercial equipment, and complete specifications for acquisition.</p> <p>FY 2017 Base Plans: Continue development and testing of prototype small arms gage calibration standards. Continue development and test of calibration systems for biological agent detectors and protective equipment. Complete tests of pneumatic standards to support avionic systems. Perform market research, evaluate commercial equipment, and complete specifications for acquisition.</p>					
<p>Title: Electrical Instruments</p> <p>Description: Research, develop, and test electrical calibration instrumentation to support areas such as deployable recertification set, intrinsic electrical standards, and electrical transport standards.</p> <p>FY 2015 Accomplishments: Performed market research, evaluated commercial equipment and developed performance specifications for acquisition. Completed testing of DC intrinsic voltage system and continued testing of AC intrinsic voltage system. Completed testing of electronic transport standards.</p> <p>FY 2016 Plans:</p>	1.208	1.272	0.776	-	0.776

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>	Project (Number/Name) L65 / <i>Test Equipment Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>Perform market research, evaluate commercial equipment and develop performance specifications for acquisition. Complete development and test of high voltage multiplier for AC intrinsic voltage system. Develop and test prototype microwave reference standard.</p> <p>FY 2017 Base Plans: Perform market research, evaluate commercial equipment and develop performance specifications for acquisition. Continue development of prototype microwave reference standards. Research improvements in reliability, transportability and supportability of DC intrinsic voltage standards.</p>					
<p>Title: Test Equipment Modernization (TEMOD)</p> <p>Description: Perform market research, bid sample testing, and evaluation of commercial general-purpose electronic test equipment (GPETE) and develop performance specifications for TEMOD acquisitions.</p> <p>FY 2015 Accomplishments: Performed market research and evaluation of commercial GPETE and developed performance specifications for future acquisitions. Conducted bid sample testing to support acquisition program.</p> <p>FY 2016 Plans: Perform market research and evaluation of commercial GPETE and develop performance specifications for equipment to support acquisition program. Conduct bid sample testing to support acquisition program.</p> <p>FY 2017 Base Plans: Perform market research and evaluation of commercial GPETE and develop performance specifications for improved capability spectrum analysis test equipment. Conduct bid sample testing to support acquisition program.</p>	0.385	0.385	0.385	-	0.385
Accomplishments/Planned Programs Subtotals	3.855	4.261	2.779	-	2.779

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• SSN N10000: <i>Calibration Sets Equipment</i>	5.726	4.650	4.963	-	4.963	5.564	8.515	4.459	3.964	Continuing	Continuing
• SSN N11000: <i>Test Equipment Modernization</i>	11.711	11.083	6.342	1.140	7.482	9.880	10.769	9.914	9.916	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

Projects are focused on use of commercial and nondevelopmental item technologies. Department of Defense services provide programmatic, engineering expertise and capability for individual development projects; otherwise, commercial service contracts are used to obtain these capabilities. Equipment required for development projects is obtained from commercial suppliers. Candidate commercial equipment and nondevelopmental items are identified and evaluated through market research and government test and evaluation.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development				Project (Number/Name) L65 / Test Equipment Development							
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
In-house Engineering	SS/LH	Civ Labor : various	4.431	0.902	Jan 2015	0.596	Jan 2016	0.680	Oct 2016	-		0.680	Continuing	Continuing	0
Subtotal			4.431	0.902		0.596		0.680		-		0.680	-	-	0.000
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CALSETS Software Environment and Calibration	Various	Various : Various	5.818	0.351	Mar 2015	0.616	Apr 2016	0.368	Jan 2017	-		0.368	Continuing	Continuing	0
Physical Instruments	Various	Various : Various	6.365	0.529	Mar 2015	0.582	Apr 2016	0.253	Dec 2016	-		0.253	Continuing	Continuing	0
Electrical Instruments	Various	Various : Various	9.029	0.503	Mar 2015	0.553	Apr 2016	0.302	Jan 2017	-		0.302	Continuing	Continuing	0
Test Equipment Modernization	Various	Various : Various	0.370	0.160	Feb 2015	0.208	Jan 2016	-		-		-	Continuing	Continuing	0
Subtotal			21.582	1.543		1.959		0.923		-		0.923	-	-	0.000
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Engineering	C/FFP	Various : Various	1.977	0.228	May 2015	0.282	Jan 2016	0.300	Dec 2016	-		0.300	Continuing	Continuing	0
Subtotal			1.977	0.228		0.282		0.300		-		0.300	-	-	0.000
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CALSETS Software Environment and Calibration	Various	Various : Various	0.570	0.311	Mar 2015	0.456	Apr 2016	0.382	Mar 2017	-		0.382	Continuing	Continuing	0

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>	Project (Number/Name) L65 / <i>Test Equipment Development</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Physical Instruments																												
CALSETS Software Environment and Calibration																												
Electrical Instruments																												
Test Equipment Modernization																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Physical Instruments	2	2007	4	2021
CALSETS Software Environment and Calibration	2	2007	4	2021
Electrical Instruments	2	2007	4	2021
Test Equipment Modernization	1	2011	4	2021

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