Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army											Date: February 2015	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602709A *I Night Vision Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
Total Program Element	-	42.624	44.935	33.807	-	33.807	35.556	37.081	37.300	38.031	-	-
H95: *Night Vision And Electro-Optic Technology*	-	42.624	38.435	33.807	-	33.807	35.556	37.081	37.300	38.031	-	-
K90: *NIGHT VISION COMPONENT TECHNOLOGY (CA)*	-	-	6.500	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Program Element (PE) conducts applied research and investigates core night vision and electronic sensor components and software to improve the Army's capability to operate in all battlefield conditions. Technologies pursued in this PE have the potential to provide the Army with new, or enhanced, capabilities to detect and identify targets farther on the battlefield, operate in obscured conditions, and maintain a higher degree of situational awareness (SA). Project H95 advances infrared (IR) Focal Plane Array (FPA) technologies, assesses and evaluates sensor materials, designs advanced multi-function lasers for designation and range finding, and develops models and simulations for validating advanced sensor technologies. In FY11 through FY16 the Army investment in advanced IR FPA technologies is augmented to ensure a world-wide technological and competitive IR sensor advantage for the United States.

Work in this PE is fully coordinated with PE 0602120A (Sensors and Electronic Survivability), PE 0602705A (Electronics and Electronic Devices), PE 0602712A (Countermine Technology) and PE 0603710A (Night Vision Advanced Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this PE is performed by the U.S. Army Communications-Electronics Research, Development and Engineering Center (CERDEC)/Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, VA.

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army	Date: February 2015
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602709A *I Night Vision Technology*

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	43.403	38.445	37.134	-	37.134
Current President's Budget	42.624	44.935	33.807	-	33.807
Total Adjustments	-0.779	6.490	-3.327	-	-3.327
• Congressional General Reductions	-	-0.010			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	6.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.779	-			
• Adjustments to Budget Years	-	-	-3.327	-	-3.327

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2014	FY 2015
Project: K90: *NIGHT VISION COMPONENT TECHNOLOGY (CA)*		
Congressional Add: *Program Increase*	-	6.500
Congressional Add Subtotals for Project: K90	-	6.500
Congressional Add Totals for all Projects	-	6.500

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602709A / *Night Vision Technology*	Project (Number/Name) H95 / *Night Vision And Electro-Optic Technology*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
H95: *Night Vision And Electro-Optic Technology*	-	42.624	38.435	33.807	-	33.807	35.556	37.081	37.300	38.031	-	-

A. Mission Description and Budget Item Justification

This project conducts applied research and develops component technologies that enable improved Reconnaissance, Surveillance, Target Acquisition (RSTA) and situational awareness (SA) at an affordable price. Component technologies include novel focal plane arrays (FPAs), processing and electronics improvements, and modeling and simulation to predict performance and to determine operational effectiveness. This research focuses on dual band infrared (IR) FPAs necessary to search, identify and track mobile targets in all day/night visibility and battlefield conditions and to improve standoff detection in ground-to-ground and air-to-ground operations. This project designs, fabricates and validates very large format IR FPAs needed for sensors to simultaneously provide wide area coverage and the high resolution for situational awareness, persistent surveillance and plume/gunflash detection. In addition this project develops multispectral and hyperspectral algorithms for on-chip hyperspectral functionality, which offer the ability to perform detection, identification and signature identification at extended ranges as well as the ability to detect targets in "deep hide". Reducing size, weight and power (SWaP) is a key research objective for all efforts. In FY11 through FY16 the Army investment in advanced IR FPA technologies is augmented to ensure a world-wide technological and competitive IR sensor advantage for the United States.

This project supports Army science and technology efforts in the Command, Control, Communications and Intelligence, Soldier, Ground and Air portfolios.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this PE is performed by the U.S. Army Communications-Electronics Research, Development and Engineering Center (CERDEC)/Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, VA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: Distributed Aided Target Recognition (AiTR) Evaluation Center of Excellence	1.761	1.801	1.794
Description: This effort researches a Defense-wide virtual/distributed capability to interactively process both real and generated 3-Dimension (3D) multispectral scenes from sensor simulations. Automatic target recognition (ATR) and aided target recognition (AiTR) algorithms are evaluated against realistic operational scenarios in aided or fully autonomous reconnaissance, surveillance and target acquisition (RSTA) missions to include roadside threats/explosively formed projectiles.			
FY 2014 Accomplishments: Investigated and evaluated target tracking algorithms through image based detection and confirmation processing to reduce false alarms and lost target tracks for persistent surveillance and airborne sensor systems; investigated signal processing and			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
algorithms for threat detection and tracking that minimizes power consumption, enabling the use of smaller processors in size, weight, and power (SWaP) constrained environments. ***FY 2015 Plans:*** Investigate algorithmic correlation approaches to further reduce false alarms in image based detection and confirmation processing for vehicle systems; design and develop improved technology for multifunction display capability; continue to investigate signal processing and algorithms for threat detection and tracking that minimizes power consumption, enabling the use of reduced power processors in SWaP constrained environments. ***FY 2016 Plans:*** Will investigate inclusion of airborne countermine data in algorithmic correlation approaches to improve image based detection and confirmation; explore new algorithms to improve slew-to-cue and robotic move to a way-point for multifunction display capability; apply low power techniques and look-up libraries to improve signal processing and algorithms for threat detection and tracking to minimize power consumption; augment current evaluation infrastructure and data repository used for RSTA and countermine applications to include human activity recognition.			
Title: Sensor Modeling and Simulation Technology ***Description:*** This effort investigates, verifies and validates engineering models, measurement techniques and realistic simulations concurrently with the development and transition of core sensor technologies. The goal of sensor modeling and simulation technology is to improve the fidelity and adaptability of in-house modeling and simulation capabilities for the purposes of 1) Warfighter training 2) sensor system analysis 3) identifying and addressing phenomenology associated with imaging technologies and 4) perception lab-based model target task calibration of imaging technologies. ***FY 2014 Accomplishments:*** Expanded the engineering models, measurements and simulations to address new and emerging sensor capabilities, modalities and target threats; researched and incorporated additions to the predictive engineering sensor performance model to include sub-pixel targets, cooperative sensors, measures of persistence and Three-Dimensional (3D) target rendering; provided calibrated, Infrared (IR) target signatures (human, Improvised Explosive Device (IED), vehicles) to simulations used for sensor development, training and wargaming; developed and performed perception testing procedures to refine combatant/non-combatant sensor performance related to activity and motion and to document effects of 3D target rendering and displays on human decision; designed, implemented and published laboratory measurement standards for new technologies including color/false color imaging, fused imaging across Electro-Optic/Infrared (EO/IR) bands and 3D displays. ***FY 2015 Plans:*** Research and incorporate sensor performance model and measurement techniques to validate the optimal implementation of target and background signatures in simulation; compare laboratory and field measurements to determine if any errors are	5.057	5.222	5.222

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
introduced by methodology; validate and measure imagery post processing algorithms and subsequent effects on human performance; research phenomenology and application of imaging sensor modalities across the waveband spectrum, to include 3D imaging and displays. ***FY 2016 Plans:*** Will implement and begin verification and validation of a two dimensional version of sensor performance model and measurement techniques; extend model and measurement methodologies to incorporate non-linear processing to include image quality based metric and advanced image processing algorithms; research modeling and simulation techniques for multi-function or multi-mission sensors systems; research new techniques and implementation methods such as virtual prototyping to support evolution of the modeling and simulation tools development.			
Title: Advanced Multifunction Laser Technology ***Description:*** This effort investigates technology for a new class of multi-wavelength laser modules which will replace multiple laser systems and reduce the size, weight and cost of current devices such as laser designators, laser rangefinders (LRFs), pointers, markers, warning systems and illuminators. The goal is to achieve a single housing, electronics board, power supply and telescope for all applications to provide a drastic reduction in the Size, Weight, and Power (SWaP) of multi-function laser systems, as well as reduction in the logistics inherent in deploying multiple systems. ***FY 2014 Accomplishments:*** Investigated technology for a single source of multifunction, eye-safe fiber lasers operating in the Short Wave Infrared Band (SWIR, 1.5 to 2.0 microns); designed a single laser for multiple applications in a compact package to perform laser range finding, day/night pointing, and 3-Dimensional (3D) Light Detection and Ranging (LIDAR) imaging. ***FY 2015 Plans:*** Design a multifunction SWIR laser breadboard that performs range finding, day-night pointing, and 3D LIDAR; extend the laser operating wavelength to Long Wave Infrared (LWIR) by examining alternative laser technology including quantum cascade lasers; research methods for electronically tuning waveband throughout the Long Wave Infrared (LWIR) band; research and improve laser diode drivers and associated electronics to improve efficiency and power consumption. ***FY 2016 Plans:*** Will validate and mature multifunction SWIR fiber-based laser breadboard, and components for performing functions such as: LRF, laser illumination, laser pointing, and LIDAR; investigate novel laser pulsing technologies to allow for compact and lightweight, solid state lasers at reduced cost; design a fiber-based laser operating in an extended-SWIR spectral band for active imaging for covert conditions.	4.137	5.276	5.276
Title: High Performance Small Pixel Uncooled Focal Plane Array (FPA)	3.007	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Description: This effort increases the working performance of both uncooled Longwave Infrared (LWIR) and Shortwave Infrared (SWIR) technologies. Through design and improved fabrication techniques this work increases detector resolution to high definition formats (LWIR-1920x1200 pixels, SWIR- 1280x720 pixels), improves sensitivity and image quality to increase recognition and identification ranges while reducing Size, Weight, and Power (SWaP). ***FY 2014 Accomplishments:*** Completed full performance characterization of the High Definition (HD) 1920 x 1080 pixel uncooled LWIR FPA camera; fabricated the final lot of HD uncooled LWIR FPA and demonstrated in a camera for long range target identification; characterized a high performance uncooled hyperspectral SWIR FPA (1280 x 720 pixel) for detection of difficult targets in high cluttered background.			
Title: Advanced Structures for Cooled Infrared (IR) Sensors ***Description:*** This effort researches detector materials and substrates for IR sensors. The emphasis is on reducing material defects and increasing the reliability by means of new ways to prepare and treat the substrates and new designs and methods of growing the structures. The goal is to develop cost effective components for high definition Army IR sensors. ***FY 2014 Accomplishments:*** Validated indium bump process for high definition format Focal Plane Arrays (FPAs); researched advanced steep sidewalled plasma etching for dual band structures for high definition FPAs, which provided more pixels on target, increased resolution and higher quality images, thus enabling a reduction in defects. ***FY 2015 Plans:*** : Investigate new growth methods for improving the uniformity and reducing the cost of very Long Wave Infrared (LWIR) (wavelength greater than 11 microns) III-V and II-VI materials; investigate new techniques for passivating LWIR III-V small pixel structures; mitigate effects of initial substrate condition and processing on resulting performance; design and validate read-out circuits appropriate for these FPAs. ***FY 2016 Plans:*** Will investigate new growth methods, detector structures and pixel level wavelets for capturing photons and meta-materials into FPAs for improving the responsivity (signal to noise ratio) of Short Wave Infrared (SWIR) through LWIR wavebands using III-V and II-VI materials; continue investigation of new techniques for etching and passivating LWIR III-V and II-VI small pixel structures; investigate small FPA pixel pitch interconnect technologies.	4.612	5.762	5.763
Title: Digital Readout Integrated Circuit (ROIC) ***Description:*** This effort investigates and designs new Digital Readout Integrated Circuit (DROIC) technology (digital-in-pixel) enabling the affordable very large format and multiband IR FPAs. The digital-in-pixel results in increased signal storage available	2.609	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
to collect incoming signal information from the scene, compared to traditional analog techniques. DROIC is an important component in reducing the overall IR sensor cost and SWaP by allowing much smaller FPA pitch. The increased storage improves dynamic range for targeting, situational awareness and persistent surveillance applications. ***FY 2014 Accomplishments:*** Researched and developed a high-definition, digital-in-pixel ROIC with on-chip signal processing for a 12 micron, 1280x720 pixel array; validated the DROIC performance (e.g. high dynamic range and low noise) using a well characterized 640x480, 20 micron pixel array.			
Title: Enhanced IR Detector ("nBn") Technology ***Description:*** This effort investigates and improves a new barrier detector structure that makes Mid Wave Infrared Focal Plane Arrays (MWIR FPAs) easier and more affordable to manufacture and allows operation at higher temperatures resulting in much more affordable sensor systems and also significant reductions in Size, Weight, and Power (SWaP) of system optics, housings and cryogenic coolers. In addition the barrier detector approach allows for very small pixel pitch (8 micron) enabling FPAs of very large format, 5000x5000 pixel, for persistent surveillance applications that were not possible prior to emergence of this barrier FPA technology. ***FY 2014 Accomplishments:*** Researched and developed 2000x2500 8 micron pitch and 4000x4000 10 micron pitch FPAs, resulting in a higher resolution, smaller size array; validated resulting FPA structures and investigated techniques to increase yield by reducing defect formation; conducted comparison studies between single very-large-format versus multiple large-format FPAs by examining FPA pitch size, FPA format, butting issues and IR system interfaces and performance relationships; began research on very small pitch (5-6 micron) ROIC and FPA designs. ***FY 2015 Plans:*** Research and develop nBn large format FPAs (up to 3000x3000, 8-micron pitch) with a cutoff wavelength at or greater than 5 microns and operating at temperatures at or exceeding 130 Kelvin with a goal to achieve repeated performance comparable to indium antimonide; develop processing and hybridization for 8 micron pixel FPAs.	7.869	3.389	-
Title: Strained Layer Superlattices (SLS) Technology ***Description:*** This effort investigates and improves III-V material (materials formed by a combination of elements from group III and V of the periodic table) thin film crystal growth of Infrared Focal Plane Arrays (IR FPAs) using a very flexible Strained Layer Superlattice (SLS) structure. This will allow high performance multi band infrared FPAs to be produced at much lower costs than the existing II-VI FPAs (Mercury Cadmium Telluride) and can leverage commercial product research and production lines, including cell phone chips, to improve uniformity related to performance.	5.369	4.141	-

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
FY 2014 Accomplishments: Fabricated 1280x720, 12 micron pitch, dual-band Mid Wave/Long Wave (MW/LW) IR FPAs on 4 inch Gallium Antimonide (GaSb) and Gallium Arsenide (GaAs) substrates; resolved the substrate flatness and detector passivation issues; began material growth and assess the material quality on 6 inch GaSb and GaAs substrates. ***FY 2015 Plans:*** Verify fabrication techniques for a 1280x720, 12 micron pitch, dual-band MWIR/LWIR FPA on analog Readout Integrated Circuits (ROICs) with increased quantum efficiency and reduced noise equivalent differential temperature; hybridize 16 bit digital ROIC with characterized 640x480, 20 micron pitch LWIR FPA; extend cutoff wavelength device designs to 11.5 and 13.5 microns.			
Title: Wide Field of View Displays and Processing for Head Mounted Display Systems ***Description:*** This effort investigates and designs optical filters, objective lenses and personal display viewing optics that will enable ultra-low profile, lightweight sensors and virtual displays for both individual head mounted and vehicle based, multi-user vision systems using the latest developments in holograms for small package optics that can be readily reconfigured (i.e. ultra-small/light optical zoom). Additional work in this effort investigates image processing as part of the optical design strategy and designs novel approaches for color filtering image processing for low light sensors in order to provide a color low-light imaging capability to the US Warfighter. This effort is fully coordinated with PE 0603710A. ***FY 2014 Accomplishments:*** Designed waveguide optical components with multiple approaches including time domain switchable materials for head mounted and vehicle mounted applications; designed and developed color low light solid state silicon focal plane to determine optimum color filter array spectral requirements, matured patterned interference filter coating technology for sub-10 micron pixel spacing and conducted experiments on tactical target low light color phenomenology. ***FY 2015 Plans:*** Integrate waveguide optical components into head wearable form factors for limited data collections and Soldier perception testing; validate ability of large area waveguide virtual displays to provide the space stabilized display in scenes with jitter; fabricate and integrate color low light solid state silicon focal plane as a test platform; determine optimum color filter array spectral requirements; improve patterned interference filter coating technology for sub-10 micron pixel spacing; conduct experiments on tactical target low light color phenomenology.	5.136	5.912	-
Title: Solid State Low Light Imaging ***Description:*** This effort develops true starlight and very low light sensing, solid state focal plane technology with reduced power and production cost for Soldier vision enhancement for deficient visibility conditions. The objective of this effort is an all solid state near- Infrared (IR) sensor for replacement of current Image Intensifier (I2) vacuum tube technology to include a new	3.067	4.872	4.971

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Complementary Metal Oxide Semiconductor (C-MOS) based sensor technology which can be integrated with new 3-Dimensional (3D) Digital Read-Out Integrated Circuit (DROIC) technology. ***FY 2014 Accomplishments:*** Investigated and developed an all solid state low light imaging architecture with sensor, processor and display in a monolithic stacked design to replace analog vacuum tube based image intensifier; developed ultra-low dark current, high quantum efficiency silicon FPA fabrication processes in a US micro-electronic foundry. ***FY 2015 Plans:*** Optimize pixel size and develop back-side illuminated silicon processes for near IR resolution comparable to current I2 technology; develop through silicon via processing capability for 3D stacking of small pixel silicon FPAs; investigate back-end processing techniques for stacking FPAs with electronics and displays; conduct design studies to determine image processing techniques required for low latency night imaging. ***FY 2016 Plans:*** Will leverage C-MOS and 3D DROIC design to achieve high resolution, low latency, stacked, lowlight silicon sensor and micro-display imaging components; validate design by conducting experiments of stacked wafer fabrication runs with C-MOS pixel densities equivalent to the full resolution designs; investigate and design low profile folded and switchable optics compatible with objective lens and eye piece lens functions suitable for the solid state stacked imager design			
Title: Sensing and Processing ***Description:*** This effort investigates processing and sensor fusion technology for low cost multi-modal sensors. Processing and sensor fusion technology will enable the capability to see through Degraded Visual Environments (DVE) and to improve Situational Awareness (SA) through automated recognition of personnel and obstacles. ***FY 2015 Plans:*** Investigate incorporation of algorithms for improved SA and mobility in DVE; develop low power processing techniques for improved imaging through DVE.	-	2.060	-
Title: 3-Dimensional (3D) Micro-Electronics for Night Vision Sensors ***Description:*** The goal of this 3D Micro Electronics effort is to research new reconfigurable optics and display technologies to interface with emerging 3D electronics processing. The ability to actively reconfigure optical elements will require research into new materials and lens designs to enable real time optical refocusing and extended fields of view. Microdisplay technology will benefit from new integrated microelectronics by use of new and improved display materials which operate at lower powers and enable all weather, day/night visualization.	-	-	5.913

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602709A / *Night Vision Technology*	**Project (Number/Name)** H95 / *Night Vision And Electro-Optic Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
FY 2016 Plans: Will investigate new lens designs to include radially indexed materials for enhanced beam steering, metamaterials, and improved coatings for improved transmission/reflectivity. Microdisplay research will explore new organic light emitting diodes (OLEDs) materials which offer luminance and multi sensor input for sensor visualization with a 3D Digital Readout Integrated Circuit (DROIC) interface.			
Title: Multi-Function Digital Readout Integrated Circuits (DROICs) for Cooled and Uncooled Focal Plane Arrays (FPAs) ***Description:*** The objective of this effort is the development of advanced 2D & 3D DROICs to replace legacy 2D analog ROICs. This effort will investigate, research and design digital readout architecture optimized for large format, small pixel pitch, high performance cooled and uncooled Infrared (IR) FPAs through the use of modeling, analysis, simulations, layouts, empirical testing and fabrication. If successful, this enabling technology will bring substantial improvement in IR imaging capabilities. ***FY 2016 Plans:*** Will investigate and develop novel Analog to Digital (A/D) architectures for new high definition FPAs; investigate A/D architectures compatible with 2D or 3D integration by use of advanced lithographic techniques; develop small pitch vertical interconnect technology such as Through-Silicon Via (TSV) technology, Isolated Deep Silicon Via Technology (iDSV), and wafer thinning and bonding processes to allow for 3D stacking of sensor display functionalities.	-	-	4.868
Accomplishments/Planned Programs Subtotals	42.624	38.435	33.807

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602709A / *Night Vision Technology*	Project (Number/Name) K90 / *NIGHT VISION COMPONENT TECHNOLOGY (CA)*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
K90: *NIGHT VISION COMPONENT TECHNOLOGY (CA)*	-	-	6.500	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Night Vision Component Technology applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015
Congressional Add: Program Increase	-	6.500
FY 2015 Plans: Program increase for night vision technology research.		
Congressional Adds Subtotals	-	6.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A