CONNECTING OUR SOLDIERS

2016 ANNUAL REPORT TO THE STAKEHOLDERS

PEO C3T
PROGRAM EXECUTIVE OFFICE COMMAND CONTROL COMMUNICATIONS-TACTICAL
The annual report to the stakeholders is published yearly to give the public and private sector an update on PEO C3T. Photos from U.S. Army, unless otherwise stated.
Over the past year, the PEO C3T continued providing enhancements to the mission command network and enabling technologies to commanders and staffs across the Army. In Fiscal Year 2016, PEO C3T fielded new capabilities to more than 75 Army, Army Reserve and Army National Guard units through Unit Set Fielding and Capability Set Fielding efforts.

As we continue to deliver new capabilities we are listening to Soldier feedback from operational deployments and operational exercises, and are applying lessons learned to deliver enhancements that better integrate the new capabilities, while implementing new training practices and streamlining fielding efforts to make the network less complex, scalable and more simplistic to operate.

We continue to team with partners at Forces Command (FORSCOM), Training and Doctrine Command, Army Materiel Command (AMC), and Army Cyber Command to improve the mission command network. Our collective efforts are focused on enhancing support to expeditionary operations, improving network scalability and simplification, while enhancing current mission command network capabilities. For example, we are reducing the number of software baselines that we field to provide users a common, intuitive experience across formations and operations. We are establishing cyber protection and sustainment plans upfront, before we field a new technology. And efforts are underway to enable less complex network initialization, configuration and management of technology, training and fielding.

We also continue to lay the groundwork for future communications that are more integrated and standardized, and therefore simpler for the user. This year there was an increased focus on the Command Post Integrated Infrastructure (CPI2) requirements definition to simplify command posts and remove the burdens posed by cumbersome, complex legacy command posts. Also in support of a more expeditionary force, we are fielding the Army’s new software defined radios that serve as an integral part of the communications network. These new radios enable the exchange of voice, data and Position/Location information enabling dismounted and mounted Soldiers to share critical mission command information. We continue to field the friendly force tracking system Joint Battle Command-Platform (JBC-P), delivering a highly intuitive Google-Earth like interface and touchscreen so Soldiers can easily zoom in to view precise locations, use icons to pinpoint improvised explosive devices on a map, and conduct chat functions across the battlefield.

Of course, we aren’t doing this alone. As we look to advance network capabilities, we continue to broaden our partnership with industry and the Army’s Research and Development community. We worked closely with these partners in fielding new technologies such as the Enroute Mission Command capability (EMC), which creates a ‘flying command post’ enabling mission command and secure voice, video and data communications to commanders and Soldiers on route to drop zones. This relationship with industry includes opening up more opportunity to small businesses, who continue to produce groundbreaking technology, such as the Transportable Tactical Command Communications (T2C2), a new duo of light-weight, portable satellite terminals that can deploy in a transit case the size of carry-on luggage. T2C2 provides connectivity so Soldiers can obtain the advanced situational awareness and mission command capabilities needed to conduct early entry operations and set the stage for follow-on forces and a buildup of additional network infrastructure.

We will continue to reach across to organizations throughout the Army and with our partner services to provide expeditionary connectivity for all phases of operations. This year we fielded the initial version of the Manpack Radio that enables connectivity via the Navy’s Mobile User Objective System (MUOS) satellite system to provide users across joint services with secure voice and data on demand. We are working closely with the Navy in testing activities in support of the system operational assessment prior to operational use. We leveraged commercial secure Wi-Fi to make command posts more expeditionary and reduce set up and tear down times. We are also reducing size, weight and power requirements of the Warfighter Information Network-Tactical network and mission command capabilities by delivering them on Humvees for light infantry and Airborne units.

We have continued our efforts with FORSCOM and AMC (Communications-Electronics Command (CECOM)), in enhancing home station training for mission command network systems. Collaborative efforts are underway with a number of units, notably brigades of the 82nd Airborne Division and the 10th Mountain Division, utilizing Mission Training Centers, Signal Universities, and additional resources to provide better proficiency on network communications systems. Our team is working diligently to reduce the burden on Soldiers through network configuration and initialization by automating the application of Information Assurance Vulnerability Patches, and improving unit maintenance procedures and organic maintenance capabilities. We will maintain a focus on improving system and unit readiness as we address maintenance and training improvements for our systems. I expect an increased focus on these areas with the recent addition of BG Karl Gingrich who will serve as my assistant Program Executive Officer for Operations, Readiness and Fielding. In this role, he will oversee how our equipment is fielded, right size our contractor field support and better target Soldiers as the first line of defense when it comes to troubleshooting network capabilities.

You’ll find more information about these efforts and more throughout the following pages, and I look forward to working with you as we continue to build and refine the Army’s tactical network.
It’s the early 2000s and the digital environment is alive and well at home. The iPod hits the market, the Segway is invented and the first digital cameras are shipped commercially. Text messages are becoming a preferred way to quickly communicate anytime, anywhere.

Yet for our Soldiers in Operation Enduring Freedom and Operation Iraqi Freedom, it’s a very different environment. Soldiers and Marines are geographically dispersed across the country operating out of numerous Forward Operating Bases (FOBs), some the size of small cities. The extensive FOB infrastructure provided Soldiers with the network connectivity they needed. But unlike back home, as soon as Soldiers left the FOBs, there was little communication backbone in place to support their situational awareness or decision making. Combat net radio systems used a decade earlier in Desert Storm no longer kept up with the pace of battle. A new network was needed.

In response, the Army began to field mobile voice, data and video communications systems. Adapting existing commercial technology, the Army expanded on-the-move digital communications down to company level. As technology progressed and users reported feedback from the field, the Army also introduced annual events like the Network Integration Evaluations (NIEs) to enable integration of the various network programs of record and the numerous industry solutions. As a result, continuous network changes were made and provided to the force. The Army also revised the way it fielded the network, implementing Capability Set fielding as a new approach to deliver the network as a packaged, integrated suite of communications systems. This push for military information dominance proved highly effective for a counterinsurgency environment, but had definite drawbacks for today’s decisive-action operations.

THAT WAS THEN, THIS IS NOW
Recognizing the Army of today and tomorrow will fight as part of a joint, inter-organizational and multinational team that will deploy rapidly into unexpected locations and transition quickly into high tempo, dispersed operations, we are evolving the network for new challenges.

Current Army efforts to strengthen and enhance our network are focused on a mission command network that is assured, interoperable, tailorable, collaborative, identity-based and accessible at the point of need, while meeting individual commanders’ requirements based on echelon and formation.

A NEW FRAMEWORK
To help align network priorities with user needs, the Army is regularly uniting the
user, doctrinal and materiel communities to assess network doctrine and materiel capabilities from the perspective of our operational formations. The consensus is for a simplified network that achieves common levels of modernization between like-type units and includes systems that facilitate expeditionary operations.

Acting on user feedback from both operational deployments and operational exercises, we have enhanced the expeditionary network by integrating new technology, implementing new training practices and streamlining fielding efforts to make the network less complex, scalable and more simplistic to operate. We delivered a software upgrade to Warfighter Information Network-Tactical (WIN-T) vehicles that resulted in a one-button initialization for the system, we continue to reduce the intricacies of our web-based mission command tools, and are simplifying Network Operations and Unit Task Reorganization for general purpose users. These efforts will simplify the effort required to initialize and configure the various network components, including over-the-air reprogramming and rekeying our network radios. We are also fielding the friendly force tracking and situational awareness tool, Joint Battle Command-Platform to operational units, bringing online battlefield chat rooms, a Google Earth-like map and touchscreen.

**BRINGING SIMPLICITY TO THE FIELD**

Already, the Army is finding answers. To achieve a more expeditionary, scalable and simplified network, we are enhancing current program efforts with agile command posts and early entry network capability.

We are working to reduce network baselines to provide users a common, intuitive experience across locations, formations and operations. Cyber protection is being established upfront, as are sustainment plans. Technology, training and fielding efforts are underway to enable less complex network initialization, configuration and management.

**CONCLUSION**

By anticipating a full range of adversaries and delivering technology accordingly, rather than concentrating only on the fight at hand, the Army will be better prepared for future conflicts. The Army Operating Concept, “Win in a Complex World,” envisions an expeditionary, agile future force that retains overmatch over opponents and has the ability to Prevent, Shape and Win in any challenge we confront.

The Army’s network is a critical enabler for this, designed to provide operational flexibility through seamless connectivity at the point of need. Working together, the Army will provide a simplified, scalable network to increase readiness and support an expeditionary force.
PEO C3T provides the communications transport network (both satellite and terrestrial), and supporting services, so Soldiers can send and receive information to execute their mission. This information transfer is the element of combat power that allows commanders to magnify the effects of maneuver, firepower and protection, while advancing mobility, modularity and agility.
EXPEDITIONARY COMMS: ONE TACTICAL NETWORK

In an increasingly complex world, the Army must be capable of supporting multiple contingencies simultaneously and at a moment’s notice, with the ability to rapidly deploy and communicate anytime, anywhere, at every stage of operations and echelon. Project Manager Warfighter Information Network-Tactical (PM WIN-T) continues to address these requirements and seek solutions for lightweight, expeditionary networking gear to support early entry forces through more mature operations.

Starting at the earliest stages of a mission, Paratroopers can now tap into the power of the Army’s single integrated tactical network, WIN-T, using the Enroute Mission Command Capability (EMC2) system to take advantage of advanced mission command applications and network communications connectivity before parachutes even open. During a large-scale Joint Forcible Entry (JFE) exercise in December 2015, Global Response Force (GRF) paratroopers leveraged EMC2 onboard a C-17 aircraft to achieve plane-to-plane, plane-to-ground communications needed for a successful parachute assault. The GRF has successfully utilized the EMC2 during other JFE exercises in FY2016 including Bold Quest in October 2015 at Fort Bliss, Texas.

“EMC2 enables mission command for the GRF and joint partners over strategic distances,” said COL Timothy Watson, assistant chief of staff for XVIII Airborne Corps G3 (operations). “It facilitates secure voice and data services, collaborative planning, up-to-date situational awareness and informed decision making for the GRF and joint partners while en route to the objective area.”

Within minutes of hitting the ground, the jumpable Transportable Tactical Command Communications (T2C2) Lite or air droppable T2C2 Heavy will enable early entry forces access via satellite to the WIN-T network. Enabled with network connectivity, these forces can obtain the advanced situational awareness and mission command capabilities needed to conduct entry operations and set the stage for follow-on forces and the scalable buildup of additional network infrastructure. In later operations, T2C2 Heavy will extend the Army’s network to the tactical edge by enabling command post/forward operating base communications. Additionally, in more mature operations T2C2 Lite could be used to support special expeditionary teams that require network access for their unique mission sets.

The T2C2 Acquisition Category III program was approved for Milestone C in November 2015 by the Milestone Decision Authority, the Program Executive Officer for Command, Control and Communications-Tactical (PEO C3T). At that time, T2C2 was approved to proceed with the Low Rate Initial Production portion of the production and deployment phase for the purpose of conducting product verification testing and an Initial Operational Test and Evaluation in preparation for a Full Rate Production decision.

In the meantime, an October 2012 Army Requirements Oversight Council (AROC)
decision calls for hundreds of upgraded Secure Internet Protocol Router/Non-secure Internet Protocol Router (SIPR/NIPR) Access Point satellite terminals, or SNAPs, and even smaller carry-on suitcase-size Global Rapid Response Information Packages (GRRIPs), to be used as bridging solutions until T2C2 is ready to begin fielding.

To further quench its thirst for expeditionary networked communications, the Army is providing a new modular suite of expeditionary communication equipment that provides increased bandwidth with significant size, weight and power reductions. Supported by Soldiers from the 127th Engineering Battalion, 1st Brigade Combat Team, 82nd Airborne Division (1/82 ABN Div), PM WIN-T conducted a demonstration of operational proof-of-concept (PoC) expeditionary Signal Modernization capabilities at Fort Bragg, N.C. in mid-March, in support of current 82nd ABN Div operational needs statement requirements. The team successfully executed the demonstration at three geographically separated locations to see how these new scalable network capabilities could be utilized during various stages of operations to provide voice, video and data communications, mission command and situational awareness over the WIN-T network.

These commercial hardware solutions included the new high-bandwidth interim Terrestrial Transmission Line Of Sight (TRILOS) radio; the lighter range-extending interim Troposcatter (Tropo); Commercial Coalition Equipment (CCE); and the Modular Communications Node - Advanced Enclave (MCN-AE), which supports intelligence users over the WIN-T network and future network convergence efforts. Additionally, the Army conducted a technical PoC demonstration at Aberdeen Proving Ground, Md. in support of the 82nd ABN Div operational needs statement that included Secure 4G LTE capabilities.

"With GRF we have seven to nine different tactical mission sets, from decisive action -- going in and kicking down doors -- to humanitarian assistance, to disaster relief; it just depends on where we get called up," said LTC Thomas Sager, deputy commanding officer for 1/82 ABN Div. "There is an interest for these capabilities; they enhance the mission command systems and mission command."

Additionally, PM WIN-T is scheduled to begin fielding another capability expected to increase the expeditionary nature of today’s forces – Secure Wi-Fi.

During Network Integration Evaluation 16.1 in November 2015, the Army demonstrated Secure Wi-Fi to help make command posts more expeditionary, so commanders can out maneuver and outfox increasingly capable enemies. By going wireless, command post set up and tear down times are reduced by hours, less cable and protective flooring have to be transported from location to location, but most importantly, units can leverage the full extent of their network mission command and communications capabilities much faster.

Why is wireless so important? Because the speed in which the tactical operations center comes up is absolutely critical, with command post Wi-Fi, we are getting to the point that systems are coming up as fast as the command post infrastructure is going up. It is a game changer, truthfully.

COL Charles J. Masaracchia, commander for 2nd Brigade, 1st Armored Division (2/1 AD)
In line with its priorities for a more expeditionary force, the Army continues to enhance the mobile communications network known as Warfighter Information Network-Tactical (WIN-T) Increment 2, to increase capability, readiness and agility, while making the system easier to operate and maintain.

As a key part of the Army’s single, interoperable tactical network, WIN-T Increment 2 provides advanced communications elements to enable mobile mission command, including a near real time common operating picture from anywhere on the battlefield. Soldiers operating inside Tactical Operations Centers (TOCs) or on-the-move inside tactical vehicles in remote and challenging terrain maintain voice, video, chat and data communications, providing the situational awareness needed to successfully complete rapid and demanding missions.

“We are going to be covering some incredible distances, especially with airborne operations, which we couldn’t have covered with standard FM communications,” said Maj. Jeffrey Fulton, communications officer (S6) for the 2nd Brigade Combat Team (BCT), 1st Armored Division (2/1 AD), during Network Integration Evaluation 16.1 in November 2015. “With WIN-T Increment 2, the commander can have communications with the ground forces across the entire footprint of the battlefield. In fact, if he were on the west coast, he could actually talk to another unit [and exchange data] on the east coast, if they had the similar equipment.”

In support of quick reaction and Air Assault missions, the Army is providing lighter weight, more transportable alternatives to the larger Stryker and Mine-Resistant Ambush Protected (MRAPs) mobile configurations initially fielded. In 2014, WIN-T Increment 2 Point of Presence (PoP) and Soldier Network Extension (SNE) configurations were integrated onto sling-loadable HMMWVs for the 82nd Airborne Brigades. The WIN-T program office is now reducing the size, weight and power (SWaP) requirements of the Tactical Communications Node (TCN) and the Network Operations and Security Center (NOSC). TCNs and NOSCs previously had been delivered on large FMTVs, but the new “Lite” versions are delivered on HMMWVs, which are much easier for Airborne units to transport. The TCN-Lite and NOSC-Lite provide the same networking and network management capability to the command post as their much larger predecessors. The Army will formally test the TCN Lite and NOSC Lite during NIE 17.2 in May 2017.

As it continues to respond to Soldier feedback, the Army is further reducing SWaP and the number of components found in the various configurations, while
consolidating functions, by implementing virtualization on General Purpose Processors (routers, switches, network services etc). These “lighter” Next Generation (NextGen) configuration items will better support the expeditionary nature of an agile future force. They are also expected to realize significant cost and complexity reduction driven by reducing the number of components, and reducing the number of cables required.

The reduction of SWaP is not the only way to increase the Army’s agility and battle operating tempo. For example, WIN-T Increment 2’s new Rapid Vehicle Provisioning System (RVPS) reduces the time it takes to configure a brigade’s networked vehicles from the current four week cycle to less than five days. The system acts like a software filling station, connecting the vehicles to a single server, which can provision, load, configure and install needed software simultaneously, versus conducting these tasks in a serial, one-at-a-time fashion.

The Army conducted a demonstration of RVPS in late February at Fort Bliss, Texas, where it installed and configured all of the 2/1 AD’s WIN-T Increment 2 equipped vehicles in preparation for the unit’s support at NIE 16.2 in May. Demonstrations, user reviews and risk reduction events will continue through the Army Warfighter Assessment 17.1 this fall and beyond. “Unit readiness is a high priority especially in today’s leaner Army,” said LTC Michael Williams, product manager of WIN-T Increment 2. “By dramatically cutting these install times, RVPS will improve unit readiness and speed of maneuver, so units can move out when the mission demands.”

To quench their thirst for high-level situational awareness while in transit, Corps headquarters (HQ) elements are also looking to join the Army’s mobile network, which currently is found at Division and below. In response to an I Corps operational needs statement, a new Mission Command On The Move pilot program is expected to provide an armored platform (the current prototype is integrated on Strykers) that enables Corps-level leaders to execute mission command during ground maneuver by obtaining real-time situational awareness, a common operating picture, and voice, video and data communications with higher and subordinate HQ.

User feedback consistently indicates a desire for scalable and agile solutions that are expeditionary, simple and affordable to operate and maintain. The Army is responding to that feedback and continually enhancing its One Tactical Network to ensure Soldiers get what they need to be effective on the battlefield and in the humanitarian efforts they may be called to support.

The system enables the commander to reach out and touch his subordinate commanders, to pass products to the staff and to have real time communications with elements that he never would have had prior to this capability.

MAJ Jeffrey Fulton, communications officer (S6) for the 2nd Brigade Combat Team, 1st Armored Division (2/1 AD)
During battlefield operations, a brigade’s fleet of WIN-T network equipped vehicles are often spread out across great distances and austere terrain, supporting both stationary command posts and on-the-move missions. Newly enhanced and simplified Network Operations (NetOps) tools will make it easier for communications officers (S6s/G6s) to see the “big picture” as they plan, manage and defend the vast tactical mission command network, increasing its security and strength.

“In a battlefield environment where everything is transferring over the network and cyber security is a constant concern, NetOps is absolutely critical,” said COL Charles J. Masaracchia, commander for 2nd Brigade, 1st Armored Division, the current main operational unit for the Army’s Network Integration Evaluations (NIEs). “With these tools we have the ability to see the network and identify and fix anomalies; we can identify a problem with a node and start troubleshooting from right here [at the brigade command post] and sometimes even fix it without ever having to go to the distant station. That’s incredible.”

The Army tested the new NetOps software upgrades in May as part of the WIN-T Increment 3 Limited User Test (LUT), conducted at Network Integration Evaluation (NIE) 16.2 at Fort Bliss, Texas. Successful evaluation results will support the software technical insertion of the new enhancements into both the at-the-halt and on-the-move increments of the WIN-T network, which is currently projected for fiscal year 2017. Since the NetOps tool suite will be fielded across both increments of the tactical network, communications officers will have a common operating picture of the network and units can simultaneously plan and manage across increments as one network. Feedback gained from the NetOps evaluations will also support future network improvements.

During the NIE’s complex decisive action exercises, the brigade’s S6 and his network staff used the improved NetOps tool suite for a wide array of tasks, including configuring, operating, monitoring and troubleshooting the network, as well as defending it against continual cyber attacks. The new enhancements automate many of these functions to make it easier for the network team to manage the network and be more effective.

The Army continues to listen to Soldier feedback from theater, user juries and test events to make WIN-T NetOps, user interfaces and network systems more intuitive, easier to operate, with a consistent look and feel. Significant simplicity improvements evaluated at
NIE 16.2 include enhancements to the NetOps planning, monitoring and troubleshooting tools.

As part of the WIN-T Increment 3 testing during NIE 16.2, the Army also evaluated the next generation of Network Centric Waveform (NCW) software, v10, which makes the network more robust. NCW enables beyond-line-of-sight (satellite) communications from division headquarters down to the company level. The NCW v10 software enhancements provide efficiencies through software coding, resulting in four times higher throughput without changing any hardware. That equates to more bandwidth available for the user with much less overhead from the network.

The new WIN-T enhancements also provide better firewall tools and defensive cyber visualization to help signal Soldiers more easily manage, protect, and harden the network from vulnerabilities.

During NIE 16.2 the enemy red team posed a very robust insider cyber threat to fully stress the systems and flush out any weak points.

One of these mechanisms, Public Key Infrastructure (PKI), provides network resiliency and an additional layer of security by supporting the distribution and identification of public encryption keys. PKI enables stronger authentication of identity for users and devices on the network. It also reduces system complexity by reducing the number of passwords needed to manage the network.

PdM WIN-T also supported the Army’s formal assessment of the upgraded Joint Enterprise Network Manager (JENM) version 3.3 during NIE 16.2. The Army also used JENM v3.3 to support both the WIN-T Simple Key Loader Demo and the Army’s assessment of the Mid-tier Tactical Network. JENM is a consolidated software application that plans, loads, and manages Mid and Lower-Tier software defined radios and associated waveforms.

One of the main upgrades included in JENM v3.3 is its new enterprise Over The Air Management (eOTAM) enhancement, which significantly reduces the manpower hours needed to reconfigure, manage, and control a tactical radio network by performing these tasks rapidly over-the-air.

The eOTAM capability reduces the need for Signal Soldiers to travel from location to location, allowing them to manage and configure their radio networks from remote sites, such as the brigade command post. The product office successfully conducted a demonstration of JENM’s eOTAM in the early phases of NIE 16.2.

Almost any user who has had a small amount of training will be able to use it and provide the commander with critical summary reports in minutes versus hours as it had been in the past, which could save lives and makes mission success much easier to obtain.

SSG Nicholas Vettore
2nd Brigade, 1st Armored Division
PEO C3T enables tactical communications by providing a wide range of radio communications systems, including the Army’s new family of tactical radios that use secure, high-bandwidth waveforms to send voice, data, images and video.
The ubiquitous catchphrase ‘there’s an app for that’ applies even to the U.S. Army. However, Soldiers toss around the term waveform rather than app. Waveforms, which connect Soldiers to the Army network through radios, are similar to apps because they allow communication via voice, data, images and video.

Waveforms draw on available spectrum to implement functions needed to operate software defined radios, providing a secure method for troops to receive and transmit information in various forms. An open architecture of cutting-edge radio waveform technology lets multiple systems communicate and increases joint interoperability. 

Just as cellphone apps allow users to perform various tasks, waveforms allow radios to function and accomplish different jobs. For example, some waveforms provide network connectivity between Soldiers on the ground and in the air, while others connect Soldiers separated by distance and over elevated terrain, such as mountains.

The Army requires the most technologically advanced and affordable radios, and it relies more on a non-developmental item (NDI) acquisition strategy to procure them. The NDI community uses government-owned, standardized waveforms to ensure interoperability between vendors’ products and to promote a competitive and fair acquisition environment. This is especially important because vendors will access the government base-line waveforms to port onto their hardware systems. Porting a waveform is a process in which a developer writes code that enables a radio’s operating environment to interact with and recognize a new waveform.

Increased competition spurred by the NDI acquisition strategy helps the Army buy and field the radios it needs economically. This tactic aligns with the Defense Department’s Better Buying Power 3.0 initiative, which aims to encourage innovation and competition and produce cost-effective acquisition programs.

The Army is working toward acquiring a family of common radios to replace disparate systems and to establish an architecture for waveforms. This was originally part of the mission of the former Defense Department’s Joint Tactical Radio System (JTRS) program, which began in 1997, when software defined radios were in their infancy. A shift in the program has the department relying on industry to develop multiple hardware platforms that operate within the same network due to common waveform applications. The Joint Tactical Networking Center (JTNC) leads the critical effort to evolve the Software Communications Architecture (SCA) and application program interfaces (APIs) that form the architectural framework for waveforms.

The SCA provides the functions for loading waveforms onto radios, running applications and integrating radios into the Army’s communications system. The SCA’s open architecture isolates software from underlying hardware platforms and enables radios made by different vendors to use common, government-owned waveforms. This feature improves both interoperability and portability.

Reuse is another key point. Vendors can reuse government-owned waveforms from the DoD Waveform Information Repository (IR), often eliminating the need for development and leading to cost savings.
Nonproprietary waveforms also improve interoperability across the services and streamline waveform development processes.

Today, the JTNC maintains the DoD Waveform IR and furnishes waveforms to government, military and industry partners. Product Manager (PdM) Waveforms develops and sustains the code, documentation and models for Army waveforms. The system lets vendors more easily load software onto hardware platforms. It also stimulates competition because vendors can access government-owned waveforms for current and future hardware platforms that will make the best use of the technology.

The Air Force, Navy and Marine Corps can use Army-developed waveforms, open SCA and standard APIs to facilitate waveform enhancements. Because networking waveforms are Internet Protocol (IP)-based, they readily interoperate with other IP-based networks, and data moves between networking waveforms and external networks. The Soldier Radio Waveform (SRW) and Wideband Networking Waveform (WNW) seamlessly connect to network infrastructures, such as the Warfighter Information Network-Tactical (WIN-T), which links troops who might be spread out at remote locations and lets them exchange critical information. The IP-based waveforms let radios ‘network’ together and serve as relays, extending the radios’ range.

The JTNC ensures the waveforms provided for reuse via the DoD Waveform IR comply with certification standards. In particular, it works closely with Service program managers and the radio vendor community to advance its role in enabling waveform reuse across the Defense Department. Waveforms added to the DoD Waveform IR undergo a disciplined analysis process before they are recommended for reuse. Services sponsor waveforms, and the JTNC analyzes them from interoperability, security, affordability and exportability perspectives. This approach helps gauge if the waveforms support mission needs based on operational requirements documents.

Working together, the program managers and the JTNC meet the challenges of evolving waveforms requirements based on the user community, enemy threats and changes in military doctrine. A primary benefit of software-defined radios is that they can be updated with the latest waveform code in the field, providing Soldiers with the best capabilities possible in the shortest amount of time. PdM Waveforms has a stringent configuration control process that ensures regular critical code fixes and enhancements. Each new waveform version delivered to the DoD Waveform IR provides enhanced capabilities: the Joint Enterprise Network Manager (JENM) releases updated and more capable waveform versions. Simultaneously, PM TR buys and fields radios, leveraging a marketplace where qualified vendors routinely compete for smaller orders, driving innovation through competition.

Through synchronized efforts, an army of apps will provide Soldiers, Sailors, Airmen and Marines with secure radio capabilities to enable communications around the world.
In today’s cellular world, communicating coast to coast is a given. But for Soldiers deployed around the world, many in austere locations with no established commercial network, it isn’t so routine.

So when Soldiers on the west coast recently communicated with their peers who were nearly 3,000 miles away on the east coast using the Army’s Manpack Radio and the Navy’s Mobile User Objective System (MUOS) waveform, the mission to keep troops connected took a significant step forward.

Working together, the Navy and Army are delivering the MUOS capability, which provides users across Joint Services with secure voice and data on demand, similar to commercial 3-G cellular service. The Navy’s Communications Satellite Program Office has overall responsibility to deliver the MUOS capability (satellite and ground stations), 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, troops all over the world can talk, text and share mission data seamlessly.

“The MUOS waveform provides a beyond-line-of-sight capability, which allows Soldiers to be anywhere in battle and maintain connectivity,” said COL James P. Ross, project manager for Tactical Radios. “In addition to infinite range, Soldiers can exchange large amounts of data using the Manpack Radio and MUOS waveform.”

The demonstration was part of an Army conducted Customer Test (CT) with the Manpack Radio running terrestrial waveforms – the Soldier Radio Waveform (SRW) and the Single Channel Ground and Airborne Radio System (SINCGARS) waveform – simultaneously with the MUOS waveform. The demonstration, paired with operational tests, will help determine if the MUOS waveform is ready for operational use across the Services.

One of the key features of the two-channel Manpack Radio is its ability to run different waveforms, including advanced and current force waveforms, on each channel. For instance, the Manpack Radio can run the SRW or SINCGARS on one channel and run the MUOS Beyond Line-Of-Site (BLOS) waveform on the other channel, allowing units that are BLOS of each other to connect seamlessly, increasing combat effectiveness of the overall system. The Manpack internally bridges the voice and data of the two waveforms to enable the interconnectivity of the BLOS SINCGARS or SRW networks.

“This was the first successful demonstration of the SINCGARS to SATCOM cross banding,” said LTC Rayfus Gary, product manager for Handheld, Manpack and Small Form Fit (HMS). “We had dismounted Soldiers using SATCOM on the move with MUOS and bridging to...
SINCGARS, which is a huge capability in tactical operations."

With Soldiers from the 3rd Brigade, 82nd Airborne Division serving as operators and test data collectors during the CT, the Manpack Radio was tested in both mounted and dismounted configurations in various terrains with the MUOS waveform. The terrains included urban areas, dense woods and open spaces. The CT also tested a new prototype low-profile Vehicle On The Move (VOTM) antenna.

"The low-profile antenna isn’t as tall as the so-called ‘top hat’ antenna, which is the current program-of-record VOTM antenna,” said Steve Stout, HMS chief engineer. "The Soldiers didn’t like that the top hat is so tall, and that it may get in the way of other items also on the vehicle, such as a gun turret, so we are seeing how well the low profile antenna performs. The low-profile VOTM is about one fourth the height of the ‘top-hat’ VOTM."

While one of the biggest challenges during the CT was the diverse terrain, the MUOS omni-directional antenna, which Soldiers carried in their rucksacks, enabled on-the-move communication without having to stop and point the antenna toward a satellite. This is a key advantage of MUOS over legacy TACSAT.

“We didn’t experience any problems in the field – we went around trees and in ditches and hills, and the radio kept the connection,” said Private First Class Michael Handley.

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 (IP) 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.

Soldiers communicated between three locations – Joint Base Lewis-McChord, Wash.; Fort Bragg, N.C.; and Fort Drum, N.Y. – in a variety of mission scenarios and vignettes. Ft. Lewis, serving as the overall test control location, acted as higher headquarters for all three sites, with calls being routed through two ground stations – Wahiawa, Hawaii and Chesapeake, Virginia – using two satellites (MUOS-1 Pacific and MUOS-2 CONUS). There are two other ground stations in Italy and Australia and two more satellites that round out the MUOS network.


Just as I am talking to you, we communicated with our peers in Ft. Lewis and Ft. Drum. MUOS negates all obstacles.

Specialist Bradley Lewis, 3rd Brigade, 82nd Airborne Division
For military operations, getting information quickly and analyzing it in real time is critical. Each minute counts as Soldiers wait for their orders. Using radios, associated waveforms and applications that serve as a “mid-tier” in the tactical network, Soldiers at the company level can talk and chat, collaborate and share reports and send data to battalion and brigade, linking the Lower Tactical Internet with the Upper Tactical Internet.

The Army validated the need for the mid-tier at Network Integration Evaluation (NIE) 16.2 with Soldiers from the 2nd Brigade Combat Team, 1st Armored Division that performed Combined Arms Maneuver missions. The assessment established several operational scenarios – with a full complement of MNVR and other data radios; with a limited number of MNVR radios; and with no MNVR radios.

The assessment also included three phases – with Blue Force Tracking (BFT), without BFT, and without WIN-T SATCOM and BFT. BFT is the satellite-based network that enables critical mission command applications, such as the Joint Battle Command-Platform friendly force tracking and messaging capability. Together, the phases within the operational scenarios demonstrated the performance and utility of the terrestrial mid-tier network during denied, degraded and full satellite capability.

One of the key features of the mid-tier is its ability to provide terrestrial, ground-level connectivity when satellite communications are restricted or non-existent. Using two high bandwidth waveforms – the Wideband Networking Waveform and Soldier Radio Waveform – each radio acts as a node in a mobile network, allowing information to hop from one MNVR to another until it reaches its destination. From the user’s perspective, the flow of data is seamless.

By utilizing advanced waveforms and the MNVR radio, the mid-tier links lower-echelon digital radios such as the Rifleman and Manpack to the upper tier of the tactical network, provided by Warfighter Information Network-Tactical (WIN-T). WIN-T is the tactical network backbone that other networked communication systems and mission command applications connect to, both at stationary command posts and on-the-move in combat vehicles.

The Army also used the mid-tier assessment at NIE 16.2 to determine the right Basis of Issue (BOI), or how many radios are needed to optimize the tactical network and effectively provide the data needed to accomplish the mission. Similar to previous NIEs where the Army assessed its radio capability mix at the lower and upper network tiers as those capabilities matured out of the development process, the operational assessment at NIE 16.2 helped determine the BOI for radios at the mid-tier and how they should be used throughout the Brigade Combat Team.

“As we continue to add more capability to the network, we need to have an understanding of how it is working at every tier,” said Douglas Wiltsie, executive director of the Army’s System of Systems Engineering and Integration Directorate, which helps oversee the NIE process. “Getting operational feedback from commanders and Soldiers at NIE allows the Army to measure the pieces and parts of the network as well as its overall effectiveness.”

The Army VALIDATES NEED FOR MID-TIER AND MNVR

ARMY VALIDATES NEED FOR MID-TIER AND MNVR

ARMY VALIDATES NEED FOR MID-TIER AND MNVR
Soldiers in a densely wooded forest hold their positions as the enemy quickly approaches. Shots are fired, but minutes later, the Soldiers are told to cease fire.

Using blank ammunition, Soldiers from the 101st Airborne Division (Air Assault) participated in a realistic operational scenario as part of testing to support the procurement of the Army’s next generation hand-held Rifleman Radio. This excursion took place at the United States Army Electronic Proving Ground (USAEPG), Fort Huachuca, Ariz. May 16-26.

The excursion is part of the Rifleman Radio Customer Test (CT) and serves as the next step in advancing the Handheld, Manpack and Small Form Fit (HMS) program toward procuring next-generation radios to support the Full Rate Production (FRP) phase of the program.

Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts for the Rifleman Radio were awarded to Harris Corporation and Thales Defense and Security, Inc. in 2015. These contracts support the program’s Non-Developmental Item (NDI) acquisition strategy. With the NDI approach, vendors use their own research and development resources to develop radios and compete for delivery orders as determined by the Army after initial contracts are awarded.

After both vendors passed the initial qualification test, the government purchased 100 radios from each vendor for the CT. The CT, which was conducted at USAEPG, included the excursion with three scenarios – in elevated and urban areas, as well as dense vegetation. Ensuring the excursion was as realistic as possible, the Soldiers were divided into two platoons and used weapons, blank ammunition and full uniform with vests. The first two days of the excursion included training the Soldiers on how to use the radio and its capabilities.

During the dense vegetation portion of the excursion, Soldiers from each platoon moved between two sites, covering various checkpoints and simulating an enemy incursion. Using the Rifleman Radio, Soldiers were able to talk, while leaders were able to track individual Soldiers’ movements with Position Location Information. At the end of each day, Soldiers provided detailed feedback via a survey and focus groups.

The Rifleman Radio is a lightweight, hand-held radio that transmits voice and data past terrain obstacles by creating a mesh network via the Soldier Radio Waveform (SRW). Carried by Soldiers at the platoon, squad and team levels, the Rifleman Radio uses the SRW to transmit information up and down the chain of command. As a critical component of the Lower Tactical Network, the Army has already purchased 21,379 Rifleman Radios through Low Rate Initial Production (LRIP).

“The Soldier excursion was a crucial activity,” said Col. James Ross, project manager for Tactical Radios. “We will use this Soldier feedback to inform the requirements community - who writes the concept of operations, the operational community - who will employ the capability, and industry.”
MISSION
COMMAND

PEO C3T develops, deploys and sustains integrated mission command and situational awareness capabilities to the Army and Joint forces that provides a common operating picture whether in a command post or mounted environment. These capabilities span across the warfighting functions of movement and maneuver, command and control, fires, sustainment, protection, intelligence and engagement.
As the Army continues to enhance its network capability, a critical step in mission command agility is reaching Soldiers with the fielding of Joint Battle Command-Platform, or JBC-P.

This next generation friendly force tracking system equips Soldiers with a faster satellite network, secure data encryption, common hardware, and software infrastructure featuring advanced position location features. Primarily a mounted system, JBC-P brings an additional set of applications to commanders giving them the ability to tailor data on a simplified platform while providing connectivity on the battlefield. Delivering a highly intuitive Google-Earth like interface and touchscreen, Soldiers can now easily zoom in to view precise locations, use icons to pinpoint improvised explosive devices on a map, and conduct chat functions across the battlefield.

"JBC-P provides vital real-time, relevant command and control information to US Army and US Marine Corps (USMC) leaders to gain tactical situational awareness and understanding to operate and win in a complex world," said Lt. Col. Shane Sims, product manager, JBC-P.

During fiscal year (FY) 2016, JBC-P fielded to 25th Infantry Division Headquarters, 3rd Infantry Division Headquarters, 1st Brigade of the 101st Air Assault, 1st and 3rd Brigade Combat Team, 10th Mountain Division and their Division Artillery. Additional fieldings are planned for FY17, including to most of the Department of the Army G3 Unit Set Fielding (USF) planned units.

JBC-P is the second phase of an upgrade to Force XXI Battle Command Brigade and Below (FBCB2) and Joint Capabilities Release (JCR). Legacy FBCB2 and JCR systems are integrated on more than 100,000 platforms, fielded to every brigade combat team in the Army and residing in each tactical operations center. The USMC has plans to field JBC-P starting in FY17.

JBC-P has been put through the full rigors of assessment and Soldier feedback and is proving to be a command asset.

"We have built the most robust, secure, simple and sustainable mission command system to date," Sims said.

Critical communication improvements from the top down include "Chat," a mission command tool used to send reports and maintain near real-time situational awareness by enabling JBC-P platforms to connect into Command Post of the Future (CPOF) chat rooms. This is in addition to interoperability with the dismounted Soldier through Nett Warrior, a chest-mounted end-user device that allows messaging and situational awareness information to be relayed.

JBC-P collaboration also brings the integrated Tactical Ground Reporting System (TIGR ASCOPE) capability, which enables planning from historical event analysis, to the commander’s finger tips. Further, the system allows for greater access to this...
historical data including basic intelligence and understanding of special regions of interest in theater.

DIVESTING AGING SYSTEMS

This year the Army’s last heavy cavalry unit divested from the Enhanced Position Location Reporting System, or EPLRS, which signified the end of heavy units using this legacy system. Falling in line with a series of unit conversions, divestment of EPLRS is set to end completely in February 2017 with the 1st Brigade Combat team, 1st Cavalry Division (1/1 CD). Part of the original FBCB2, EPLRS preceded Blue Force Tracker (BFT), the Army’s predominant beyond line-of-sight communications link.

The key capability upgrade delivered in the conversion signifies a shift from a terrestrial, radio-based network with limitations due to line-of-sight connections between end point devices, to a beyond line-of-sight satellite communication link. In addition to an improved network, Soldiers will also have access to the enhanced JCR and JBC-P software that includes expanded messaging functionality and chat.

The Army’s efforts to divest aging systems and old software in order for new capabilities to reach the field is a multi-faceted process with one goal: to provide enhanced capabilities to the Soldier. In accordance with the Army’s EPLRS divestiture plan, a priority list targets units with older equipment and software to move them forward to JBC-P, which is the latest instantiation of the original FBCB2.

In addition to divesting of the EPLRS Systems, Product Manager JBC-P has diligently worked to retire the Movement Tracking System (MTS) by the end of the year. The MTS program merged with the JBC-P product office in 2011 and the capabilities of that system were included in JCR-LOG and JBC-P LOG. This decision will result in improvements to cybersecurity and a savings in satellite costs.

CONTINUED EVOLUTION

Product Manager JBC-P will continue to build upon proven success by evolving capabilities through the new Command Post Computing Environment (CP CE) and Mounted Computing Environment (MCE) infrastructure, an Android environment built to support third party applications. This will provide a collaborative environment, allowing government and industry partners to build tactical apps that can seamlessly integrate with JBC-P data and services.

This is an important step as the Army shifts towards a Common Operating Environment, which will incorporate warfighting capabilities onto a common infrastructure and architecture across MCE and CP CE.

While JBC-P fits into legacy hardware, it also runs on the new Mounted Family of Computer Systems, or MFoCS, which includes three models, one of which is a tablet.

Future divestment efforts for FY17 will focus on removing FBCB2 software/hardware from the field and replacing with upgraded software and hardware such as JBC-P.
Efforts to convert unique warfighting systems onto a common framework is part of the big “common operating” picture approach known as the Command Post Computing Environment or CP CE.

During the Network Integration Evaluation (NIE) 16.2 capability demonstrations and an Operational Assessment of CP CE provided a clear path forward with the next steps in mission command evolution.

What Soldiers experienced in the evaluation environment of NIE 16.2 was an additive set of capabilities to current warfighting systems that will deliver a common operating picture from a common server. Not yet a full replacement of current stand-alone mission command applications, Soldier feedback from the assessment will help drive enhancements that culminate with the start of fielding in the Fiscal Year 2019 (FY19) timeframe.

“From a capabilities standpoint, CP CE is bringing engineering, medical and logistics functionality back into the COP [Common Operating Picture],” said Col. LaMont Hall, former deputy project manager for Mission Command. “Soldiers now have the access and ability to contribute, build and see the COP.”

Currently residing in command posts across the globe are unique stand-alone warfighting systems for missions related to fires, logistics, intelligence, airspace management and maneuver. These are individual pieces of a picture that together bring everything a commander needs to execute mission command. However, in today’s battlespace that is no longer enough. Capabilities must be shareable and collaborative, in other words—common.

With fielding planned for Fiscal Year 2019, thin, web-based applications or widgets will begin to replace standalone systems. Efforts to widgetize the command post with CP CE provides users with mission command and intelligence applications and puts command tools in one web-based, user-friendly place that mimics the look and feel of commercial applications on a computer, tablet or smartphone.

Replacing standalone systems represents a paradigm shift in the way the Army modernizes capabilities and a cut-over process of capabilities is one step as the command post evolves.
Trekking through rough terrain in combat situations, Army engineers provide survivability, mobility and counter mobility data in support of military operations around the globe. Soon, these engineers will be able to input, share and view data with a new suite of engineering applications.

With one less obstacle to tackle, sharing the location of road hazards, floods or mine fields will be as simple as dropping an icon on the map of a web-based mission command widget technology known as Command Web.

Soldiers used Command Web for the first time in a tactical environment this year during New Equipment Training (NET) at Hohenfels, Germany.

“The Command Web environment encompasses tactical edge applications and services to improve functional integration, collaboration and display of relevant information in order to establish a Common Operating Picture (COP),” said Maj. Jerry L. Jones Jr., assistant product manager for Tactical Mission Command. “For a commander, this means having the additional engineering overlay and data to plan military movements, set up a defensive obstacle belt, know exactly where published hazards and obstacles are, and to rapidly access that information from any laptop connected within the tactical operations center. The commander will also be privy to seeing and manipulating overlay information on a digital 3D map with similar functionality and feel to Google Earth."

As the engineering capability gap solution to the Command Post of the Future or CPOF, the Army’s current system for providing the COP and sharing mission command information, Command Web brings graphics and data from Army Battle Command Systems (ABCS) onto one common map. Engineer staff can use maneuver widgets to subscribe to the COP, create and disseminate graphics, and publish as well as subscribe to data feeds from other ABCS staff functions. Command Web users will be able to share and collaborate on a variety of data sources visualized on a Common Map widget.

The Maneuver, Obstacles and Hazards Services (OHS), and Engineering Mobility Services (EMS) widgets also publish graphics and data to the Common Map widget which means engineering Soldiers on battalion and brigade staff are no longer constrained to using standalone ABCS systems with a keyhole view of the COP.

A part of the Army’s shift toward delivering a Common Operating Environment, Command Web is part of the Command Post Computing Environment, which is delivering warfighting capabilities as software applications. Pending test results and a fielding decision, Command Web is expected to begin fielding in late Fiscal Year 2017.

"The commander will also be privy to seeing and manipulating overlay information on a digital 3D map with similar functionality and feel to Google Earth."
The thunder of artillery echoed across the New Mexico desert, but this was not a normal Army training mission. Instead artillery units representing seven countries were participating in a live-fire event.

For the first time, multinational coalition partners passed calls for artillery fire support digitally between nations, resulting in U.S. and Norwegian howitzers and U.S. High Mobility Artillery Rocket Systems, or HIMARS, being fired on target.

Part of Bold Quest 15.2, the live-fire event, which took place October 2-3, 2015, included seven nations with seven different fire support command and control systems. Yet a language barrier didn’t exist, thanks in part to the U.S. Army’s Artillery Systems Cooperation Activities, or ASCA, an interface that digitally links weapons systems of partnering nations for seamless execution.

During Bold Quest 16, which took place at Fort Stewart, Ga. in October, ASCA again served a pivotal role. After all, without ASCA, each country would need to radio in orders for tactical call-for-fire directions and commands - something that could potentially delay fire support and pose challenges in a multi-national setting.

ASCA, a software solution and interface, removes language barriers and human error, allowing each country’s individual fire support systems to “talk” to each other and relay information digitally to determine the right weapon, firing the right munitions, at the right time.

“As some countries use a grid, others use latitude/longitude,” said CPT Brian McCown, fire directions officer for the 4th Battalion, 27th Field Artillery Regiment, based on Fort Bliss, Texas. “With ASCA, that conversion is a lot easier now. We want to know our systems can communicate and this takes away that gap in time and allows us to communicate quickly.”

The coalition call-for-fire demonstrations at both events will help future development of new functionality for the ASCA interface, enabling partner nations to directly exchange information and promote the ability to engage as a cohesive coalition force. Using the ASCA interface, partner nations can communicate automatically by linking their fire support command and control systems, increasing the ability to leverage fire support internationally and in coalition settings.

ASCA works with the U.S. fire support command and control system known as the Advanced Field Artillery Tactical Data System (AFATDS), a comprehensive fires planning system that processes, analyzes and exchanges combat information with other systems to plan, coordinate and execute fires and effects.
INTEROPERABILITY KEY TO COMMON OPERATING PICTURE

To meet the demands for a common operating picture, or COP, as a way forward to increase interoperability between allies and partners, Army network program managers, the requirements community and Army Research and Development Centers are actively working technology capabilities to ease coalition integration challenges.

One technical solution is an embedded software application known as the Multilateral Interoperability Programme, or MIP, used to mediate between coalition partners’ command and control systems that share locations, graphics and reports.

Since 1990, the U.S. Army has not entered any major operations without coalition support, making interoperability a key focus area. MIP could strengthen the ability for allied countries to collaborate, and share a truly common operating picture.

Serving as the Army’s only tool allowing U.S. C2 systems to interoperate with other nations’ C2 systems, MIP is an automated exchange for users to send and receive COP data between coalition partner systems as well as translate information to U.S. data format and vice versa. The information sharing capabilities MIP supports includes, plans and orders, operational graphics and task organization.

Working with a coalition of 26 nations, NATO and the European Defense Agency, the MIP partnership comes with certain challenges.

“In principle, each nation has agreed to use the latest version of MIP, but due to budgets, contracting and other government level issues, all nations share, many haven’t built their MIP application to the latest standards,” said Lt. Col. Timothy Gearhart, past product manager for Strategic Mission Command. “However, we still need to operate with these nations; so we are working toward backwards compatibility with all versions of MIP.”

Up next for MIP is the development of block 4.0, which includes different types of web service exchanges, specific Battle Space Objects, or BSO, schema and a representative prototype that will be available as a software development kit for nations to begin their own application. Agile development is key for MIP 4.0, which will deliver a set of specifications within 18-months and incrementally move forward with expanding capabilities with backwards compatibility to previous sets.
ENABLERS

PEO C3T fields the hardware, software, processes and standards that keep the network running and secure – in other words, the “enablers” for the network. These network enablers provide an integrated and standardized family of products that improve the user experience, while supporting the dynamic tactical network environment.
Seizing the mandate to deliver a tactical communications network that is simple for Soldiers to use but tough for adversaries to break, Network Enablers (Net E) efficiently manages multiple programs that protect, connect, bond and streamline the Army’s tactical network. Net E is charged with ensuring the security and fidelity of the information transmitted across the tactical network; simplifying Soldiers and first responder network tasks and operations; and streamlining the delivery of common hardware, software and collaborative technology solutions to meet today’s changing needs.

Under the Net E umbrella, there is a consolidation and efficiency effort of bringing in various product offices that support or secure the tactical network as a whole across the Army. One of the largest ongoing efforts of Net E is the Embedded Crypto Modernization Initiative or ECMI. This will incorporate a large population of various systems with embedded cryptography, including the Single Channel Ground and Airborne Radio Systems (SINCGARS), with more than 300,000 currently in the field. The Request for Proposal package for engineering solutions for the different radios that need to be modernized is currently in development. However, the hardware that uses embedded cryptography must be updated in order to be able to accept and utilize modern keys.

“We’ll be going directly to units since a lot of these radios are currently in vehicles and work on a plan to swap out the radios with those that have been reset with the modern crypto chip and algorithm, said Mr. Stan Niemiec, Project Lead, Network Enablers. “This effort will allow Soldiers to continue to talk secure net in the future and give them reset radios a little faster than originally planned.”

Net E continuously strives for improvements to the existing capabilities within its portfolio. Within the Tactical Network Initialization and Configuration (TNIC), which includes data products, the focus is on streamlining and automating processes. For example, the Initialization Tool Suite (ITS) allows the Army’s mission command and networked tools to communicate with each other and brings a simplified start up process, increased flexibility and the opportunity to make changes on the fly.

“The process prior to ITS included sending out a preloaded disc of data products could take more than 16 weeks before delivery, Niemiec said. “Now Soldiers can make changes as needed without waiting.”

Moreover, the Army’s Key Management Infrastructure (AKMI) program brings an automated way to download cryptographic key securely. This web-based storefront for delivery of keys replaces manual process and legacy equipment while protecting radios, tactical laptops and other comms systems from enemy interception.

Both ITS and KMI are reducing significant vulnerabilities by replacing the need to physically deliver data products and key to units, even when they are out on the battlefield. This not only reduces the time required to download new key, but also saves manpower.

Most recently added to the office’s portfolio is the Vehicle Intercom System or VIS, found in tactical vehicles. With it comes two different systems, the VIC-3, which is in sustainment and fielded to more than 120,000 platforms and VIC-5, the newest intercom system. The biggest difference between the two is that the VIC-3 supports the legacy, non-data radios and the VIC-5 supports the Army’s next generation of software-defined tactical radios and is backwards compatible with VIC-3.

As these new capabilities advance, Net E is also working an effort to clean up old hardware across COMSEC and property book accountability, replacing it with upgraded equipment. $283 million worth of modernized equipment is set to replace 30,000 legacy end cryptographic units through an accelerated fielding process, known as the Army-Wide Cryptographic Network Standardization (ACNS) initiative.
Much like the workings of a car, the Army’s tactical network operates as a holistic, integrated weapon system, bringing together different capabilities such as digital radios, mission command applications, satellite-equipped vehicles and smartphone-like end user devices. Working in the background are the capabilities that link these systems to one another, allowing seamless interoperability for the Soldier. These data products include Internet Protocol addressing, telephony management, network configuration, and the Initialization Tool Suite (ITS), which is comprised of three components: the Warfighter Initialization Tool (WIT) Manager (M), Server (S), and Platform (P).

When mission command and network hardware is turned on for the first time, these capabilities enable them to communicate with each other. Data products essentially bring the Army’s tactical network “online” in the same way a commercial computer goes through a similar process the first time it is turned on.

“Data products are the glue that hold the larger system together. Without them, the systems can’t communicate,” said John Anglin, deputy product lead for Tactical Network Initialization and Configuration (TNIC). Part of the Army’s PEO C3T, TNIC supports the rapid delivery of relevant network initialization products and solutions to the Warfighter, while ensuring interoperability of Mission Command and Army C4ISR systems within the current force network.

In addition to providing data products to all operational units, TNIC also supports larger efforts by providing engineering for individual network needs. One of the best venues to witness this collaboration is during the Network Integration Evaluation (NIE). These Soldier-led evaluations take the latest Network Capability Set architecture and combine it with the newest emerging technologies, creating a consolidated network. Since this architecture is comprised of many different capabilities, the efforts to ensure interoperability are tackled largely by the behind-the-scenes enablers.

As these programs bring new capabilities to the table, the TNIC office continues to evolve ITS capabilities in order to ensure that systems function as advertised and interoperate to provide the total Army network. An additional component of the ITS, the Warfighter Initialization Tool-Joint Platform (WIT-JP), is scheduled to field in mid-late Fiscal Year 17. WIT-JP allows a user to add new data products to the JBC-P platform that could not be previously loaded, therefore enabling the Soldier to instantiate the network as they see fit.

TNIC produces an average of 350 Unit Initialization Data Products annually.
In serving as the one-stop-shop for the Army’s tactical commercial off-the-shelf information technology (COTS IT) hardware, the Common Hardware Systems (CHS) program is taking a holistic, innovative approach that is getting noticed. Recent undertakings resulted in increased efficiencies, significant cost avoidance and official designation as the primary organization to oversee tactical COTS IT hardware procurement for the Army.

CHS provides state-of-the-art computing and networking equipment that improves connectivity, interoperability, logistics and maintenance support to Soldiers, and is available for use by all DoD and Federal Agencies.

CHS gains efficiencies by coordinating across programs and leveraging common configurations. This consolidated acquisition approach can design, develop, modify, ruggedize, environmentally test, procure, support and provide configuration management for hardware systems, all while using a single contract action and a single part number.

“Our role is to enable supported Army and Department of Defense program offices to meet expedited fieldings and compressed schedules while mitigating costs,” said Bill Gehrum, strategic initiatives lead for CHS. “We work with program offices to help them identify and subsequently procure COTS IT hardware configurations and support services that will meet their needs.”

With its current contract ending on Aug. 24, CHS is preparing to compete its new CHS-5 contract. Valued at more than $3 billion, the CHS-5 contract will enable the rapid procurement of total life cycle system management solutions in support of tactical programs by providing seamless and consolidated procurement of Commercial Information Technology (IT), customizable sustainment strategies, non-personal services and continuous technology upgrades.

As the commercial industrial base adapts to fit a leaner Army, the organic industrial base will be called upon to provide more holistic life-cycle sustainment support. The CHS-5 contract requires vendors to establish a Public-Private Partnership (P3) with Tobyhanna Army Depot, or TYAD, in order to facilitate product support for programs procuring hardware via CHS-5. This partnership leverages the innovation, resources and leadership skills of both TYAD and CHS in order to provide the best value to the Soldier.

This requirement builds upon a Memorandum of Understanding (MOU) that was signed between TYAD and PEO C3T’s Network Enablers, which CHS is assigned to, establishing an effort through which CHS and TYAD collaborate to repair out-of-warranty CHS hardware.

The PEO C3T plans to compete the CHS-5 contract by the end of 2016, with an award expected within the first quarter of FY 18.
Partner nations evaluate PM MC digital call for fires at Bold Quest 15.2
2nd Brigade Combat Team "STRIKE"101st Airborne Division conclude decisive action training at the Joint Readiness Training Center, which included operational missions using WIN-T Inc 2 equipped vehicles
PMO Net E and Tobyhanna Army Depot (TYAD) sign a Memorandum of Understanding to facilitate TYAD out of warranty repairs for the Common Hardware Systems (CHS)
The T2C2 Acquisition Category III program was approved for Milestone C in November 2015 by the Milestone Decision Authority, PEO C3T
CHS hosts Industry Day to discuss new requirements and importance of competition as Army prepares to release proposals for the new CHS-5 contract
Soldiers from the 505th Infantry Regiment, 3rd Brigade Combat Team, 82nd Airborne Division at Ft. Bragg, N.C. train for the Mobile User Objective System (MUOS) Manpack Radio assessments
Soldiers from I Corps trained on new prototype configurations of WIN-T Inc 2 and various mission command capabilities integrated on Stryker platforms
KEY PROGRAM METRICS

PEO C3T ACQUISITION PROGRAMS AND EFFORTS: 53

PROGRAMS:

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*ACAT I Programs: TMC (IAC), WIN-T Inc 1 (IC-Inactive), WIN-T Inc 2 (IC), WIN-T Inc 3 (ID), HMS (ID), AMF SANR (ID), MNVR (ID), JTN/Waveforms (ID-Inactive)

FY16 MILESTONE DECISIONS:

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<td>PM Tactical Radios</td>
<td>Mid-Tier Networking Vehicular Radio (MNVR)</td>
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JANUARY

Veronica “Roni” Ewing, BMD director receives the Army Acquisition Executive’s Excellence in Leadership award for Business Operations

As of 11 August 2016

DECEMBER

LTC LaMont Hall, former PdM WIN-T Inc 2, is promoted to the rank of Colonel

Army’s PdM WIN-T Inc 1 successfully tested Network Operations (NetOps) convergence across PM WIN-T at Taunton, Mass
**FINANCIAL SUMMARY**

**PEO C3T FY16 FUNDING** ($ in K)

- OMA: $80,155
- OMA Supp: $101,110
- RDTE: $291,717
- OPA: $1,317,347
- OPA Supp: $6,024

**TOTAL:** $1,796,353

**PROJECTED FY17 FUNDING** ($ in K)

- OMA: $77,704
- OMA Supp: $39,707
- RDTE: $374,738
- OPA: $1,321,923
- OPA Supp: $35,500

**TOTAL:** $1,849,572

**Sources:**
- FY16 OPA/RDTE: 5F0 Report - EOM JULY
- FY17 OPA/RDTE: PB17 (UTR funding (RDTE) assigned to WIN-T
- FY16 OMA: ASC Targets as of 11 Aug 16
- FY17 OMA: Initial ASC Targets as of 27 Jul 16

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**FEBRUARY**

- As part of the Home Station Training Initiative, Soldiers with the 101st Airborne Division (Air Assault) train on mission command applications

**MARCH**

- USARPAC exercise demonstrates how the Manpack Radio and MUOS waveform provide effective voice and data to Soldiers throughout the Pacific Theater
- Army conducts a demonstration of Rapid Vehicle Provisioning System (RVPS) at Fort Bliss, Texas, where it installed and configured all of the 2/1 AD’s WIN-T Increment 2 equipped vehicles
- LTC Joseph Ward Roberts, former PdM WIN-T Inc 3, is promoted to the rank of Colonel
- First New Equipment Training (NET) class for Army’s Key Management Infrastructure (KMI) Management Client Node completed
- Soldiers from 1st Brigade Combat Team, 82nd AD conduct PM WIN-T proof of concept demo for new expeditionary network capabilities, which significantly reduces SWaP

**APRIL**

- PM MC completes successful Operational Tests for GCCS-A & Command Web at U.S. Army Europe (USAREUR)
PERSONNEL SUMMARY*

WORLDWIDE PERSONNEL LOCATIONS (OCONUS)

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>50%</td>
</tr>
<tr>
<td>Middle East</td>
<td>35%</td>
</tr>
<tr>
<td>Far East</td>
<td>15%</td>
</tr>
</tbody>
</table>

*Minimum of 20 personnel

MAY

Mr. Jeff Mercer is appointed as the Director of the Joint Tactical Networking Center (JTNC) and as the Senior Mission Commander for all PEO C3T San Diego personnel

Mission Command completes Enhanced Position Location Reporting System (EPLRS) conversion of 3rd Brigade Combat Team /4th Infantry Division (3/4 ID)

Command Post Computing Environment completes an operational assessment at NIE 16.2

Army tests new NetOps software upgrades as part of the WIN-T Increment 3 Limited User Test (LUT), conducted at NIE 16.2.

Army assesses the mid-tier using MNVR system at NIE 16.2

PM TR begins fielding of 1,659 Rifleman and Manpack Radios to the First Brigade Combat Team, 101st (Airborne) Division as part of Capability Set 16

JUNE

PEO C3T and Army CIO G/6 host Mission Command Network Industry Forum with more than 250 Government and Industry representatives in attendance
2016 Annual Report to the Stakeholders

Personnel Breakdown

- Military: 73%
- Civilian: 13%
- Matrix: 13%
- Contractor: 1%

Average Age of Workforce

- 49 years
- 100 years

Key Skill Sets:

- Program Management
- Engineering
- Information Technology
- Security
- Logistics
- Contracting / Procurement
- Accounting and Budget
- Administration and Clerical
- Computer Science

Education Breakdown*

- Doctorate: 1%
- Masters: 26%
- Post Bachelors: 26%
- Bachelors: 40%
- Associates: 9%
- Some College: 11%
- High School: 10%

Average Certification of Acquisition Personnel†

- Level 1: 33%
- Level 2: 64%
- Level 3: 3%

*Civilian Personnel only
†Civilian and Military Personnel only

July

- Army completes its fielding of Joint Battle Command-Platform (JBC-P) to the 25th Infantry Division Headquarters
- 101st AD Soldiers participate in an operational scenario at Fort Huachuca, Ariz. as part of testing to support the procurement of the next generation hand-held Rifleman Radio
- MUOS 5 launches from Cape Canaveral, Fl.
- PM WIN-T executes the final scenario of the line-of-sight Highband Networking Waveform (HNW) 3.0 Demo at Electronic Proving Ground (EPG) Fort Huachuca, Az.
- PM MC, CECOM and TYAD, work with Soldiers of the 2nd IBCT, 25th ID to install Joint Capabilities Release (JCR) on vehicles from a Stryker BCT to an Infantry BCT
- COL Karl Gingrich is promoted to Brigadier General and starts his tenure at PEO C3T as the Assistant PEO for Operations, Readiness and Fielding

August

- PM Tactical Radios releases draft request for proposals to support Small Airborne Networking Radio (SANR)