CONNECTING
OUR SOLDIERS

2015 ANNUAL REPORT TO THE STAKEHOLDERS

PEO★C3T

PROGRAM EXECUTIVE OFFICE COMMAND CONTROL COMMUNICATIONS-TACTICAL

LETTER TO THE STAKEHOLDERS

This is an exciting time for PEO C3T as we continue to modernize the network as a key enabler for a globally responsive, regionally engaged force and in support of the Force 2025 Vision.

In Fiscal Year 2015, under the direction of Maj. Gen. Daniel P. Hughes, we delivered enhanced mobile connectivity to units in Afghanistan, networked Soldiers during the Ebola response in Africa, deployed satellite communications terminals in support of operational needs in Iraq, provided field support to units in Operation Atlantic Resolve and fielded the National Guard with new capabilities for communications with local first responders. We also established a roadmap to enable phased enhancements of our network systems.

Even prior to assuming the PEO C3T charter in June, I was struck by the scope and scale of equipment fielded by this organization within the current constrained environment. We have successfully updated network and mission command capabilities to the Army, Army Reserve and National Guard units. Last year, we fielded 16 units with Capability Set equipment, including brigade combat teams and division headquarters, and fielded upgraded communications and mission command systems to other units under Unit Set Fielding. This year we are scheduled to upgrade mission command capabilities in
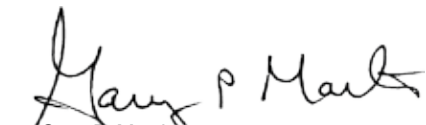
73 Active Component and National Guard units through Capability Set and Unit Set Fieldings.

As we continue to deliver improved capabilities to the Army and work to ensure our network enables an expeditionary force, we will continue to further improve integration of the various network components (mission command systems, tactical networking systems, and mobile computing platforms), to simplify the tasks that Soldiers must take to operate and maintain the tactical network, and to work with the United States Army Forces Command (FORSCOM), Training and Doctrine Command (TRADOC), and Army Materiel Command (AMC) to improve sustainment training for C4ISR equipment at Home Station.

While feedback on our capabilities is often positive, Soldiers and leaders who use our systems in combat and training exercises have asked for more simplistic user interfaces, lighter weight solutions and the ability for rapid reconfiguration of the systems. For Warfighter Information Network-Tactical Soldier Node Extension vehicles, we delivered a software upgrade resulting in a one-button initialization for the system. We will continue to focus on reducing the intricacies of our web-based mission command tools, while also simplifying Network Operations and Unit Task

Reorganization for the general purpose user. These efforts will greatly simplify the effort required to initialize and configure the various network components, including over-the-air reprogramming and rekeying of our networking radios. We will continue to address Soldier concerns and expect to continue to make significant progress in meeting these requests.

I look forward to the work we will do as we continue to build cross command collaboration within the Aberdeen Proving Ground campus and across the broader United States Assistant Secretary of the Army for Acquisition, Logistics, and Technology community, ensuring PEO C3T delivers effective, sustainable and integrated mission command and networking solutions to the Army.

Gary P. Martin
Program Executive Officer

SIMPLIFYING THE NETWORK FOR EXPEDITIONARY FORCES

In expeditionary maneuver, we can no longer expect a hulking tactical operations center to serve as the "information brain" for mobile and dispersed combined arms operations. We don't have the luxury of waiting until boots hit the ground to establish situational awareness and exercise Mission Command. We must enable uninterrupted Mission Command across home station, en route and in deployed conditions with connectivity that is available upon immediate entry and then matures within a theater. We need to provide uers a common, intuitive experience across echelons, formations and phases. This vision is known as the Mission Command Network and was collaboratively developed by U.S. Army Training and Doctrine Command and the Assistant Secretary of the Army for Acquisition, Logistics and Technology communities. It is the blueprint now shaping the doctrine and communications technologies that will be delivered to Soldiers between today and 2020. It will be critical to the Army's success in achieving our expeditionary expectations.

We need to provide users a common, intuitive experience across echelons, formations and phases

Fight on Arrival

The Mission Command Network takes on the challenge of providing capability solutions for en route and early entry operations that will enable expeditionary U.S. forces to truly fight on arrival. The Enroute Mission Command Capability, which began fielding to the Global Response Force at Fort Bragg, N.C., is a transport-plane integrated communications package providing military Internet access and Mission Command capability for in-flight Soldiers. Commanders will plan missions while onboard an aircraft with uninterrupted situational awareness from garrison to theater. Soldiers will receive real-time operational updates and watch surveillance video of upcoming drop zones before their parachutes ever open. This uninterrupted connectivity gives U.S. forces situational awareness of an objective nearly equal to that of the enemy, eliminating much of the confusion that can surround an initial assault.

Once on the ground, Soldiers must be able to move immediately with initial communications and expand operations as additional forces arrive. That requires early entry capabilities that are lightweight, mobile and adaptable to swiftly changing circumstances. Informed by operational needs statements, the Army is looking at commercial technology to field "jumpable" satellite dishes smaller than a briefcase, which can be set up and on the air in less than 10 minutes to connect small detachments and teams to the Army's network backbone.

Early entry operations are also supported by the Army's tactical radios and many improvements are being made to provide Soldiers and Commanders with the best capabilities possible to support the increased requirements of current and future contingencies. New capabilities will continue to be introduced, such as the Mobile User Objective System, which uses Navy satellites and Army radios to provide smartphone-like connectivity for disconnected and dispersed joint users in challenging urban, jungle or mountainous terrain.

The Army is also integrating improvements into legacy tactical radios based on user feedback from operational training, testing and overseas use. Manpack Radio improvements will include reduced radio and battery weight, as well reductions in radio temperature. The Army is also looking to eliminate the need for dismounted leaders to carry two Rifleman Radios and to provide a two-channel capability. Addi-

tionally, the service is working to increase range for Soldier Radio Waveform and Wideband Networking Waveform for the Mid-tier Networking Vehicular Radios.

Command Post 2025

Today's typical brigade command post includes hundreds of feet of wires and cables, temporary flooring, stacks of transit cases and several cumbersome tents. It often requires an entire day and a platoon of Soldiers to assemble.

Recognizing that this complexity is a hindrance to expeditionary operations, the Army continues an effort to transform the command post into a well-honed weapon system—no longer an anchor but an integrated enabler that is more than the sum of its parts. As part of the Mission Command Network, the Command Post 2025 concept shrinks the command post footprint by introducing mobile and scalable capabilities that can support connectivity across all phases of tactical operations, forms of maneuver and doctrine. A critical operational advantage of the new approach is that it will enable corps and division main command posts to operate primarily from home station while deploying forward smaller

"right-sized" formations armed with leaner mobile tactical command posts to deter and operate in multiple regions simultaneously. These new posts will be tied to combat vehicles equipped with the Army's mobile tactical communications network and corresponding Mission Command applications.

To support these flexible, distributed command nodes and the corresponding training and doctrine, the Army is leveraging evolving technologies such as secure Wi-Fi, virtualized hardware, Web-based Mission Command applications and intelligent power as part of the Mission Command Network. Rather than crowding the command post with multiple stovepiped systems for fires, logistics, intelligence, airspace management and maneuver—each with its own computer terminals, server stacks and other bulky infrastructure—the new Command Post Computing Environment delivers the same capabilities through user-friendly applications. Commanders will break free from the juggling act of mentally combining information from various screens, equipped instead with common views, shared data, shared maps and integrated services across all tactical Mission Command applications.

Common User Experience

Through the sweeping Common Operating Environment (COE) initiative, the Army has created "system of systems" software standards that government and industry developers must build to. One piece of the COE, the Mounted Computing Environment, serves as the standard for communications systems inside tactical vehicles. It recently adopted the Android framework to make apps easier for developers to create and for Soldiers to use.

The "common" in COE extends beyond what Soldiers see on the screen to the infrastructure behind it. By replacing individual system servers with a tactical cloud, the COE's Unified Data capability will simplify the way Soldiers share information across systems and echelons.

Today's Army is already engaged in expeditionary operations. Rising to meet future demands will require reliable, intuitive and integrated capabilities that go beyond what we have in the force today. The Mission Command Network, built with the expeditionary paradigm in mind, will drive us to the new level of effectiveness needed to win in a complex world.

Technologies for expeditionary command posts are quickly advancing to the field

Command Post 2025 shrinks the command post footprint by introducing mobile and scalable capabilities

PROTECTING THE TACTICAL NETWORK

The need to assure the confidentiality, integrity and availability of information is not new. Today's military systems are protected through patch management, authentication, encryption, host-based security processes and more. But because of the piecemeal approach to acquiring weapon systems, the Army traditionally treated cybersecurity as a support effort or service for an existing capability. As cyber now takes on a new role – viewed as a warfighting capability for use in the digital battlefield – the Army is developing the integrated requirements to deliver a new set of solutions for today's security environment.

Teaming Up for the Cyber Realm

Creating requirements focused specifically on cyber reinforces the need for information security and resilience throughout the program life cycle from cradle to grave. To do this, the Army is using the Common Operating Environment (COE) as a vehicle for increased security in newer systems, while also establishing security mechanisms for legacy systems. This strategy necessitates a holistic approach to acquisition and requirements that is adaptive to

address changing, emerging and unknown threats.

To be well prepared for these threats while also protecting and defending DoD's information network and data, the Army materiel development and cyber operational communities are building cyber requirements to meet today's needs. This team includes the U.S. Army Cyber Command (ARCYBER), the U.S Army Training and Doctrine Command (TRADOC) Cyber Center of Excellence, the acquisition community and a range of partners from industry and academia. From the acquisition side, the Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA (ALT)) System of Systems Engineering and Integration Directorate's Cyber Acquisition Task Force is responsible for prioritizing cyber gaps and distributing requirements across program executive offices (PEOs) for execution.

Working with the ASA(ALT) Cyber Task Force and requirements community are three PEOs with key roles in supporting these future technologies: PEO Command, Control and Communications –Tactical (C3T) leads in defense of the tactical

network; PEO Enterprise Information Systems (EIS) leads in defense of the enterprise network; and PEO Intelligence, Electronic Warfare & Sensors (IEW&S) leads in offensive cyber efforts. This collaboration—along with those formed with other organizations that support cyberspace operations, such as the intelligence community, international alliances and joint and coalition forces—is key to employing a more defendable network architecture in the joint information environment.

Divide and Conquer

From weapon systems to communications capabilities, the Army must lock down its systems even more securely than they are today. The acquisition community has been responding directly to its customer, the Soldier, by addressing ARCYBER operational needs statements as they come in – even as we are establishing the resources and processes that will govern the long-term acquisition of cyber defense and warfare capabilities.

To aid in improved weapon systems cybersecurity, capabilities for the Army's newly constituted cyber mission forces and resilience for networks, the acquisition and

The DoD Cyber Strategy: Strategic Goals

Build and maintain ready forces and capabilities to conduct cyberspace operations.

Defend the DoD information network, secure DoD data, and mitigate risks to DoD missions.

Be prepared to defend the U.S. homeland and U.S. vital interests from disruptive or destructive cyberattacks of significant consequence.

Build and maintain viable cyber options and plan to use those options to control conflict escalation and to shape the conflict environment at all stages.

Build and maintain robust international alliances and partnerships to deter shared threats and increase international security and stability.

requirements communities are working together to create new cyber requirements. These include various capability development documents that focus on defensive cyberspace operations, cyber situational awareness and offensive cyberspace operations. Leveraging multiple cyber requirements documents, instead of focusing on a single document, is by design and meant to instill a new level of adaptability.

The mechanism that allows this multipronged approach, where several requirements documents work together holistically, is known as the "Information Technology (IT) Box." This model allows approval for an overarching requirement—cyber, for example—then includes individual information system requirements documents for defensive cyber operations, cyber situational awareness and offensive cyber operations that would only need approval at the service level instead of the joint level. The intent of the IT Box approach is to provide agility and flexibility.

In addition to the overarching requirements documents for cyber capabilities, the Office of the Secretary of Defense is also imposing new cyber requirements

at the individual system level, creating a cyber survivability key performance parameter to help programs increase cybersecurity in their baselines.

By pulling the requirements documents together, TRADOC and ASA(ALT) are also, for the first time, including capabilities that reach across the total Army network, including both enterprise and tactical systems.

The Army's increasingly mature networked communications systems provide the commander and troops a dominating view of the battlefield. However, as the Army adds more capability to the network, it creates additional vulnerabilities and entry points for cyber attacks. Aware of this challenge, the Army continues to advance the modernization and integration of mission command capabilities to allow greater visibility in detecting and defending against cyber threats. The COE, which enables a common interface and architecture for a "plug-and-play" experience across different systems and operational environments, will also improve security through a common, cyber-hardened data foundation.

Within the next year, validated require-

ments and their associated documents will establish the framework for the future acquisition and delivery of cyber capabilities across the Army. While this is a significant challenge, the good news is there's a lot of work already done.

For example, as part of the COE, the Command Post Computing Environment (CP CE) displays a range of fires, logistics, intelligence, airspace management and maneuver data on a common, geospatial digital map hosted on a common hardware and software infrastructure. By fusing and running the right analytics on mission command data, the Army could leverage these tools to gain a better situational awareness of cyberspace. CP CE also provides a Unified Data capability that will automatically label, redact and share information according to the data's classification level, thus preserving cybersecurity while reducing obstacles to collaboration with other nations and agencies.

Getting cyber requirements right for the short, middle and long term is essential to successful network modernization for Force 2025 and Beyond.

Global cyber attacks up 48% in 2014

Governments rank at number two with 20.2% in June 2015 -Hadkmageddon

TRANSPORT

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.

ARMY FIELDS NEW FLYING COMMAND POST
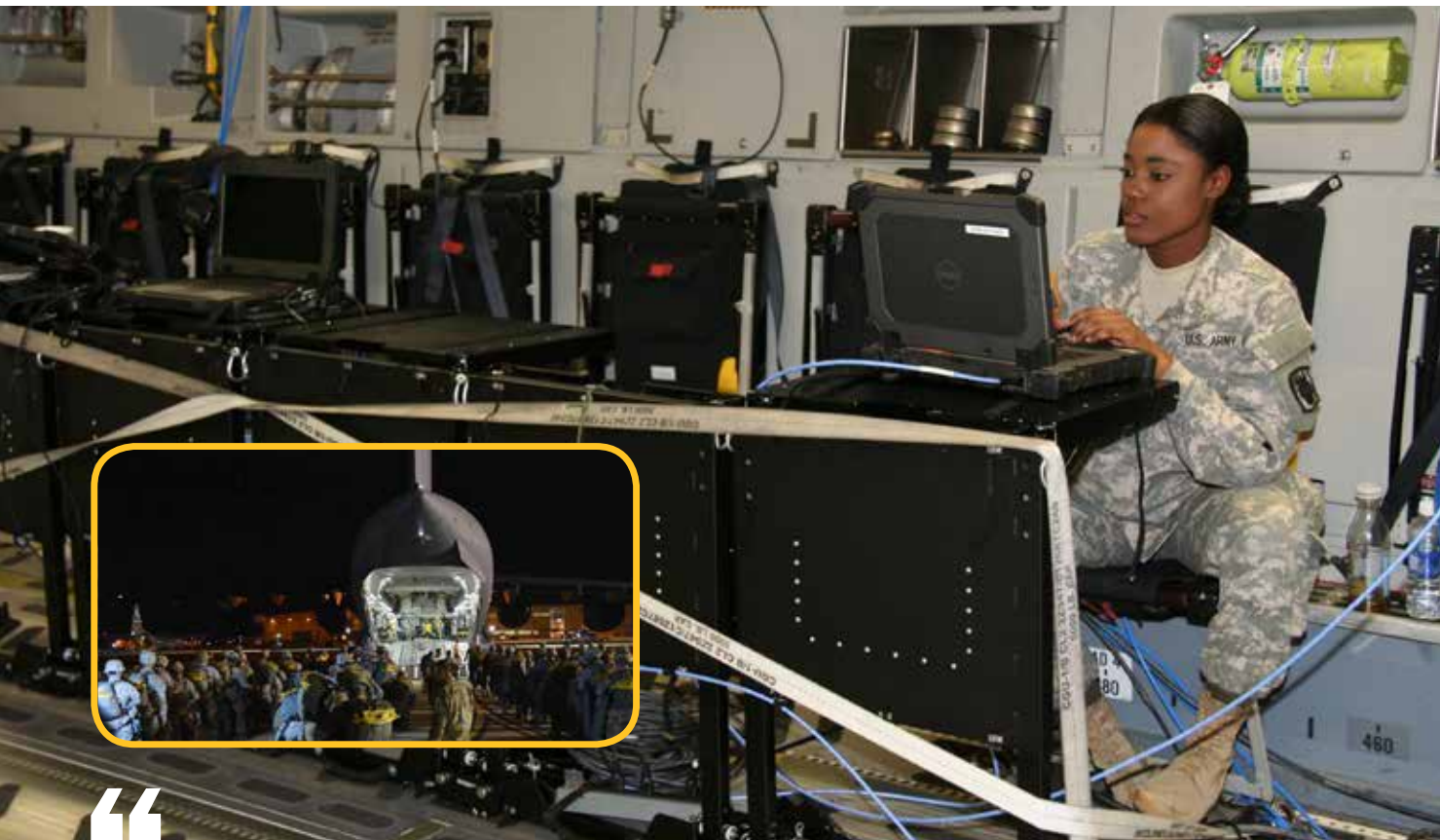
Paratroopers are already in a risky business, and commanders can now reduce that risk by having much more situational awareness.

Col. Robert L. Edmondson II, *commander of the 35th Signal Brigade*

The Global Response Force (GRF) of the XVIII Airborne Corps supports unique and often dangerous early entry missions, and because they are first in, they need as much situational awareness as possible.

The Army recently fielded new secure in-flight network communications technology -- Enroute Mission Command Capability (EMC2) – to provide real-time situational awareness to GRF commanders and paratroopers, giving them a comprehensive understanding of the potential challenges waiting for them on the drop zone.

"Here in the XVIII Airborne Corps we are expeditionary, with a big 'E,'" said Lt. Gen. Stephen J. Townsend, commander for the XVIII Airborne Corps. "And that is what EMC2 is all about -- enabling our Army to move from home station to a very austere, hostile situation and become immediately effective once we hit the ground."

"It's going to allow commanders and Soldiers to stay informed and know what is going on in the objective they are about to parachute into," Townsend said. "That is an incredible advantage."

The Army demonstrated EMC2 capabilities onboard a C17 aircraft on May 13 and 14 at Pope Army Air Field, Fort Bragg, N.C. The 50th Expeditionary Signal Battalion, 35th Signal Brigade, which is now supporting the XVIII Airborne Corps' GRF mission, was fielded with the initial operational capabilities of EMC2 and was the operational unit for the demonstration.

By leveraging technologies similar to those used by today's commercial airlines to provide inflight internet access, EMC2 enables the GRF to now connect to the Army's tactical communications network, Warfighter Information Network-Tactical (WIN-T), while in flight. Because of the increased bandwidth the system provides, GRF commanders can now tap into mission command applications, such as Command Post of the Future, and utilize services such as Secure Voice Over Internet Protocol (SVOIP) phone calls, chat and email. Paratroopers can watch live full motion video feeds from unmanned aerial vehicles flying over the drop zone.

"We're enabling the GRF to see more than a three dimensional picture of the drop zone, they are actually seeing the fourth dimension – time," said Lt. Col. Joel Babbitt, who served until July as product manager for WIN-T Increment 1, which manages EMC2. "During their flight on the C17 aircraft they are watching their objective over time, watching the enemy and the disposition of forces and how things change before they parachute in to assault that objective."

1/1 AD STRYKER BRIGADE TRAINS WITH MOBILE NETWORK

Stryker and other units fighting in realistic missions at the National Training Center (NTC) are finding that the Army's mobile tactical communications network is providing increased communication and mission command capability throughout the austere battlefield, increasing situational awareness and operational tempo.

These capabilities are increasingly important as the Army transitions to decisive action training, emphasizing expeditionary forces in harsh environments facing a hybrid of threats.

"[With these mobile network capabilities], the brigade commander can get orders down to his subordinate commanders more quickly, making decisive actions a lot faster and smoother, allowing us to achieve our objectives a lot quicker," said Cpt. Ian Kinsey, battalion S6 for 1st Stryker Brigade Combat Team (BCT), 1st Armored Division (1/1 AD). "It also gives a

commander more fidelity in decision making. He understands, all the way down to the platoons, what his forces are doing, where they are going and how they are being affected on the battlefield and that helps him make better decisions."

The Army's mobile tactical communications network backbone, Warfighter Information Network-Tactical (WIN-T) Increment 2, which moved into full rate production this year, enables Soldiers operating in remote and challenging terrain to maintain voice, video and data communications while on the move, with connectivity rivaling that found in a stationary command post.

In mid-June, 1/1 AD finished its NTC training rotation that included utilizing WIN-T Increment 2 integrated onto Stryker platforms in an operationally relevant environment. Located at Fort Irwin, Calif., the NTC is roughly the size of the

state of Rhode Island, and there the Army conducts a full range of realistic military operations with unified action partners to prepare BCTs and other units for combat.

To best support unique operational requirements, WIN-T Increment 2 has been integrated onto different platforms including Mine-Resistant Ambush Protected (MRAPs), High Mobility Multipurpose Wheeled Vehicle (HMMWVs) as well as Stryker platforms. It provides units with high-speed, high-capacity mobile communications, enabling them to reach further into the fight while staying connected and increasing their effectiveness on the battlefield.

"No matter what platform WIN-T Increment 2 is integrated onto, the system provides on-the-move networked communications and enhanced situational awareness to units whose mobility is crucial to the fight," said Lt. Col. Lamont Hall, product manager for WIN-T Increment 2.

> *It's much easier and less stressful to have our network on the move. I can start the system up before we go, and the entire time that I am moving, I am connected. We are never out of the net; we are never out of touch.*
>
> **Spc. Aaron Noble** *2-3 Field Artillery, 1/1 AD, operator and maintainer of his battalion's WIN-T Increment 2 equipment*

NG 29TH ID SIGNAL COMPANY FIRST TO RECEIVE UPGRADES

WIN-T Increment 1 EOL Tech Refresh uses virtualization to reduce transit cases by one third, shedding 1,000 cases across the Army

Call it the "Slim-Fast program" for the Army network: the Warfighter Information Network-Tactical (WIN-T) Increment 1 End Of Life Technical Refresh increases capability while reducing equipment by one third.

The Army began fielding the WIN-T Increment 1 EOL Tech Refresh and three other WIN-T Increment 1 upgrades to the Maryland Army National Guard's Company C (Signal) of the 29th Infantry Division in the fall of 2014. An aggressive fielding schedule is planned to rapidly bring the new EOL Tech Refresh to all Army units with WIN-T Increment 1 by the end of 2017.

"We field to all Army components on an equal basis; from a WIN-T perspective the Active Army, the Reserve and the National Guard are all on one network," said Lt. Col. Joel Babbitt, product manager for WIN-T Increment 1. "We are providing improvements in security, bandwidth and capability, while reducing size weight and power (SWaP) requirements so units can be more effective and expeditionary."

The EOL upgrades include new commercial hardware and software components such as routers, switches, servers and firewalls. These new products reduce SWaP by combining capabilities that once required their own hardware onto virtualized servers. Virtualization, which replaces hardware appliances with software, enables the Army to reduce the number of required Increment 1 transit cases by one third – shedding 1,000 cases over the next three years across the Army – and reduces the weight of the remaining cases. This reduction frees up strategic lift, saves space for other critical items and reduces Soldier burden, supporting a more expeditionary force.

Additionally, virtualization efforts replace outdated equipment and provide 50 percent more capacity for current and future modernization efforts. Over time, if additional capabilities are needed, the Army can simply add those to the virtualized platform.

To increase efficiencies, the Army is fielding WIN-T Increment 1 EOL Tech Re-

fresh at regional training sites at the same time that it fields three other ongoing WIN-T Increment 1 upgrades. The remaining units that have already received the previous upgrades will receive the EOL Tech Refresh through on-site fielding at their home stations.

These ongoing upgrades include the WIN-T Increment 1b upgrade, which improves the security and efficiency of the network, while increasing interoperability between Increments 1 and 2. Another upgrade simplifies and reduces the number of network management tools for communications officers, while the upgrade to the High Capacity Line Of Sight radio provides a fourfold increase in throughput.

The fielding of all four upgrades provides higher bandwidth and bigger pipes for troops to exchange voice, data and video more securely and efficiently than ever before. Critical to Army priorities, these enhancements also simplify the network for Soldiers while reducing hardware weight and clutter in support of a more expeditionary force.

WIN-T INC 2 MOVES TO FULL RATE PRODUCTION

The Army received approval to proceed to Full Rate Production (FRP) and fielding of its mobile tactical communications network backbone, Warfighter Information Network-Tactical (WIN-T) Increment 2 in June. The approval was the result of a Defense Acquisition Board (DAB) review of the program conducted in May.

Obtaining the FRP decision means that the program has been deemed mature, has met all its basic requirements and reduced its risk to the point where the program can proceed with fielding for the duration of the program lifecycle. The FRP decision enables the program office to procure and field the capability to all remaining Army units that are projected to receive WIN-T Increment 2 through FY2028.

"WIN-T Increment 2 provides mobile network communications in challenging environments and extends the operational footprint so forces can obtain advanced situational awareness when and where they need it," said Lt. Col. Lamont Hall, product manager for WIN-T Increment 2. "We will continue to enhance and simplify the system so Soldiers are provided the best capability possible to enable support of missions in a complex world."

Following the FRP decision, a $220 million delivery order was awarded for WIN-T Increment 2 Lots 4, 5 and 6. This ensures availability of WIN-T Increment 2 configuration items for fielding to capability sets starting in Fiscal Year 2017.

The program was also granted Full Materiel Release (FMR) in June, signifying that the Army has rigorously tested and evaluated the system and determined that the Increment 2 system is safe, operationally suitable and logistically supportable for use by Soldiers. A FMR is required by Army acquisition policy for the program to continue fielding.

WIN-T Increment 2 is a critical part of the Army's tactical network modernization strategy and the backbone of its network capability sets. Combat and tactical vehicles integrated with WIN-T Increment 2 provide the on-the-move communications, mission command and situational awareness that commanders need to lead from anywhere on the battlefield. WIN-T Increment 2 enables deployed Soldiers down to the company level operating in remote and challenging terrain to maintain voice, video and data communications while on patrol, with connectivity rivaling that found in a stationary command post.

U.S. Soldiers have already deployed with and utilized the system in Afghanistan, where commanders referred to it as their "digital guardian angel." Additionally, WIN-T Increment 2 is currently supporting forces in Operation Inherent Resolve.

Operation Inherent Resolve (OIR) is the U.S. military operation name for the military intervention against Islamic State of Iraq and the Levant (ISIL), including both the campaign in Iraq and the campaign in Syria.

RADIOS

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.

MID-TIER RADIO ADVANCES BATTLEFIELD NETWORK

> "
> *Our radio is built specifically for survivability, redundancy and efficiency for Soldiers on the ground – it's seamless.*
>
> **Capt. Justin Seehusen,** *assistant product manager for MNVR*
> "

With vehicles that are equipped with a new high-bandwidth networking radio, Soldiers can move across the battlefield, rapidly exchanging mission-critical voice messages, images and video with their commanders.

Using line-of-sight communications waveforms that are not dependent on satellites, the Mid-tier Networking Vehicular Radios (MNVR) provides ground-level connectivity that link Soldiers at the company level with battalion and brigade.

"MNVR meets the need of getting data down to the Soldiers," said Lt. Col. Stephen Dail, the communications officer, or S6, for the 2nd Brigade Combat Team, 1st Armored Division (2/1 AD). "The fact that you have the ability to push data back out from locations in the field and graphically get that information back to higher headquarters – who has the expertise to examine it and potentially get information back to the Soldiers while they're still on the ground so they can react – is a game changer."

In order to ensure the MNVR will be ready to field to Soldiers as part of the Army's network Capability Set (CS) 17, the system is being tested extensively, including a Limited User Test (LUT) that was conducted at Network Integration Evalua-

tion (NIE) 15.2. Testing at the NIE included using the MNVR in the Command Post, as well as mounting it on Strykers, Mine-Resistant Ambush Protected (MRAP) vehicles and High Mobility Multipurpose Wheeled Vehicles (HMMWVs).

To prepare for the LUT, the MNVR radios participated in laboratory evaluations, over-the-air testing, logistics assessments and operational tests. These events included a large scale technology demonstration that was conducted at the Electronic Proving Ground (EPG) at Fort Huachuca, Ariz.; a lab based Government Integration Test (GIT) at the Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Systems Integration Laboratory (CSIL) at Aberdeen Proving Ground, Md.; and a GIT Over-The-Air (OTA) event at EPG. Results from these tests, including the LUT, will be used to inform program milestone decisions leading up to MNVR fielding in 2017 and beyond.

These tests are important because they subject the radios to a wide range of operational and environmental conditions, which Soldiers may face during real world missions.

"We completed a tropic field experi-

ment in Panama where the radios were subjected to high temperatures, humidity and fungus to see how well they performed in these conditions," said Eric Goodman, product manager for MNVR. "While this was not a pass/fail event, we will use the information to set a baseline for future evaluations."

A key feature of the MNVR is its ability to provide terrestrial, ground-level connectivity with restricted or non-existent satellite communications. The radio, which uses the Wideband Networking Waveform (WNW) and Soldier Radio Waveform (SRW), operates as a node in a mobile network so information can hop from one MNVR system to another until it reaches its destination. Both the WNW and SRW allow communication without a fixed infrastructure such as a cell tower or satellite network.

By using these waveforms to link lower-echelon digital radios like the Rifleman and Manpack to Warfighter Information Network-Tactical (WIN-T), the MNVR provides a significant tactical advantage for Soldiers. Since the MNVR is integrated into Army tactical vehicles, it ensures wireless communications and networking services for both mobile and stationery forces.

At the LUT, operationally realistic conditions were established to determine how the WNW and SRW performed with regard to message completion rates, latency and voice quality. Testers evaluated the radio using 23 different test cases that ensured the network routing was properly configured and the WNW and SRW waveforms could operate in various situations. The MNVR was also tested on how it integrates into Army vehicle platforms; how it interoperates with other current and legacy Army radios; and how it interfaces with the Army's satellite communications backbone, WIN-T.

"The results from all of these evaluations and tests are being used to help us continue to work to improve the radio's capability and prepare for the next major event, an Initial Operational Test and Evaluation (IOT&E), which will be conducted in 2016," said Pat Layden, deputy product manager for MNVR.

MARKETPLACE LEADS TO IMPROVEMENTS FOR RADIOS

Using a Rifleman or Manpack Radio, Soldiers can send text messages to report enemy locations, request medical help, track unit readiness and equipment availability and digitally call for fires. These radios rely on secure software waveforms to transmit information and keep small units connected as they maneuver throughout the battlefield.

The PM TR team is leveraging the Army's "radio marketplace" to procure additional Rifleman and Manpack Radios and round out the lower tactical network for brigade combat teams across the Army. Earlier this year, the Army awarded contracts to two vendors for the Rifleman Radio and released Request for Proposals (RFPs) for the Manpack Radio. Contract awards are expected in Fiscal Year (FY) 2015 for the Rifleman Radio and FY 2016 for the Manpack Radio, with Full Rate Production beginning in FY 2017 for both radios.

The Army is using a competitive Non-Developmental Item (NDI) strategy with full and open competition, fostering innovation as vendors build state-of-the-art radios that use government-owned waveforms. With the NDI approach, the Army expects to award contracts to multiple vendors that will compete for delivery orders as needed.

"With each new order, we hope to improve the radios with more capabilities, faster processors and increased power and battery life," said Col. James P. Ross, project manager for Tactical Radios. "By working closely with industry, we will deliver radios into the Army network that have the best available commercial capabilities."

The Army held numerous industry days and one-on-one forums that corresponded to each RFP release so that vendors could gather information about the radios' requirements. In response to comments received from industry and users, the Army added additional objective requirements, including a two channel version of the hand-held Rifleman Radio. Using the Single Channel Ground and Airborne Radio System waveform, Single Channel SATCOM, or Soldier Radio Waveform, a two channel Rifleman Radio will enable communication on both channels simultaneously.

The Army is also refining requirements for the Manpack radio using feedback from industry and Soldiers. For instance, in response to Soldier feedback, the Army partnered with the Natick Soldier Systems Center and developed a new Multi-Day Rucksack for the dismounted Manpack. The rucksack, which is positioned higher on a Soldier's back, distributes the overall weight more evenly and allows better antenna reception. It also allows Soldiers to carry sustainment gear for at least a 72 hour mission while simultaneously meeting specific cooling requirements of the Manpack.

The Army also refined the Manpack Radio's full mission weight. The current full mission weight is 19.33 pounds, which includes the radio with two batteries hours and supporting gear (two handheld mikes, antennas, a GPS antenna and the battery bucket). The new full mission weight requirement is 16 pounds with equipment necessary to meet the current dismounted range requirements.

"We are using an incremental approach to the weight of the Manpack Radio," said Gary. "Starting with 16 pounds, our goal is to get down to 14 pounds by FY 2024."

> *As an objective requirement, vendors do not have to provide a two-channel hand-held Rifleman Radio to get a contract. We look forward to seeing what vendors have to offer in both single-channel and two-channel solutions.*
>
> **Lt. Col. Rayfus Gary,** *product manager for Handheld, Manpack and Small Form Fit*

ARMY GEARS UP TO PROVIDE NEW AIR GROUND RADIO

As a team of Apache aircraft fly over an area in support of a squad of dismounted Soldiers, the Apaches receive a close combat attack request from the squad leader. If the Apaches were equipped with Small Airborne Networking Radios (SANR), the squad leader and Apaches would exchange critical mission command information and successfully conduct the close combat attack.

"By connecting air and ground units through voice and data, the new SANR radio will give a better overall picture of ground forces in real time and provide situational awareness, which is invaluable during operations," said Lt. Col. Monique Rivera, product manager for Airborne, Maritime & Fixed Station (AMF).

The SANR is advancing toward fielding in the coming years under the Army's AMF program, which is part of Project Manager Tactical Radios. Targeted for all Army rotary wing platforms, the SANR does not need satellite connectivity or a fixed infrastructure to communicate, and it will change the way air and ground forces communicate on the battlefield.

As part of the Non-Developmental Item (NDI) acquisition strategy, the radio will leverage high-bandwidth, government-owned waveforms that are housed in the Department of Defense's Joint Tactical Networking Center (JTNC), allowing the radios to interoperate with legacy systems and the Army's joint partners. As a clearinghouse that develops and evolves the standards for waveform products, the JTNC certifies which products meet the standards and makes the waveforms available to both government and industry developers. Using common waveforms will ensure the radios are interoperable, even if they are made by different vendors.

The SANR radio will use two networking waveforms – the Soldier Radio Waveform (SRW) and the Wideband Networking Waveform (WNW) – as well as the legacy Single Channel Ground and Airborne Radio System (SINCGARS). Using the widely fielded SINCGARS waveform increases SANR's interoperability for units across the force.

The SRW, first fielded in 2012 and continually upgraded since, enables real-time information that was previously only available in vehicles or command posts to be transmitted down to dismounted Soldiers. By functioning as a "node" or "router" in a radio network, the SRW links the dismounted Soldier to his company. While the SRW transmits small data packets, the information covers large distances and over elevated terrain, such as mountains. Once installed in aircraft, SRW connects to tactical radios, including the Rifleman Radio, Manpack Radio and Mid-Tier Networking Vehicular Radio, forming an air to ground combined arms team.

The WNW provides network connectivity between aircraft and ground vehicles and re-routes and re-transmits communications when elevated terrain presents challenges for users attempting to communicate beyond line-of-sight. By connecting to the mid-tier WNW network at brigade, Soldiers will be able to securely communicate between the upper and lower tiers.

"With the better overall capability that the SANR radio will provide, Army aircrews will have more situational awareness of their ground brethren," said Maj. Matthew Miskowski, assistant product manager for AMF. "Also, with the SANR radio, Army aircrews will be capable of exchanging mission command information with other SINCGARS-equipped aircraft as well as dismounted leaders on the ground."

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.

SOLDIERS 'FIGHT ON ARRIVAL' WITH NEW BFT SYSTEM

The Army's next-generation mounted situational awareness capability is now officially in the hands of Soldiers.

Featuring satellite-linked situational awareness data and easy to use battlefield chat rooms, the Joint-Battle Command Platform (JBC-P) supported the Soldiers of the 4th Infantry Brigade Combat Team, 3rd Infantry Division (4IBCT, 3ID), during their three-week Vanguard Focus exercise in early 2015.

"They had to come in and fight upon arrival," said Col. Thomas Gukeisen, brigade commander for 4IBCT, 3ID, the Army's first unit equipped with the JBC-P system. "We wanted to challenge the mission command capabilities over long distances and JBC-P endured."

With JBC-P, users now experience a highly intuitive Google-Earth like interface that allows units to zoom in to view precise locations, use icons to pinpoint improvised explosive devices on a map, and use instant messaging to call for medics.

JBC-P, part of the PEO C3T's Project Manager Mission Command (PM MC) portfolio, efficiently upgrades Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT), the widely fielded friendly force tracking system that is integrated on more than 130,000 platforms.

JBC-P was shaped in large part by feedback received from recently deployed Soldiers through user juries or the Network Integration Evaluation events held at Fort Bliss, Texas and White Sands Missile Range, N.M. The Soldiers' primary request was to make JBC-P more user friendly, specifically when messaging within and between units.

"Now we can quickly get on chat, so everyone can collaboratively see what we are doing, gain situational awareness, and adjust decisions," Gukeisen said.

Soldiers of the 4 IBCT/3ID were also fielded the next generation vehicle

The platform capabilities of approximately 50 units will be upgraded or fielded next year, with about 15 receiving JBC-P and the others receiving JCR.

mounted tactical computer called the Mounted Family of Computer Systems (MFoCS). MFoCS allows multiple mission command functions to be collapsed onto one screen, and offers a "family" of options that range from a detachable tablet to a fully-loaded, vehicle-mounted workstation. In addition, integrating this system reduces the size, weight, and power (SWaP) burden inside the vehicles.

Looking to the future, JBC-P will also serve as the foundation for the Mounted Computing Environment (MCE), which will deliver Android-based warfighting web apps as part of the Army's Common Operating Environment (COE).

"Young Soldiers enter the Army used to smartphones and apps," said Lt. Col. Michael Olmstead, product manager for JBC-P. "They expect the same type of technology while conducting their missions, and we will continue to evolve to ensure we meet their expectations."

SMART TECHNOLOGY ENABLES TRUE MISSION COMMAND

Step by step, Army mission command capabilities are transitioning into the same type of personal computing systems young Soldiers use in their everyday lives.

"Our Soldiers are technologically savvy, and they demand modern, interoperable and easy to use web-based capabilities," said Col. Michael Thurston, Project Manager for Mission Command. "That is exactly what we are building and delivering."

This effort requires the Army to convert existing stand-alone mission command systems into user-friendly apps, displayed on a common geospatial map, to create one common operating picture. Developers build these apps within the Army's Common Operating Environment (COE), made up of several computing environments including the Command Post (CP CE) and Mounted (MCE), the two areas led by PEO C3T.

CP CE is unfolding in phases that increase capability over time. CP CE v1, which created one common environment for operational and intelligence capability development, is now an established baseline at the Army's Network Integration Evaluation (NIE) exercises.

CP CE v2 transitions several stove-piped systems to web apps, including the conversion of more than half of the Army's logistics management capabilities. In addition, developers have consolidated the number of maps used across mission command systems from 26 down to six. CP CE v2 also brings a Tactical Server Infrastructure (TSI), which merges operational and intelligence functions into one server at the secret and below classification. The TSI and other select portions of CP CE v2 will be assessed as a baseline technology during NIE 16.1 and are scheduled for delivery in fiscal year (FY) 2017.

The most significant technological leap will occur with CP C3 v3, expected to field in FY 19, when all mission command standalone systems will migrate to the web and operate on a single map. CP CE v3 also brings the powerful Unified Data infrastructure, a single-storage solution for the tactical environment that simplifies the steps required to share information between warfighting systems.

To extend collaboration to the dismounted Soldier, the Joint Battle Command-Platform (JBC-P) friendly force tracking system serves as the first version of MCE, and includes an infrastructure called the Mounted Android Computing Environment (MACE). Already familiar with Android, developers have quickly generated tactical apps for MACE that operate seamlessly with the smartphone-like Nett Warrior handheld device, providing dismounted Soldiers with map-based friendly and enemy situational awareness and other key capabilities.

"Within one week, developers created an Ebola training app in response to this year's rapid outbreak," said Lt. Col. Michael Olmstead, Product Manager for Joint-Battle Command-Platform.

Additional MACE apps will undergo evaluation at NIE 16.1, including the On Demand Information Network (ODIN). ODIN reduces the Unit Task Reorganization (UTR) process time from several days or weeks down to three clicks and three minutes. The Army expects to field the first suite of MACE apps in FY16-17.

Most importantly, tactical apps are developed once and will run on multiple hardware platforms, across echelons and networks, increasing efficiency and effectiveness.

"In the not so distant future we will finally keep abreast of our young Soldiers' proficiencies in technology," Thurston said. "We must ensure that they can conduct mission command anytime, anywhere and on any device."

> The number of maps used across mission command systems were consolidated from 26 down to six.

CPOF EVOLVES INTO A SUITE OF WEB-BASED CAPABILITIES

With more than 20,000 systems deployed or in use around the world, the Army's collaborative mission command support system has begun a phased approach that will sustain its current capabilities and then transition those capabilities into a collaborative web environment that reaches across all echelons – and all devices.

This system, the Command Post of the Future (CPOF), processes and displays combat information onto digital maps from other Army systems at the battalion and above echelons.

"CPOF revolutionized the face of the command post," said Col. Michael Thurston, project manager for Mission Command. "It produced the technological leap from acetate maps to digital screens, and became the foundation for the advanced, collaborative technologies our Soldiers are using now or soon will be."

While earlier versions of CPOF have moved to sustainment, Soldiers are still receiving critical capabilities in its newer versions, including the Disconnected, Intermittent, Limited function that provides uninterrupted operations in the event of a network outage.

By FY 2019, CPOF functionality will transition to a web application-based solution set, tentatively termed Tactical Applications (TacApps). TacApps is one component of the Army's Command Post Computing Environment version 3 (CP CE v3), and it will merge CPOF with Command Web, the framework that supports web app development; Battle Command Sustainment and Support System (BCCS), which includes all of the logistics web apps; and Common Tactical Vision (CTV), an up-and-coming situational awareness capability that includes a DVR-like playback function.

The TacApps suite incorporates many of the modern capabilities commanders and Soldiers seek to communicate across the battlefield.

"Soldiers told us they wanted a more intuitive, web-based user interface and also one that has the same look and feel from the division down to the Soldier at battalion and below," said Lt. Col. Shane Taylor, product manager for Tactical Mission Command. "Commanders said they must command untethered from the command post."

In response to these requests, TacApps includes an application infrastructure that will allow seamless collaboration and a shared understanding not just across different systems and devices, but across echelons, so that Soldiers will be able to collaborate both vertically and horizontally, from brigade to brigade, or division to brigade across the local area network.

"During the 1980s, General Paul Gormon, former Commander in Chief, United States Southern Command, often stated that 'a command post is not a place,'" Taylor said. "He was ahead of his time, and we are ultimately realizing his vision through a collaborative environment that will allow the commander to command from anywhere on the battlefield."

NEW TECHNOLOGIES LINK MULTIPLE NATIONS FOR SHARED MISSION COMMAND

U.S. Air Force photo by Tech. Sgt. Kenya Shiloh

To meet the challenges of persistent and emerging military conflicts, joint and coalition partners must operate as one, unified force. That means their situational awareness systems need to speak the same digital language and provide a common and secure operating picture.

Project Manager Mission Command (PM MC) delivers these situational awareness capabilities to the joint and coalition forces, spanning across echelons and warfighting functions.

"The Army is a formidable force, but collaborating with our joint and partner nations will always be the best deterrent to our adversaries, and is also the most effective option for our humanitarian missions," said Col. Michael Thurston, Project Manager for Mission Command.

One warfighting function that demands precise language translation is fires support, and both the Advanced Field Artillery Tactical Data System (AFATDS) and the Joint Automated Deep Operations Coordination System (JADOCS) bring enhanced joint fires capability to U.S. and coalition troops throughout the world.

"In the heat of the fight, the U.S. and our partner nations must precisely interpret where, when and how to engage the enemy target to avoid fratricide," said Julie Ruhnke, product director for Fire Support Command and Control. "To meet this challenge, we have established a standard, transparent interface with multiple European countries."

While fire support capabilities are more visible, behind the scenes the Global Command and Control System-Army (GCCS-A) provides the infrastructure that links joint and coalition information systems. Its web-based capability displays this information on one, digital map.

"GCCS-A provides many avenues to visually team with our partners within a controlled environment," said Lt. Col. Timothy Gearhart, product manager for Strategic Mission Command.

Controlling all data in a coalition environment is imperative to meet cyber se-curity requirements, and the Unified Data capability will help to meet this challenge. By using cell level classification, Unified Data will automatically redact certain information displayed on every system so that the user can only view what he or she is authorized to see – ensuring information security while removing some of the manual barriers to coalition collaboration.

Many of PM MC's joint and coalition technologies have been featured in training exercises across Europe, and were prevalent at Bold Quest 15.2 held at White Sands Missile Range, N.M., where Soldiers of the 2nd Brigade, 1st Armored Division along with coalition forces will conduct fires and command post missions.

"We face many challenges in today's complex environment," Thurston said. "Our systems are designed to meet those challenges by allowing all commanders to conduct mission command through one, shared language."

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.

EFFICIENCY REALIGNS TACTICAL NETWORK INITIALIZATION

Turn on a new computer for the first time and you are met with a few questions before the computer is registered and recognized.

In Army command posts, Soldiers must also complete this initialization step when their communications hardware is first turned on, so it can recognize and exchange critical information with other systems across the battlefield.

Only a year ago, this process required installing a disc preloaded with unit information known as data products. If something changed and revisions were needed, a new set of data products would have to be created, with units waiting up to 15 weeks for the updates.

Now, the Army is bringing increased flexibility to the way troops initialize their mission command systems by putting the power in the hands of the communications staff officer, or S6, to make real-time changes on the fly.

± 3 minutes to initilize a system

"Ten steps in approximately three minutes - that's the process with this new capability," said Giovanni Oddo, technical management division lead for Product Management Office Initialization. "Each Soldier at a workstation in a command post will be able to do the initialization themselves. It's very simple, you just pull down the menus and the selections are limited, so it really walks you through the process."

The S6 will now be able to integrate new equipment, modify or add roles, and have those changes take effect almost immediately compared to the old way of doing business. This capability has already been delivered to select units across the Army fielded with Capability Sets 13-15.

The Army is now taking that effort one step further with the fielding of the next generation of initialization tools, which will enable Soldiers at individual workstations to initialize their own system, much like turning on a commercial computer for the first time.

Known as the Initialization Tool Suite, or ITS, the streamlined process further reduces the burden on the signal Soldier by giving the end-user the ability to initialize their mission command systems and join the tactical network.

The ITS is made up of three tools: the Warfighter Initialization Tool-Manager, or WIT-M; WIT-Platform, or WIT-P; and WIT-Server, or WIT-S. Together they rapidly update units' data products or "digital phone books" to reflect what occurs in the operational area of responsibility, including equipment or organizational changes such as receiving a new communications technology or temporarily cross-attaching another unit.

The suite can provide senior commanders a more accurate common operating picture and gives the S6 a simplified, more hands-on approach to adapting their network based on their fight.

ARMY MODERNIZING CRYPTOGRAPHIC EQUIPMENT

Emphasizing modernization, standardization and ease of use, the Army is continuing its push to replace aging cryptographic devices with upgraded equipment.

Known as the Army-Wide Cryptographic Network Standardization (ACNS) initiative, the effort is bringing commonality and simplification to cryptographic equipment, replacing it with modern, user-friendly devices to help streamline protection of the information that resides on the tactical network. Started in 2012, the effort began at bases in the continental United States, followed by Army accounts throughout the Pacific, with the focus now in Europe.

"There are mandates out there from the Army and the National Security Agency that call for the replacement of these legacy devices," said James Hayden, the total package fielding manager and ACNS lead for Product Director Communications Security (COMSEC) Cryptographic Systems. "This effort will clean up the battlefield by standardizing what we use to protect information on the Army's network."

Replacing the existing "hard coded" equipment with new software programmable devices will also enable efficiency for future upgrades, which will no longer require a complete overhaul of hardware.

"Now, as we move forward with standardized equipment, we'll be able to reprogram algorithms from the field," said Hayden. "So in theory, if the hardware box can survive 30 years without breaking, we would only need to do software upgrades instead of what we're doing today, which includes totally replacing hardware and software."

As cryptographic equipment comes out of compliance, it could result in an inability to communicate at secret and top secret levels. Additionally, the legacy equipment will not be compatible with the Army's data network as the Army migrates toward Internet Protocol Version 6 or IPV6, said Hayden.

The ACNS effort is focused on replacing the legacy End Cryptographic Units (ECU) through an accelerated fielding process. PdD COMSEC Cryptographic Systems identified 30,000 ECUs at almost 70 geographical sites that had aging algorithms and needed to be replaced. Of those, only 15 sites remain before moving onto National Guard and Reserve units later this year.

"As the network and mission command systems continue to evolve, so too must our cryptographic devices," said Robert Vik, product director for COMSEC Cryptographic Systems. "This initiative ensures Soldiers have the most modern equipment possible. Without it, it could compromise secret-and-above information being transported."

The process includes identifying the equipment to be replaced, filling orders, training and integration, and disposal of legacy equipment. To date over 6,000 pieces of legacy equipment have been removed from the field and are in the process of being disposed of. The goal is to be as non-intrusive to daily operations as possible.

ONE-STOP-SHOP FOR TACTICAL COMMERCIAL HARDWARE

By establishing one, go-to mechanism for tactical commercial off-the-shelf information technology (COTS IT), the Army has created a standard marketplace that utilizes the most effective and efficient contract vehicles to deliver needed IT solutions for Soldiers.

On April 30, Heidi Shyu, the assistant secretary of the Army for Acquisition, Logistics and Technology, signed a memorandum designating the Common Hardware Systems (CHS) program office as the primary organization to oversee tactical commercial hardware procurement. The CHS program office maintains a portfolio of commercial technologies that satisfy tactical requirements including servers, clients, network routing and switching devices, ruggedized laptops, handheld devices, operational transit cases and other peripheral devices. The memo creates a holistic approach

CHS also offers a strong connection to the Army organic industrial base including Tobyhanna Army Depot

and a streamlined lifecycle management path by directing all Army program offices requiring Tactical COTS IT systems to first coordinate with CHS.

"This important step moves the Army's tactical COTS IT procurement into the modern age," said Stan Niemiec, the Army's project director for Network Enablers, which includes CHS. "It gives the Army a single focal point to assist program managers in deciding the best route when procuring their tactical hardware packages, and it inserts commonality into the systems."

As the Army continues to advance the Common Operating Environment (COE) framework to support the rapid development and delivery of secure, interoperable software applications, CHS is coordinating with multiple programs to facilitate efficient procurement and sustainment of hardware items across the COE, while leveraging industry innovation to supply the latest technologies to Soldiers.

Through its holistic approach to Army tactical hardware, CHS realized $132 million in cost avoidance across 11 programs in fiscal year 2014.

"We're collaborating with programs to understand their near-term and long-term requirements for COTS IT," said Breck Tarr, acting product director for CHS. "This information will enable CHS to identify common requirements and to offer recommended lifecycle solutions to supported programs."

This one-stop-shop for tactical COTS IT will help to garner benefits for Army programs. By consolidating COTS IT system configurations via a Common Hardware Menu, program managers can achieve efficiencies through consolidated procurements of COTS IT leveraging the most effective commercial contract vehicle, and facilitate consolidated sustainment for COTS IT leveraging the Army's organic resources.

CHANGE IN COMMAND

PEO C3T, OUTGOING

MG DANIEL P. HUGHES
*Program Executive Officer For
Command, Control And Communications Tactical*

PEO C3T, INCOMING

MR. GARY MARTIN
*Program Executive Officer For
Command, Control And Communications Tactical*

PM WIN-T, OUTGOING

COLONEL EDWARD SWANSON
PM Warfighter Information Network-Tactical

PM WIN-T, INCOMING

COLONEL GREGORY COILE
PM Warfighter Information Network-Tactical

PdM WIN-T INCREMENT 1, OUTGOING

LIEUTENANT COLONEL JOEL BABBITT
PM Warfighter Information Network-Tactical

PdM WIN-T INCREMENT 1, INCOMING

LIEUTENANT COLONEL MARK HENDERSON
PM Warfighter Information Network-Tactical

PdM AMF, OUTGOING

LIEUTENANT COLONEL MARCUS L. VARNADORE
PM Tactical Radios

PdM AMF, INCOMING

LIEUTENANT COLONEL MONIQUE N. RIVERA
PM Tactical Radios

PdD CHS, OUTGOING

MS. DANIELLE KAYS
PD Network Enablers

PdD CHS,ACTING

MR. BRECK TARR
PD Network Enablers

PdD KM, OUTGOING

MR. DENNIS TEEFY
PD Network Enablers

PdD KM, INCOMING

MR. KEVIN WALSH
PD Network Enablers

CYBER OPS, OUTGOING

MR. EMERSON KESLAR
Cyber Operations & Defense

CYBER OPS , INCOMING

DR. PORTIA CROWE
Director, Cyber Operations

PdD MILTECH SOLUTIONS, INCOMING

MS. CLAUDIA DECARLO
PD Network Enablers

EMPLOYEE SPOTLIGHTS

In the Field: Building Comms to Fight Ebola

Be humble, no matter how well you know your stuff.

For Matt Iannelli, that attitude is what earned the trust of the U.S. Africa Command (AFRICOM), the 101st Airborne Division and the other units who deployed to Liberia to control the deadly spread of the Ebola virus.

Iannelli, an engineer in PEO C3T headquar-ters' Technical Management Division, deployed to AFRICOM headquarters in Germany for several weeks in the fall of 2014 to help manage the standup of a tactical communications network for the mission. Although he and other PEO C3T subject matter experts (SMEs) contributed significant expertise to the development of the network architecture, their approach was flexible to the desires of the combatant command within the unique operational environment.

"We didn't go in there saying that we knew everything – we went in there with the mindset that, 'We're here to augment you and be your technical SMEs, so tell us what your thoughts are and we will help you work through them,'" Iannelli said. "It was a much more collaborative relationship, and we were truly embedded as part of that team."

That partnership – sustained through participation in dynamic working groups in Germany and reachback to other PEO elements in the U.S. – enabled AFRICOM to avoid pitfalls in adjusting to the constraints of a tactical satellite communications network, while implementing innovative solutions designed for the Operation United Assistance (OUA) theater.

The network they devised ultimate-

Through the test: WIN-T's NIE point man

Retired Soldier, Robert Carr, leverages the ingenuity, integrity and determination developed during his many deployments to tackle a different battlefield -- the Army's Network Integration Evaluations (NIEs).

Carr serves as the local NIE point man for Project Manager Warfighter Information Network-Tactical (PM WIN-T), the Army's tactical communications network. Although the NIEs are biannual events, Carr is on site all year round, most often working 12-14 hour days, preparing for, executing and wrapping up each event only to begin the next.

"Bob Carr is the single interface to the field for WIN-T at the Army's NIEs," said Col. Gregory Coile, project manager for WIN-T. "He is our enduring on-the-ground presence."

Carr played a pivotal role in the successful execution of the extensive WIN-T Increment 2 Follow-on Operational Test and Evaluation (FOT&E 2) held in conjunction with NIE 15.1, in the fall of 2014. More than 5,000 Soldiers conducted the test, which lasted 19 days and covered more than 3,000 square miles at Fort Bliss, Texas and White Sands Missile Range, N.M. Results from the FOT&E2 supported the successful Full Rate Production decision in May 2015 and the system's Full Materiel Release in June.

"My main goal is to reduce as much risk as possible to ensure a successful event," Carr said.

The mobile WIN-T Increment 2 network is the backbone at the NIEs, which means that all of the communications, mission command and software-defined radio systems need to "plug" into WIN-T Increment 2 and work in unison to relay information across the deserts and mountains of the NIE landscape. Other network capabilities, such as Command Post

Modernizing Field Support for the Army

When the 2nd Armored Brigade Combat Team, 1st Infantry Division (2/1 ID) rolled across the 1,200 square miles of the Mojave Desert to begin their 14-day National Training Center rotation in March, they were equipped with a new tool for troubleshooting communications systems – themselves.

And that's exactly what Rich Li-cata, field support manager for PEO C3T had envisioned. The 2/1 ID was the first to employ a new Army field support model that empowers Soldiers as the first line of defense.

This transfer of knowledge from specialized Field Support Representatives (FSRs) to Soldiers as the Army draws down from more than a decade at war, is spearheaded by Licata, who served as co-lead on a C4ISR Field Support Integrated Process Team.

"We knew we were in a fiscally constrained environment, so we looked at how we could best support the Soldier," Licata said. "The best part is that the Soldiers want to take this on. The Army needs to be lighter, more agile and able to move into combat without worrying about civilians. What it boiled down to was that the majority of the work shouldn't be done by FSRs."

The concept is backed by data. After validating more than 25,000 field support trouble tickets from pilot tests and validation exercises, the Army found that 78 percent of those were training related and could have been resolved at lower echelons had train-

ly improved coordination across a diverse task force of military, government and aid organizations responding to the outbreak.

"Where the network really came in was to help provide command and control and situational awareness, not only to U.S. forces there, but also to enable them to share that information with non-governmental organizations, with USAID and other interagency partners," said Col. Patrick C. Dedham, J6 director for AFRICOM. "The PEO C3T engineers were instrumental in the detailed planning rehearsals to get everyone prepared to do the mission when they hit the ground."

One unique element of the network built for OUA was the delivery of commercial internet enclaves and the activation of commercial services at the Army's Regional Hub Node in Landstuhl, Germany. Given the makeup of the OUA task force, the commercial capabilities provided unimpeded internet connectivity to resources not residing on Department of Defense networks, such as those found from academia and the Centers for Disease Control and Prevention, Iannelli said.

At AFRICOM's request, the team also configured the Warfighter Information Network-Tactical (WIN-T) network architecture to use a com-

mercial satellite managed by the Air Force under the Pathfinder program. This effort enabled throughput capacity far exceeding the usual standards for the Army tactical network, with speeds between 24 and 36 megabits per second rather than 8 megabits per second.

"One of the things that came out of this is that with the right satellite communications resources, we can deliver much higher throughput links to our brigade and division sites," Iannelli said. "We can put large pipes in up front, even during full spectrum type operations, which could bring some significant capabilities to the

fight earlier."

Another lesson learned that stayed with Iannelli after the OUA mission concluded in the spring of 2015 is the value of consistent engagement and collaboration with combatant commands (COCOMs) to keep them updated on the state of the network architecture, current challenges and how the PEO can support.

"For AFRICOM to have that open mind, and for us to be there to give that perspective, was critical," he said. "OUA showed the success of tightly integrating the acquisition community with the COCOM and we need that to continue."

Wi-Fi and ground satellite terminals, are provided by the WIN-T Increment 1 and the WIN-T Satellite Communications programs. The myriad of moving parts and inevitable challenges spawned by the sheer size of the endeavor have to be succinctly and timely managed, and all fall under Carr's jurisdiction.

"Some of our challenges arise when someone reports a problem with the network, when in reality, most of the time the network is not the root cause of the problem," Carr said. "So you have to go out to the unit and root out the problem and then try and solve it. Many times, the fault resides with a cable, a configuration, an integration

problem, or an issue with another system being plugged into WIN-T."

Carr and his close working partner, Alex Kolkin, WIN-T NIE System of Systems engineer, have been supporting these exercises since 2012, continually adapting as the NIEs evolve. Together this duo dynamically manages and troubleshoots WIN-T related equipment, integration, training and logistics challenges.

"Bob Carr, the man, the myth, the legend," Kolkin joked. "But seriously, he is a key player in NIE and is called by everyone to help solve issues; if some seemingly impossible task has to be resolved, whether it's with integration, a malfunction or human error,

Bob finds a way and the right people to flush it out and resolve it."

Carr has developed strong working relationships with key NIE stakeholders, including the operational unit and the NIE "Triad," which consists of the Brigade Modernization Command; the Army Test and Evaluation Command; and the System of Systems, Engineering and Integration Directorate. Carr serves as the WIN-T representative during the daily meetings with the TRIAD, units and other NIE participants.

As the WIN-T Site Lead on the ground, Carr also oversees incoming and outgoing equipment for each exercise, reducing the potential for loss

which preserves resources.

"Our successes at NIE are the result of great support from the entire PM Team," Carr said. "I'd like to thank them all, with special thanks to Alex and our local team for the tremendous support they provide."

Part engineer, part logistics guru, part politician, Carr connects the equipment, the network, and the people during every phase of NIE. Whichever hat he may be wearing at any given time, his reputation for getting the job done always precedes him.

"It's like no other job in the world," Carr said. "It can be challenging, and it's not for everyone, but I love it."

ing been performed at home station prior to rotations.

The new model builds on a Soldier-tested, four-tiered process tailored to smartly do more with less, while ensuring units get the support they need.

"This effort doesn't decrease the level of support to the U.S. Soldier," Licata said. "Instead, it's utilizing

smaller, multi-functional field support teams to accomplish the same level of support."

This new model, expected to significantly reduce field support costs for tactical systems, is being implemented across combat training center rotations. In June, a pilot of the program was started with Capability Set fielded units.

COMMUNITY SUPPORT

Dennis Teefy and Kyle Bond at the Meadowvale Career Day with support from two fifth graders, Cainan Fisher and Nathan Brown. This is their second year attending.

MG Hughes visited with the Boys & Girls Clubs of America in Harford County. We talked about leadership, character and what it's like to be in the military

PEO C3T shows its holiday cheer by providing gifts, clothes, food and more to 15 families, including 55 children

Employees of PEO C3T volunteer for Chesapeake Support Our Heroes. The 2014 Gala raised approximately $150,000 for the Fisher House Foundation.

OTHER C3T NEWS

OCTOBER

PEO C3T begins operational support to Ebola Response

Army Acquisition Corps' 25th Anniv., 25 professionals were selected as the best in the AAC community, including four individuals from PEO C3T. Dr. Portia Crowe, Colleen McQuillan, Dennis Teefy and David Williamson

Mission Disaster Incident Response Emergency Communications Terminal (DIRECT) communications capabilities demonstrated at the Demoed at Disaster City, Texas

NOVEMBER

Network Integration Evaluations 15.1, which included the Follow-on Operational Test and Evaluation 2 for WIN-T Increment 2

MilTech and Defense Connect Online hosts third virtual conference with the theme "DoD Digital Collaboration in the Joint Information Environment: Mobile CIO"
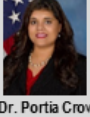
DECEMBER

Common Hardware Systems hosts Technology Expo & Program Review with 26 vendors and government organizations demonstrating technologies

PM TR's Field and Readiness Equipping Database, also known as FRED, debuts

PEO C3T ORGANIZATION

HEADQUARTERS & SENIOR LEADERSHIP

Mr. Gary Martin
Program Executive Officer

Ms. Mary Woods
Deputy PEO

COL William Sheehy
Chief of Staff

Ms. Veronica Ewing
Director, BMD

Mr. Joseph Hollenbeck
Director, RMD

Ms. Jennifer Zbozny
Director, TMD

Dr. Portia Crowe
Director, Cyber/CIO

Salvatore Corpina
Director, OPS

PMO Net E
Project Management Office Network Enablers

Mr. Stan Niemiec
Project Lead

| COMSEC Cryptographic Systems |
| Common Hardware Systems |
| Key Management |
| Initialization |
| MilTech Solutions |
| Tactical Network Architectures And Configurations Current |

PM MC
Project Manager Mission Command

COL Michael Thurston
Project Manager

| Fire Support Command and Control |
| Joint Battle Command-Platform |
| Strategic Mission Command |
| Tactical Mission Command |

PM TR
Project Manager Tactical Radios

COL James Ross
Project Manager

| Airborne, Maritime Fixed Station |
| Handheld, Manpack and Small Form Fit |
| Mid-tier Networking Vehicular Radio |
| Waveforms |

PM WIN-T
Project Manager Warfighter Information Network-Tactical

COL Gregory Coile
Project Manager

| WIN-T Increment 1 |
| WIN-T Increment 2 |
| WIN-T Increment 3 |
| Joint Enterprise Network Manager |
| Satellite Communications |

JTNC
Joint Tactical Networking Center

Mr. William Wygal
Director

JANUARY

Mr. William R. Wygal is selected as the new Director of the Joint Tactical Networking Center (JTNC)

The Army National Guard's C Signal Company, 29th Infantry Division is the first to receive the Army's upgrade to its WIN-T Increment 1 network

Army's First Unit Equipped with Joint Battle Command-Platform National Guard 4th Infantry Brigade Combat Team, or the Vanguard Brigade, of 3rd Infantry Division

FEBRUARY

MilTech Solutions led successful SharePoint 2013 migration for several organizations within the ASA(ALT) and AMC; milSuite surpasses 500,000 users across the DoD

Congratulations to PEO C3T's LTC Michael Olmstead and Robert Reichelmann for being selected as 2015 Federal Computer Week Federal 100 Award winners

MARCH

Soldiers with the 28th Infantry Division, Pa. Army National Guard, train on the Host Based Security System (HBSS). This is the first implementation of HBSS for the National Guard. 2nd Armored

Brigade Combat Team/1st Infantry Division (2/1 ID) is the first unit to utilize the Army's new field support construct and the Unified Trouble Ticketing System

KEY PROGRAM METRICS

PEO C3T ACQUISITION PROGRAMS AND EFFORTS: 48

PROGRAMS:	
ACAT I	8*
ACAT II	3
ACAT III	11
PRE-ACAT	6
Other Non - PoR	23

PHASES:	
PRE-ACAT*	6
Tech Development	0
EMD	3
Production & Deployment	8

*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)

FY15 MILESTONE DECISIONS:

PM	Program	MS
PM Mission Command	Pocket-sized Forward Entry Device (PFED) Increment 2	Milestone B
PM Warfighter Information Network-Tactical	WIN-T Increment 2	Full Rate Production
PM Warfighter Information Network-Tactical	Enroute Mission Command Capability (EMC2)	Production and Deployment

As of 30 September 2015

APRIL

The Army awarded contracts to two vendors - Harris Corporation and Thales Defense and Security Incorporated - for the Rifleman Radio

Army Chief of Staff Gen. Ray Odierno visits PEO C3T

PEO C3T hosts the Army's Tactical Network Industry Forum

Cyber Ops and Defense published the first C3T Cyber Reference Standards Guide, signed Memorandum Of Understanding between C3T and INSCOM HQ

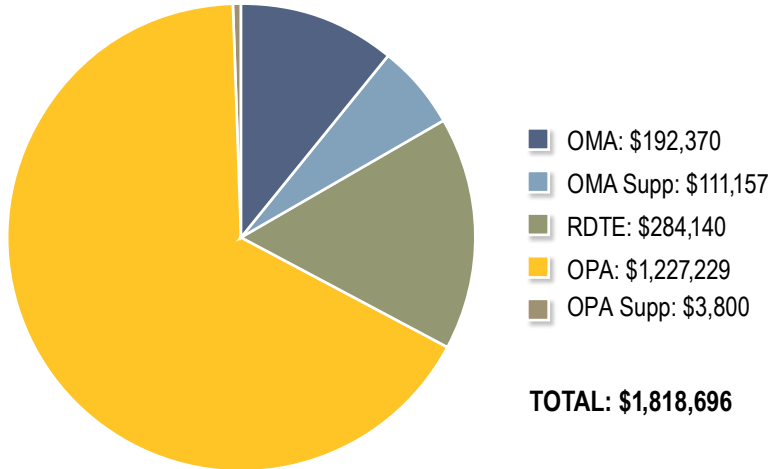Mr. Terry Edwards, SES, retires

MAY

Kevin Walsh accepts Product Director Key Management charter and Breck Tarr accepts Common Hardware Systems charters
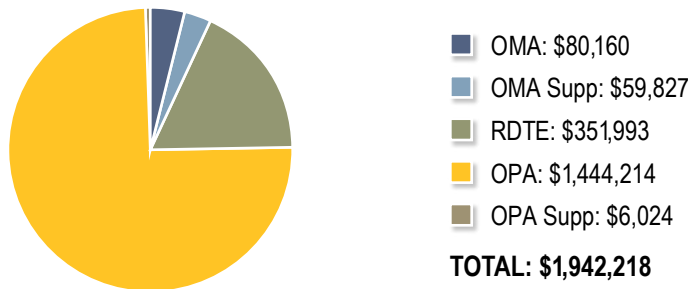
NIE 15.2 at Ft. Bliss, Texas. NIE 15.2 includes a Limited User Test for the new MNVR

# FINANCIAL SUMMARY

PEO C3T FY15 FUNDING ($ in K)

- OMA: $192,370
- OMA Supp: $111,157
- RDTE: $284,140
- OPA: $1,227,229
- OPA Supp: $3,800

TOTAL: $1,818,696

PROJECTED FY16 FUNDING ($ in K)

- OMA: $80,160
- OMA Supp: $59,827
- RDTE: $351,993
- OPA: $1,444,214
- OPA Supp: $6,024

TOTAL: $1,942,218

FY15 RDTE FUNDING

- PM WIN-T, 47%
- PM MC, 33%
- PM TR, 8%
- JTNC, 3%
- PD Net E, 4%
- PEO C3T HQ, 3%

FY15 OPA FUNDING

- PM WIN-T, 71%
- PM MC, 20%
- PM TR, 4%
- PD Net E, 7%

FY16 RDTE FUNDING

- PM WIN-T, 48%
- PM MC, 47%
- PM TR, 9%
- JTNC, 4%
- PD Net E, 4%
- PEO C3T HQ, 3%

FY16 OPA FUNDING

- PM WIN-T, 75%
- PM MC, 21%
- PM TR, 7%
- PD Net E, 6%

Sources: FY15 OPA/RDTE: Executable APPN as of Sept 2015. FY16 OPA/RDTE: PB Request.
FY16 OMA: PB Targets
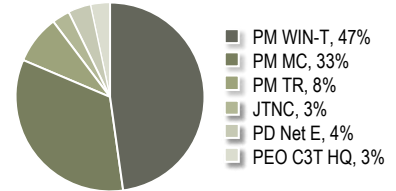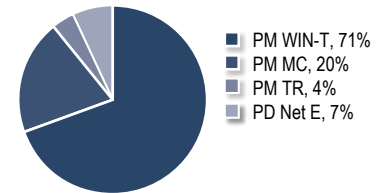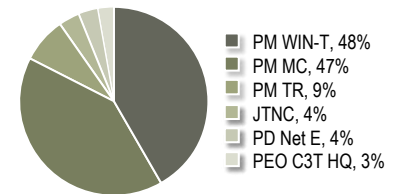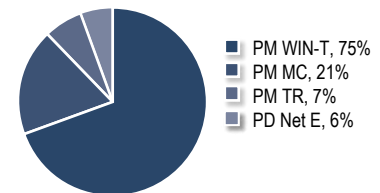
MAY

JUNE

PD Net E's Global Integrated Partnership for COMSEC (GIPC) User IPT at Fort Huachuca, Az.

The Army demonstrated EMC2 onboard a C17 aircraft at, Fort Bragg, N.C. The 50th Expeditionary Signal Battalion, 35th Signal Brigade, is the first unit fielded with EMC2

PEO C3T Cyber Ops and Defense made Tactical PKI lead for the Army's tactical environment

Mr. Emerson Keslar, Project Director Cyber Operations and Defense, retires after more than 33 years in federal service

COL Michael Thurston is named C4ISR & Networks "Elite 6" award winners for 2015
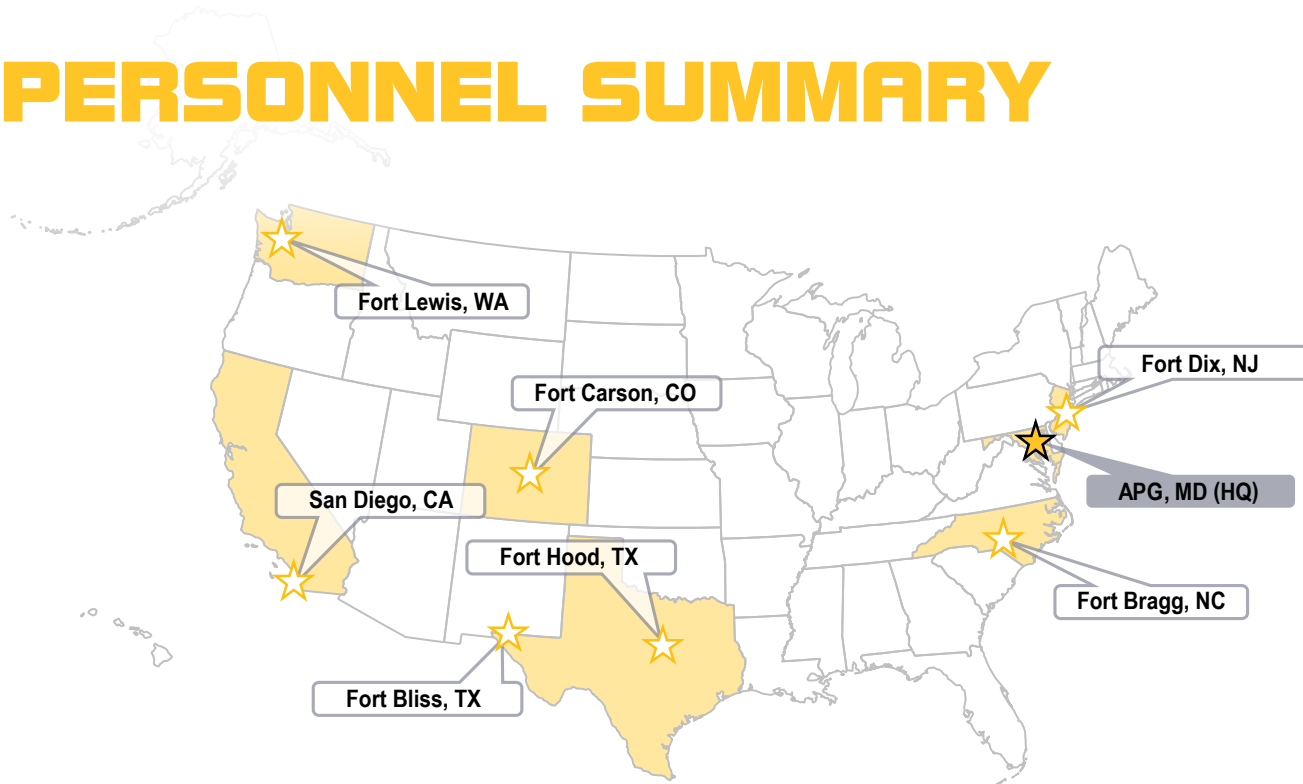

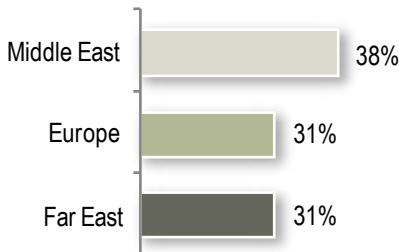Claudia DeCarlo accepts the charter as the new Product Director of MilTech Solutions

Army receives approval to proceed to full rate production and fielding of Warfighter Information Network-Tactical (WIN-T) Inc 2
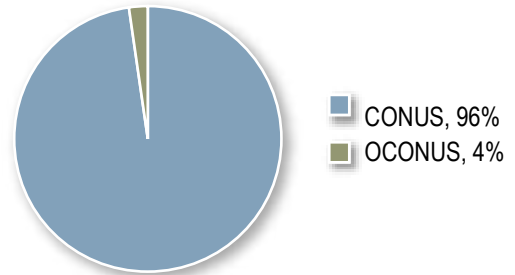
PERSONNEL SUMMARY

Fort Lewis, WA

Fort Carson, CO

Fort Dix, NJ

San Diego, CA

APG, MD (HQ)

Fort Hood, TX

Fort Bragg, NC

Fort Bliss, TX

WORLDWIDE PERSONNEL LOCATIONS (OCONUS):

Middle East	38%
Europe	31%
Far East	31%

PERCENTAGE

- CONUS, 96%
- OCONUS, 4%

PEO C3T Change of Charter from MG Daniel P. Hughes to Mr. Gary Martin

Marne Focus training exercise at Ft. Stewart, Ga. with the 2nd Brigade Combat Team/3rd Infantry Division (2/3 ID) using Joint Battle Command-Platform

CAPT Kevin R. Peterson retires, PM Joint Tactical Networking (JTN); JTN transitions to PM TR and PM WIN-T

WINT-T program granted Full Materiel Release for WIN-T Increment 2

PM TR welcomes Lt. Col. Monique N. Rivera as the new Product Manager Airborne, Maritime & Fixed Station
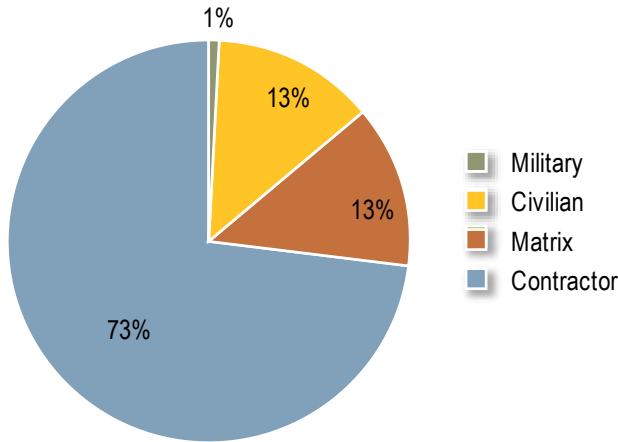
PEO C3T participates in panel discussions during Association of United States Army (AUSA) National Hot Topic seminar on Networks

PdM WIN-T Increment 1 Change of Charter from Lt. Col. Joel Babbitt to Lt. Col. Mark Henderson
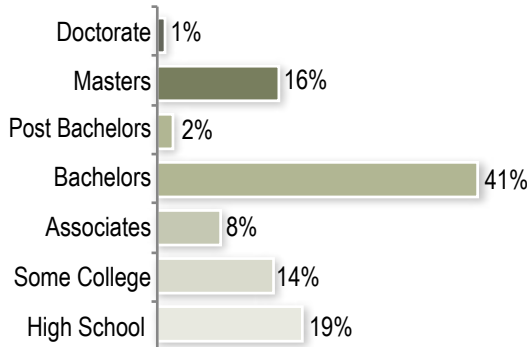
PERSONNEL BREAKDOWN

- 1%
- 13%
- 13%
- 73%

- Military
- Civilian
- Matrix
- Contractor

AVERAGE AGE OF WORKFORCE
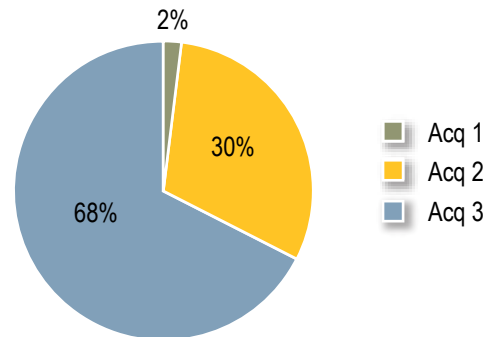
0 — 49 — 100

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 16%
- Post Bachelors 2%
- Bachelors 41%
- Associates 8%
- Some College 14%
- High School 19%

*Civilian Personnel only

2015 CERTIFICATION OF ACQUISITION PERSONNEL*

- 2%
- 30%
- 68%

- Acq 1
- Acq 2
- Acq 3

JULY

PM WIN-T Change of Charter from Col. Ed Swanson to Col. Greg Coile

The C4ISR community, led by CERDEC and supported by PEO C3T and PEO IEW&S, takes part in E15 a field based risk reduction event to validate integrated capabilities

AUGUST

PM MC, PD Main Battle Tank Systems, and PM Armored Fighting Vehicles are in the process of upgrading the Abrams, Bradley and other combat vehicles of the Brigade Combat Team

Request for Proposals (RFP) for full and open competition to procure additional Manpack Radios

SEPTEMBER

In support of NIE 16.1, 20th CBRNE Command teams train on PM WIN-T's Global Rapid Response Information Package (GRRIP)

Mobile User Objective System (MUOS) satellite launched from Cape Canaveral, Fl. The Army's Manpack radio is the first radio to be used with the MUOS waveform

Start up of NIE 16.1 and Bold Quest 15.2 at Ft. Bliss, Texas and White Sands Missile Range, NM

PROGRAM EXECUTIVE OFFICE COMMAND CONTROL COMMUNICATIONS-TACTICAL
HTTP://PEOC3T.ARMY.MIL

SOCIAL MEDIA WEBSITE:
HTTP://WWW.FACEBOOK.COM/PEOC3T

HTTPS://TWITTER.COM/PEOC3T

PEO★C3T
PROGRAM EXECUTIVE OFFICE COMMAND CONTROL COMMUNICATIONS-TACTICAL