NETWORKING THE SOLDIER

NETWORKING THE FORCE

The Army's Mission Command Network is a critical enabler for an expeditionary, agile, globally responsive force, delivering the power of information that allows us to quickly adapt to any contingency. Today, Mission Command Network equipment is supporting robust connectivity for our Soldiers in overseas operations, including Operated United Assistance, Operation Resolute Support, Operation Inherent Resolve, Operation Atlantic Resolve and Pacific operations.

A robust, secure, interoperable, intuitive network is a key enabler for Force 2025 and Beyond, providing operational flexibility and enhancing leaders' situational awareness in support of decisive mission command. The network is critical to connecting our forces and empowering our Soldiers and leaders with the right information at the right time to make decisions.

> FIELDING THE NETWORK

Network Capability Set (CS) systems provide mobile satellite, digital radio, and mission command capability for commanders and Soldiers to take the network with them in vehicles and while dismounted. They are comprised of tactical data radios, Warfighter Information Network-Tactical (WIN-T) systems and tactical mission command software and hardware applications, all supported by data products and cryptographic systems that help network stand-up and cyber security.

The Army began fielding the first Capability Set, CS 13, in October 2012. CS 13 subsequently deployed with Soldiers of the 10th Mountain Division and 101st Airborne Division (Air Assault), and supported the U.S. mission in Afghanistan by allowing Soldiers to share critical information over vast distances and challenging terrain, even as fixed network infrastructure was dismantled during U.S. and coalition retrograde operations. Recently, the Army fielded Capability Set equipment to 1st Cavalry Division HQ, elements of the 25th Infantry Division, 82nd Airborne, 2nd Infantry Division, 3rd Infantry Division and 1st Armored Division.

Even as the Army has prioritized select units for Capability Set fielding, we have not stopped fielding other updated network and mission command equipment to operational units. In 2016, 79 Active Component and Army National Guard units are scheduled to receive tactical network upgrades through the CS Fielding and Unit Set Fielding processes. These upgrades are key as the Army strives to increase connectivity, simplify mission command software and defend against cyber threats.

“THE ENHANCED SITUATIONAL AWARENESS GIVEN TO US BY THIS SUITE OF TECHNOLOGY HAS ALLOWED US TO MAINTAIN A ‘DIGITAL GUARDIAN ANGEL’ AS WE CONDUCT OUR MISSIONS.”

> THE NETWORK INTEGRATION EVALUATION

The Network Integration Evaluations (NIEs) are field exercises conducted in a realistic operational environment at Fort Bliss, Texas, and White Sands Missile Range, N.M. Using NIEs, the Army has integrated and assessed hundreds of government and industry systems, leveraging the Soldiers executing realistic mission threads including combined arms maneuver, counterinsurgency and stability operations.

Test data and Soldier feedback from the NIEs – each iteration building on results from the previous event – have enabled the Army to establish an integrated network baseline based on a combination of satellite-based communications and terrestrial networking radios. NIEs have not only allowed for Soldier-driven evaluations and assessments of network technologies, they have also aided the Army in development of Tactics, Techniques and Procedures for employing Capability Sets.

The Army has been making adjustments to the NIE construct since its inception in order to ensure that each NIE is the most effective for the Army. Beginning in FY16, the NIE will become an annual event that hosts integrated network assessments of mature program of record capabilities to include formal operational testing to meet strategic network objectives. The new Army Warfighter Assessment will take the place of the other semiannual NIE event and will be devoted to the evaluation of emerging capabilities in support of concept and requirements refinement and development.


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> NETWORK INTEGRATION AND TRAINING

A Capability Set is a tool kit of hardware and software technology that enable Soldiers to tailor the power of the Army's mobile tactical network. Capability Sets provide expeditionary, real-time information and mobile network hotspot connectivity that Soldiers need to plan and execute their mission whether they are at home station, in a command post, on the move in a tactical vehicle or dismounted.

Drawing on lessons-learned from the first units fielded with Capability Sets, the Army is establishing a Home Station Training Initiative to improve readiness and reduce the integration burden for units. It will leverage institutional sustainment training platforms such as Signal Universities, Mission Command Training Centers and Unit training events, as well as increasing the agility of New Equipment Training. This builds on the already established system of systems training concept that embraces instruction on integrated capabilities, leverages Soldier knowledge and creates an underlying familiarity with how the equipment supports operations. The system of systems training includes an overview course so commanders understand the network as an integrated combat multiplier and not just a collection of separate capabilities. It also includes "crew drills" that cross-train a collective crew on network systems to ensure an overall understanding. As systems continue to become more integrated, Digital Master Gunner courses will extend network capability training beyond Signal Soldiers to noncommissioned officers, system integrators, operators and more.

The right mix of technology and training will continue to evolve as the Army works to simplify the network, making it easier to use, train, maintain and sustain.

> SIMPLIFYING THE NETWORK

While today's tactical communications capabilities are giving commanders and Soldiers more information than ever, many systems are still too fragmented by functional area and not as intuitive as they could be for the user. Today's Soldiers expect the tactical network to provide the same seamless, intuitive experience as the communications devices they use in their everyday lives. The Army's priority is to simplify network and mission command capabilities to make it easier for Soldiers to get the information they need – anytime, anywhere, and on any device.

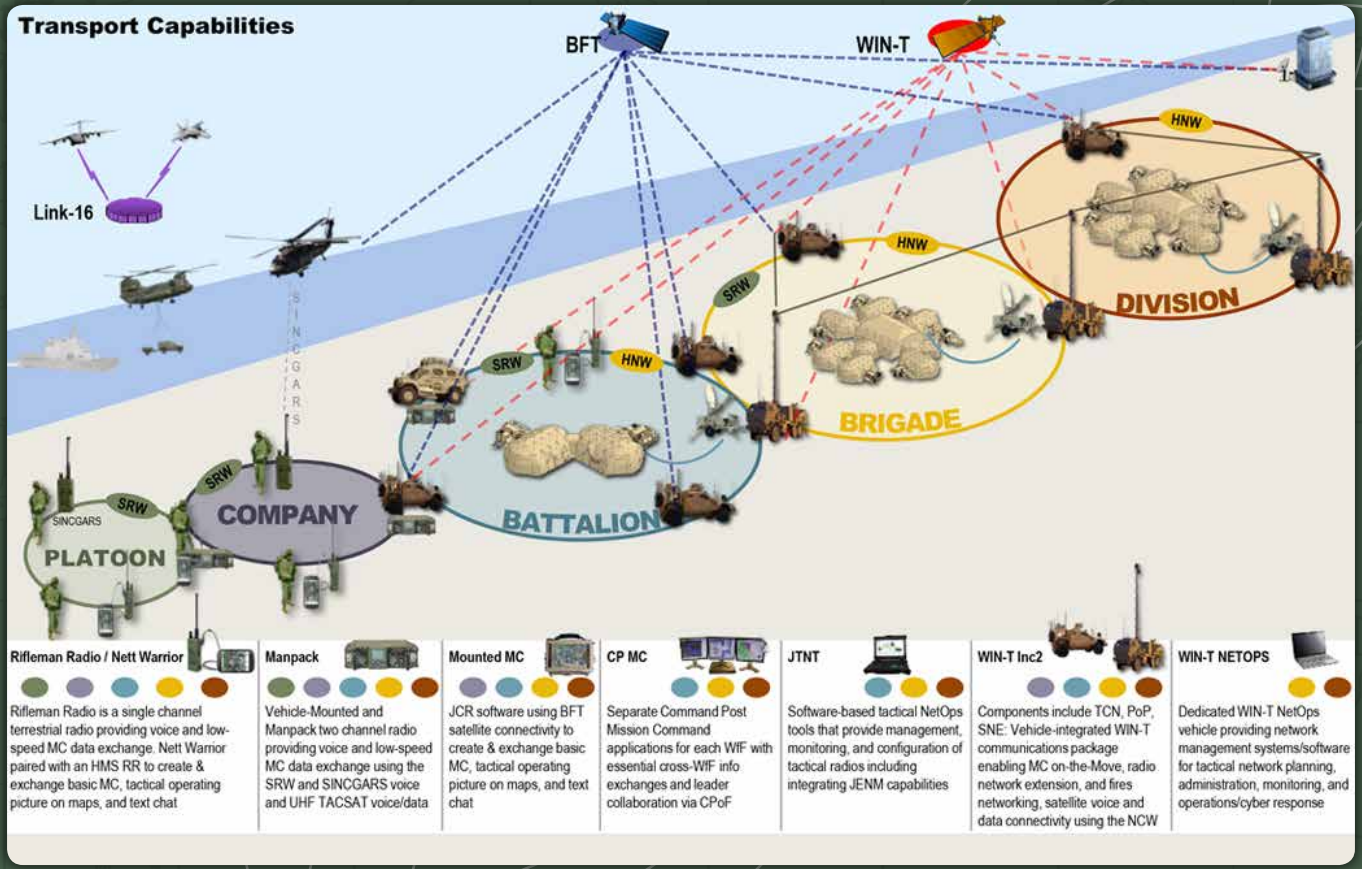
The Army's future Mission Command Network will continue to simplify and improve upon today's capability sets. It will standardize maps, messaging and icons to provide a unified user experience, as well as transition standalone mission command systems to a common web-based environment that delivers powerful warfighting systems as integrated apps. The future command post will be smaller, more mobile and more agile while still supporting mission command. Communications systems will be cyber hardened and interoperable with joint and coalition partners.

Aside from the operational benefits, simplifying the network will lead to cost savings by combining hardware and other infrastructure, reducing software development efforts and decreasing the number of field service representatives (FSRs) required to train Soldiers, troubleshoot systems and sustain the tactical network. The Army will continue phased modernization of network capabilities to help deliver a seamless user experience from the home station to the foxhole.


MOUNTAIN

> TODAY'S BASELINE MISSION COMMAND NETWORK

BFT: Blue Force Tracking
HNW: Highband Networking Waveform
J-TNT: Joint Tactical Networking Environment Network Operations Toolkit
MC: Mission Command
NCW: Network Centric Waveform
NOSC: Network Operations and Security Center
PoP: Point of Presence
SNE: Soldier Network Extension
STT: Satellite Transportable Terminal
TACSAT: Tactical Satellite
TCN: Tactical Communications Node


Transport Capabilities
BFT
WIN-T
Link-16
SINCGARS
HNW
SRW
DIVISION
BRIGADE
BATTALION
COMPANY
PLATOON
SINCGARS
Rifleman Radio / Nett Warrior
Rifleman Radio is a single channel terrestrial radio providing voice and low-speed MC data exchange. Nett Warrior paired with an HMS RR to create & exchange basic MC, tactical operating picture on maps, and text chat
Manpack
Vehicle-Mounted and Manpack two channel radio providing voice and low-speed MC data exchange using the SRW and SINCGARS voice and UHF TACSAT voice/data
Mounted MC
JCR software using BFT satellite connectivity to create & exchange basic MC, tactical operating picture on maps, and text chat
CP MC
Separate Command Post Mission Command applications for each WIF with essential cross-WIF info exchanges and leader collaboration via CPoF
JTNT
Software-based tactical NetOps tools that provide management, monitoring, and configuration of tactical radios including integrating JENM capabilities
WIN-T Inc2
Components include TCN, PoP, SNE: Vehicle-integrated WIN-T communications package enabling MC on-the-Move, radio network extension, and fires networking, satellite voice and data connectivity using the NCW
WIN-T NETOPS
Dedicated WIN-T NetOps vehicle providing network management systems/software for tactical network planning, administration, monitoring, and operations/cyber response

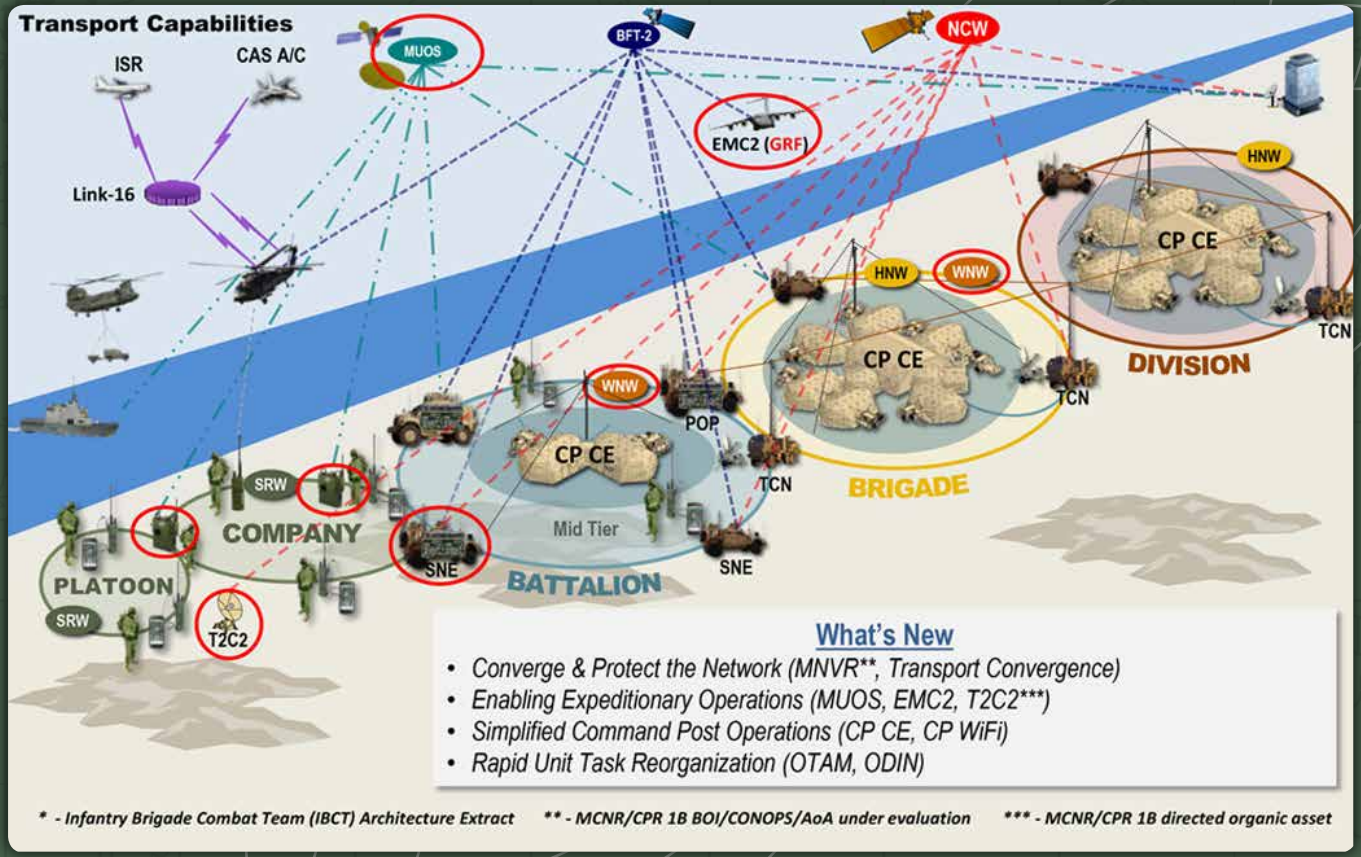
> CAPABILITY SET 17/18: WHAT'S NEW

Thickening & Healing the Network	Enabling Expeditionary Operations	Simplified Command Post Operations	Rapid Unit Task Reorganization
Mid-tier Networking Vehicular Radios (MNVR)	**En-route Mission Command Capability (EMC2)*, Mobile User Objective System (MUOS), Transportable Tactical Command Communications (T2C2) Lite****	**CP WiFi***, Common Operating Environment (COE) v1.1, Homestation Mission Command**	**OTA Management, On-Demand Information Networking (ODIN)**
			
Two-channel, vehicle-integrated radio providing medium-speed data connectivity that links lower and higher echelon terrestrial networks through a Mid-Tier network using Wideband Networking Waveform (WNW)	**EMC2**: Transport plane-integrated communications package providing Mission Command applications & infrastructure and Beyond Line of Sight (BLOS) satellite connectivity for continuous, in-transit, mission command synchronization from garrison to theater **MUOS:** Satellite voice and low-speed data connectivity for disconnected users **T2C2 Lite**: Small-form factor satellite communications package providing voice and medium speed data connectivity to small company and team sized units in the early phases of joint operations.	**Command Post (CP) WiFi:** Secure commercial-based wireless local area network devices to simplify Command Post setup and operations **CP CE v1.1**: Command Post Mission Command Computing Environment that converges on common server infrastructure, uses universal clients, and delivers some mission command services via web browser-based widgets **Homestation Mission Command**: Standardized Installation as a Docking Station (IAADS) capabilities and an initial, Net-Enabled Integrated Training Environment (ITE) to the tactical edge	Software-based NetOps tools and integrated design to enable over-the-air (OTA) reconfiguration of tactical radios and the warfighter to join radio networks on demand (On Demand Information Networking (ODIN)) enabled by implementation of the Mounted Computing Environment

** Fielding planned for GRF units in this timeframe*

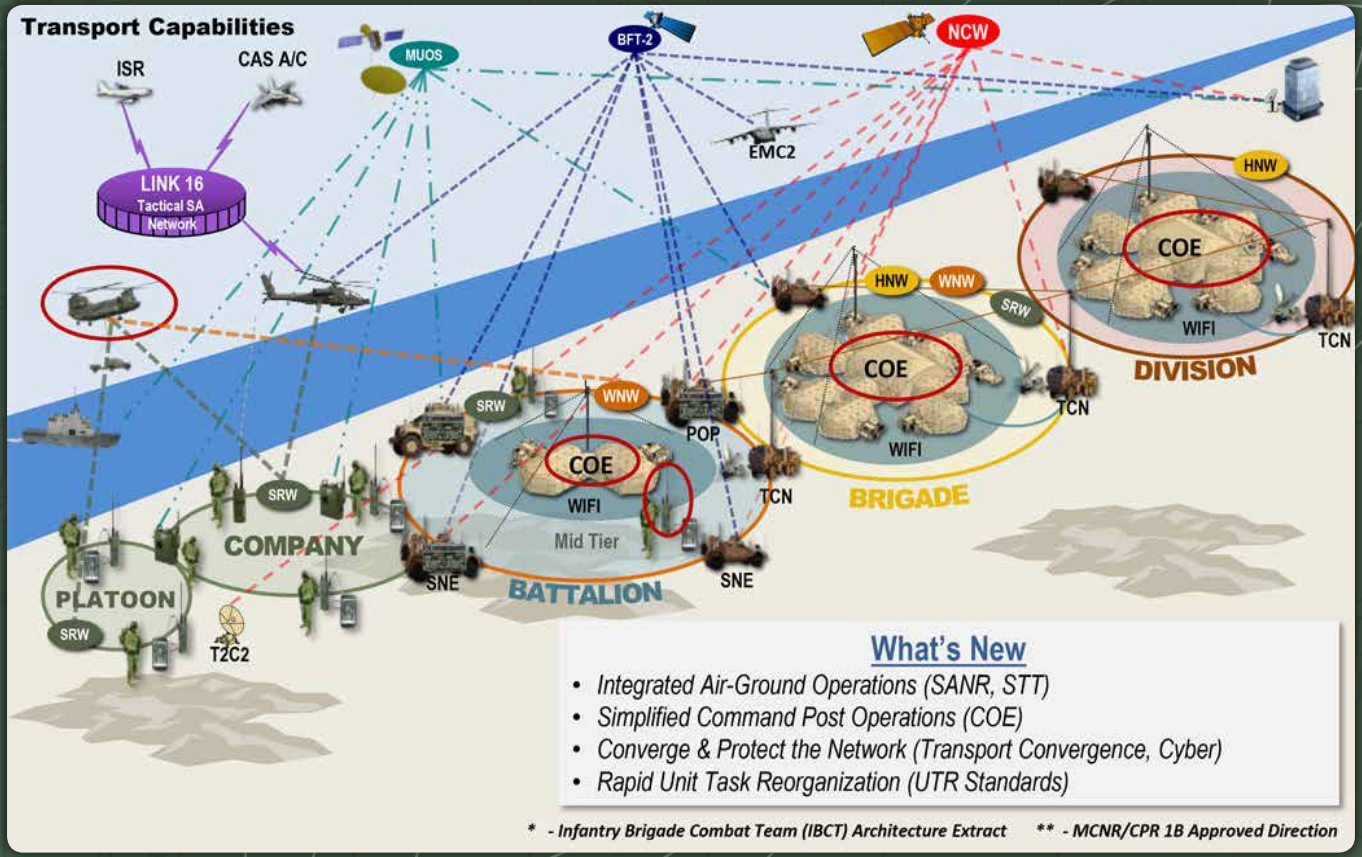
*** Fielding planned for select BCTs in this timeframe*

**** Fielding planned for WIN-T Inc 1 units in this timeframe*


Transport Capabilities
ISR
CAS A/C
Link-16
MUOS
BFT-2
NCW
EMC2 (GRF)
HNW
WNW
CP CE
TCN
DIVISION
POP
BRIGADE
SRW
COMPANY
Mid Tier
SNE
BATTALION
PLATOON
T2C2
What's New
• Converge & Protect the Network (MNVR**, Transport Convergence)
• Enabling Expeditionary Operations (MUOS, EMC2, T2C2***)
• Simplified Command Post Operations (CP CE, CP WiFi)
• Rapid Unit Task Reorganization (OTAM, ODIN)
* - Infantry Brigade Combat Team (IBCT) Architecture Extract
** - MCNR/CPR 1B BOI/CONOPS/AoA under evaluation
*** - MCNR/CPR 1B directed organic asset

> CAPABILITY SET 20: WHAT'S NEW

Integrated Air-Ground Operations	Rapid Unit Task Reorganization (UTR)	Simplified Command Post Operations
Small Airborne Networking Radio (SANR)	**UTR Standards and Tools**	**COE v3, Homestation Mission Command**
		
Multi-channel, aviation platform-integrated radio connecting air platforms to terrestrial networks using the Wideband Networking Waveform (WNW) for data (e.g., telemedicine) and Soldier Radio Waveform (SRW) or legacy SINCGARS for voice or data connectivity	NetOps architectural standards and software-based tools to simplify planning and initialization of mission command network capabilities	**COE v3**: Mission Command applications converge across Command Post and Mounted environments, providing a consistent look-and-feel with a common geospatial foundation with a majority of mission command services accessible via widgets **Homestation Mission Command**: Standardized IAADS broadly deployed and fully implemented Net-Enabled Integrated Training Environment to the tactical edge


Transport Capabilities
ISR
CAS A/C
LINK 16
Tactical SA
Network
MUOS
BFT-2
NCW
EMC2
HNW
COE
WIFI
TCN
DIVISION
HNW
WNW
SRW
COE
WIFI
TCN
BRIGADE
SRW
WNW
POP
COE
WIFI
Mid Tier
TCN
SNE
SNE
BATTALION
SRW
COMPANY
PLATOON
SRW
T2C2
What's New
• Integrated Air-Ground Operations (SANR, STT)
• Simplified Command Post Operations (COE)
• Converge & Protect the Network (Transport Convergence, Cyber)
• Rapid Unit Task Reorganization (UTR Standards)
* - Infantry Brigade Combat Team (IBCT) Architecture Extract
** - MCNR/CPR 1B Approved Direction

KEY NETWORK CAPABILITY SYSTEMS

WIN-T INCREMENT 1

Warfighter Information Network-Tactical (WIN-T) Increment 1 is the Soldier's current and future expeditionary internet, extending the tactical communications network and providing high speed voice, data, and video communication to the force at-the-quick-halt. More than 90 percent of the tactical Army is currently fielded with WIN-T Increment 1. As part of the Army's continued network modernization efforts and to support changing mission requirements, ongoing improvements continue to be made to the system. These upgrades include WIN-T Increment 1b, Network Operations upgrades, and the Tactical Network Upgrades, which improve the security and efficiency of the network and improve interoperability between users of WIN-T Increment 1 and Increment 2 equipment.

WIN-T Increment 1 has three types of transportable network nodes that provide high-speed network capability for secure voice, video and data exchange: the Tactical Hub Node (THN), Joint Network Node (JNN), and Battalion Command Post Node (BnCPN). The THN supports division headquarters, the JNN supports brigade level headquarters, and the BnCPN supports battalion level headquarters. The fourth type of node, the Regional Hub Node (RHN), is a regionally aligned fixed installation equivalent to three THNs that provides reach back capability in support of theater based operations. The Satellite Transportable Terminal (STT) is a highly transportable and mobile satellite access system, which operates in conjunction with the JNN and BnCPN by providing the transport necessary to establish secure voice, video and data communications virtually anytime and anywhere.


“WIN-T INCREMENT 2 ALLOWS US TO BE ON-THE-MOVE AND CONTINUE TO PASS MISSION COMMAND DATA TO LEADERS. IT ENHANCES OUR ABILITY TO BE MANEUVERABLE AND ACCOMPLISH THE MISSION.”

> WIN-T INCREMENT 2

WIN-T Increment 2, first fielded with CS 13, is a major upgrade to WIN-T Increment 1, enabling mobile mission command, advanced communication and a 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, with the situational awareness needed to conduct rapid operations across great distances. WIN-T Increment 2 also extends satellite communications to the company level, so the Soldiers closest to the fight have greater connectivity than ever before, and Soldiers can retrans FM networks over satellite without range limitations to extend operational range even further. Additionally, the WIN-T Inc 2 network improves the speed and reliability of the fires network, extending network range and increasing survivability for artillery units.

The Army continues to enhance WIN-T Inc 2 capability to improve system reliability, simplicity and usability. Current enhancements include the reduction of size, weight and power requirements of the Tactical Communications Node (TCN) and the Network Operations and Security Center (NOSC), which provide network connectivity and Network Operations (NetOps) capabilities to the command post. The Army will integrate the new TCN and NOSC Lites on HMMWVs in support of airborne units' transport and expeditionary requirements. The Army is also introducing the Rapid Vehicle Provisioning System (RVPS), which configures and installs needed software into a brigade's networked vehicles to significantly reduce install time. Additionally, the Army continues to enhance and simplify WIN-T NetOps to make it easier for communications officers to manage the network.

SATCOM

The Army's global array of Satellite Communications (SATCOM) capabilities provides high-speed, high-capacity connectivity, so Soldiers can communicate across vast distances in austere locations and restrictive terrain, at any stage of operations. Ranging in size from carry-on luggage that early entry teams can employ in minutes, to a small house that ties major headquarters elements into more robust strategic and tactical networks, the Army's SATCOM terminals provide Soldiers with assured and reliable communications throughout the world, leveraging both commercial and military satellite constellations for optimum connectivity and efficiency. Most of the SATCOM systems in the portfolio support and complement the Army's tactical WIN-T network and architecture.

A new duo of light-weight, portable satellite terminals, called Transportable Tactical Command Communications (T2C2), will provide early entry units in air-to-land missions, as well as follow-on units at the tactical edge, with a lite (v1) and heavy (v2) variant of high-bandwidth, deployable satellite dishes, to keep Soldiers and Commanders connected to the network and well informed, no matter where the mission may take them. The low rate initial production solutions of T2C2 are inflatable satellite antennas that can be jumped or air-dropped from a plane, and because they are inflatable, they can provide a larger dish size with increased capability and bandwidth efficiency in a smaller package.

> EN ROUTE OPS AND AGILE COMMAND POSTS

By bridging the information gap between home station, en route and deployed environments, the Army will be able to fight on arrival and quickly adapt communications systems to fit changing conditions. For example, the Army's new Enroute Mission Command Capability (EMC2) enables commanders of Global Response Force (GRF) units to plan missions while onboard an aircraft, while their Soldiers receive operational updates and watch full motion video of upcoming drop zones before their parachutes ever open. EMC2 enables in-flight connection to the WIN-T network backbone so they can stay current with changes on the ground and adjust their plan accordingly.

The Army is also simplifying its command post configurations and reducing setup and teardown time for increased unit agility. Currently, brigade command posts require extensive amounts of cable that have to be transported, laid out, bundled and plugged into servers. Recently introduced Wi-Fi coverage for the command post removes a multitude of those cables and allows Soldiers to roam from their computers so they can be more effective. Also supporting more agile command posts is the consolidation of mission command systems and servers, as well as the ability to virtualize hardware components, so that a physical piece of hardware becomes a weightless piece of software.

COMMAND POST COMPUTING ENVIRONMENT

As a component of the Army's Common Operating Environment (COE) strategy, the Command Post Computing Environment (CP CE) gives commanders a consolidated warfighting picture on a singular workstation, enhancing their ability to make rapid adjustments according to the combat situation.

The CP CE expands access to the Common Operating Picture (COP), enhances coordination within and across command posts, vehicles and handheld devices and begins to transition Operations/Intelligence (Ops/Intel) convergence on a single hardware environment. By consolidating the capabilities for missions related to fires, logistics, intelligence, airspace management and maneuver into a single, intuitive environment, CP CE will enable a significant reduction in unique system hardware and software by leveraging integrated maps, chat and other services.

CP CE also converges Ops/Intel software onto a common server platform known as the Tactical Server Infrastructure (TSI), which enables more resources to each echelon. Running on the Ozone Widget Framework, web-enabled applications (widgets) increase situational understanding and allows the Army to develop and field interoperable applications. Progressing to integrated, lightweight capabilities enables expeditionary operations and improves the Soldier experience.

JOINT BATTLE COMMAND-PLATFORM

Joint Battle Command-Platform (JBC-P) is the Army's latest incarnation of the widely fielded mounted friendly force tracking system known as Force XXI Battle Command Brigade-and-Below/Blue Force Tracking (FBCB2/BFT). Fielding for JBC-P began in January 2015. By displaying blue and red icons over a digital map, FBCB2, the interim Joint Capabilities Release (JCR) and now JBC-P provide lifesaving situational awareness information to Soldiers deployed worldwide.

JBC-P upgrades include a Google Earth-like interface and real-time chat rooms so that Soldiers can now quickly zoom in to view precise locations, use icons to pinpoint improvised explosive devices on a map, and use instant messaging to call for medics. It also brings a faster satellite network, secure data encryption and Marine Corps interoperability. JBC-P is the foundation for the Mounted Computing Environment (MCE), which is a component of the Army's Common Operating Environment (COE) strategy. As part of the MCE implementation, the Mounted Android Computing Environment (MACE) enables the rapid development of apps that work seamlessly across handhelds, radios, tactical vehicles and the command post.

> TACTICAL RADIOS

RIFLEMAN RADIO

A lightweight, rugged, hand-held radio enabling dismounted Soldiers to exchange voice and data via the Soldier Radio Waveform (SRW). The radio connects with smartphone-like Nett Warrior devices to transmit text messages, PLI and other data.

HMS MANPACK

The two-channel, software defined HMS Manpack radio provides line-of-sight/beyond line-of-sight communications through current and future higher bandwidth waveforms, enabling connectivity at the lowest echelons.

SINCGARS

The primary radio the Army uses for voice communications in the field today. With configurations including manpack, vehicular (both low and high power), and airborne models, more than 500,000 SINCGARS have been fielded.

AN/PRC 117G

A wireless voice and data radio that allows troops to exchange large amounts of tactical data, such as video and biometrics. The radio can support small-unit operations and connect the tactical edge with forces at company level and above.

SOLDIER RADIO WAVEFORM APPLIQUÉ

A single channel, vehicle mounted radio running the SRW that can be installed into the SINCGARS CNR vehicular mount. SRW Appliqué radios act as a conduit for voice and data between the dismounted Soldier, his unit and higher headquarters.

MNVR

A vehicle-mounted radio that provides a new, critical link between the lower tier of the tactical network at the company level and below with the upper tier at battalion and brigade, providing increased terrestrial bandwidth using the Soldier Radio Waveform and Wideband Networking Waveform.

“WE USED THE RADIO LAST WEEK DURING PATROL, AND WE WERE ABLE TO MARK AN IMPROVISED EXPLOSIVE DEVICE LOCATION, WHICH SHOWED UP ON EVERYONE’S SCREEN.”

> NETT WARRIOR

The Nett Warrior (NW) is an integrated dismounted leader situational awareness (SA) system for use during combat operations. The NW, an Android-based, smartphone-like capability, can be linked to the Army's Rifleman Radio and enables Soldiers to securely send text messages and photos, access mission-related applications and track one another's locations with Global Positioning System (GPS) technology. The Nett Warrior provides unparalleled SA to the dismounted leader, allowing for faster and more accurate decisions to the tactical fight. With advanced navigation, SA and information sharing capabilities, leaders can avoid fratricide and are more effective and lethal in executing combat missions.

The NW program focuses on the development of the SA system, which has the ability to graphically display the location of an individual leader's location on a digital geo-referenced map image. Additional Soldiers and leader locations are also displayed. NW is connected through a secure radio that sends and receives information from one NW to another, thus connecting the dismounted leader to the network. These radios also connect the equipped leader to higher echelon data and information products to assist in decision making and situational understanding.

All of this allows the leader to easily see, understand and interact in the method that best suits the user and the particular mission. NW will optimize and integrate capabilities while reducing the Soldier's combat load and logistical footprint.

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