

# FORCEnet

## JOINT SERVICE/NAVY-WIDE SYSTEMS

### Architectures and Standards

FORCEnet is the core of *Sea Power 21* and naval transformation, and is the Navy and Marine Corps vehicle to make Network-Centric Operations/Warfare (NCO/W) an operational reality. FORCEnet is the “glue” that makes Sea Strike, Sea Shield, and Sea Basing possible by integrating weapons, sensors, command/control, platforms, and warriors into a secure, networked, distributed combat force as part of the Global Information Grid. FORCEnet is not an acquisition program; it is an enterprise alignment and integration initiative that serves as a change agent and a forcing function for innovation, touching every naval program. Since its inception in 2003, FORCEnet has substantially transformed the Navy and Marine Corps in both process and product. FORCEnet is being implemented in coordination with transformation initiatives in the Army, Air Force, and Coast Guard—enhancing efficiency, joint interoperability, and warfighting effectiveness.

FORCEnet is key to the Navy’s strategic shift from a platform-centric to a NCO/W environment. This includes how the Navy defines future capabilities-based requirements, develops systems, and delivers combat power to the warfighter. NCO/W derives power from rapid, robust, and secure networking of well-informed, geographically dispersed warfighters that will enable an overpowering tempo and a precise, agile style of maneuver warfare. Using effects-based operations, the aim is to sustain access and decisively impact events ashore. FORCEnet develops and drives command and control doctrine and processes to make commanders at all levels more effective by enhancing efficient use of information, allowing accelerated and improved decision-making. Toward this goal, the FORCEnet Functional Concept was developed jointly by Navy and Marine Corps warfighters and operators, and was approved by the Chief of Naval Operations and the Commandant of the Marine Corps in 2005.

Additionally, enhanced joint warfighting capabilities, including the development and refinement of warfighting requirements and operational processes, were fielded in both 2003 and 2004 through the Trident Warrior joint operational event. Trident Warrior efforts in 2005 will focus on enhanced allied/coalition warfighting capabilities, which will be further developed in 2006. FORCEnet is working with the other services, the Office of the



Secretary of Defense, the Joint Staff, combatant commanders, allies/coalition partners, and industry in the development, refinement, and implementation of joint capabilities-based enterprise requirements, architectures, and standards. In 2005, these will be instantiated in an end-to-end FORCENet compliance process that will substantially increase efficiency and effectiveness while supporting integration into the DoD Global Information Grid. Assessment and tracking of FORCENet compliance in individual Programs of Record and S&T initiatives is an inherent part of this process, supporting migration of both legacy and developing systems into a NCO/W environment while also enhancing investment decisions by identifying duplications and gaps in warfighting capabilities.

### Automated Digital Network System (ADNS)

#### *Description*

The ADNS is the Tactical Internet Protocol (IP) Routing and Switching system for all Wide Area Network (WAN) IP services which connect afloat units to the various global shore sites. It provides ship and shore Internet Protocol (IP) connectivity and promotes the efficient use of available satellite and line of sight communications bandwidth. ADNS is engaged in converging all voice, video, and data communications between ship and shore to an IP medium taking full advantage of all RF means aboard ship to transmit data efficiently. Specifically, it automates the routing and switching of tactical and strategic C4I data via Transmission Control Protocol/Internet Protocol (TCP/IP) networks linking deployed battle group units with each other and with the Defense Information Systems Network (DISN) ashore. ADNS uses Commercial Off-the-Shelf (COTS) and Non-Developmental Item (NDI) Joint Tactical Architecture (JTA)-compliant hardware (routers, processors, and switches), and commercial-compliant software in a standardized, scalable, shock-qualified rack design.

#### *Status*

Two hundred and eighty shipboard and eight shore sites (Network Operations Centers) have been fielded through FY 2002. Afloat installations include amphibious ships, carriers, cruisers, command ships, destroyers, frigates and submarines. The shore installations of multiple ADNS nodes have been fielded at the four major sites supporting Surface Ship Operations (NCTAMS LANT, EURCENT, PACIFIC, and at NCTS Bahrain) and at the four major sites supporting Submarine Afloat Communications (Broadcast Control Authority Sites at LANT, PAC, COMSUBGRU Eight in Italy, and COMSUBGRU Seven in Japan). Plans include accomplishing 52 additional Shipboard Installations and the accomplishment of a tech refresh at all the major shore installations. This will be in accordance with the fleet commanders' coordinated IT21 fielding plans. Fielding plans starting in FY 2004 include CISCO router



backfit plan, the submarine variant that will include the shore BCA, fielding of the SCN-variant, and determination and fielding of a new baseband system. FY 2005 completes the CISCO backfit, starts Increment II fielding and Increment II plus which will eliminate bandwidth bottlenecks on large deck platforms. Plans also call for technology integration of Quality and Class of Service (QoS/CoS) with either new router templates or implementation of a “Packet Shaper” technology. This technology will start to be implemented with ADNS Increment II.

#### *Developers*

SPAWAR Systems Center Code 2631; San Jose, California  
 Science Applications International Corporation;  
 Arlington, Virginia.  
 Primary vendor - Cisco: San Jose, California

### Link-11/16/22 Advanced Tactical Data Link Systems (ATDLS)

#### *Description*

The ATDLS program develops, fields, and supports joint and coalition Tactical Data Link (TDL) capabilities. These joint TDLS include terminals, gateways, networks, and support initiatives that improve TDL connectivity, promote equipment commonality and interoperability, and provide training and fleet support. Link-11 is used by Navy, Air Force, Army, Marine Corps, and allied ships and aircraft, many of which are also equipped with Link-16. In accordance with the Joint Tactical Data Link Management Plan (JTDLMP), Link-11, which uses the M-series message standard, is scheduled to be shut down no later than 2015. Link-16, which uses the J-series message standard, has been designated as the DoD primary Tactical Data Link. The Navy is implementing Link-16 in most of its link-capable platforms. As the JTDLMP approved replacement for Link-11, Link-22 is a multi-national development effort and will use the J-Series message standard. Major supported efforts are as follows:

- > **Terminals: Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) Low Volume Terminal (LVT), MIDS Joint Tactical Radio System (JTRS), and the Common Shipboard Data Terminal Set (CSDTS)**
- > **Gateways: Command and Control Processor (C2P), Common Data Link Management System (CDLMS), Next Generation C2P, and Common Link Integration Processing (CLIP)**
- > **Support Initiatives: Joint Interface Control Officer (JICO) Support System (JSS), Dynamic Network Management (DNM)**

These capabilities allow more effective employment of fleet units by improving timeliness, accuracy, and content of tactical data transfer.



**Status**

See following FORCENet program descriptions on pages 134-173.

**Developers**

Data Link Solutions (DLS); Cedar Rapids, Iowa  
 ViaSat Inc., Carlsbad; California  
 Advanced Programing Concepts; Austin, Texas  
 BAE Systems Wayne; New Jersey  
 DRS, Inc., Wyndmoor; Pennsylvania  
 Northrop Grumman Information Tech; Sorrento Valley, California

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**Base Level Information Infrastructure (BLII)**
**Description**

BLII is the program of record that modernizes IT facilities at 16 OCONUS Navy bases, stations, and headquarters. It installs new, or upgrades existing infrastructure to provide state-of-the-art IT capability. Further, the program installs the hardware, software, and enterprise management tools to enable a fully integrated, interoperable, and secure IT network for rapid and reliable transfer of data, voice, and video. The program also replaces or upgrades obsolete telephone switches at 140 CONUS and OCONUS locations. Major functional areas of BLII are:

**OCONUS IT infrastructure modernization**

- > **Installs/modernizes base and building cable plants; WAN, BAN, and LAN electronics; information assurance; network management; configuration management; and asset management capabilities**
- > **Provides engineering and operations expertise at the IT Service Centers and the IT Outreach Centers**
- > **Installs and sustains system hardware, software and related training**

**OCONUS force protection (IT)**

- > **Installs/modernizes OCONUS pier IT infrastructure to IT-21 standards (Equal to or better capability pier-side as ships had at sea)**
- > **Provides engineering, operations and maintenance support to the newly installed IT infrastructure**
- > **Expands SIPRNET capability at OCONUS locations**

**Naval Network and Space Command (NNSOC) telephone switch replacement/modernization**

- > **Replaces obsolete telephone switches and upgrades firmware and software on a progressive schedule to ensure compliance with JCS directives and the recently enacted Public Law 107-314 at the 140 NNSOC telephone switch locations that service our forward deployed OCONUS and CONUS support forces**
- > **Modernizes telephone switch cable plants**



**Status**

The backbone phase of the OCONUS IT infrastructure modernization is rapidly coming to conclusion at the 16 designated overseas fleet concentration centers. The next major phase of the OCONUS IT modernization is to bring users to the new physical infrastructure followed by the migration of these users to the new OCONUS enterprise network. Funding is in place to continue this evolution to include technical upgrades and technology insertion through FY 2011. The replacement and upgrade of the Navy's telephone switches is accomplished on a progressive and systemic schedule to meet the OSD/Joint Staff mandated timeframe.

**Developers**

Navy policy is to procure only hardware and software from the DISA JITC tested/certified/interoperable "Approved Products List." All hardware and software procured and installed in conjunction with the BLII POR is under the cognizance of PEO C4I and Space (PMW 790). CNO N71, NETWARCOM and the PMW maintain close synchronization in the requirements validation, acquisition, installation and logistics process.

**Command and Control Processor (C2P)****Description**

The C2P serves as the interface and the data translator between the surface platform's Combat Direction System (CDS) and the Tactical Data Links (TDL). It is considered a gateway as described in the ATDLs discussion above. It is the data forwarder between Links-11 and 16. In 1984, implementation of JTIDS/Link-16 based CDSs commenced with the Advanced Combat Direction System (ACDS) Model 5. The ACDS Model 5 contract had an option for development of a C2P to provide the functionality of the TDL Communication Processor. Also in 1984, the Operational Requirement (OR) for the C2P was established. The operating program of UYQ-62 (V), the initial C2P variant, was coded in CMS-2 and hosted in a single UYK-43. When development of ACDS Model 5 was delayed, the C2P was modified to support Model 4 (Link-11) based surface platforms. This allowed installation of C2P and JTIDS/Link-16 aboard Model 4 AEGIS and ACDS Block 0 ships. With this capability, C2P serves as a gateway to connect a Link-16 network to a legacy Link-11 network. C2P Model 4 successfully completed OPEVAL in a combined test with Link-16 in FY 1994. C2P Model 5 successfully completed OPEVAL in FY 2000. The approaching obsolescence of the C2P computer brought about the need to identify a suitable hardware set to re-host the functionality of the C2P. As a practical and cost-effective option, the C2P re-host initiative was joined with another initiative that encompassed the concept of co-locating multiple tactical link management, coordination, and monitoring in a single host.



**Status**

The C2P is fully fielded with the capability being re-hosted as software within the Common Data Link Management System and Next Generation C2P.

**Developers**

GSA/Anteon; Fairfax, Virginia

DRS Inc.; Wyndmoor, Pennsylvania

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**Common Data Link Management System (CDLMS)****Description**

The CDLMS initiative extends the functionality of the Command and Control Processor by consolidating several functions previously performed by separate systems or subsystems, and providing improved Human Machine Interface (HMI) and Link maintenance. CDLMS also incorporates the Link Monitoring System (LMS) along with supporting the initial phase of development of the Common Shipboard Data Terminal Set (CSDTS). The CSDTS initiative provides the next generation Link-11 data terminal replacing legacy Link-11 terminal hardware while incorporating Multi-Frequency Link-11 (MFL), Satellite Link-11, and supporting the initial Dual Net Link-11. Re-hosting the C2P within CDLMS provides the same functionality in COTS hardware, namely the UYQ-70 console, which makes the system easier and less expensive to upgrade. The CDLMS integrates the CSDTS and C2P (Rehost) in a set of VME cards to provide consolidated displays and controls to monitor multi-TDL networks simultaneously. The CDLMS/ C2P(R) program has fielded the USQ-86 (V), consisting primarily of an UYQ-70 EPS housing four VME chassis. Three of these are populated with VME card sets for the following: C2P(R), CSDTS, and the Link Management/ Monitoring Component. This hardware configuration supports the transformation to Next Generation C2P (NGC2P), which conceivably will take the place of the current C2P(R). CDLMS has successfully completed Aegis and SSDS Combat System Integration and Test (CSIT) and is currently being installed. CSDTS implementation is ongoing, enabled by, but separate from, CDLMS/C2P(R).

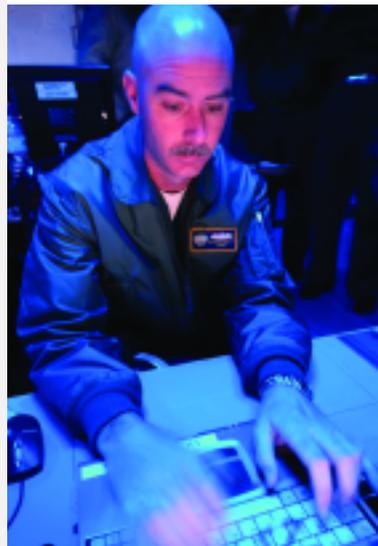
**Status**

CDLMS is being fielded.

**Developers**

GSA/Anteon; Fairfax, Virginia

DRS Inc.; Wyndmoor, Pennsylvania



## Common Link Integration Processing (CLIP)

### *Description*

The Navy and Air Force have jointly entered into the CLIP initiative. CLIP is envisioned as an open architecture software-based common Tactical Data Link (TDL) message processing and integration capability with applications across various military platforms and installations, including air, surface, C2 shore sites, and ground-based tactical units. A chief objective is to provide greater interoperability and reduce implementation cost. CLIP will be an evolutionary spiral development process with functionality specified at each delivery point to match platform TDL requirements. It will provide the interface to all the various communication systems including current terminals and radios as well as those under development such as JTRS. It will act as a gateway providing translations and data forwarding to legacy systems and be the primary interface to any host system (i.e., combat). CLIP is envisioned to be primarily software that can reside on any operating system or hardware.

### *Status*

A CLIP MOA between PEO-C4I & Space and Air Force Electronic Systems Center was signed in August 2003. An Acquisition Documentation Package including an Acquisition Strategy (AS), Acquisition Program Baseline (APB) and an ACAT designation letter for the proposed ACAT II program is currently in staffing at PEO-C4I & Space and will be forwarded to ASN (RD&A) for approval. Contract awarded in May 2005.

### *Developers*

Northrop Grumman: Reston, Virginia

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## Combined Enterprise Regional Information Exchange System (CENTRIXS)

### *Description*

CENTRIXS enables ship-to-ship and ship-to-shore Web replication, secure e-mail, chat communications over SATCOM with allied/coalition partners. It also provides a ship-to-shore SATCOM IP path to compliment existing ship-to-ship HF e-mail capabilities. The network infrastructure is implemented by using a combination of network switches, routers, crypto, servers, PCs and commercial networks technologies. CENTRIXS supports seven different enclaves available to the warfighter: CENTRIXS Four eyes (AUS/CAN/UK/US); CENTRIXS Japan (J); CENTRIXS Korea (K); NATO Initial Data Transfer System (NIDTS); Global Counter Terrorism Task Force (GCTF); Combined Naval Forces CENTCOM (CNFC); and Multi Coalition Forces Iraq (MCFI). Currently, the Pacific Region Network Operations Center (PRNOC) is the only network hub for all CENTRIXS connectivity. CENTCOM has directed that all ships deploying to NAVCENT AOR have CENTRIXS capability.



**Status**

147 of 153 Navy deployable warships have coalition connectivity. This includes a separate shipboard coalition LAN/WAN with respective infrastructure, servers and work stations. Under current procurement and installation funding, FOC for CENTRIXS is 2018.

**Developers**

Hardware for procurement and development of ISNS is under the cognizance of PEO C4I/Space PMW 160 as well as OPNAV (N71). These organizations work together to identify and implement the latest technologies to ensure proper implementation into the program. Engineering, development, integration, installation, training, and life cycle support will be accomplished through Navy and Defense Department activities.

### Commercial Satellite Communications: Commercial Wideband SATCOM Program (CWSP)

**Description**

The CWSP, formerly known as Challenge Athena, is a full-duplex, high data-rate communications link that operates in the C-band spectrum up to 2.048 Mbps. The CWSP terminal (WSC-8(V)1, 2) with modifications by the developer/manufacturer is also capable of operating in the Ku-band spectrum. Because of open ocean limitations, there are currently no plans to enhance the Navy's commercial satellite terminal to include Ku coverage. CWSP is capable of providing access to voice, video, data, and imagery circuit requirements. It supports fleet commander flagships (LCC/AGF), aircraft carriers (CV/CVN), amphibious ships (LHA/LHD/LPD) and other selected ships, including hospital ships (T-AH) and submarine tenders (AS). Terminals are also installed at schoolhouse locations in San Diego, Calif., and Norfolk, Va.

Examples of specific communications circuits that are provided include: Distributed Common Ground Surface System—Navy (DCGS-N), Video Tele-Conferencing (VTC), Video Information Exchange system (VIXS), Video Tele-Medicine (VTM), Video Tele-Training (VTT), Afloat Personal Telephone Service (APTS), Integrated Digital Switching Network (IDSN) for voice/telephone, Secret/ Unclassified Internet Protocol Router Networks (SIPRNET/ NIPRNET), and Joint Worldwide Intelligence Communications System (JWICS). The CWSP terminal uses commercial satellite connectivity and COTS/NDI Equipment. It has transitioned from augmentation, to surge, and in recent years has become an integral part of Navy's SATCOM architecture because of the existing and extremely overburdened military satellite communications systems.



**Status**

The majority of CWSP terminals procured have been installed on 32 ships. Five additional terminals are planned on new construction ships (CVN and LPD). Commercial leasing options for satellite capacity continue to be evaluated. The program office is considering options to refurbish the aging CWSP (WSC-8) terminals.

**Developers**

Various COTS/NDI.

**Distributed Common Ground/Surface System—Navy (DCGS-N)****Description**

DCGS-N is the Intelligence, Surveillance, Reconnaissance, and Targeting (ISR&T) processing and exploitation component of FORCENet that will support all levels of the command and control decision process. The Navy DCGS merges ISR&T, mission planning, and situational awareness functions into a Web-enabled, network-centric, joint-interoperable architecture. DCGS-N will support the Navy's command and control tiers of numbered fleet command ships and ashore command centers (Tier 1); carrier strike group/ expeditionary strike group (Tier 2); and unit level strike platforms (Tier 3). Each tier will have a scalable set of DCGS-N capabilities to support its assigned roles and missions. DCGS-N will utilize network-centric, multi-intelligence processing and exploitation to support the Task, Post, Process, Use (TPPU) process for the Commander Joint Task Force and the maritime warfighter. Leveraging existing SPAWAR (GCCS-M), NAVAIR (JSIPS-N), and NAVSEA (TES-N) programs, DCGS-N includes timely interfaces to national, joint, theater, and organic sensors. The aim points generated by DCGS-N will be provided to a variety of air, surface, and sub-surface launched precision guided weapons systems. DCGS-N will be interoperable with the DCGS elements of the other services through the use of the DCGS Integration Backbone (DIB) as the foundation of the DCGS-N architecture.

**Status**

A total of 34 systems are currently planned for installation between FY 2007 and FY 2010 on aircraft carriers, large-deck amphibious ships, fleet command ships, and designated shore-based reach-back support sites. Fleet Forces Command and OPNAV are working together to determine the appropriate afloat/shore-based architecture and fielding plan that will meet fleet ISR exploitation and targeting requirements.

**Developers**

Northrop Grumman: Linthicum, Maryland

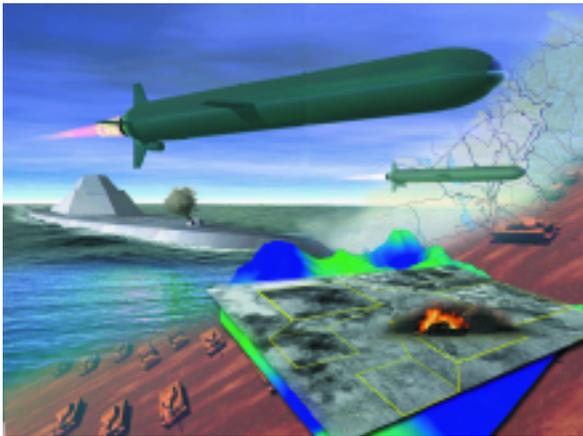
Raytheon: Garland, Texas

SAIC: Columbia, Maryland

BAE Systems: Rancho Bernardo, California

LMSI: Valley Forge, Pennsylvania

Titan Systems: Chantilly, Virginia



## Deployable Joint Command and Control Capability (DJC2)

### Description

The DJC2 is a joint DoD transformation initiative, with Navy as the lead component, to provide a standardized deployable Command and Control (C2) capability for Regional Combatant Commanders (COCOMs) and Joint Force Commanders (JFCs). Fielding of DJC2 will greatly reduce the *ad hoc* nature of Joint Task Force (JTF) C2. DJC2 will provide the JFC with a level of C2 application integration that currently only exists for the Component Command (and below) headquarters. Theater level elements (e.g. Joint Communications Support Element) will provide the communications links for the fully deployed system. DJC2 will build upon the Joint Global Command and Control System (GCCS-J), the Joint Forces Command developed Collaborative Information Environment (CIE) toolkit and existing joint and service C2 programs (especially the GCCS family of systems), and lessons learned from OEF and OIF, to equip the Regional COCOMs and JFCs with a tested C2 system that is:

- > **Horizontally and vertically integrated across all levels of command**
- > **Interoperable across joint, coalition, interagency, Non-Governmental Organization/Private Volunteer Organization (NGO/PVO) realms**
- > **Robust, scalable, and rapidly deployable, including an en-route capability**

Spiral development and fielding of evolving technology will help to meet regional COCOM and JTF requirements. The first step will be compilation and review of all ongoing C2 efforts including Science and Technology (S&T) initiatives, Advance Concept Technology Demonstrations (ACTDs), programs of record, and fielded capabilities.

### Status

The JROC validated the DJC2 Mission Need Statement (MNS) in February 2002. DJC2 received milestone A approval in May 2002. The analysis of alternatives was completed in July 2003 and the Operational Requirements Document (ORD) approved by the Joint Requirements Oversight Council (JROC) in September 2003. Milestone B approval was granted in March 2004. The Capability Production Document (CPD) was approved by the JROC in November 2004. The Navy acquired the developmental experimentation suite for Joint Forces Command in FY 2004. The initial operational DJC2 delivery will be to the Pacific Command in FY 2005, followed by a delivery to the Central Command, intended to provide a tech-refresh to the CENTCOM Deployable Headquarters (CDHQ) in FY 2005. Other planned DJC2 deliveries are: European Command, FY 2006; Southern Command, FY 2007; and a maritime variant in FY 2009.





nate the multitude of expensive “stovepipe” legacy record messaging systems that provide organizational and individual message traffic between operational units. The DMS architecture has been derived using the Multi-command Required Operational Capability (MROC) requirements and has been targeted to provide the armed services and agencies with a high assurance messaging capability. The DMS provides messaging, directory, and management services.

#### **Status**

Current DoD implementation of DMS closed the DMS Transitional Hubs (DTHs) for GENSER on September 30, 2003 and for Emergency Action Message (EAM) messaging on February 22, 2004. Navy is transitioning to a Web-based interface known as the DMS Expanded Boundry Solution (DEBS). The transition to DEBS will be completed in 2007.

#### **Developers**

Lockheed Martin; Manassas, Virginia

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### **Dynamic Network Management (DNM)**

#### **Description**

DNM will correct Link-16 network management limitations and provide the warfighter greater flexibility in the use of Link-16. DNM will facilitate automated net entry/exit of additional platforms in the future, including smart weapons with a Weapons Data Link (WDL), and will provide a real-time capability to modify Link-16 network parameters with existing messages to meet evolving changes in the theater. DNM will also enable capabilities such as IP over Link-16, variable update and throughput rates, monitoring and analyzing of real-time network loading, and executing stacked and multi-net operations. DNM is essential to reducing Link-16 network saturation and is an enabler for the JICO Support System (JSS). It also provides essential support for time critical targeting and time critical strike.

#### **Status**

The Air Force plans to award contracts for JICO Support System (JSS) Block 1, which incorporates DNM technology, in March 2005 to two vendors followed by a down-select to a single vendor. Initial JSS Block 1 is planned for shipboard testing in late 2005. The DNM program will enable a fully tested and interoperable version of the platform’s host system, known as the Joint Host Demand Algorithm (JHDA), in the shipboard Command and Control Processor (C2P) in early FY 2006. A random access mode that provides a nodeless, flexible, and scalable means of adapting the network to rapid changes in topology and message traffic conditions, known as SHUMA, is being lab tested.

#### **Developers**

SPAWARSYSCEN; San Diego, California  
Northrop Grumman; San Diego, California



## Global Broadcast Service (GBS)

### Description

The GBS can augment and interface with other communications systems to provide virtual two-way network to deliver a high-speed, one-way flow of high-volume information disseminated quickly by broadcast to proliferated, low-echelon, geographically dispersed users supporting situational awareness, weapons targeting, intelligence, and homeland defensive operations. GBS can support military operations with U.S. allies or coalition forces and non-DoD governmental organizations. GBS will revolutionize communications with increased capacity, faster delivery of data, near-real-time receipt of imagery and data to the warfighter, and reduced over-subscription of current MILSATCOM systems.

### Status

The Navy is fielding receive-suites on carriers, larger-deck amphibious warfare ships, command ships, guided missile submarines (SSGN), and half of the nuclear-powered attack submarines (SSN). Guided missile cruisers, destroyers, and strategic missile submarines are required, but not funded. Transition to an IP-based enhanced architecture should be completed by September 2005. The enhanced architecture provides a nearly doubling worldwide capacity with potentially eight times more coverage. Afloat-platform capability will have up to six multiple-receive channels (each up to 24 Mbps) and support additional security enclaves (each of 70 Mbps). Compartmented enclaves such as a top secret or allied broadcast are not funded. Within bandwidth there are no constraints on the number of concurrent video stream products received for viewing on computer workstations across attached networks. The enhanced architecture permits improved sharing and reallocation of broadcast coverage and bandwidth between, users, information product, media types, and security levels. The system is more queue driven, priority based rather than scheduled based. On the larger, more capable ships or fixed shore platforms the enhanced architecture will also permit multiple satellite receive capability, including UFO and WGS or commercial satellites, concurrently.

In January 2005 the DoD approved new and maturing operational requirements defining spiral development, including automated satellite spot beam sharing (important naval requirement), two-way transmit receive suites, better management of new space segment resources, enhanced GIG integration, suit-case and rucksack portable receive suites, communications-on-the-move ground mobile receive suites, terrestrial wireless rebroadcast receive suites, global system-wide management and content sharing, flexible system restoration, and bandwidth efficiency metric reporting for better planning and system allocation planning.

### Developers

Joint Program Office: U.S. Air Force, Space and Missile Systems Center/Raytheon; El Segundo, California



## Global Command and Control System—Maritime (GCCS-M)

### Description

As the naval implementation of the GCCS-M (formerly the Joint Maritime Command Information System (JMCIS)) is the OSD-designated Command and Control (C2) migration system for the Navy. The evolutionary integration of previous C2 and intelligence systems, GCCS-M supports multiple warfighting and intelligence missions for commanders at every echelon, in all afloat, ashore, and tactical naval environments, and for joint, coalition, and allied forces. GCCS-M meets the joint and service requirements for a single, integrated, scalable C2 system that receives, displays, correlates, fuses, and maintains geo-locational track information on friendly, hostile, and neutral land, sea, and air forces and integrates it with available intelligence and environmental information. Key capabilities include: multi-source information management, display, and dissemination through extensive communications interfaces; multi-source data fusion and analysis/decision-making tools; and force coordination. More than 56 joint and naval systems interface with GCCS-M to exchange data.

The GCCS-M program was designated to an ACAT-1AC program in March 2001. GCCS-M Version 3.1.2.1 was released to the fleet in FY 2001, and included major enhancements to GCCS-M's intelligence and warfighting software applications. Version 3.1.2.1 reduces time-lateness problems with Common Operational Picture (COP) track data, and enables high-data-rate communication-configured ships and shore headquarters to exchange COP track information via a faster IP transmission method. GCCS-M Version 4.X will deliver updated COTS hardware, operating systems and more Web-enabled and integrated functionality. GCCS-M version 4.X is undergoing operational testing on the USS *Nimitz*(CVN-68) and is awaiting FY 2005 Milestone C approval. GCCS-M version 4.X will deliver updated hardware and software to designated warship's and ashore installations by end of FY 2009. GCCS-M will transition to Joint Command and Control (JC2) based on Net-Centric Enterprise Services (NCES) over the FYDP as these joint programs deliver capability that can be implemented on naval afloat and ashore sites.

### Status

GCCS-M Afloat is installed on 261 ships and submarines throughout the Navy. GCCS-M Ashore has been installed at 36 sites including the Chief of Naval Operations Navy Command Center; five fleet commander headquarters; and various allied/NATO sites.

### Developers

Various COTS/GOTS



## Information Assurance (IA)

### Description

IA is defined as information operations that protect and defend information and Information Systems (IS) by ensuring their authenticity, availability, confidentiality, data integrity, and non-repudiation. The Navy's primary IA program is Information Systems Security Program (ISSP).

FORCEnet is the Navy's component to the DoD Global Information Grid. The Navy has embraced a Defense-in-Depth strategy to protect FORCEnet by employing multiple layers of protection starting at the desktops. The IA Technical Framework (IATF) has been adopted and divides ISSP resources into three fundamental categories: technology, operations, and people. The IATF provides a documented source of technical solutions and guidance mapped to the Defense-in-Depth goals. Selection, training, and retention of network security specialists are vital elements in our ISSP arsenal.

ISSP focuses on development, acquisition, implementation, upgrade of the CND products and services such as firewalls, guards, Virtual Private Networks (VPN), intrusion detection systems, electronic key management systems, Public Key Infrastructure (PKI), and Common Access Cards (CAC). ISSP also focuses on the development of new cryptographic technology that can support a wide variety of applications and algorithms.

### Status

Acquisition vehicles are in place for TYPE I Communications Security (COMSEC) and TYPE II COTS technologies to support the Navy's bandwidth requirements for secure voice and data, and PKI under the expanding umbrella of Key Management Infrastructure highlighted by the Navy's contributions to the DoD's Crypto Modernization (CM) program.

### Developers

Space and Naval Warfare Systems Command (SPAWAR) provides operational support to Navy warfighter by disseminating IA information and providing technical services.

## Integrated Broadcast Service/Joint Tactical Terminal (IBS/JTT)

### Description

The IBS is a system-of-systems that will migrate the Tactical Receive Equipment and Related Applications Data Dissemination System (TDDS), Tactical Information Broadcast Service (TIBS), Tactical Reconnaissance Intelligence Exchange System (TRIXS), and Near Real-Time Dissemination (NRTD) system into an integrated service with a common format. The IBS will send data via



communications paths, such as UHF, SHF, EHF, GBS, and via networks. This program supports Indications Warning (I&W), surveillance, and targeting data requirements of tactical and operational commanders and targeting staffs across all warfare areas. It comprises broadcast-generation and transceiver equipment that provides intelligence data to tactical users. The Joint Tactical Terminal (JTT) will receive, decrypt, process, format, distribute, and transmit tactical data according to preset user-defined criteria across open-architecture equipment. JTT will be modular and will have the capability to receive all current tactical intelligence broadcasts (TDDS, TADIXS-B, TIBS, and TRIXS). JTT will also be interoperable with the follow-on IBS UHF broadcasts. However, the current JTT form factor does not meet space and weight constraints for a majority of the Navy and Air Force airborne platforms. Therefore, to ensure joint interoperability, the Navy and Air Force will continue to support the current Multi-mission Airborne Tactical Terminal (MATT) through a low cost Pre-Planned Product Improvement (P3I) program until the transition to an IBS capable JTRS airborne variant starting in FY 2007.

#### **Status**

A receive-only JTT was delivered to the Navy for early integration efforts in the third quarter FY 2000. The Navy received the first four fully capable JTTs (with transmit capability) in third quarter FY 2001. The Navy commenced shipboard installations in fourth Quarter FY 2001 for developmental testing. OT&E will occur in third quarter FY 2005. JTT fielding has occurred from 2001 to 2004. Additional installations are anticipated in 2006 and 2007. The JTTs will continue to receive the legacy broadcasts (e.g. TDDS, TIBS, TRIXS) until next-generation broadcast services are developed and fielded.

#### **Developer**

IBS: TITAN/BTG

JTT: Raytheon Systems; St. Petersburg, Florida

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## **Integrated Shipboard Network System (ISNS)**

#### **Description**

The ISNS program is a derivative of the common elements from various other programs of record with the purpose of providing robust LANs on all Navy ships. ISNS provides integration and support for all requisite classifications (i.e., SCI, TS, secret, non-U.S., and unclassified). The ISNS program implements networks using a combination of network switches, hubs, routers, servers, PCs and commercial network software application technologies. It provides the capability to establish connectivity to the Defense Information Systems Network (DISN) WAN for global information distribution. In addition, it provides internal information dissemination capabilities for individual fleet units. By providing





the infrastructure for shipboard C4I programs, ISNS facilitates implementation of the Navy's IT-21 strategy and is an enabler for network-centric warfare. It provides the transport medium for Web-enabling all IT-21 related programs (i.e., NTCSS, GCCS-M, Voice-Video-Data (VVD)). ISNS networks support the robust information flow requirements necessary to achieve *Sea Power 21* capabilities, as well as providing the backbone for information interoperability with coalition forces.

#### **Status**

ISNS installations have transitioned from ATM networks to the Gigabit Ethernet architecture. Under current procurement and installation funding, IOC for ISNS is 2011.

#### **Developers**

Hardware for procurement and development of ISNS is under the cognizance of PEO C4I/Space PMW 165 as well as OPNAV (N71). These organizations work together to identify and implement the latest technologies to ensure proper implementation into the program. Engineering, development, integration, installation, training, and life cycle support will be accomplished through Navy and Defense Department activities.

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### **Joint Interface Control Officer (JICO) Support System (JSS)**

#### **Description**

The JSS is a "tool set" enabling the JICO to properly plan and manage the Multi-Tactical Data Link (TDL) network in building and maintaining the Common Tactical Picture (CTP) in support of the Joint Force Commander. The CTP is the near-real time picture of air, space, surface, land and subsurface vehicular tracks as well as points, lines and areas. Because the CTP is the product of data provided primarily by the Joint Data Network (JDN), the JICO also serves as the theater JDN Manager. The JDN includes the Joint Force Multi-TDL network and those interfaces between the Multi-TDL network and national data nets. As JDN Manager, JICO plans, implements, monitors and manages the joint force Multi-TDL architecture and controls those interfaces between Interface Units (IUs) in the Joint Task Force and other networks that contribute data to the CTP.

#### **Status**

Contract awarded in May 2005.

#### **Developers**

Northrup Grumman, Reston, Virginia

## Joint Tactical Information Distribution System (JTIDS)

### *Description*

This digital information-distribution system provides rapid, secure, jam-resistant (frequency-hopping) communications, navigation, and identification capabilities appropriate for military use up to and including secret information. A joint program directed by OSD, JTIDS provides crypto-secure, jam-resistant, and low-probability-of-exploitation tactical data and voice communication at a high data rate to Navy tactical aircraft and ships and Marine Corps units. JTIDS also provides capabilities for common-grid navigation and automatic communications relay. It has been integrated into numerous platforms and systems, including Navy aircraft carriers, surface warships, amphibious assault ships, and E-2C Hawkeye aircraft; Air Force Airborne Warning and Command System (AWACS) aircraft; and Marine Corps Tactical Air Operations Centers (TAOCs) and Tactical Air Command Centers (TACCs). Other service and foreign country participants include the Army, Great Britain, and Canada. Additionally, JTIDS has been identified as the preferred communications link for Theater Ballistic Missile Defense programs. JTIDS is the first implementation of the Link-16 Joint Message Standard (J-series) and provides the single, near real-time, joint data link network for information exchange among joint and combined forces for command and control of tactical operations.

### *Status*

The Air Force is the lead service for JTIDS. The program successfully completed OPEVAL in August 1994 and was authorized to enter full-rate production in March 1995. Production is now complete. The Multifunctional Information Distribution System (MIDS) Low Volume Terminal (LVT) is the Pre-Planned Product Improvement (P3I) to the JTIDS terminal. The MIDS Joint Tactical Radio System (JTRS) terminal is the funded follow-on to MIDS LVT.

### *Developers*

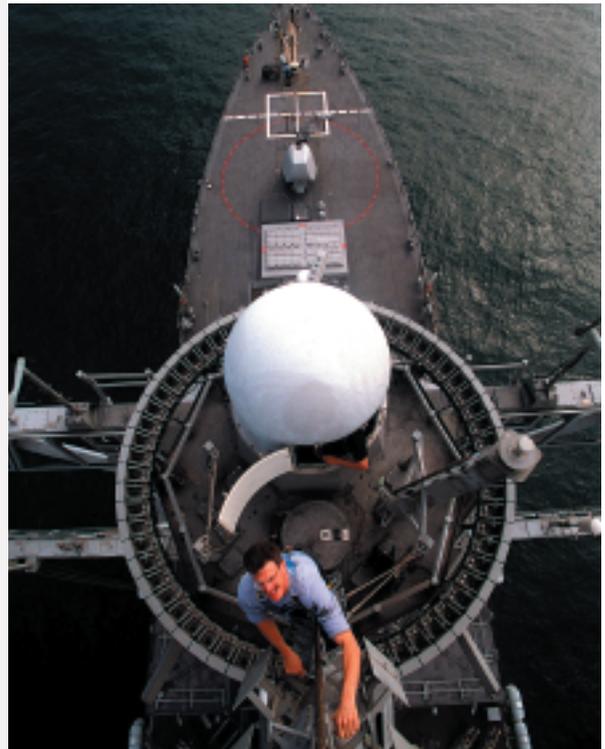
GEC-Marconi Electronics Systems; Wayne, New Jersey  
Rockwell-Collins Avionics; Cedar Rapids, Iowa  
Northrop Grumman; Bethpage, New York

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## Joint Tactical Radio System (JTRS)

### *Description*

The JTRS is a software-programmable multi-band, multi-mode family of networkable radios capable of simultaneous voice, data, and video communications. The program will effect the migration of more than 25 radio families, encompassing thousands of radio systems, to the JTRS family of radio systems. All radios will be compliant with Software Communications Architecture (SCA), a single, open-system architecture. SCA, now at version 2.2, provides the standards





for all JTRS software in the future. In addition, JTRS will be developed with a focus toward integrated GIG transformational capabilities. At the same time the JTRS will be backwards compatible with selected legacy radio systems. At present there are five designated clusters that make up the JTRS family across DoD: handheld; man-packed; vehicular; airborne/maritime/fixed; and small form-fit. The JTRS requirements are derived from the Joint Tactical Radio System (JTRS) Operational Requirements Document (ORD) Version 3.2 dated April 9, 2003. This Joint ORD is updated annually to incorporate additional validated requirements gathered from all the DoD Services. The ORD is currently being converted to a capabilities development document. JTRS will be an enabler of FORCEnet by implementing current tactical communications standards in addition to future higher data rate networking waveforms. The first iteration of JTRS for the maritime forces will satisfy narrowband waveform requirements of the JTRS ORD. This will include HF, VHF, UHF Line-of-Sight (LoS), and current and future UHF SATCOM requirements. Follow-on spiral development for maritime and aircraft platforms will provide for narrowband and wideband requirements derived from the ORD, to include the Wideband Networking Waveform.

#### **Status**

The JTRS Cluster Airborne Maritime Fixed (AMF) Pre-System Design and Development (SDD) contract was awarded September 8, 2004 to two vendors, Boeing and Lockheed Martin, with a low rate of production commencing in FY 2008 and IOC expected in FY 2011. Additionally, OSD NII and Joint Staff J6 have directed that an analysis of alternatives be conducted to aid decision makers in determining the best technical, operational, and economic approach to provide high-band and high-throughput capable terminals and waveforms that are JTRS, including Software Communications Architecture (SCA) Version 3.0, compliant in the 2 GHz and above frequency range.

#### **Developers**

Developers to be determined in open competition.

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### **Lightweight Super High Frequency Satellite Communications**

#### **Description**

The Lightweight Super High Frequency (SHF) Satellite Communications (SATCOM) terminal and parabolic antenna enables Navy ships to access the following systems: Defense Satellite Communications System (DSCS) for reliable, secure, beyond line-of-sight information exchange at medium-to-high data rates with other fleet units; fixed and mobile joint and allied forces; Navy C4I commands ashore. This capability is provided by upgraded and new WSC-6 terminal variants and enhancements to the submarine High Data Rate (HDR, see separate program summary) Antenna, which provides an SHF capability for the

Navy's attack submarines. Key services available via SHF SATCOM are: Defense Information Systems Network (DISN), Global Command and Control System (GCCS and GCCS-M), broadcast record message traffic, Tomahawk Mission Planning packages and updates, imagery support, DSN telephone/ISDN access, Joint Deployable Intelligence Support Service (JDISS), Joint Worldwide Intelligence Communications System (JWICS), Unclassified-but-Sensitive Internet Protocol Router Network (NIPRNET), Secret Internet Protocol Router Network (SIPRNET), and Video Information Exchange System (VIXS)/Video Teleconferencing (VTC).

### Status

SHF SATCOM capability is provided to Navy surface ships and submarines by several WSC-6 variants according to the requirements of those platforms. Surveillance Towed Array Sensor (SURTASS) platforms are configured with the WSC-6(V)1. Four aircraft carriers have the WSC-6 (V)4 variant. Numbered fleet commander flagships (AGF/LCC), the other eight aircraft carriers, and flag-capable amphibious ships (LHA/LHD) are configured with the WSC-6(V)5. This variant provides a dual-termination capability, enabling the ships to establish and simultaneously maintain their C4I links with Naval Computer and Telecommunications Area Master Stations (NCTAMS) and additional links with an Army, Marine Corps, or Air Force Ground Mobile Force (GMF) SHF terminal ashore in the AOR. The WSC-6(V)7 is a single-termination variant being fielded on Aegis cruisers and amphibious ship (LPD and LSD) classes. The WSC-6(V)9 is a single-termination, dual (C/X) band terminal developed to provide wideband, high data rate capability to guided missile destroyers (DDGs) and amphibious ships (LPDs and LSDs). New-construction *San Antonio* (LPD-17)-class amphibious ships are also planned for an SHF SATCOM terminal variant installation. Five remaining WSC-6(V)4 terminals will be replaced with dual channel, dual antenna, WSC-6(V)7s. All WSC-6(V)5 terminals will be inspected and groomed beginning in FY 2008. The existing WSC-6(V)7 terminals will remain installed and an antenna refurbishment problem will be implemented. The WSC-6(V)9 terminal is in the process of being fielded on all DDGs (to be completed in FY 2009). Future terminal plans include the Navy Multi-Band Terminal (NMT). All WSC-6(V) variants will be equipped with the Enhanced Bandwidth Efficient Modem (EBEM) (tactical variant) in the FY 2006 to FY 2008 timeframe.

The follow-on to the WSC-6 (V)9 is planned to be a multi-band including Q, Ka (ship), X/Ka (ship), Q/X Sub and GBS Receive (ship/sub).

### Developers

Electro-Space Inc.; Dallas, Texas

Raytheon; Marlborough, Massachusetts

Various COTS/NDI



## Mark XIIA Mode 5 Identification Friend or Foe (IFF)

### *Description*

The Mark XXIIA Mode 5 IFF is a secure, real-time, cooperative blue force combat identification system. Combat identification is a prerequisite in FORCENet, thereby becoming a precondition for each of the other pillars as well. IFF Mode 5 uses technology advances in modulation, coding and cryptographic techniques to provide reliability, security, and performance improvements over Mode 4, which National Security Agency decertified in 2003. It is implemented through evolutionary upgrades to Mark XIIA interrogators, transponders, and processors. Mode 5 can be fielded on all DoD platforms, whether Link-capable or not. It is NATO and JROC-approved and is compatible with all U.S. and international civil IFF requirements.

### *Status*

The Navy's ACAT II POR is based on the improved Mark XII Cooperative IFF Operational Requirements Document, dated April 27, 2001. It will be installed on 319 ships and 3,149 Navy and Marine Corps aircraft. The program does not include fielding of the shipboard control and display unit, F/A-18 platform integration, or Mode S shipborne interrogation capability. Milestone C is scheduled for January 2006. IOC is September 2007; shipborne FOC in platforms is 2015 and aircraft FOC is 2019. Navy is the lead service for Mode 5 cryptographic modernization and Mode 5 synchronization across the services. Army and Air Force plans rest on Navy plans and all services' plans have IOC in 2007 and FOC in 2015.

### *Developers*

BAE Systems; Greenlawn, New York  
General Dynamics Decision Systems; Scottsdale, Arizona

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## Multi-functional Information Distribution System Joint Tactical Radio System (MIDS-JTRS)

### *Description*

The MIDS-JTRS is an engineering change proposal migrating the MIDS Low Volume Terminal (LVT) to Joint Tactical Radio System Software Communication Architecture (SCA) compliance. MIDS JTRS will be a four channel software programmable radio capable of processing Link-16 on one dedicated channel and any of the other JTRS waveforms on the remaining three channels.

### *Status*

MIDS-JTRS is in early development with IOC in the F/A-18 expected in early FY 2009.

### *Developers*

ViaSat: Carlsbad, California  
Data Link Solutions: Cedar Rapids, Iowa



## Multi-functional Information Distribution System (MIDS-LVT)

### *Description*

MIDS-LVT is a multi-national cooperative development program to design, develop, and produce a tactical information distribution system equivalent to Joint Tactical Information Distribution System (JTIDS), but in a low-volume, lightweight, compact terminal designed for fighter aircraft with applications in helicopters, ships, and ground sites. Navy procurement, limited by available resources, is targeted for F/A-18 Hornet aircraft as the lead aviation platform and surface craft. MIDS-LVT is a pre-programmed product improvement and replacement for JTIDS, providing identical capabilities at reduced size, weight, and cost. As a P31 of the JTIDS Class 2 Terminal, the MIDS-LVT will employ the Link-16 (TADIL-J) message standard of Navy/NATO publications. MIDS-LVT is fully interoperable with JTIDS and was designed in response to current aircraft, surface ship, submarine, and ground host volume and weight constraints. The solution variants, MIDS-LVT (1), MIDS-LVT (2), and MIDS-LVT (3), support Navy, Marine Corps, and Air Force aircraft; Navy ships; Army Patriot, THAAD, MEADS and ground-based defense systems; Air Force and Marine Corps ground-based command and control platforms; and potentially other tactical aircraft and ground-based systems. MIDS-LVT is an international project partnering the U.S. with Germany, Spain, Italy, and France.

### *Status*

The program entered the engineering, management and development (EMD) phase in December 1993. MIDS was approved for Low Rate Initial Production in FY 2000. It reached IOC on the F/A-18C/D Hornet in FY 2003. MIDS is being procured for all F/A-18A+ through F/A-18F aircraft. The U.S. is the MIDS-LVT program leader with Germany, Spain, Italy, and France entering into a European partnership, called EUROMIDS. The Air Force F-15 fighter variant, MIDS-LVT (3), is currently in full-rate production and has reached IOC. The Army variant, LVT-2 entered full-rate production in September 2003. The Navy/Air Force variant, LVT-1, passed OPEVAL and was authorized to enter full-rate production on September 9, 2003. MIDS is planned to transition to OSD-mandated Joint Tactical Radio System (JTRS) Software Compliant Architecture (SCA) to allow for a smaller, lighter, and reduced-cost MIDS variant to meet Link-16 requirements on Marine Corps Offensive Air Support (OAS), Air Force aircraft, and naval air assets with an IOC of FY 2007.

### *Developers*

ViaSat; Carlsbad, California

Data Link Solutions; Cedar Rapids, Iowa and Wayne, New Jersey

An International consortium, MIDSCO, developed MIDS-LVT.

EUROMIDS will be the European producer of MIDS terminals





## Mobile User Objective System (MUOS)

### *Description*

The MUOS will provide a replacement tactical narrowband satellite communications (SATCOM) capability to the UHF Follow-On (UFO) satellite program. MUOS has been designated a DoD Space Major Defense Acquisition Program (MDAP) and will leverage commercial technology to the greatest degree possible. It will provide tactical narrowband netted, point-to-point, and broadcast services of voice, video, and data worldwide. It will consist of four geo-synchronous satellites plus a spare and provide a four-fold increase in network accesses. The target users are unified commands and joint task force components, DoD and non-DoD agencies, and allied and coalition mobile users who need to communicate while on the move.

### *Status*

Concept exploration studies, analysis of alternatives, and the Component Advanced Development (CAD) phase have been completed. The Key Decision Point (KDP) B MUOS Operational Requirements Document (ORD) was approved by the JROC on August 2, 2004. Based on technical and schedule risk, the Under Secretary of the Air Force for Space (Milestone Decision Authority) changed IOC from 2009 to 2010. The Milestone Decision Authority also approved entry into the Risk Reduction and Design Development (RR&DD) phase on September 16, 2004 (KDP B). PEO Space, PMW 146 awarded the RR&DD contract to Lockheed Martin on September 24, 2004. The Service expects MUOS will reach IOC in 2010.

### *Developers*

Lockheed Martin; Sunnyvale, California  
Boeing; El Segundo, California  
General Dynamics; Scottsdale, Arizona

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## NATO Improved Link-11

### *Description*

Link-22 is the next-generation NATO Tactical Data Link also referred to as the NATO Improved Link Eleven (NILE). It is a co-development program with seven NATO countries and is in the latter half of its research and development phase. As an evolutionary new Link design, Link-22 is based on modern, media-independent networking technology that will be applied in the exchange and forwarding of tactical data at extended ranges and between multiple networks over a variety of RF media. A member of the J-series family, Link-22 will complement Link-16 by providing Beyond Line of Sight (BLOS) connectivity among C2 platforms and modern, robust,

relay/routing techniques. The Link-22 design includes a growth feature to accommodate the addition of SATCOM media for BLOS J-series data exchange. Link-22 will support interoperability with critical allied/coalition partners that have transitioned from Link-11 to Link-22 but do not possess a Link-16 capability. Implementation of Link-22 will ensure allied/coalition forces maintain the level of situational awareness required to plan and execute coordinated combat operations across the allied/coalition Area of Responsibility. Since Link-22 is an evolutionary Tactical Data Link (TDL), the Next Generation Command and Control Processor (NGC2P) will implement hardware and software changes that will provide a full Link-22 capability with little if any change to host combat systems.

#### *Status*

Link-22 will first be introduced in an adjunct processor to Common Data Link Monitoring System (CDLMS) in FY 2006. Full Link-22 functionality will be introduced as part of the Next Generation Command and Control Processor (NGC2P) in FY 2007.

#### *Developers*

Northrop Grumman; San Diego, California  
VIASAT; San Diego, California  
SPAWARSYSCEN; San Diego, California

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## NAVSTAR Global Positioning System (GPS)

#### *Description*

The NAVSTAR GPS is a space-based, satellite, radio navigation system that provides users with worldwide, all-weather, three-dimensional positioning, velocity, and precise time data. Navy requirements include the integration of GPS in more than 300 surface ships and submarines and 5,100 aircraft, integration of shipboard combat systems with the Navigation Sensor System Interface (NAVSSI), and anti-jam protection for high-priority combat platforms through the Navigation Warfare (NavWar) program. GPS plays an important role not only in navigation, but also in providing precise time to precision strike weapons, naval surface fire support systems and ship C4I systems.

NAVSSI is a system that collects, processes, and disseminates position, velocity, and timing data to weapons systems, and C4I and combat support systems onboard surface warships. It hosts embedded, next-generation, card-based GPS receivers. NavWar will provide anti-jam antennas for the protection of select naval platforms in order to ensure a continued high level of mission effectiveness in a GPS-jamming environment. NavWar also incorporates the capabilities of GPS modernization into Navy user equipment to receive the future military satellite signals.



**Status**

By the end of FY 2004, 100 percent of the ships and submarines had completed their initial GPS installations and 98 percent of aircraft integrations were complete. The FY 2005 budget supports equipping the remaining planned aircraft with initial GPS capability by 2005, providing surface combatants with modernized NAVSSIs through the FYDP, and ensuring that the GPS signal is protected on naval platforms.

**Developers**

Rockwell-Collins; Cedar Rapids, Iowa  
Raytheon; Los Angeles, California  
Trimble Navigation; Sunnyvale, California  
Litton Data Systems; San Diego, California

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**Navy EHF/AEHF Navy Extremely High Frequency Satellite Communications****Description**

The Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program fields the AN/USC-38(V), an anti-jam, low-probability-of-intercept (LPI) communications terminal designed to accommodate a wide variety of command-and-control and communications applications (i.e., secure voice, imagery, data, and fleet broadcast systems). Navy EHF terminals provide protected tactical and strategic communications to the naval warfighter. The terminal operates within the EHF uplink and Super High Frequency (SHF) downlink radio frequency spectra (termed Q band). The terminals are interoperable with Army and Air Force terminals and will operate with the five operational MILSTAR satellites; EHF payloads onboard Ultra High Frequency (UHF) Follow-On (UFO) satellites 4-11; EHF payloads on the Fleet Satellite (FLTSAT) 7 and 8; and the three planned (one operational in 2003) Polar EHF payloads which fly onboard classified host satellites. There are currently two EHF waveforms. EHF Low Data Rate (LDR) that operates from 75 bps to 2400 bps, and EHF Medium Data Rate (MDR) which ranges from 4.8 Kbps to 1.544 Mbps. MDR capability can be accessed only on Milstar satellites 4, 5, and 6. All other operational EHF satellite payloads provide LDR services only.

**Status**

Fielding of the LDR/MDR capable Follow-on-Terminal (FOT) continues in FY 2005, leading to projected completion in 2007. Planning is underway for fielding an Advanced EHF (AEHF) terminal capability to operate with AEHF satellites (MILSTAR replacement), which will begin operations in FY 2010. AEHF, a new waveform, will provide protected communications at data rates up to 8.129 Mbps as well as providing LDR and MDR backwards compatibility. The Navy AEHF Multiband Terminal (NMT)

received Milestone B approval in October 2003. FY 2005 focuses on development of NMT prototypes by two competing contractors leading to the award of a single procurement contract in FY 2007.

#### **Developer**

NESP and FOT: Raytheon; Marlborough, Massachusetts  
NMT developers: Raytheon; Marlborough, Massachusetts  
Harris; Melbourne, Florida.

### **Navy Meteorological/Oceanographic Sensors (METOC) Sensors [Space]**

#### **Description**

The Navy METOC Sensors (Space) program supports Navy interests in meteorological and oceanographic (METOC) space-based remote sensors. These interests include commitments to satellite, sensor, and operational development activities associated with the Defense Meteorology Satellite Program (DMSP) and the National Polar-orbiting Operational Environmental Satellite System (NPOESS). The sensors carried on DMSP and future NPOESS satellites provide global oceanic and atmospheric data of direct operational relevance, including sea surface temperature, wind speed and direction, sea ice conditions, precipitation rates, and storm intensity. The program provides for Navy participation in Navy/Air Force cooperative efforts leading to current and future METOC sensor development, including calibration and validation of instruments and delivery of satellite products to the Fleet.

#### **Program Status**

In October 1997, the program commenced development of CORIOLIS/WINDSAT, the world's first space-based sensor that passively measures ocean surface wind speed and direction, launched in December 2002. Development of the Airborne Polarimetric Microwave Imaging Radiometer (APMIR) for calibration and validation (cal/val) of the Air Force Special Sensor Microwave Imager/Sounder (SSMIS) and CORIOLIS/WINDSAT began in early FY 1998. APMIR is in service to support the first SSMIS mission on DMSP-F16, launched in October 2003. APMIR will continue as an ongoing cal/val program for DMSP, CORIOLIS/WINDSAT, and NPOESS microwave radiometer sensors. In addition to these projects, discussions are underway with NASA, NOAA, and other agencies to fulfill the long-standing requirement for geostationary environmental imagery of the Indian Ocean.

#### **Developer**

WINDSAT Sensor: Naval Research Laboratory(NRL);  
Washington, District of Columbia  
CORIOLIS Spacecraft: Spectrum Astro; Gilbert, Arizona





## Navy Marine Corps Intranet (NMCI)

### *Description*

NMCI is a long-term initiative between the DoN and the private sector to deliver a single, integrated department-wide network for Navy and Marine Corps shore commands. The NMCI contract, awarded in October 2000, is a seven-year contract with a three-year option to procure service-wide IT services and provides the shore network infrastructure within the CONUS for the Navy's FORCEnet architecture. NMCI provides comprehensive end-to-end information services for data, video, and voice communications for DoN military and civilian personnel and connects to the GIG, making the DoN workforce more efficient, more productive, and better able to support the critical warfighting missions of the DoD.

### *Status*

NMCI is operational and continues to provide commercial IT services for nearly half a million DoN employees and one Combatant Commander. To date, the DoN has ordered 335,000 of the expected 345,000 FY 2005 seats and deployed 238,000 end-state seats. Implementing NMCI has enabled the DoN to increase the security posture of its networks and has provided unprecedented visibility into IT costs. Upon completion of the Operational Evaluation (OPEVAL) in September 2003 and the delivery of the final report in April 2004, NMCI successfully completed all OSD directed milestone decision points leading to approval of full program implementation. Oversight of NMCI was returned to the DoN in September 2004 and future seat requirements will be provided for through the Navy's Planning, Programming, Budgeting, and Evaluation System (PPBE) System.

### *Developers*

The NMCI contract was awarded to a team of contractors led by Electronic Data Systems (EDS). The remainder of the contractor team comprises MCI (communications circuits), Microsoft (operating systems and desktop software) Dell (desktop hardware and servers), WAMNET (network architecture), Cisco (switching and network devices), Raytheon (information assurance).

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## Naval Tactical Command Support System (NTCSS)

### *Description*

The NTCSS is the Navy combat logistics support information system that enables unit commanders and their chains of command to manage and assess the readiness of unit and battle group material and personnel. NTCSS is a cornerstone of the Sea Basing aspect of the four *Sea Power 21* pillars. Sea Base includes joint command and control, fire support, and logistics. This program provides combat support

systems to surface, sub-surface, and aviation operational commanders. Its support functions include organizational maintenance, supply, and personnel administration through every level of operations, in peacetime and during war. NTCSS also supports network-centric warfare by integrating logistics information for the warfighter. It replaces, merges, and optimizes legacy Shipboard Non-tactical ADP Program (SNAP), Naval Aviation Logistics Command Management Information System (NALCOMIS), Maintenance Resource Management System (MRMS), and several smaller logistics applications into an integrated logistics system. NTCSS, through migration with the Defense Information Infrastructure Common Operating Environment (DII COE) technical architecture, will be used to complete the tactical readiness picture for operational commanders by supporting the Global Command Support System (GCSS) and the Common Operational Picture. This program employs an evolutionary strategy merging the technical and functional capabilities of the system components. The first stage of the strategy included hardware modernization and network installations using open system architectures and operating environments at all sites. This hardware environment is common with tactical programs and compliant with DII standards. The second stage involves technical optimization of the functional applications using modern software development tools, relational databases, and a common operating environment. Follow-on stages of the program involve development and implementation of Business Process Improvements (BPIs) under the sponsorship of functional and fleet managers and the movement of logistics applications into a web-based environment. BPI development, when integrated with Business Process Re-engineering and Enterprise Resource Planning efforts, will support increased efficiencies from improved operations, reduced manpower, and migration of work from afloat to ashore units. As a result, Navy will be able to reduce total ownership cost across the theater of operations.

### **Status**

The program is currently in phase two: fielding NTCSS-Optimized on ships, submarines, and afloat and ashore aviation intermediate maintenance activities to support the modernization of the logistics operations of operating forces. Once successful Low Rate Initial Production evaluation is achieved, phase three can begin, allowing legacy SNAP III units to transform directly to the web-enabled eNTCSS environment. NTCSS-Optimized platforms will also upgrade to eNTCSS.

### **Developer**

The COTS hardware is being procured through indefinite delivery/indefinite quantity government contracts. Engineering, development, integration, installation, training, and life cycle support will be accomplished through Navy and Defense Department activities, with additional support from industry partners.



## SSQ-137 Ship Signal Exploitation Equipment (SSEE) Increment E

### *Description*

The SSQ-137 SSEE Increment E is a Shipboard Information Warfare (IW)/Cryptologic Systems (SIWCS) operational program that provides warship commanders with threat search and identification information and analysis of Signals Intelligence (SIGINT). SSEE provides deployed forces operating in the littoral with an afloat IW sensor and radio direction-finding capability to cue weapons systems and support theater C2W exploit and attack missions. SSEE is a COTS/NDI program that is easily reconfigured and therefore able to respond rapidly to tasking. The system design permits the rapid insertion of new and emerging technologies that will integrate capabilities from existing systems and advanced technologies into a single, scalable, spirally developed, interoperable system.

### *Status*

SSEE Increment E is in full-rate production.

### *Developers*

Argon: Fairfax, Virginia

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## Tactical Switching

### *Description*

Tactical Switching and its implementation, known as the Shore Infrastructure Master Plan (SIMP), is focused on automation and conversion of the existing circa-1970 Serial Switched point-to-point shore infrastructure connecting three Navy Computer and Telecommunications Area Master Stations (NCTAMS), ten Navy Computer and Telecommunications Stations (NCTS), 27 NCTS Detachments, 23+ Network Operation Centers (NOC), and 5,270 personnel. The plan currently underway will invoke multiple spirals to implement the technology and automation and infrastructure necessary to evolve the shore infrastructure to two Regional Network Operations and Security Centers (Atlantic/Pacific) and one Global Network Operations and Security Center providing interoperable joint global network-centric services and connectivity to tactical and strategic naval assets. This architecture will be managed, monitored, operated, maintained and defended with fewer than 50 percent of today's manpower resources and eliminate more than 70 percent of today's fixed sites further reducing infrastructure costs.

### *Status*

FY 2005 provided High Speed Global Ring (HSGR) connectivity between the five critical regions, which will enable accelerated consolidation of services into the Atlantic and Pacific regions. Significant progress has been implemented to convert the existing Tactical Video Teleconferencing (VTC) to IP reducing reliance on the serial infrastructure and installation of Element Management

Systems that will enable remote management and operations of existing equipments. Enterprise Management and Monitoring systems are currently being evaluated to further consolidate services and personnel as well as provide tactical and strategic visualization of the Navy enterprise to service and Combatant Command/Commander (COCOM) agencies NetOps in support of GIG operations.

### *Developers*

PEO C41 and Space; San Diego, California

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## Trusted Information Systems (TIS)

### *Description*

TIS provides a complete cross-domain capability for the automatic exchange of critical intelligence and operational information between U.S., allied, and Coalition forces. TIS includes both the Radiant Mercury (RM) and Joint Cross Domain Exchange (JCDX) systems. Both systems are Director of Intelligence Directive 6/3 Protection Level 4 (PL-4), Multi-level Secure (MLS) certified providing unique cross-domain information sharing capabilities from top secret SCI to GENSER and GENSER to unclassified. JCDX is DoD's only comprehensive multi-level C4I system serving as the backbone automated information system providing accredited manual and automatic exchange of multilevel Common Operational Picture (COP), e-mail, imagery, and event-by-event data dissemination. The system provides MLS C4I and cross-domain services to U.S. Joint Intelligence Centers and is the national level defense intelligence system for the United Kingdom and Australia, and is the service-level operational intelligence system for the Japanese Maritime Defense Forces as well as the Republic of Korea.

RM is certified and accredited by both the SCI (top secret and below interoperability) and GENSER (secret and below interoperability) communities. RM provides a fully-automated, bi-directional, multiple input/output channel capability, that can be serial or network connected, to sanitize, transliterate, downgrade, and guard classified, formatted information to users at lower classification levels. RM also processes unformatted message types and imagery utilizing reliable human review (semi-automated). RM is deployed to more than 138 sites worldwide including all Combatant Commands, Navy large-deck aircraft carrier and amphibious warships, Shared Early Warning, Blue Force Tracking and multiple Air Force and Army sites as well as national agencies.

### *Status*

Current developments are focused on integrating these unique multi-level capabilities with afloat, joint, and coalition-network architectures. The Navy is executive agent for the multi-service,



multi-agency RM. The Navy will remain responsible for the fielding of all new sites, and the maintenance of the 138+ operational sites. JCDX/OED installations are planned at Maritime Surveillance System (MSS) sites in FY 2005 to support U.S. secret/allied/SPECAT interoperability.

#### *Developers*

Maxim Systems; San Diego, California  
Northrop Grumman Mission Systems; Arlington, Virginia  
Lockheed-Martin; Denver, Colorado

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### UFO UHF Satellite Communications Follow-On

#### *Description*

The Ultra High Frequency (UHF) Follow-On (UFO) satellite program comprises eight satellites and one on-orbit spare, and it replaced the Fleet Satellite (FLTSAT), Gapfiller, and Leased Satellite (LEASAT) UHF constellations. UHF SATCOM services, provided by UFO, include worldwide, narrowband, unprotected netted, point-to-point, and broadcast service of voice, video, and data using 5 and 25 KHz UHF channels. UFO also provides a protected Fleet Broadcast using an Extremely High Frequency (EHF) uplink and UHF downlink to provide an anti-jam capability on the uplink. UFOs 4-11 carry an EHF payload that provides anti-jam capability on the uplink and downlink. Protected services include netted, point-to-point, and broadcast service of voice and data. The EHF payload also provides an anti-jam telemetry tracking and control uplink capability. UFOs 8-10 also include a Global Broadcast Service (GBS) payload. GBS uses direct broadcast technology at an extremely high data rate to many users via very small terminals.

#### *Status*

Ten satellites have been launched and nine are operational. The launch of UFO 1 was a failure, and UFO 10 was launched in November 1999 to replace it. The first launch of UFO with GBS capability occurred in 1998. A Gapfiller (UFO-11) was launched in December 2003 to maintain a constellation availability of 70 percent through 2010. In 2010, Mobile User Objective System (MUOS) will begin replacing UFO.

#### *Developer*

Boeing Satellite Systems (BSS); Los Angeles, California  
SPAWAR Systems Command; San Diego, California.

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### Undersea Warfare-Decision Support System (USW-DSS)

#### *Description*

The USW-DSS program provides an integrated, near-real time, network-centric Undersea Warfare (USW) Command and Control



(C2) capability across multiple platforms, even with low bandwidth or intermittent inter-platform communications. USW-DSS leverages existing communication links, networks, contact pictures, and sensor data from air, surface, submarine, theater, and surveillance platforms and integrates them to produce a common USW near-real time decision support tool. It provides a critical capability, not only for the Sea Combat Commander (SCC), but also for the Theater USW Commander (TUSWC), Antisubmarine Warfare Commander (ASWC), and Mine Warfare Commander (MIWC), for an integrated capability to plan, conduct, and coordinate USW operations with multiple ASW and MIW platforms. USW-DSS will provide common and improved visualization, integrated USW platform sensor data sharing, reduced data entry, improved performance prediction, reduced redundancy across USW Tactical Decision Aids (TDAs), and data fusion, which is currently not available to the SCC. USW-DSS will provide greater understanding of the undersea battle space by allowing the entire force (CSG/ESG, theater, or other) to have a common, thorough understanding of the battle space with characterized uncertainties. USW-DSS will also serve as the single consolidated repository for all USW TDAs across all USW platforms, thus saving the cost of maintaining numerous individual applications, TDAs, and stove-piped systems.

USW-DSS uses the spiral development process, and a peer review group will select current and developmental technologies to be incorporated into a build-test-build process to develop a network-centric USW capability. USW-DSS Builds 1-4 (FY 2006-FY 2011) will align with Common Operating Environment (COE)/Global Command and Control System-Maritime Applications (GCCS-M)/Net-Centric Enterprise Services (NCES), FORCENet, Joint Command and Control (JC2)-as a maritime application, and Program Executive Office for Integrated Warfare Systems (PEO IWS) open architecture. Current plans are for USW-DSS to transition into a GCCS-M application with a subsequent migration as a maritime application in JC2.

### Status

USW-DSS currently uses a Top Level Requirements (TLR) document signed by the Warfare Sponsor, Task Force ASW (formerly N74) on October 2, 2003, and was documented based on high-level guidance from a Net-Centric USW (NCUSW) Mission Needs Statement (MNS). The TLR will be further refined by the ASW in C2 Study Working Group, sponsored by N71 and N76, by late spring 2005. In FY 2004, USW-DSS was installed as a temporary alteration on selected platforms in the USS *John C. Stennis* (CVN-74) Carrier Strike Group to participate in the *Rim of the Pacific* (RIMPAC) 2004 exercises, and on selected platforms to participate in *Theater ASW/Annual Exercise* (TASWEX/ANNUALEX) 2004. In FY 2005, USW-DSS is being installed on a number of shore sites as a roll-on roll-off capability,



and will be further engineered prior to IOC in FY 2006. Each year starting in FY 2006, USW-DSS will be installed on undersea warfare combatants in two CSGs and two ESGs as well as theater USW assets and MIW assets. Candidate platforms include CVNs, DDGs, CGs, MCM vessels, submarines, P-3s, SURTASS vessels, and supporting shore nodes (CTF, TSC, Training, and NOPF)

#### *Developers*

Multiple Navy and university labs and industry participants will perform the various developer and manufacturer roles. The software integration role for each Build (1- 4) will be competed amongst industry and labs.

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### USQ-167 Communications Data Link System (CDLS)

#### *Description*

The USQ-167 CDLS is a surface-mounted terminal that supports Navy and joint airborne sensor programs that require data communications with shipboard processors. Part the Common Data Link (CDL) family of communication systems. CDLS receives data from remote sensors and transmits data to airborne platforms via the CDL waveform at high data rate.

#### *Status*

CDLS is in production and will complete fielding on 10 CV/CVNs, 6 LHDs, and 6 LHAs by 2010.

#### *Developers*

CUBIC Communications; San Diego, California

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### Web Enabling (WEN)

#### *Description*

WEN efforts were started by CNO in April 2001 as a transition effort. One of the key requirements in any network-centric warfare architecture is the ability to exchange data transparently. Throughout recent years there have been many DoD and DoN attempts to meet this requirement, some more successful than others. WEN will help to make the warfighter more productive with inclusion of tools such as sharing of disparate data base information between systems and the ability to rapidly manipulate and customize the presentation of such data to the needs at hand.

Implementation of the WEN is part of the transformation process that will rationalize many of the inconsistencies in the way Navy information systems currently work together. To achieve this transformation, WEN will leverage and influence the planned capabilities and resources of IT programs within both the shipboard (ISNS), Base Level Information Infrastructure (BLII) and Navy and Marine Corps Intranet (NMCI) shore environments. At



the enterprise level, the NMCI ashore WEN portal and the ISNS afloat WEN portal will interface to share user information, data, services, and content. The BLII overseas and the Marine Corps Enterprise Network (MCEN) will also leverage these capabilities as they are implemented. Enabling technologies and processes to be employed include PKI enabled Single Sign-On, a Naval Global Directory Service providing a single flat name-space for users; synchronization of user directories, a synchronized relationship between portal instances; and establishment of a common data replication process between NMCI, BLII, MCEN and ISNS.

#### **Status**

IOC was provided in FY 2004. Classified and unclassified portal pilots have been implemented ashore and afloat. These pilots are consistent with the guidance specified for the enterprise Web architecture, and will be rolled into the NMCP infrastructure concurrent with the IOC of the NMCP. The afloat and ashore portals will be fully connected for redundancy, replication, and ease of access. Further implementation is subject to funding. Incorporation to the architectures is planned for FY 2006.

#### **Developers**

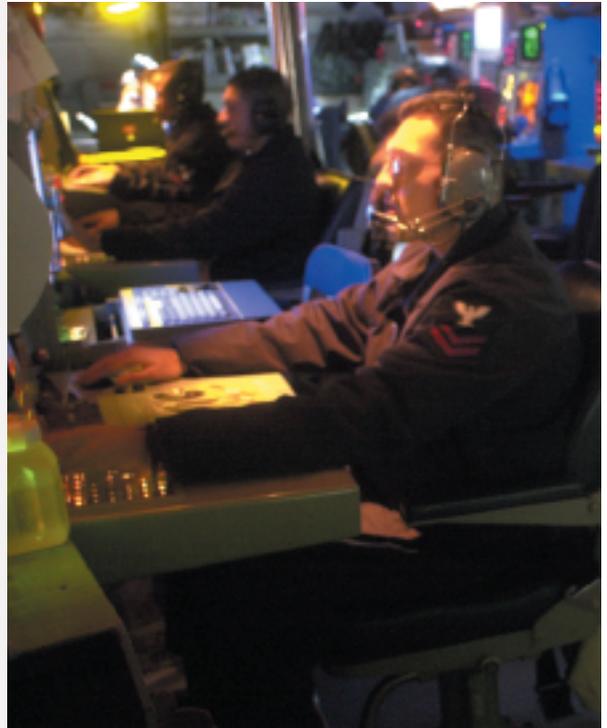
SPAWAR has the lead in architecting, implementing, and testing the infrastructure and services that comprise the Navy Enterprise Portal-Afloat. General Dynamics has the contract for upgrade of Baseline II that will include Web Enabling capabilities. ISF/EDS is the contract company for NMCI.

## **AIRBORNE SYSTEMS**

### **Aerial Common Sensor (ACS)**

#### **Description**

ACS will replace the aging EP-3E Aries II aircraft. In August 2004, the Army, as the lead service for the ACS program, awarded Lockheed Martin a contract to develop the next-generation airborne Intelligence, Surveillance and Reconnaissance (ISR) system for the Army and Navy. The ACS sensor suite will fly on board a militarized Embraer ERJ-145 aircraft and will replace the Navy's EP-3E with a system developed via an Army-Navy partnership that will result in a transformational multi-intelligence platform capable of providing strike targeting. ACS transitions from the stand-alone EP-3E to a fully integrated, network-centric ISR platform with reach-back capability. The multi-intelligence capability includes traditional SIGINT (COMINT, ELINT and special signals) with additional information provided via Synthetic Aperture Radar (SAR), Ground Moving Target Indicator (GMTI), Electro-Optical (EO), infrared (IR) and Measurements and Signals (MASINT). ACS will be capable of automatic and manual intelligence fusion in order to provide superior decision quality information to commanders. ACS aligns to all of the *Sea Power 21*





pillars, but primarily supports FORCenet. ACS will be a node within the Maritime Cryptological System architecture and within the GIG enabling near-instantaneous collection, analysis, and dissemination of information to joint force commanders. This network-centric constellation approach will horizontally integrate ACS with other Navy and national assets. Both on and off-board operators will have equal access to sensors while utilizing a robust reach forward/reach-back capability. The aforementioned capabilities allow for better use of Low density/High demand (LD/HD) assets, deploy with a smaller footprint, and garner a significant manpower reduction.

#### *Status*

ACS is an Army-led program. The Army ACS ORD was approved via JROC memorandum on October 20, 2003 and the Navy ACS ORD annex was approved via JROC memorandum on May 3, 2004. The Army completed MS B on July 29, 2004 and awarded a contract to Lockheed Martin on August 2, 2004. The Army and Navy completed an Overarching Integrated Product Team (OIPT) meeting on January 24, 2005, which recommended Navy as a fully integrated partner with the Army. The Navy will procure 19 ACS airframes. The EP-3E (see separate program summary) will be modernized to a common configuration and sustained until Navy ACS reaches IOC in 2012 and FOC in 2014.

#### *Developers*

Lockheed Martin; Denver, Colorado

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### **E-2 Hawkeye Airborne Early Warning Aircraft Upgrade**

#### *Description*

The E-2 Hawkeye is the Navy's airborne surveillance and command-and-control platform, providing battle management and support of decisive power projection at sea and over land in a joint operational architecture. In addition to current capabilities, the E-2 has an extensive upgrade and development program to prepare it as a critical element in an overall joint theater air and missile defense program.

Two upgrades will ensure that Hawkeyes keep pace with changing tactical environments: the E-2C Hawkeye 2000 and the Advanced Hawkeye (AHE), including the Radar Modernization Program. The E-2C Hawkeye 2000, the most advanced Hawkeye variant in production, features Mission Computer Upgrade (MCU), Cooperative Engagement Capability (CEC), Improved Electronic Support Measures (ESM), Joint Tactical Information Distribution System (JTIDS), Global Positioning System (GPS), and data and voice satellite communications. The MCU greatly improves weapons systems processing power enabling the incorporation of CEC. In turn, CEC-equipped Hawkeyes will significantly extend the engagement capability of surface forces.



It is the key to early cueing of the Aegis Weapon System, dramatically extending the lethal range of the Standard Missile (SM-2). The Advanced Hawkeye's Radar Modernization Program is developing a radar that will bring over-the-horizon, overland detection, and tracking to the strike group. This, coupled with CEC, will fully integrate Advanced Hawkeye into the Joint Integrated Air and Missile Defense (JIAMD) role. This advanced detection and tracking capability, in conjunction with Aegis and the upgraded Standard Missiles, will allow strike groups to deploy an organic, theater-wide air and cruise missile Sea Shield umbrella to protect high-priority areas and U.S. and coalition forces. The E-2's systems are fully interoperable with the Airborne Warning and Control System (AWACS) and ground-based systems for a seamless joint architecture. The Hawkeye will continue as the airborne "eyes and ears" of the fleet as it applies its capabilities in the integrated joint, overland, theater-wide air- and cruise missile-defense environment. Many of the technological improvements being incorporated in the Hawkeye represent leading-edge improvements in U.S. forces, not just in the Navy's theater air and missile defense programs.

#### *Status*

The Hawkeye 2000 is operating in three fleet squadrons. Deliveries will continue until 2007. E-2 Advanced Hawkeye IOC is scheduled for FY 2011.

#### *Developers*

Northrop Grumman; Bethpage, New York and St. Augustine, Florida

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### EP-3E Modification and Sustainment

#### *Description*

The EP-3E Aries II Weapon System is the Navy's only airborne Information Warfare (IW) and tactical Signals Intelligence (SIGINT) platform supporting naval and joint commanders. EP-3Es provide long-range, high-endurance support to aircraft carrier strike groups and expeditionary strike groups in addition to performing independent maritime operations. The current force consists of two active squadrons. The original EP-3E Joint Airborne SIGINT Architecture Modification (JMOD) program has been restructured to bring all EP-3E platforms into a common configuration and will be sustained until Aerial Common Sensor (ACS), a joint development program with the Army, can be fielded with an FOC of 2014. EP-3E modernization/sustainment strategy includes three elements: P-3 to EP-3E conversions; EP-3E JMOD common configuration; and airframe inspections/repairs.

**P-3 to EP-3E conversions:** The P-3 to EP-3 conversion program converts five P-3C Orion aircraft to EP-3E platforms. Four will be completed in FY 2005 and one in FY 2006.





**EP-3E JMOD common configuration:** The EP-3E JMOD Program has been restructured to align all EP-3E mission systems to a common baseline that meets the challenge of rapidly emerging threat technology, identified as the JMOD Common Configuration (JCC). JCC will address mission system obsolescence and incorporate “quick reaction” capabilities specifically developed for OEF/OIF. JCC will also accelerate capabilities, developed under the JMOD program, to the fleet five years ahead of schedule. The JCC includes expanded ELINT exploitation capability and COMINT signals coverage, new multi-platform COMINT Direction-Finding Capability, and advanced Special Signals-Collection capability.

**Inspections/repairs:** EP-3Es will be sustained through a series of Special Structural Inspections (SSIs) and Special Structural Inspection-Kits (SSI-Ks). SSIs will be completed on all aircraft. SSI-Ks will be completed on select aircraft meeting criteria as required and will include preemptive replacement of fatigue critical structures.

**Recapitalization:** The replacement for the EP-3E aircraft will be the Aerial Common Sensor (see separate program summary).

#### *Status*

The projected IOC for the JMOD common configuration is the second quarter of FY 2007. The projected FOC is fourth quarter FY 2009.

#### *Developers*

None listed.

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## Naval Mission Planning Systems (NAVMPs)

### *Description*

NAVMPs is a suite of applications that includes: Tactical Automated Mission Planning System (TAMPS), Navy Portable Flight Planning Software (N-PFPS), and Joint Mission Planning System (JMPS). TAMPS is the current Navy/Marine Corps standard unit-level aircraft mission planning system for tactical aircraft. It allows aircrew to perform tactical mission planning at the secret level for a wide variety of aviation platforms, including the F/A-18 Hornet, F-14 Tomcat, S-3 Viking, and E-2 Hawkeye. TAMPS is also used to transfer mission critical flight data from the planning workstations to the aircraft mission computers. Examples of this critical flight data are the loading overlays for aircraft software and bulk files for missile software, enabling the use of weapons such as the Stand-Off Land Attack Missile (SLAM), Joint Stand-Off Weapon (JSOW), and the Joint Direct Attack Munitions (JDAM). It also allows loading Joint Tactical Information Distribution System (JTIDS) and Global Positioning System (GPS) files into aircraft flight software. N-PFPs is the Navy/Marine Corps standard flight-planning system that covers non-TAMPS aircraft. It allows aircrew to plan fuel



performance, view and print National Imagery and Mapping Agency (NIMA) charts and it provides a data loader to transfer planning data into the respective aircraft. JMPS will replace both TAMPS and N-PFPS. It is a co-development effort between Navy, Marine Corps, Air Force, Army, and U.S. Special Operations Command. JMPS will bring all “stovepipe” legacy DOD mission-planning systems under one program with a common framework. The initial investment in the JMPS architecture and legacy system migration should yield significant long-term savings as these systems migrate to JMPS.

#### **Status**

JMPS began replacing TAMPS in FY 2005. The final version of TAMPS will be removed from the fleet in FY 2006. N-PFPS is scheduled to be replaced by JMPS in FY 2008. JMPS Core Architecture commenced development in 1998 and reached IOC in FY 2004. Expeditionary warfare planning-capability is scheduled for incorporation into the JMPS architecture during FY 2006 and beyond. Single aircraft planning systems such as TEAMS (EA-6B mission planning) and MPS/MOMS (AV-8B mission planning) will also migrate to JMPS, eliminating several legacy “stovepipe” systems in a favor of a single common architecture.

#### **Developers**

British Aerospace; Camarillo, California  
 USAF 46TS/TYBRIN; Fort Walton, Florida  
 Northrop Grumman; San Pedro, California

## **SUBMARINE SYSTEMS**

### **Common Submarine Radio Room [CSRR]**

#### **Description**

The CSRR modernizes the radio rooms on *Seawolf* (SSN-21), *Ohio* (SSBN-726, SSGN-726), and *Los Angeles* (SSN-688)-class submarines based on the Exterior Communications System (ECS) architecture in development for *Virginia* (SSN-774)-class submarines. The system includes up to two High Data Rate (HDR) and/or up to two OE-538 Multi-function Masts (total of two masts per ship) for enhanced wideband connectivity. A common approach to submarine radio room modernization provides the submarine force with the added benefit of common training, common logistics, and common technical insertion.

#### **Status**

There are currently three submarines, spanning two classes, installed with the CSRR design. All class submarines are to be back-fitted by FY 2014.

#### **Developers**

Lockheed Martin; Eagan, Minnesota  
 NUWC; Newport, Rhode Island  
 SPAWAR; San Diego, California



## Submarine High Data-Rate Antenna (HDR)

### *Description*

The submarine HDR antenna program is a top-priority submarine C4I initiative and is the Navy's first multi-band dish antenna. The HDR antenna provides the submarine force with worldwide high data-rate satellite communications capability. It enables the submarine to access the secure, survivable Joint MILSTAR Satellite Program in the Extremely High Frequency (EHF) band. It also provides the capability to receive time critical tactical information from the Global Broadcast Service (GBS). Additionally, the HDR antenna will provide access to the Defense Satellite Communications System (DSCS) in the Super High Frequency (SHF) frequency band.

### *Status*

The HDR Antenna is currently installed on 43 fast attack submarines, with all submarines being outfitted by FY 2009. SHF FOT&E is scheduled for FY 2007 with the implementation of SHF FOT.

### *Developers*

Raytheon; Marlboro, Massachusetts

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## Submarine Local Area Network (SubLAN)

### *Description*

SubLAN provides separate secret, top secret, SCI, and unclassified LANs with full network services and connectivity. It integrates non-tactical subsystems and applications, including Task Force Web's Navy Enterprise Portal and back-fit versions of *Virginia* (SSN-774)-class Web-enabled "paperless ship" applications. It accommodates hardware/software upgrade and technology insertion for the life of the ship.

SubLAN provides end-to-end connectivity for all tactical and non-tactical subsystems, enabling battle force/JTF interoperability and enables ship-wide access to the common operating picture, JWICS/SIPRNET/NIPRNET e-mail and Web browsing, battle force chat, and other collaborative tools.

### *Status*

SubLAN 1 installations commenced in FY 2004 and will complete in FY 2009. SubLAN 2 installations will commence in FY 2006 and are planned to complete in FY 2014.

### *Developers*

Naval Underwater Warfare Center; Newport, Rhode Island  
Space and Naval Warfare Systems Command Systems Center;  
San Diego, California

Science Applications International Corporation; Sterling, Virginia



## SURFACE AND EXPEDITIONARY SYSTEMS

### Advanced Combat Direction System (ACDS)

#### Description

The ACDS is a centralized, automated command-and-control system. An upgrade from the Naval Tactical Data System (NTDS) for aircraft carriers and large-deck amphibious ships, it provides the capability to identify and classify targets, prioritize and conduct engagements, and exchange targeting information and engagement orders within the battle group and among different service components in the joint theater of operations. ACDS is a core Sea Shield component of non-Aegis/non-SSDS combat systems.

#### Status

ACDS Block 0 is deployed on six aircraft carriers, five *Wasp* (LHD-1)-class amphibious assault ships, and five *Tarawa* (LHA-1)-class amphibious assault ships. ACDS Block 1 is installed in USS *Eisenhower* (CVN-69), USS *John F. Kennedy* (CV-67), USS *Nimitz* (CVN-68), USS *Wasp*, and USS *Iwo Jima* (LHD-7). ACDS Block 1 failed OPEVAL and is slated for replacement on *Eisenhower*, *Kennedy*, *Nimitz*, and *Iwo Jima* by 2007 with the Ship Self-Defense System (SSDS, see separate program summary).

#### Developers

Raytheon, San Diego, California. ACDS Block I development, performance, and integration testing: Raytheon; SPAWAR Systems Center, San Diego, California; and the Integrated Combat Systems Test Facility (ICSTF) and Naval Surface Warfare Center Port Hueneme Division (NSWC/PHD), Dam Neck, Virginia.

### Cooperative Engagement Capability (CEC)

#### Description

The Navy's CEC has demonstrated significantly improved battle force air defense capabilities by integrating the sensor data of each cooperating ship and aircraft into a single, real-time, fire-control-quality composite track picture. CEC also interfaces the weapons capabilities of each CEC-equipped ship in the battle group to support an integrated engagement capability. By simultaneously distributing sensor data on airborne threats to each ship within a battle group, CEC extends the range at which a ship can engage hostile missiles to well beyond the radar horizon, significantly improving area, local, and self-defense capabilities. Operating under the direction of a designated commander, CEC will enable a battle group or joint task force to act as a single, geographically dispersed combat system. CEC will provide the fleet with greater defense-in-depth and the mutual support required to confront the evolving threat of anti-ship cruise missiles and theater ballistic missiles.





### *Status*

Initial operational capability for the system was declared in FY 1996. TECHEVAL and OPEVAL were successfully completed in 1998-2001 following extensive development and testing of shipboard combat systems with which CEC interfaces. The report of the Commander, Operational Test and Evaluation Force is complete and shipboard CEC was determined to be ready for fleet use. In April 2002, the Defense Acquisition Board (DAB) approved full-rate production for the USG-2 shipboard equipment sets and Low Rate Initial Production (LRIP) for the USG-3 airborne equipment sets. In September 2003, USD(AT&L) approved FY 2004/FY 2005 follow-on LRIP for the USG-3.

By the end of 2005, CEC systems will have been delivered for installation or installed on 34 ships (Aegis CGs and DDGs, carriers, and amphibis) and five E-2C Hawkeye 2000 air squadrons. The USG-3 E-2C Hawkeye 2000 FOT&E-1 was completed in November 2002 and was evaluated as potentially ready for fleet use. FOT&E-2 was conducted in FY 2004 and the USG-3 airborne CEC system was declared "operationally effective," but required further evaluation. Interim suitability deficiency resolutions will be in place mid-2005, final resolutions by the end of 2005. FOT&E-3 and FOT&E-4, CEC Software Baseline 2.1 for CVN-69 and LPD-17, are scheduled for FYs 2005 and 2006, respectively.

CEC is a spiral development program. The revised CEC acquisition strategy was approved in August 2004. This will help achieve DoD system improvements including overall reduced system cost, size, and weight, less power and cooling, and open network architecture initiatives including SIAP common track management capability and GIG sensor fusion initiatives. The Navy is also coordinating with Joint Staff and OSD to explore potential multi-service avenues for CEC capability implementation that will expand sensor netting track data availability to meet a variety of warfighter needs across various platforms including ground mobile systems.

### *Developers*

Johns Hopkins University, Applied Physics Laboratory;  
Laurel, Maryland  
Raytheon Systems Company; St. Petersburg, Florida

## SCI Networks

### *Description*

SCI Networks (previously known as TACINTEL II / SCI ADNS) is an IP-capable, network-centric, automated, communication system for real-time receipt and transmission of Special Intelligence (SI) and Sensitive Compartmented Information (SCI) data while satisfying established Information Assurance (IA) Computer Security criteria. SCI Networks provides secure and reliable IP communications for Cryptologic, Intelligence, and Information Operations (IO) systems supporting strike group commanders; including Direction Finding (DF) Data Transfer, Record Messaging, E-Mail, Chat, File Transfer and Web Browsing. SCI Networks uses open-architecture standards, and is thus a critical element in the Navy's evolving concept of network-centric warfare. The full capability will include voice, video and data transfer among SCI-capable ships and submarines, with gateways to shore nodes. Under the submarine phase of the program, SCI Networks brings the top secret enclave to submarines in addition to the SCI enclave. SCI Networks is the lead program for implementing the SI/SCI portion of the Joint Maritime Communications Strategy (JMCOMS) under the C4I Networks initiative.

### *Status*

Installation of shore Network Operations Center Facilities is complete, however Defense in Depth DCID 3/6 security upgrades are being fielded with completions scheduled for the first quarter of FY 2005. Installation of Build-1 ship hardware began in FY 1999 and was completed early in FY 2003. Release 2.2 began fielding in the fourth quarter of FY 2003. A milestone III full-production decision was approved on October 4, 2001. Incremental hardware and software upgrades scheduled through FY 2004 and beyond will provide the following capabilities: Defense in Depth security, Submarine Version (to include TS), Packet Prioritization, Direct Ship-to-Ship Network Services, Quality of Service, Interface to Defense Messaging System (DMS), and an Interface Afloat to DMS. SCI Networks has been designated as an evolutionary program allowing for continued growth and expansion through future technology insertion. It provides the mechanism for phased implementation of both planned improvements and those that surface through advancing technology. The premise of using COTS, GOTS, NDI and existing systems to meet the requirements for SI communications will continue to be followed. To realize the FORCENet architecture, FY 2005 through FY 2008 program funds will procure and incorporate the capabilities necessary to implement the emerging DoD/Joint architecture enabling SCI Networks to continue providing rapid, reliable, and secure SI communications to the fleet well into the future.

### *Developers*

Science Applications International Corporation;  
Arlington, Virginia