

IW Pavilion on-site points of contact for media:

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Pavilion Schedule

	MONDAY 5/16	TUESDAY 5/17	WEDNESDAY 5/18	
9:00	Open Demonstrations	Open Demonstrations	Open Demonstrations	9:00
9:15				9:15
9:30				9:30
9:45				9:45
10:00				10:00
10:15				10:15
10:30	Speaker	Speaker RADM Matthew Kohler - Commander, NAVIFOR <i>"IW TYCOM Update"</i>	Speaker Capt. Jeff Czerewko (N2N6F2) <i>"TCPED - an enterpise approach to the process"</i>	10:30
10:45	VADM Ted Branch - OPNAV N2N6			10:45
11:00	<i>"Information Warfare - It's All About Warfighting"</i>			11:00
11:15				11:15
11:30				11:30
11:45				11:45
12:00			12:00	
12:15	Sea Services Luncheon	Sea, Air & Space Luncheon	Secretary of The Navy Luncheon	12:15
12:30	Potomac A/B	Potomac A/B	Potomac A/B	12:30
12:45	Speaker: General John M. Paxton Jr.	Speaker: The Honorable Ashton B. Carter	Speaker: The Honorable Sean J. Stackley	12:45
13:00	Asst. Commandant of the Marine Corps	Secretary of Defense	Asst. SECNAV Research, Development & Acquisition	13:00
13:15				13:15
13:30				13:30
13:45				13:45
14:00	Speaker	Speaker		14:00
14:15	VADM Jan Tighe - Commander, FCC/C10F	RADM Dave Lewis - Commander, SPAWARSSYSCOM		14:15
14:30	<i>"FCC/C10F Update"</i>	<i>"SPAWAR Update"</i>		14:30
14:45				14:45
15:00	Speaker	Speaker		15:00
15:15	RDML Christian Becker - PEO C4I/PEO Space Systems	Mr. Troy Johnson (N2N6F4)		15:15
15:30	<i>"Designing & Delivering the Future"</i>	<i>"Navy Cyber Resilience/Cybersecurity"</i>	Exhibit floor closes - End Show	15:30
15:45				15:45
16:00				16:00
16:15				16:15
16:30		Exhibit floor closes at 4:45. Reopens 6:00-7:30 pm		16:30
16:45		to support formal banquet		16:45

Demonstration Descriptions

Hands-on demonstrations bring a visually dynamic and interactive element to the IW Pavilion. The following pages contain short descriptions of the demonstrations that will be located in the Navy Information Warfare Pavilion.

Multi-Purpose Reconfigurable Training System (MRTS)

Definition: Multi-Purpose Reconfigurable Training System (MRTS) is a network-controlled, computer-based trainer for the C4I Common Submarine Radio Room (CSRR). MRTS utilizes liquid crystal display flat panel touch screens. A Windows operating system combined with a commercial off-the-shelf graphics software product allows the developer to easily replicate the front panels of the tactical communications equipment.



Details about the system:

- The CSRR MRTS trainer equips the student with a means to interact with the simulated communications equipment, responding to student's input in a manner identical to that of the tactical CSRR system
- Used for operator, maintenance and team training
- Provides high definition pictorials of CSRR system hardware and circuit emulation
 - System displayed on a series of flat panel touch screens
 - Provides realistic system functionality and capability
- Current implementations
 - CSRR variants installed on SSBN, VA, SSGN and LA submarine classes
 - Currently located at seven submarine training locations

Details about the demo: Operator Training Scenario demonstrates the ability to train CSRR operators and maintainers in normal, emergency and alternate recovery procedures. The demonstration will also show how to train various submarine missions including strategic, battle group, strike, special warfare, and intelligence, surveillance, and reconnaissance.

Benefits to the Navy:

- Cost effective C4I submarine hardware solution – MRTS is a 68 percent cost savings over normal technical training equipment
- MRTS allows shifting software baselines
- Provides capability with minimal infrastructure cost
- Configuration changes to program of record systems are implemented through software updates to trainer
- Ability to inject faults at any step to force team to exercise casualty procedures
- Simulates faults and casualties impossible to implement in tactical equipment
- Records every student action
- Enforces procedural compliance
- Provides scenario based mission training
- Provides maintenance and operator training

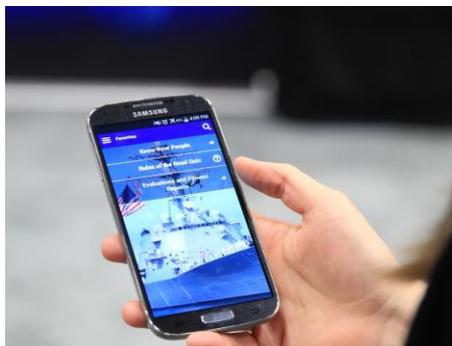
How does it support the Information Warfare community?

- CSRR supports the Assured Command and Control pillar by providing multiple, robust, secure communications (voice, data, video) links for strategic and non-strategic platforms. CSRR supports the information infrastructure within the platform and between the Navy's overall information environments to provide uninterrupted worldwide communications.
- MRTS allows the operators and maintainers to train and develop proficiencies in a safe, isolated but virtual environment. Additionally, the MRTS provides greater flexibility over a traditional hardware training solution by leveraging the development of each version to multiple sites nearly simultaneously. MRTS provides integrated video, data and C4I application training.

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Mobile Applications

Definition: The Mobile App demo will give the audience a chance to try out six of the Navy's newest apps: eDIVO, Domestic Violence Prevention, Final Multiple Scores Calculator, OPSEC, New to the Navy, and Navy Credentialing Opportunities On-Line (COOL). These apps are currently available in both the Apple and Android app stores.



Details about the system:

- The apps provide training and/or information on various topics to the user.
- Navy service members, civilians and their families (depending on the app).
- The apps are available for Android and App phone and tablet operating systems.
- New apps are coming out in the future including Navy LifeSkills Reach-back, Records Management (training), and PII (training). All apps will receive regular updates as needed.

Details about the demo:

- The demo will involve several mobile devices (phones and tablets) that have the apps downloaded on them. People will have a chance to go through the apps on their own or can be guided through by one of the demonstrators. On the monitor either an app demo will be running or promotional slides on each of the apps.

Benefits to the Navy:

- By deploying mobile apps, the Navy is increasing the different methods of delivering training and information to Sailors, giving them more options to independently complete training and/or find the information they need in their career.
- There have been more than 41,000 downloads to date and more than 2,200 course completions using the General Military Training apps.
- The apps reduce administrative distractions by allowing service members complete training and access to useful information without the need for a computer. The Domestic Violence Prevention and OPSEC apps allow Sailors to complete and submit training, which is updated in their Electronic Training Jacket. Apps like New to the Navy, eDIVO and FMS Calculator give access to useful and correct information without the need to access a computer, which is especially useful to those at sea.

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Intelligence Carry On Program (ICOP)

Definition: This is an unclassified, disconnected demonstration of the Battlespace Awareness and Information Operations Program Office (PMW 120) Intelligence Carry on Program (ICOP) hardware and software suite. The ICOP program of record system responds to multiple fleet requirements, delivers a suite of multi-intelligence, analytical capabilities and extends the intelligence, surveillance and reconnaissance (ISR) enterprise and Distributed Common Ground System family of systems to unit level platforms.



Details about the system:

- The robust ICOP suite of multi-source intelligence and analytical capabilities includes an integrated 3-D operational picture, displaying intelligence and other data sources to provide a richer and more complete picture of the battlespace on unit level platforms. The system supports full motion video receive, process, exploit and dissemination capabilities.
- This suite is used by Independent Duty Intelligence Specialists.
- The system supports cruisers, destroyers and LPD-17 class ships.
- Future development includes continued Integrated Fires experimentation, SCI and unclassified variants.

Details about the demo:

- The demo of disconnected ICOP capabilities with demo data to show applications and visualization on an UNCLAS, disconnected system.
- This will differ from actual user experience because it will not include classified data or network connectivity.

Benefits to the Navy:

- There are more than 90 prototype systems supporting worldwide naval operations in advance of the program of record.
- ICOP helps put the ship in the “right place at the right time” to support the warfighter. It provides a quantum leap forward in terms of ISR processing, analysis, visualization and dissemination capabilities on unit level ships.
- Potentially significant fuel savings by providing the ISR information to position the platform in the right place at the right time. Provides an integrated, highly effective, video-based training capability to improve user effectiveness and reduce help desk and fly away technical support needs.
- ICOP system is highly flexible, scalable and adaptable. It is designed to support mobile cloud afloat to include hosting intelligence community data at the tactical edge.

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Mobile User Objective System

Definition: The Navy's Communications Satellite Program Office has overall responsibility to deliver the MUOS capability (satellites, ground stations, network), and the Army's Project Manager for Tactical Radios will supply the Manpack Radio, which will initially be the primary radio used with MUOS. Using the MUOS waveform's beyond line-of-sight capability, troops all over the world can talk, text and share mission data seamlessly.



Details about the system: MUOS is a complex orchestra comprised of a five-satellite constellation, four ground stations across the globe, an integrated waveform, radios and complex software to manage the network.

The Navy plays a key role in national space efforts by providing narrowband satellite communications for the Department of Defense and other government agencies. While MUOS was designed for mobile users who require worldwide, secure voice and mission data at higher data rates, these capabilities are also available for ships, aircraft and ground vehicles used by all U.S. military services.

Details about the demo: Leveraging 3G Wideband Code Division Multiple Access (WCDMA) cellular telephone technology, the MUOS system uses geosynchronous satellites with ground stations to provide military users with secure voice and Internet Protocol data connectivity. Information travels via UHF WCDMA to one of the MUOS satellites, then Ka-band down to a ground station. From there it can be routed to another ground station via terrestrial fiber, then it is uplinked back to the same or different MUOS satellite via Ka-band communications, and then back down via UHF to another user anywhere in the world.

Even though the routing seems complex, information is delivered quickly, with messages traveling nearly 100,000 miles a little less than a second and a half.

Benefits to the Navy: MUOS supports all three Navy Information Warfare pillars: Assured Command and Control, Integrated Fires and Battlespace Awareness.

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Nanosatellites

Definition: Nanosatellites are an emerging low-cost space technology being developed by Program Executive Office Space Systems, Space and Naval Warfare Systems Center (SSC) Pacific, additional organizations in the U.S. Navy, and other academic, commercial and military entities. Nanosatellites are less than a foot long and weigh less than 25 pounds. More than 100 were launched in both 2013 and 2014. Nanosatellites can't replace every large satellite but they are quickly becoming more capable.



Details about the system:

Future nanosatellites will provide capabilities in communications, intelligence, surveillance, reconnaissance, environmental monitoring and other missions. Nanosatellites can provide unique access to areas that undersea or airborne platforms cannot. The primary intended users of nanosatellites are members of the Fleet.

SSC Pacific has multiple, on-going nanosatellite development efforts. The Vector Joint Capability Technology Demonstration launched two satellites into an orbit in November 2013 and successfully demonstrated advanced communications capabilities. Also, PEO Space Systems, with support from SSC Pacific, is developing the Integrated Communications Extension Capability (ICE-Cap), to demonstrate the ability to communicate through the Mobile User Objective System to send data directly to users on secure networks. ICE-Cap leverages four Small Business Innovative Research, or SBIR, efforts.

Details about the demo:

The demo will show a nanosatellite model, which – although not operational – represents the same size of an actual nanosatellite. The booth will also include visual displays with information on nanosatellites' capabilities and the missions nanosatellites support.

Benefits to the Navy:

Nanosatellites support all three Navy Information Warfare pillars: Assured Command and Control, Integrated Fires and Battlespace Awareness. Nanosatellites are a cost-effective technology providing enhanced capabilities; they are launched into orbit when a larger satellite mission has spare room, similar to riding on a space-available airline flight.

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Consolidated Afloat Networks and Enterprise Services (CANES)

Definition: CANES is a \$12 billion Acquisition Category 1AC program with an inventory objective of 178 ships, submarines and shore sites. It consolidates five existing networks and reduces IT footprint while providing a common IT infrastructure across all security domains. CANES is funded and programmed for a technology refresh strategy that ensures that the system is modernized on a regular basis to provide increased capabilities, mitigate end-of-life vulnerabilities and maintain pace with the latest cybersecurity tools.



Details about the system:

- Provides a mission-critical network that meets current and projected warfighter requirements for reliability, security and capability.
- Provides integrated voice, video, data and system management functions to reduce shipboard workload.
- Supports the Navy's Maritime Strategy by delivering agile and effective knowledge-superiority capabilities to the fleet.
- Inventory objective includes CVN, LHA/LHD, CG, DDG, LSD, LPD, SSN, SSBN, SSGN and FF.
- Seven vendors compete for production contract delivery orders to produce CANES sets based on a government build-to-print design.
- Future builds will enable mobile devices, provide increased processing and storage, reduce space, weight and power, and enhance cybersecurity
 - CANES Mod 01 will begin installation in March 2016.
 - CANES Objective Baseline 2 will begin installation in 2019.

Details about the demo:

- This static display consists of two CANES racks - a data center rack and an edge switch rack.
- This is a "cold iron display" that is not powered.

Benefits to the Navy:

- CANES delivers information warfare capabilities by modernizing afloat networks and providing hardware, software, processing, storage, services, and end-user devices for all Navy mission-critical applications on all security domains.
- Using a common architecture, CANES is scalable. For example, a DDG consists of 18 racks, a CVN has 49 racks.
- The technology refresh strategy ensures that the system is modernized on a regular basis, meets Fleet needs, and will continue to provide the latest information warfare capabilities in the future.

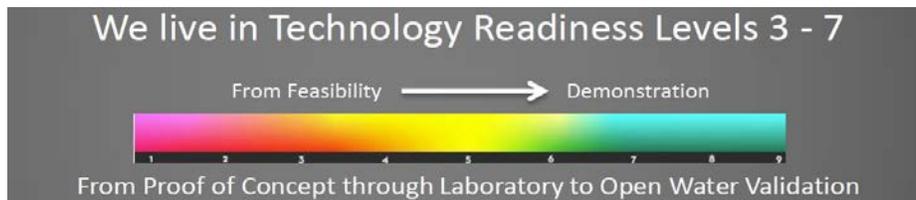
Additional Information: <http://www.public.navy.mil/spawar/PEOC41/ProductsServices/Pages/CANES.aspx>

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Squirrelworks

Definition: The Squirrelworks (SQW) team anticipates our nation's need by developing high-payoff, high-risk, game-changing, emerging technologies that define our future battlespace. We deliver transformational warfighting capabilities to the U.S. Navy and Marine Corps that have the potential to dramatically change the way naval forces fight.

SQW is currently exploring disruptive technologies of radical departure from established requirements and concepts of operation that are expected to demonstrate and/or prototype a transition-able warfighting capability within four to eight years.



Details about the program:

- System of Systems which provides the ability to synchronize electronic warfare (EW) effects across a variety of distributed platforms a coherent and consistent EW effect
- Game Changing Capabilities
- Full spectrum Information warfare to achieve decision superiority
- Leveraging C4ISR and EW to affect decision making
- Operationally effective solutions solving immediate problems (Speed to Fleet)
- World class capabilities embedded in operations

Details about the demo:

- RF Spectrum Engagement – Sense/Evaluate/Transmit
- Arbitrary Waveform Generation - utilizing FPGA/DSP technology, targeted to embedded systems
- REDHAWK Framework - Software Defined Radio
- Systems of Systems Architecture – Operational and Technical
- E2E RF hardware delivery chain (Antenna Demonstration)
- System Utilization – non traditional
- Prototyping, testing and real world operations (Video Wall)



Benefits to the Navy:

- SQW directly supports Integrated Fires, Assured C2, Battlespace Awareness and Unmanned Systems
- Engineering
- Fleet Transition
- Special Projects
- Operations
- Prototype
- Urgent Needs
- Assessments / Analysis



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Littoral Battlespace Sensing Unmanned Underwater Vehicle

Definition: The Littoral Battlespace Sensing – Unmanned Undersea Vehicles (LBS-UUV) program is funded by the Chief of Naval Operations Naval Intelligence and Communications, Oceanography (N2/N6E) and managed by the Program Executive Officer, Command, Control, Communications, Computers, and Intelligence (PEO C4I) Program Management Warfare for Battlespace Awareness and Information Operations (PMW 120) Program Office. Two systems, the Littoral Battlespace Sensing – Glider (LBS-G) and the Littoral Battlespace Sensing – Autonomous Undersea Vehicle (LBS-AUV), comprise the LBS-UUV capability. They both support a persistent undersea Intelligence Preparation of the Operational Environment capability as an enabler for joint assured access and joint undersea superiority.



Details about the system:

- LBS-G System gliders are small (man-portable, ~130 lbs.), long-endurance (90 to 180 days), buoyancy-driven vehicles that provide a low-cost, autonomous, and highly-persistent means to sample and characterize the ocean water column properties that influence sound propagation and optical clarity for predicting acoustic sensor and optical weapon performance within an area of interest.
- LBS-AUVs are moderately large (~ 700lbs), medium-endurance (24 to 72 hours), electric powered vehicles that increase the spatial extent and resolution of the ocean bottom (bathymetry, hydrographic, and imagery data) and water column properties that influence safety of navigation.
- Both LBS-UUV systems are operated and maintained by Naval Oceanographic Office (NAVOCEANO) and deployed from Transportation Service – Auxiliary Geodetic Survey (T-AGS) 60 Pathfinder Class multi-mission oceanographic ships.

Details about the demo:

- The LBS-G glider on display has previously operated off the coast of San Diego.
- The AUV on display is a Hydroid REMUS 100 that is similar in shape to the much larger LBS-AUV.

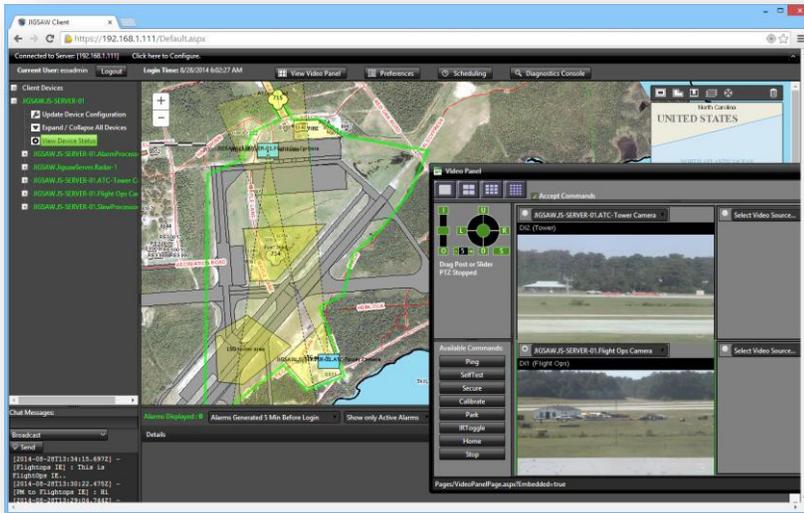
Benefits to the Navy:

- Both LBS-UUV systems improve the coverage, accuracy, and precision of environmental characterizations over conventional data collection methods and systems. This enables the warfighter to make tactical adjustments to asset allocation by optimizing sensor and weapon platform placement and modes of operation, and by increasing tactical effectiveness while reducing tactical timelines and risk to forces.
- The LBS-G system, as the first and only program of record of its kind in the U.S. Navy, continues to fill a critical gap in the area of persistent Intelligence Preparation of the Operational Environment, and has proven to be an extremely cost effective force multiplier in that it gathers water column property data from a broad range of operating areas, thus relieving the oceanographic ship to focus on other missions.
- The LBS-AUV system performance specification calls for extremely high navigation accuracy and employs the proprietary Kongsberg Maritime Navigation Processing Suite (NavP) which improves overall vehicle navigation accuracy by a factor of four over other AUV systems based on a timing accuracy to 1ms or better and complete time synchronization of all onboard navigation sensors. This feature, to the best of PMW 120's knowledge, enables the LBS-AUV system to be the only AUV to meet International Hydrographic Organization (IHO) Order 1a and 1b depth and positioning standards.

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JIGSAW – Joint Interoperable Gateway for Security, Anti-terrorism and Warfighting

Definition: JIGSAW is a unique command and control system that is 100 percent GOTS (Government-Off-The-Shelf). JIGSAW can easily integrate sensors or legacy systems with a unique SDK (Software Development Kit). All the data is then automatically converted into one common standard, ICD-101B, and transported across a fast SOA (Services Oriented Architecture). The GUI (Graphical User Interface) can be viewed through any browser on any computer or tablet (eg. PC, MAC, Android, IPAD) and is a true “thin client”, requiring no software to download. JIGSAW is a robust enterprise architecture that has been IA certified and runs on a small laptop or a large server with VMware.



Details about the system:

- Currently uses ESRI for GIS mapping. (customizable)
- Slew-to-cue capability with tracking between radar targets and cameras.
- Remote JIGSAW Auxiliary Nodes (JANs) can interface MASS notification (for example: on-site within FDBs (Field Dist. Boxes.)

- Custom “Drivers” for sensors or systems can typically be done in < 1 day through a unique SDK
- GUI client interface can be customized for individual requirements
- “Fusion” software can easily interface using ICD-101B and transmit data on a bi-directional SOA message bus.

Details about the demo:

- JIGSAW has been tested in used in San Diego at the Integrated Waterside demonstration.
- JIGSAW is being deployed worldwide at all the Marine Corps fixed base locations.
- JIGSAW is currently deployed at Sigonella, Italy.

Benefits to the Navy:

- Can quickly integrate any sensor and make them all speak the same language – ICD 101B
- 100 percent GOTS and completely customizable.
- Works in small dedicated applications to large Enterprise environments
- SOA allows for very efficient data analysis and automated control
- Works with many standards such as ONVIF, Pelco D, CoT, OTH Gold (Navy harbor security protocol)

Point of Contact: Steve Davis: steven.a.davis@navy.mil

U.S. Naval Observatory Master Clock

Definition: The USNO's Master Clock is the time standard for the Department of Defense, in accordance with CJCSI 6130.01E. The Master Clock is an ensemble of Cesium beam clocks, Hydrogen Masers and Rubidium Fountains that are averaged to generate a time scale that is better than any individual clock in the ensemble. Clocks are maintained in environmentally controlled spaces to maximize performance, with multiple system redundancies to ensure robust operation. An Alternate Master Clock (AMC) is maintained at Schriever AFB in Colorado Springs.



Details about the system:

- All DoD components must get their time from the USNO Master Clock, either directly or via GPS.
- The Master Clock at USNO consists of 100 HP-5071A Cesium Beam Frequency Standards, 24 Sigma-Tau Hydrogen Masers and 4 “in-house” designed Rubidium Fountains.
- The AMC consists of 24 HP-5071As, 12 Masers and 2 Fountains.
- In order to comply with the directive to provide a Master Clock that meets or exceeds current requirements, we also conduct research and development of clock and time-transfer technology. Our rubidium fountains were developed and built at USNO, and are the best continuously-running clocks in the world.
- Time distribution methods include GPS (10 nanoseconds [ns] precision), Two-Way Satellite Time Transfer (5 ns) and dedicated optical fiber (5 ns), as well as lower precision methods, such as NTP (computer, 10 milliseconds [ms]) and phone (100 ms).

Details about the demo:

- The HP-5071A Cesium Beam Frequency Standard represents one of many such devices in the Master Clock ensemble. The SI Second is defined as “the duration of 9,192,631,770 cycles of radiation corresponding to the transition between two hyperfine levels of the ground state of cesium 133”.

Benefits to the Navy:

- ☑ Precise time allows for precise positioning, navigation, and weapons system targeting; a timing error of one microsecond (1000 ns) corresponds to a positioning error of almost 0.2 miles.
- ☑ Allows for rapid code recognition in signals such as from GPS and IFF systems.
- ☑ Frequency-hopping for secure communications, encryption/decryption of command/control data.

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