Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Navy										DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 3: *Advanced Technology Development (ATD)*				R-1 ITEM NOMENCLATURE PE 0603235N: *Common Picture Advanced Technology*							
COST ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**Cost To Complete**	**Total Cost**
Total Program Element	91.526	48.985	-	-	-	-	-	-	-	0.000	140.511
2919: *Communications Security*	91.526	48.985	-	-	-	-	-	-	-	0.000	140.511

Note

FY 2013 funding associated with Future Naval Capability (FNC) efforts are transferring to a new Program Element titled Future Naval Capabilities Advanced Technology Development (PE 0603673N). This is to enhance the visibility of the FNC Program by providing an easily navigable overview of all 6.3 FNC investments in a single location.

A. Mission Description and Budget Item Justification

The efforts described in this Program Element (PE) are based on investment directions as defined in the Naval S&T Strategic Plan approved by the S&T Corporate Board (Sep 2011). This strategy is based on needs and capabilities from Navy and Marine Corps guidance and input from the Naval Research Enterprise (NRE) stakeholders (including the Naval enterprises, the combatant commands, the Chief of Naval Operations (CNO), and Headquarters Marine Corps). It provides the vision and key objectives for the essential science and technology efforts that will enable the continued supremacy of U.S. Naval forces in the 21st century. The Strategy focuses and aligns Naval S&T with Naval missions and future capability needs that address the complex challenges presented by both rising peer competitors and irregular/asymmetric warfare.

Activities and efforts in this program address the advanced technology development, test, and evaluation of a dynamic distributed common picture based on emergent technologies that will improve situational awareness across command echelons. The promise of net-centricity and potential for persistent and pervasive sensing creates greater demand for automated fusion of large volumes of multi-sensor data, techniques to coordinate deployment of multiple diverse sensors, and tailored dissemination of information to support network centric operations. The focus of this program is to refine technologies that exploit information and networking technology to ensure mission success in unpredictable warfighting environments. These missions include the Overseas Contingency Operations (OCO), urban operations, and asymmetric warfare. To ensure Maritime Domain Awareness, the Navy must be able to collect, fuse, and disseminate enormous quantities of data drawn from US joint forces and government agencies, international coalition partners and forces, and commercial entities. To further network centric capabilities, this project demonstrates technologies that support seamless information services afloat and ashore; collaborative decision-making among geographically dispersed warfighters; a common, consistent view of the battlespace geared to user requirements; system interoperability with coalition forces; real-time information access with quality of service guarantees; and information assurance. Technologies of interest provide access to, and automated processing of, information necessary to make decisions that lead to rapid, accurate decision-making and result in decisive, precise, and desired engagement outcomes. The payoff is access to tailored information in near real time with corresponding increases in speed of command, improved decision-making, and reduction in manpower.

The Common Picture Program supports FORCEnet, Sea Shield and Sea Strike pillars and contains investments in the following Enabling Capabilities (ECs): Combatant Commanders (COCOM) to Marine Combat ID; Combat ID Information Management of Coordinated Electronic Surveillance; Combat ID in the Maritime Domain to Reveal Contact Intent; Automated Control of Large Sensor Networks; Dynamic Command and Control (C2) for Tactical Forces and Maritime Operations Center (MOC); Dynamic Tactical Communications Networks; Globally Netted Joint/Coalition Force Maritime Component Commander; OCO Focused Tactical Persistent

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Surveillance; Actionable Intelligence Enabled by Persistent Surveillance; High Band Width Free-Space Laser Communications; Pro-Active Computer Network Defense and Information Assurance; Fast Magic; Naval Research Laboratory (NRL) Space; Advanced Tactical Data Link; and Autonomous Tactical Persistent Surveillance.

In the context of the Naval Transformation Roadmap construct, this investment will achieve capabilities required by FORCEnet (Persistent Intelligence, Surveillance, and Reconnaissance; Time Sensitive Strike; and Sea Based Information Operations), Sea Strike (Ship-to-Objective Maneuver), and Sea Shield (Theater Air and Missile Defense).

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

B. Program Change Summary ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget	96.720	49.068	47.752	-	47.752
Current President's Budget	91.526	48.985	-	-	-
Total Adjustments	-5.194	-0.083	-47.752	-	-47.752
• Congressional General Reductions	-	-0.083			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.892	-			
• SBIR/STTR Transfer	-2.689	-			
• Program Adjustments	-	-	-47.752	-	-47.752
• Congressional General Reductions Adjustments	-0.613	-	-	-	-

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
2919: *Communications Security*	91.526	48.985	-	-	-	-	-	-	-	0.000	140.511

A. Mission Description and Budget Item Justification

Activities and efforts in this project address the advanced technology development, test, and evaluation of a dynamic distributed common picture based on emergent technologies that will improve situational awareness across command echelons. The promise of net-centricity and potential for persistent and pervasive sensing creates greater demand for automated fusion of large volumes of multi-sensor data, techniques to coordinate deployment of multiple diverse sensors, and tailored dissemination of information to support network centric operations. The focus of this program is to refine technologies that exploit information and networking technology to ensure mission success in unpredictable warfighting environments. These missions include the OCO, urban operations, and asymmetric warfare. To ensure Maritime Domain Awareness, the Navy must be able to collect, fuse, and disseminate enormous quantities of data drawn from US joint forces and government agencies, international coalition partners and forces, and commercial entities. To further network centric capabilities, this project demonstrates technologies that support seamless information services afloat and ashore; collaborative decision-making among geographically dispersed warfighters; a common, consistent view of the battlespace geared to user requirements; system interoperability with coalition forces; real-time information access with quality of service guarantees; and information assurance. Technologies of interest provide access to, and automated processing of, information necessary to make decisions that lead to rapid, accurate decision-making and result in decisive, precise, and desired engagement outcomes. The payoff is access to tailored information in near real time with corresponding increases in speed of command, improved decision-making, and reduction in manpower.

The Communications Security project supports FORCEnet, Sea Shield and Sea Strike pillars and contains investments in the following Enabling Capabilities (ECs): COCOM to Marine Combat ID; Combat ID Information Management of Coordinated Electronic Surveillance; Combat ID in the Maritime Domain to Reveal Contact Intent; Automated Control of Large Sensor Networks; Dynamic C2 for Tactical Forces and Maritime Operations Center (MOC); Dynamic Tactical Communications Networks; Globally Netted Joint/Coalition Force Maritime Component Commander; OCO Focused Tactical Persistent Surveillance; Actionable Intelligence Enabled by Persistent Surveillance; High Band Width Free-Space Laser Communications; Pro-Active Computer Network Defense and Information Assurance; Fast Magic; Naval Research Laboratory (NRL) Space; Advanced Tactical Data Link; and Autonomous Tactical Persistent Surveillance.

In the context of the Naval Transformation Roadmap construct, this investment will achieve capabilities required by FORCEnet (Persistent Intelligence, Surveillance, and Reconnaissance (ISR); Time Sensitive Strike; and Sea Based Information Operations), Sea Strike (Ship-to-Objective Maneuver), and Sea Shield (Theater Air and Missile Defense).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: HIGH-INTEGRITY GLOBAL POSITIONING SYSTEM (HIGPS)	39.505	-	-
Description: The High-Integrity Global Positioning System (HIGPS) activity is focused on developing the technology required to demonstrate the capability of using the existing Iridium satellite constellation to enhance current GPS navigation and timing			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
capabilities. Enhancements include improved anti-jam performance, improved accuracy of navigation and positioning, increased availability of satellite navigation signals, improved accuracy in time stability transfer, and faster acquisition times. This activity focuses on integrating a HIGPS Enabling Technology Development (ETD) prototype. This effort is planned to transition to a HIGPS Technology Concept Demonstration (TCD) program under Navy program management at Office of Naval Research. ***FY 2011 Accomplishments:*** - Completed HIGPS TCD project. The HIGPS project used HIGPS ETD as a foundation to assemble a system that will demonstrate the GPS augmentation concept.			
Title: INFORMATION SECURITY RESEARCH ***Description:*** The overarching objective of this activity is to protect the Navy and the Joint information infrastructure from hostile exploitation and attack and this activity transfers to PE 0602235N effective FY 2013. The current specific objectives are: a) Network Situation Awareness & Security: Develop tools, techniques and methodologies to improve network resistance to denial of service attacks and improve indications and warnings of suspect activities. b) Network Traffic Analysis and Assessment: Develop methods for conducting network traffic analysis; monitoring and assessing network status and health; identifying new capabilities to analyze network vulnerabilities and attacks; and providing situational awareness of network assets and operations. ***FY 2011 Accomplishments:*** Network Situation Awareness & Security: - Continued new high assurance security protocols for networks and communications infrastructure with particular emphasis on attack resistance and security management. - Completed development of a tool for the development of agents that integrates Unified Modeling Language (UML) and that provides a verifiable agent programming language, an inter-agent communication protocol, security agents for enforcing run-time properties, and property checkers. Network Traffic Analysis and Assessment: - Completed development of the security management tool that provides a common picture of the networked environment with respect to IA and security, with emphasis on visualization capabilities to support active computer network defense.	1.770	1.873	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
- Completed the development of capabilities and an infrastructure that will support the management of high assurance devices/ components used within Navy networks. ***FY 2012 Plans:*** Network Situation Awareness & Security: - Continue all efforts of FY 2011 less those noted above as completed. - Develop of algorithms/methods for providing attribution of threat-agents through the network/infrastructure. Emphasis will be placed on addressing translational boundaries, cross-domains, and obfuscation techniques to avoid detection and tagging. - Develop of new algorithms to link/mine disparate system/network activities in order to identify malicious/threat agent actions against infrastructure components/systems. Network Traffic Analysis and Assessment: - Develop new algorithms focused on detection of nation state sponsored activities through the network infrastructure. Develop algorithms to address sophisticated malicious code techniques that exploit network traffic/data that is fragmented, encrypted, and/ or obfuscated using polymorphic techniques. Information Assurance: - Continue all efforts of FY 2011. - Development of new domain data sharing algorithms/technology to address disparate classification levels, identification and authentication, inference techniques, and policy enforcement. Ensure algorithms/technology scale to support representative networks and provide the necessary protections against exploitation techniques such as data exfiltration.			
Title: KNOWLEDGE SUPERIORITY AND ASSURANCE (KSA)	50.251	47.112	-
Description: A portion of this activity is devoted to mid-term technology development in close concert with programs of record. The products of these efforts are expected to transition at the end of their schedule into the associated acquisition programs of record. This activity area also appears in PE 0602235N. The aspects of a given EC in PE 0602235N focus on component technology, while this PE focuses on the integration of the components and on demonstrations. Warfighter Capability Gaps are being addressed by EC's. Each EC delivers capability-level products to acquisition in a three to five-year effort, and allocates a sufficient investment to ensure a capability is provided. The Future Naval Enabling Capabilities in this activity span across the Information Infrastructure, Applications/Tools/Decision Aids, Command and Control, Apertures and Radios, and Tactical Networks and Network Control/Management, and Computer Network Defense and Information Assurance technology areas. Technologies being developed will integrate sensors, networks, decision aids, weapons and supporting systems into a highly adaptive, human-centric, comprehensive maritime system. This			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
system will operate from the sea bed to space in a Service Oriented Architecture (SOA) that can be used in a Joint Environment. To accomplish this information integration, efforts are underway to develop rapid, accurate decision making and dynamic, efficient, mission-responsive communications and networks. Objectives of the current ECs are: a) Combat ID in the Maritime Domain to Reveal Contact Intent: Develop an automated capability to understand and interpret relationships among objects in the context of the maritime environment to include threat prediction and intent as well as event outcome assessment. Benefits to the Naval decision-maker include: automated interpretation of asset relationships and threat/ impact assessment; automated processing over wide disparate datasets; recognition of anomalies, and proactive means to confirm or discount suspicious activity; framework extension of fusion to a real-time SOA enterprise environment. b) Automated Control of Large Sensor Networks: Develop a capability for automated and mission specific tactical sensor fields capable of fulfilling specific mission objectives with smart sensors that are capable of forwarding knowledge vice raw data. Technical development efforts also include a fusion engine capable of translating tactical sensor data into appropriate situational awareness for battalion level forces and below. Integration of the tactical sensor network with Distributed Common Ground System (DCGS) will assure that fusion, visualization, resource management and information dissemination engines run seamlessly from the individual Marine to the Commander, Joint Task Force (CJTF). c) OCO Focused Tactical Persistent Surveillance: Develop a netted, organically controlled, adaptive sensor field that is capable of detecting and classifying features relevant to OCO. This includes organic sensors for small tactical expeditionary units, capable of supporting the dynamic character of modern operations from the highly mobile to the long-term. Also, Tracking, Tagging and Locating (TTL) technical development of Quantum dot, Electro-Optic (EO) phase shifted and optical tags for use against vehicles and high priority entities. Finally the effort includes technical development to enhance tactical sensor communications for a two-way high data rate radio. Technology allows for automatic adaptation of waveforms for increased network capacity. d) Globally Netted Joint/Coalition Force Maritime Component Commander: Develop 'globally- networked, theater-focused' maritime capabilities to enhance Joint Task Force (JTF) and COCOMs' ability to execute their intentions. The efforts will support multiple users and multiple roles to access data at any command echelon; provide consistent, qualified, and traceable operational & tactical maritime information across theaters; provide pedigree to provide a clear representation of complex situation and threat elements; supports user interaction across the SOA environment. The benefits to Naval forces include: exploitation of navy presence FORWARD to monitor vessels, people, cargo and designated missions, areas of interest within the global maritime environment; access to all relevant databases; and collection, analysis, and dissemination of relevant information. e) Dynamic Tactical Communications Networks: Develop, integrate and demonstrate dynamically adaptive automated software algorithms, protocols, and network management techniques that provide a rapidly auto-configuring and self-organizing networking			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
capability. This capability will adapt to available links of opportunity at lower echelons and assure priority movement of critical data intra-network and through reachback gateway networks that interface with the Global Information Grid (GIG) across multiple security/routing domains. Benefits of this effort to the war-fighter include: timely exchange of situational awareness and C2 information for the Naval Expeditionary Combatant forces; high throughput tactical network access/delivery, SOA and coalition interoperability through a reliable communications grid; ad-hoc re-tasking and targeting of warriors, weapons and sensors with minimum human intervention; shortened kill chain for tactical engagement missions. f) Dynamic C2 for Tactical Forces and Maritime Operations Center (MOC): Develop a capability that will provide the maritime commander with agile and responsive control and management of tactical Anti-Submarine Warfare (ASW) interactions in a net-centric enterprise environment. Focus will address classified ASW requirements for command and control at the tactical level. Benefits to Naval forces include flexible command and control among tactical units with severely degraded communications with the Maritime Operations Center. g) High-bandwidth Free-space Laser Communication (Lasercomm): Develop an affordable, reliable and high-bandwidth Free-Space Lasercomm capability which is adaptive and agile in mitigating a wide range of atmospheric and sea surface/state turbulence, precipitation and obscuration conditions. Benefits include real-time high-bandwidth direct ship-ship, ship-air and ship-shore links in RF denied environments; enhanced reachback for Forward Operating Bases (FOB) to Marine expeditionary Command Operation Centers (COC) with limited SATCOM access; and biometrics information sharing between Marine Interdiction Operation (MIO) parties. h) Actionable Intelligence Enabled by Persistent Surveillance: Develop a capability to provide accurate threat detection by exposing the enemy's vulnerabilities, unmasking their latent networks, discovering their tactics, techniques, procedures and exploiting in new ways the vast amount of sensor data available today against an irregular threat. Also being developed: an electro-optical, infrared and laser Intelligence, Surveillance, and Reconnaissance Targeting (ISRT) optics technology, capable of wide Field of View/Field of Range (FOV/FOR) at variable resolution & pointing direction, for installation in mobile platforms without gimbals; a light weight, low cost sensor suite and autonomy algorithms to enable detection and avoidance of all classes of aircraft or Unmanned Aerial Vehicles (UAV). i) Pro-Active Computer Network Defense and Information Assurance: Develop a capability to 1) identify and counter real-time threats to the network during mission execution; 2) provide dynamic security management and component management of network-based assets to support mission execution; and 3) ensure mission essential capabilities and data exist despite malicious cyber actions. Specific efforts include: 1) Next Generation Sensors and Gateways to provide security and control mechanisms to protect networks, data and systems from attacks (e.g., malicious code, data exfiltration); 2) Next Generation Security Protocols and Security Management Protocols to provide hardened, highly survivable, stealthy, reconfigurable overlay of protocols onto			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
networks to ensure network-base configuration and control of security components essential to mission operations, as well as provide data provenance to support dynamic resource management and decision support; and 3) Common Operational Security Decision System to aggregate, correlate, fuse and visualize network security posture information to support integrated warfighting decisions. j) Fast Magic: Develop a capability for enabling Information Operations from tactical platforms in a net-centric environment. Details are classified. k) NRL Space: Develop a capability to integrate multiple sensor information from multiple net-centered data stores in a service oriented architecture environment for persistent vessel tracking situational awareness. Details are classified. l) Advanced Tactical Data Link - Develop a capability to support Advanced Tactical Data Link operations in permissive, contested, and anti-access environments as well as the real-time network operations capabilities needed to dynamically add/remove participants, allocate Advanced Tactical Data Link resources to each participant, and add/remove network partitions in support of dynamic mission execution. m) Autonomous Tactical Persistent Surveillance - Develop a capability to allow autonomous control of persistent, tactical networks of sensors; enable ISR assets to provide an "Information Bubble" to the mobile user; provide revolutionary sensor and data support to agile tactical missions by anticipating information needs; and provide sensor planning and management relevant to a higher order knowledge model. This will provide the capability to autonomously maintain persistent surveillance of activities and entities over a region of interest, 24/7, while providing underlying context for real time adaptive surveillance in support of tactical mission objectives. The following accomplishments and plans are non-inclusive examples of accomplishments and plans for projects funded in this activity. The decrease from FY 2011 to FY 2012 represents the completion of multiple products in FY 2011 in the "Combat ID in the Maritime Domain to Reveal Contact Intent" and "Automated Control of Large Sensor Networks" ECs. The funding variation with this activity reflects the summation of the changing funding requirements between multiple FNC, EC programs and associated products. Each EC and its products represent multi-year development efforts with changing funding requirements across each products approved baseline.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013

The decrease of funding from FY 2012 to FY 2013 is the result of the transfer of resources from this R2 Activity titled FORCEnet. Efforts in this R2 Activity have been continued from FY 2012 to FY 2013 in the new R2 Activity to support all FNC program EC investments.

FY 2011 Accomplishments:

Combat ID in the Maritime Domain to Reveal Contact Intent:

- Completed the development of algorithms and software that will provide an automated capability to understand and interpret relationships among objects in the context of the maritime environment to include threat prediction and intent as well as event outcome assessment.
- Completed the development and demonstration of software that provides the capability to extract anomalies and provide basic reasoning techniques to separate false alarms from true anomalies. Tests will be conducted in both Limited Technology Experiments and Sea Trials.
- Completed the development and demonstration of smart algorithms for each sensor type that enables the translation of signals to information at the node; tactical multi-INT fusion algorithms; enhancements allowing for the fusion of tactical and higher sourced data and for the combined translation of information to actionable intelligence; and a tactical service oriented architecture.

Automated Control of Large Sensor Networks:

- Completed the development and demonstration of smart algorithms for tactical sensors that can process data at the node in a battery efficient manner; an ability to generate behavioral indications and warnings based on detected alerts across disparate data sources; and functional extensions of a service oriented environment down to the most tactical node.
- Completed the development, integration and demonstration of high information tactical agile sensors, including a tactical wide area surveillance UAV payload, tactical RF sensors, sensors to sense the state of a person and smart tactical imagers and acoustic sensors; of novel high bandwidth communications links for tactical UAVs and battery powered high information content tactical sensors; and airborne readers of optical tags. Tests will be conducted in an Advanced Warfighting Experiment.

OCO Focused Tactical Persistent Surveillance:

- Continued the development of a netted, organically controlled, adaptive sensor field that is capable of detecting and classifying features relevant to overseas contingency operations. This includes organic sensors for small tactical expeditionary units, technical development of Quantum dot, Electro-Optic (EO) phase shifted and optical tags for use against vehicles and high priority entities, and technical development to enhance tactical sensor communications for a two-way high data rate radio.
- Continued development, integration, and demonstration of high information tactical agile sensors, including a tactical wide area surveillance UAV payload and an RF payload for a tier-2 UAV.
- Continued development, integration, and demonstration of a distributed architecture of smart metadata and analysis tools.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Globally Netted Joint/Coalition Force Maritime Component Commander: - Continued development of technology to enable the coordinated Global Joint and Coalition Force Maritime Component Commander (J/CFMCC) capture and share information from sources and processes; with the intended result of managing at least 10,000 tracks per day in a consistent manner to support user awareness and control (current capability is approximately 200 tracks per day globally). - Continued the development, integration, and demonstration in Sea Trials the near real time ability to access all relevant databases and collect, analyze and disseminate relevant information to Maritime Component Commanders. Dynamic Tactical Communications Networks: - Continued effort to develop and apply emerging technologies that support self-organizing networking and assured communications exchange in tactical communications networks. - Continued development, integration and demonstration of wireless network auto-configuration and self-organization (including dynamic partitions and merge) algorithms and protocols; distributed and dynamic policy based network management and secure mobility management solutions; network service discovery mechanisms and network-aware middleware-enabled applications; inter-domain (security and routing) protocols for fully-connected domains; and robust and bandwidth efficient group communication protocols for the tactical environment, including disruption tolerance. Dynamic C2 for Tactical Forces and MOC: - Continued effort to mature, demonstrate and apply emerging technologies that support dynamic and response management and control of netcentric enterprise theater and tactical ASW operations. This includes automation support for synchronized planning of resources and multimission execution, and access and shared awareness of data, activities and status among Maritime Operation Centers and tactical forces in a tactical netted SOA environment. - Continued the development, integration and demonstration of SOA tactical services that support C2 by providing decision-quality information to the commander much more rapidly than in the past, and in response to unanticipated changes in operational requirements using data management with disconnected, intermittent, or limited communications paths; shared awareness of track data; adaptation to network conditions; and automated and real-time composition of existing tactical enterprise services to accomplish a new C2 function. - Continued the development and demonstration of automated techniques for force planning and allocation of resources based on information as it is passed from the Operational Level MOC to the local-tactical level and from local-tactical centers to adjacent local-tactical centers. High-bandwidth Free-space Lasercomm: - Continued the development of software/hardware for mitigation techniques for laser beam propagation through atmospheric turbulence and aerosol obscuration; fast acquisition and fine beam steering/tracking algorithms; characterization of performance/			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
affordability of mechanical steering to not-so-mature electronic steering approaches under the Adaptive Photonic Phase-Locked Elements (APPLE) program. - Continued the development of wide-area avalanche photo-diode receive array techniques; high bandwidth wide field-of-view retro-reflector optics; and adaptive bit rate and transmit power control. - Continued the development and integration of turbulence mitigation techniques to dual-mode free-space optical terminal electronics/optics. - Continued the development and demonstration of adaptive bit rate (10 Mbps-1 Gbps) and transmit power control; wide-area avalanche photodiode receive array technique; high bandwidth wide field-of-view retro-reflector optics. - Continued the development of platform specific (e.g., P3/E2-C or ship or sub periscope mount) terminal configuration and 'disadvantaged platform' specific retro-reflector configuration. Actionable Intelligence Enabled by Persistent Surveillance: - Continued development, integration and demonstration of an active liquid crystal lens for a very high resolution focal plane array, a distributed architecture of smart meta data and analysis tools, and control laws that allow a tier-2 UAV to satisfy flight safety standards required in manned airspace. Pro-Active Computer Network Defense and Information Assurance: - Developed, integrated and demonstrated the Next Generation Sensors and Gateways to provide security and control mechanisms to protect networks, data and systems from attacks (e.g., malicious code, data exfiltration.) - Developed, integrated and demonstrated the Next Generation Security Protocols and Security Management Protocols to provide hardened, highly survivable, stealthy, reconfigurable overlay of protocols onto networks to ensure network-base configuration and control of security components essential to mission operations, as well as provide data provenance to support dynamic resource management and decision support. - Developed, integrated and demonstrated Common Operational Security Decision System to aggregate, correlate, fuse and visualize network security posture information to support integrated warfighting decisions. Fast Magic: - Developed algorithms and demonstration of technologies and software for enabling Information Operations from tactical platforms in a net-centric environment. Details are classified. NRL Space:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
- Developed multiple intelligence fusion algorithms and software for dynamic distributed computing environments. Demonstrate the capability to integrate multiple sensor information from multiple net-centered data stores in a service oriented architecture environment for persistent vessel tracking situational awareness.			
FY 2012 Plans: OCO Focused Tactical Persistent Surveillance: - Continue all efforts of FY 2011. Globally Netted Joint/Coalition Force Maritime Component Commander: - Complete all efforts of FY 2011. Dynamic Tactical Communications Networks: - Continue all efforts of FY 2011. Dynamic C2 for Tactical Forces and MOC: - Continue all efforts of FY 2011. High-bandwidth Free-space Lasercomm: - Continue all efforts of FY 2011. Actionable Intelligence Enabled by Persistent Surveillance: - Continue all efforts of FY 2011. Pro-Active Computer Network Defense and Information Assurance: - Continue all efforts of FY 2011 Fast Magic: - Continue all efforts of FY 2011. Details are classified. NRL Space: - Continue all efforts of FY 2011. Details are classified. Advanced Tactical Data Link			

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APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603235N: *Common Picture Advanced Technology*	PROJECT 2919: *Communications Security*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
- Develop, integrate and demonstrate technologies to support Advanced Tactical Data Link operations in permissive, contested, and anti-access environments as well as the real-time network operations capabilities needed to dynamically add/remove participants, allocate Advanced Tactical Data Link resources to each participant, and add/remove network partitions in support of dynamic mission execution. Autonomous Tactical Persistent Surveillance - Develop, integrate and demonstrate technologies to allow autonomous control of persistent, tactical networks of sensors; enable ISR assets to provide an "Information Bubble" to the mobile user; provide revolutionary sensor and data support to agile tactical missions by anticipating information needs; and provide sensor planning and management relevant to a higher order knowledge model.			
Accomplishments/Planned Programs Subtotals	91.526	48.985	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

This PE supports the development of technologies that address the advanced technology development, test, and evaluation of a dynamic distributed common picture based on emergent technologies that will improve situational awareness across command echelons. Each PE Activity has unique goals and metrics, some of which include classified quantitative measurements. Overall metric goals are focused on achieving sufficient improvement in component or system capability such that the 6.2 applied research projects meet the need of or produce a demand for inclusion in advanced technology that may lead to incorporation into acquisition programs or industry products available to acquisition programs.

Specific examples of metrics under this PE include:

- Enable the coordinated Global Joint and Coalition Force Maritime Component Commander to capture and share information from sources and processes with the intended result of managing at least 10,000 tracks per day in a consistent manner to support user awareness and control (current capability is approximately 200 tracks per day globally).
- Enable faster planning of assets allocated to fill ISR coverage gaps by 100 times; 100 percent more coverage or 50 percent reduction in sensor asset usage to enable more effective allocation of assets to eliminate redundant ISR coverage; 95 percent of all significant military objects correctly located, tracked and identified.
- Enable self-organizing tactical communication networks by increasing multimember network size from 20 nodes to 200 nodes; decreasing time for networks auto-configuration from hours to five minutes for 200 nodes; and decreasing time for individual entities to join or leave a network from minutes (often hours) to 10 seconds.