

WIN-T

THE MOBILE,
EXPEDITIONARY
SOLDIER'S
NETWORK

WARFIGHTER INFORMATION NETWORK-TACTICAL



GENERAL DYNAMICS
Mission Systems

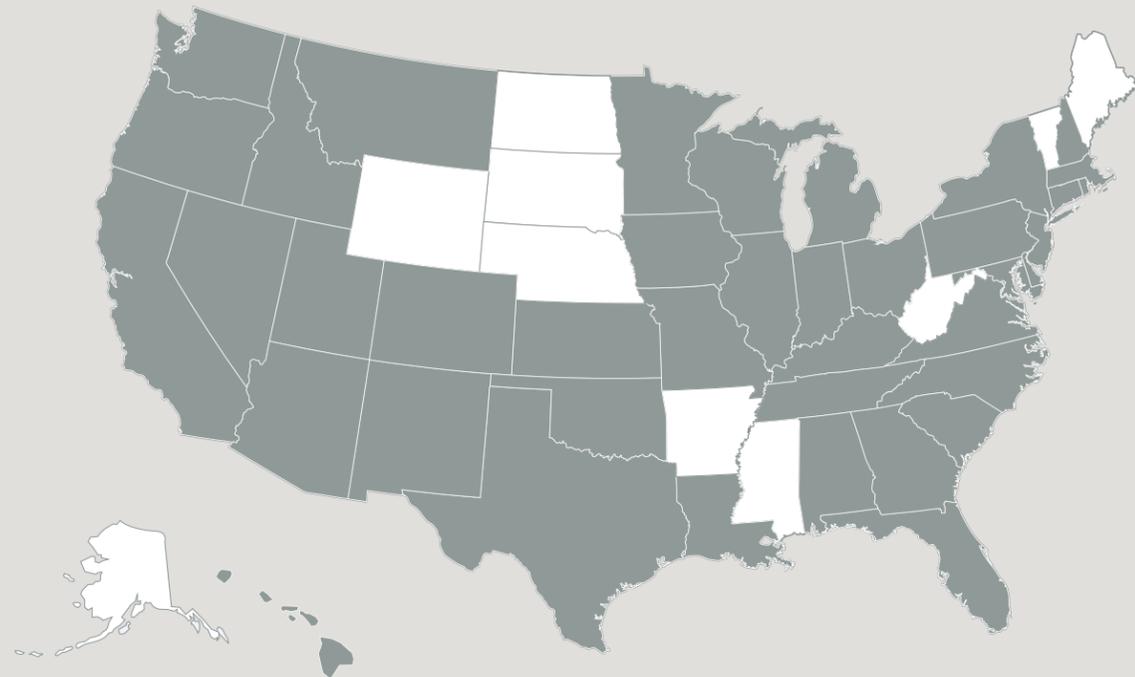
THE SOLDIER'S NETWORK



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MARCH 2017 RELEASE

WIN-T NATIONAL SUPPLIER NETWORK



MORE THAN
400
SUPPLIERS

192
CONGRESSIONAL
DISTRICTS

MORE THAN
\$690
MILLION SPENT
IN 2015-16

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LETTER TO THE READER

Dear Reader,

June 2015 was an inflection point in the history of the Army Warfighter Information Network-Tactical (WIN-T) program, as it marked when the Army received approval for full-rate production and fielding of WIN-T Increment 2 capabilities.

Army personnel require access to critical information from the moment they climb on board a C-17, parachute out, establish early-in operations, secure the area and begin their mission. WIN-T Inc. 2 is the connective tissue that protects soldiers, connects them to real-time information, keeps commanders informed and shifts the advantage decisively to our men and women in uniform.

Thousands of soldiers have had the opportunity to use Inc. 2 capabilities in Iraq, Afghanistan, Western Europe, Africa and at Army training centers across the country. Their feedback has led to the reduction of overall system complexity as well as improvements that make the system easier to use. For example, some of the system's communications functions are similar to the way we use a smartphone at home to access a map, text with a friend and share family pictures. These improvements help the soldier fight extremely effectively, as well as take advantage of commercial wireless and broadband technologies that reduce system size, weight and power needs, as well as overall cost.

Since that decision, tremendous progress has been achieved in fielding Inc. 2 capabilities. Today, 13 brigade combat teams and seven division headquarters have received these capabilities. The Army is currently testing new and improved versions of two key WIN-T capabilities. Integrated on HMMWVs instead of five-ton FMTVs, both the Tactical Communications Node-Lite (TCN-L) and the Network Operations and Security Center-Lite (NOSC-L) feature a greatly reduced footprint and improved transportability for expeditionary operations (C-130 roll-on/roll-off and CH-47 sling loadable). The TCN-L and NOSC-L provide the same networking and network management capability to command posts while reducing the complexity to install, operate and maintain the Army's mobile tactical communications network.

We reached another key milestone in the fielding cycle as the NextGen PoP/SNE nodes completed their Critical Design Review. These platforms feature increased capabilities and reduced size, weight and power. The program is also working with other acquisition community offices on integrating Inc. 2 capabilities into armored units. More units are on track to receive Inc. 2 capabilities in 2017, including the first unit in the National Guard.

Our continued progress depends on the robust partnership between the entire Army and the nationwide network of suppliers that puts this life-saving, force-multiplying network communications capability into the hands of soldiers and their commanders. Given the changing threats confronting our nation, now is the time to accelerate the fielding of these critical capabilities and achieve the full potential of mobile networked combat forces for expeditionary operations.

In the following pages, you can read more about how the WIN-T network improves combat readiness by increasing a unit's ability to shoot, move and communicate. You will learn firsthand that WIN-T is the foundational network modernization program that enables the warfighter to win in the most dynamic and dangerous operational environments.

Sincerely,

CHRIS MARZILLI
President
General Dynamics Mission Systems

PROVEN & READY

“In a future battlefield, if you stay in one place longer than two or three hours you will be dead. I can guarantee you the days of Victory Base, the days of Bagram or other static places for comfort or command and control, will not exist on a future battlefield against a high-end threat.”

— GENERAL MARK A. MILLEY, ARMY CHIEF OF STAFF, OCTOBER 4, 2016



SUPPORTING THE SOLDIER

From combat operations in Iraq and Afghanistan, to deployments in Korea and Europe, to humanitarian operations in West Africa, WIN-T provides soldiers and commanders a scalable, expeditionary and mobile network capability that supports the Army's goal of uninterrupted mission command at every stage of an operation.

WIN-T is the Army's network connectivity backbone, providing commanders with a toolkit of capabilities that will support every mission in a continuously changing and complex world.

The Army needs lighter, more mobile command communications capabilities that securely connect soldiers with uninterrupted global access to timely combat information and situational awareness. WIN-T is always on to provide integrated mobile network services that are quickly deployable to the most remote locales and toughest conditions. In the budget-constrained environment facing our Army, WIN-T overcomes the challenges of a smaller force by delivering information to soldiers at all levels of command, keeping the most current operational details and intelligence flowing to maneuver forces so that they can shoot, move and win.

A WIN-T-equipped Stryker at the National Training Center at Ft. Irwin, CA.



WARFIGHTER INFORMATION NETWORK-TACTICAL

WIN-T provides commanders and soldiers an unprecedented ability to communicate and share information and intelligence while on patrol, with connectivity rivaling that found in a stationary command post. It continues to be the Army's secure communications network modernization priority.



WIN-T-equipped HMMWVs.

The WIN-T network is the first of its kind, giving soldiers voice and data service on the move and providing unique situational awareness and communications capabilities—enabling them to make faster, more informed decisions from anywhere on the battlefield. WIN-T gives soldiers the ability to pass information back and forth seamlessly with improved cybersecurity protection—from the company commander in the operating environment to the division and higher echelons—enabled in part by the system's unique satellite communications' on-the-move capability. As the Army moves toward an expeditionary force in the face of a constrained budget environment, the seamless information distribution enabled by WIN-T ensures soldiers at all levels are better informed than our enemies—no matter the environment our soldiers face. Full-rate production of Inc. 2 was approved in June 2015 following the successful fielding of WIN-T Inc. 1.

FIELDING WIN-T TO SERVE A GLOBAL FORCE

General Dynamics Mission Systems' engineering teams are working closely with Program Executive Office Command Control Communications-Tactical (PEO C3T) to upgrade technology, streamline the system to "work the way a soldier works" and provide information, agility and a decisive advantage on every mission.

INCREMENT 1: AT-THE-HALT

WIN-T Inc. 1 began fielding in 2004 to support combat missions during Operation Enduring Freedom and Operation Iraqi Freedom. Today, Inc. 1 is in use by the entire U.S. Army, National Guard and Army Reserve.

WIN-T is similar to most Americans' internet connections at home, but with critical security protections and the ability to connect in the most remote environments. Providing the Army's tactical force with secure high-speed, high-capacity voice, data and video communications "at-the-halt," Inc. 1 gives soldiers the ability to quickly communicate with their operations center.

With the introduction of WIN-T Inc. 1, soldiers on the battlefield had a digital high-speed, interoperable voice and data communications network down to the battalion level for the first time in history. Since the initial Inc. 1 fielding was completed, the program has delivered incremental upgrades, resulting in enhanced capabilities for Inc. 1-equipped units. A key partner in this process has been the Common Hardware Systems (CHS-4) program, which provides for the development of specialized and ruggedized hardware, including systems engineering expertise and turnkey warranty support.



A WIN-T Inc. 1 at-the-halt satellite terminal.

INCREMENT 2: ON-THE-MOVE

WIN-T Inc. 2 brings modernization and the power of the network to the Army in ways never seen before. Together, with soldiers and their commanders and in partnership with PM WIN-T, we are making WIN-T easier to use. WIN-T is becoming more agile and mission ready for both operations on the ground and in the next combat dimension—cyberspace.

WIN-T Inc. 2 delivers on-the-move communications, allowing commanders to use voice and data communications and mission command applications while mobile or at the immediate halt. These capabilities provide a new "digital reach" the Army has never before had in the operational environment, down to the company level. The 10th Mountain Division experienced this new capability in 2013. WIN-T Inc. 2's unique value was immediately recognized.

The Tactical Communication Nodes (TCNs) in Inc. 2 are a foundational building block in providing a mobile high-bandwidth infrastructure at a variety of security levels on the battlefield. When the TCNs are combined with Point of Presence (PoP) and Soldier Network Extension (SNE) nodes, WIN-T Inc. 2 enables mobile mission command from division to company in a mobile, ad hoc, self-forming, self-healing network using both line-of-sight and beyond line-of-sight transmission. The SNE can also be employed to heal and extend tactical radio networks, bridging ground communications for forces geographically separated or blocked by challenging terrain. The Network Operations and Security Center (NOSC) provides real-time operational, network and cyber security visibility, allowing commanders to plan, monitor and defend their assets in the prosecution of their mission.

Commanders and select staff now have the ability to maneuver anywhere on the battlefield and maintain network connectivity access to mission command applications, like CPoF, TiGR, BFT, chat and Voice over Internet Protocol (VoIP), without the need to stop and set up communications.

WIN-T Inc. 2 is currently integrated into Mine Resistant Ambush Protected (MRAP), High Mobility Multi-purpose Wheeled Vehicles (HMMWV) and Stryker vehicles and is capable of being inserted into future platforms such as AMP-V and JLTV. To date, seven division headquarters and 13 brigade combat teams have WIN-T Inc. 2. The system is currently deployed to Iraq in support of Operation Inherent Resolve and previously served Army units supporting Security Force Assistance Brigades in Afghanistan. In the summer of 2014, a mixed WIN-T Increment 1&2 network provided the "communications grid" for humanitarian operations responding to the Ebola epidemic in West Africa.

In today's challenging environment of emerging electronic warfare (EW) capabilities possessed by peer and near-peer adversaries, a mobile, ad hoc, self-forming, self-healing network that enables mission command down to the company level is an absolute necessity. Being able to securely talk, coordinate operational maneuvers and share data on the move is the first step in a multi-level effort to combating EW threats. WIN-T Inc. 2 delivers that capability.



A NOSC-L being carried in a slingload under a CH-47 Chinook during recent testing.

A WIN-T-equipped Stryker during a recent training exercise.



WIN-T INC. 2 GLOBAL FIELDING



WIN-T TIMELINE

The following timeline lists major milestones for the WIN-T program with regard to production, testing and deployment.

August 2004	Start of WIN-T Inc. 1 fielding (3 rd Infantry Division)
August 2007	WIN-T Inc. 2 development started
April 2009	WIN-T Inc. 2 limited user test completed (4 th Brigade Combat Team, 2 nd Infantry Division and 3 rd Infantry Division)
March 2010	First Inc. 2 Low Rate Initial Production approved by DoD
November 2011	Inc. 2 fielding started for test units (2 nd Brigade Combat Team, 1 st Armored Division and 101 st Airborne Division (Air Assault))
May 2012	First operational test completed
June 2012	WIN-T Inc. 1 fielding completed
September 2012	Inc. 2 begins fielding to operational units
June 2013	First Inc. 2 deployment (4 th Brigade Combat Team, 10 th Mountain Division and 101 st Airborne Division (Air Assault))
June 2015	Defense Acquisition Executive (DAE) and Army Acquisition Executive (AAE) approved WIN-T Inc. 2 Full Rate Production/Full Materiel Release
October 2015	WIN-T Inc. 2 supports coalition network, early entry airborne missions and expeditionary command posts at NIE 16.1
May 2016	NIE 16.2 features enhanced NetOps tools to simplify, harden and automate the network
August 2016	First TCN-L/NOSC-L systems featuring reduced SWaP and simplified operations begin test program. NextGen PoP/SNE nodes with increased capabilities and reduced SWaP complete Critical Design Review
December 2016	TCN-L and NOSC-L complete developmental testing at Ft. Campbell, KY
January 2017	TCN-L participates in FORSCOM Command Post Summit at Ft. Bliss, TX

MISSION AT HOME: WIN-T AND THE NATIONAL GUARD

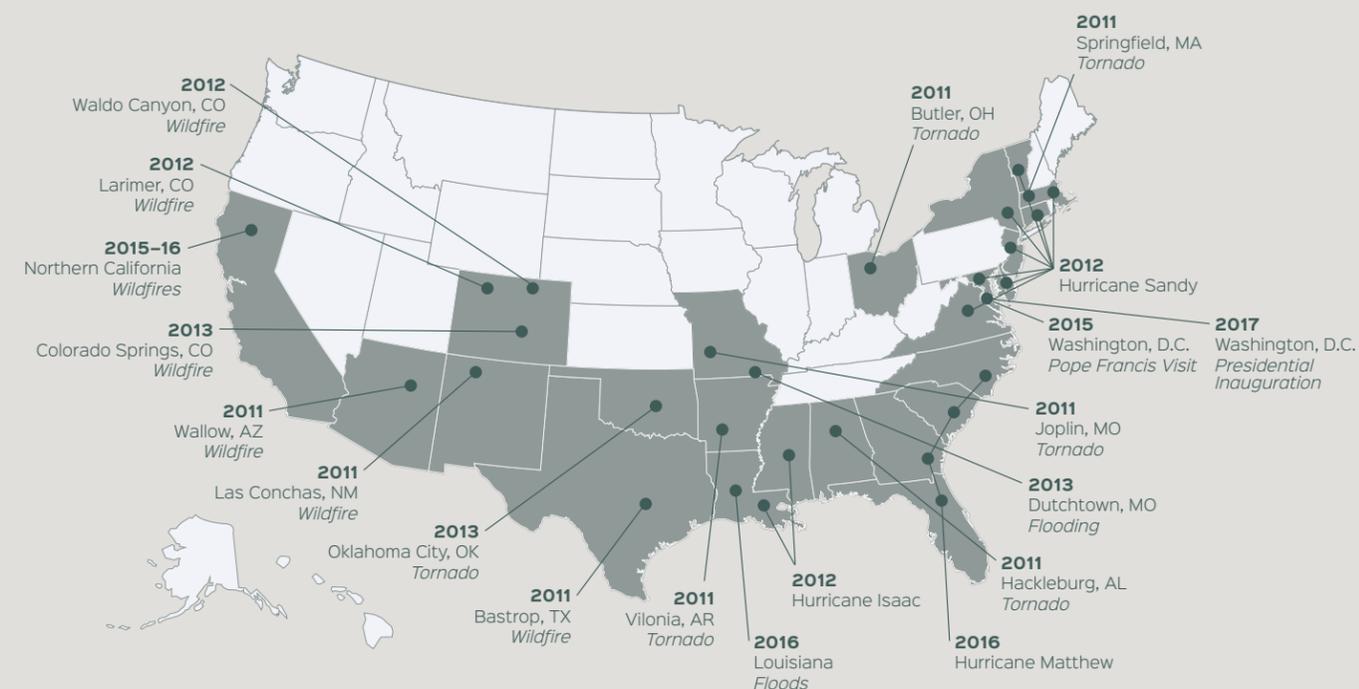
WIN-T Inc. 1 is fielded to the National Guard and supports both military and civil missions. While WIN-T was originally developed for overseas combat operations as a critical communications hub that establishes secure, high-speed, on-the-move network communications, it also serves a role in responding to domestic natural disasters and civil emergencies.

WIN-T was used in this capacity following Hurricane Sandy in October 2012. When power was lost and cellular and mobile communications were unavailable, WIN-T enabled law enforcement, first responders and military units to remain in constant contact, share data and collaborate while keeping communication over secure, dedicated military networks separate.

The Iowa National Guard will be the first National Guard brigade combat team to receive WIN-T Inc. 2 capabilities. The fielding, which is scheduled to occur in 2017, begins the process of extending to the National Guard the same scalable, expeditionary and mobile network capability as Active Component units.



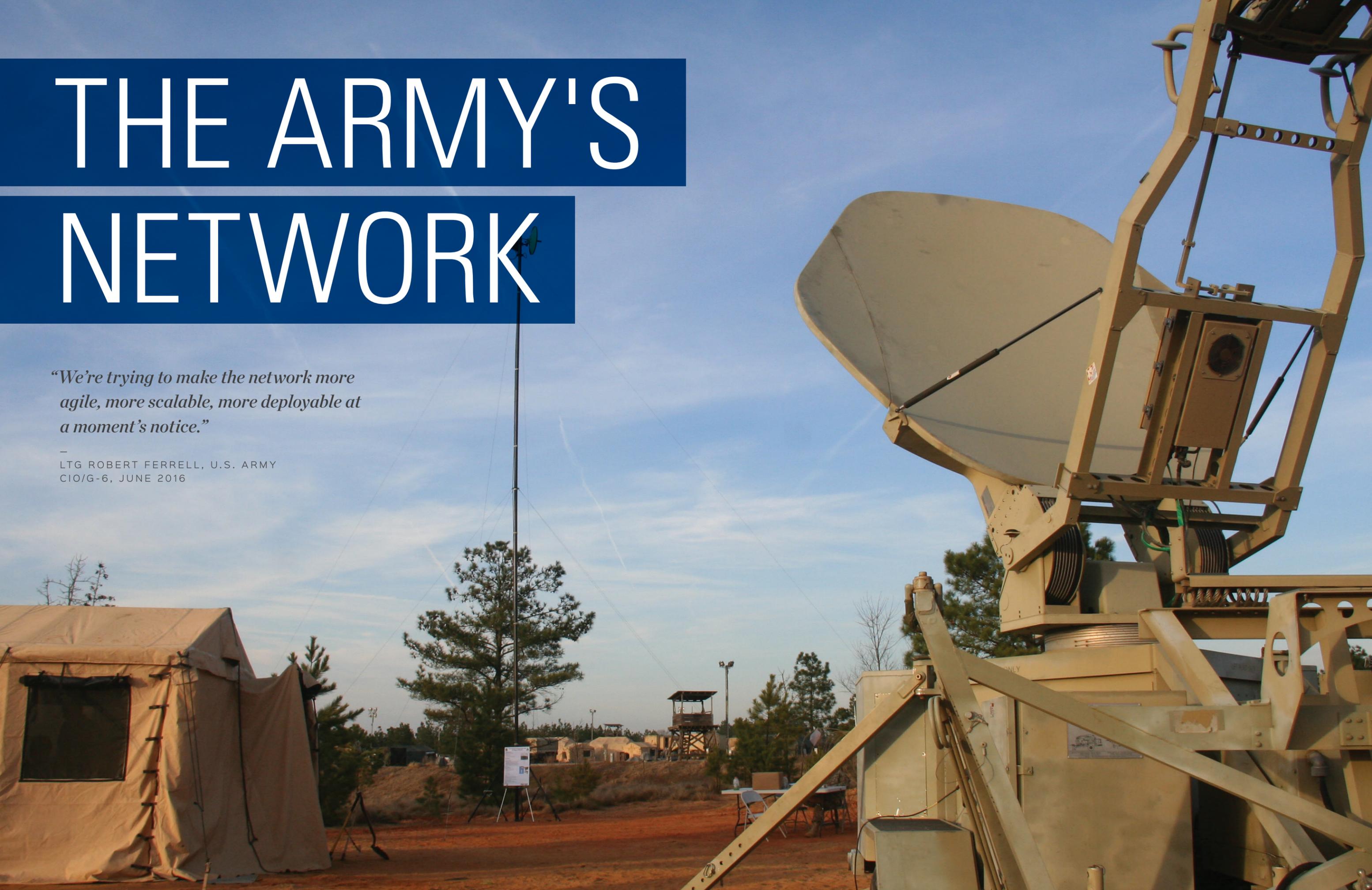
The National Guard responds to Hurricane Sandy in 2012



THE ARMY'S NETWORK

“We’re trying to make the network more agile, more scalable, more deployable at a moment’s notice.”

—
LTG ROBERT FERRELL, U.S. ARMY
CIO/G-6, JUNE 2016



ADVANCING CAPABILITY, STREAMLINING FUNCTIONALITY & REDUCING COST

General Dynamics Mission Systems is constantly working to refine and simplify our network product offerings to meet the evolving needs of the warfighter. By doing so, we are able to dynamically respond to the ever-shifting requirements of the battlefield.

REDUCING COST & INCREASING MISSION AGILITY

General Dynamics Mission Systems has streamlined a series of key technologies that integrate into WIN-T to create a single mission command system. The purpose of these efforts is to make these platforms easier to maintain, which in turn will increase the readiness posture of Inc. 2-equipped units. By incorporating feedback from soldiers and working with our own user experience experts, these enhanced capabilities feature a reduced footprint (fewer parts/cabling) as well as a simplified user experience that makes them easier to install, operate and maintain.

Some of the ways we are advancing capability and streamlining functionality while reducing cost include:

- > The Tactical Communications Node-Lite (TCN-L) and Network Operations and Security Center-Lite (NOSC-L), which are undergoing developmental testing, are now integrated on HMMWVs instead of five-ton FMTVs. Both platforms feature a greatly reduced footprint and improved transportability for expeditionary operations (C-130 roll-on/roll-off and CH-47 sling loadable). They will provide the same networking and network management capability to command posts while reducing the complexity to install, operate and maintain the network.

- > The NextGen Point of Presence (PoP) and Soldier Network Extension (SNE) nodes, which completed their Critical Design Review in August 2016, will result in a 45 percent reduction in the number of components, a 52 percent reduction in weight and a 30 percent reduction in the number of cables. For soldiers, this means improved reliability and simplified usability and platform integration.

- > These nodes also have enhanced user interfaces and a simplified user experience.

UPGRADING CURRENTLY FIELDDED UNITS

Updating WIN-T equipment currently being used by Army units in the field ensures all warfighters are able to achieve and maintain an information advantage in pursuit of mission objectives. Upgrading current WIN-T technology already in use will simplify operations for users and provide soldiers a more highly transportable network to achieve mission objectives. Ultimately, the network foundation created through these updates will enhance the Army's ability to be a global rapid-response force capable of flexible expeditionary deployments.

A CH-47 Chinook carrying a TCN-L in a slingload during recent testing.



FIELDING ENHANCED WIN-T CAPABILITIES

In today's complex environment with expanding threats, including electronic warfare and cyber, the WIN-T program must continue to evolve by fielding enhanced capabilities across the active and reserve components of the Army. In particular, these capabilities will improve the Army's ability to:

Shoot

WIN-T Inc. 2 enables joint fires to effectively strike targets and avoid fratricide while moving. It also enables maneuver units to coordinate joint fires from supporting forces on the move—avoiding the delays and vulnerabilities of establishing fixed command posts.

Move

WIN-T Inc. 2 provides the long-range command and control needed to synchronize combat power across multiple units with multiple offensive capabilities (artillery, unmanned assets, fixed and rotary wing aviation and joint supporting forces). Static command posts have demonstrated vulnerabilities, especially in an era of precision weapons and the escalating use of electronic warfare.

Communicate

Communication is vital to successful combat operations, not only to coordinate maneuver and fires, but to optimize the delivery of intelligence, logistics and support. WIN-T Inc. 2 allows commanders to communicate over vast distances far beyond line-of-sight, keeping the most current operational details and intelligence flowing to maneuver forces.

A WIN-T equipped HMMWV on the move.

EVOLUTION OF TCN & NOSC

Leveraging technology advancements such as virtualized routing and innovative packaging, the enhanced Tactical Communications Node-Lite (TCN-L) and the Network Operations and Security Center-Lite (NOSC-L) have been integrated on a HMMWV instead of the five-ton FMTV today's TCN and NOSC currently require.

Warfighters operating a TCN-L or NOSC-L will have access to simplified troubleshooting wizards as well as automated fault detection and correction to reduce the likelihood of operator error and decrease the frequency of maintenance. Automated fault detection and correction will combine with the smaller platform to reduce operator involvement and speed troubleshooting.

Both the TCN-L and NOSC-L feature a greatly reduced footprint and improved transportability for expeditionary operations (C-130 roll-on/roll-off and CH-47 sling loadable). Simplified user interfaces and task automation reduce the complexity to install, operate and maintain both nodes. Compared to the existing NOSC, the NOSC-L will see a 60 percent reduction in time and an 80 percent reduction in the steps required for start-up. The TCN-L will see a 30 percent reduction in time and a 70 percent reduction in the steps required for start-up compared to the current TCN.

These innovations will increase available deployment and operation locations and reduce maintenance costs. Warfighters using the TCN-L and NOSC-L will find the network easier to use, maintain and transport. Both the TCN-L and NOSC-L are scheduled to undergo operational testing in the summer of 2017. The successful completion of this testing will allow for full materiel release and for TCN-L and NOSC-Ls to be fielded to the wider Army.

INVESTING IN THE NEXT GENERATION OF NETOPS

The Army and its industry partners, led by General Dynamics Mission Systems, continue to invest in technology, research and development for simplifying and streamlining WIN-T Network Operations (NetOps) along with other software upgrades that improve the communications capabilities of the WIN-T network overall.

Setting the stage for the Army's network plan of 2025, converging NetOps into a single, simple and integrated solution will help soldiers learn network operations faster and make them more efficient in tactical situations. Improving network operations will also allow the Army to leverage commercial cyber and NetOps investments, enabling a protected expeditionary network and reducing network complexity while delivering enhanced capabilities to the field.

In 2017, the Army will see the results of these investments. WIN-T increased its cyber posture by transitioning to Risk Management Framework (RMF), which applies a more holistic, integrated approach to cyber security. The program will deploy updates to simplify, harden and automate network operations. This will reduce training time and increase system ease of use for soldiers.



A TCN-L (on left) represents a significant step forward in creating a more agile WIN-T network at reduced cost as compared to the initial TCN (on right). Integrated onto a HMMWV, a TCN-L provides complete TCN capability in a greatly reduced footprint and improved transportability for expeditionary operations (C-130 roll-on/roll-off and CH-47 sling loadable) while also reducing the complexity to install, operate and maintain the system. (Photo credit: General Dynamics)

The next generation of WIN-T will simplify and reduce the number of network management tools soldiers use to manage the WIN-T network. Cyber Defense and NetOps tools have been improved through human-centered design and open architecture solutions. These design processes will lead to simplified visualizations with a composable user interface. Such an interface will provide a variety of components that can be selected and assembled in various combinations to meet specific user requirements. The interface will provide a single operational view for the WIN-T network. NetOps reduces and automates tasks required to install, monitor, operate and defend the network.

Integrated NetOps achieve network visibility from the enterprise level to the tactical level. This simplifies Signal staff management and provides operational visibility, while also enabling network convergence.

ENHANCING THE USER EXPERIENCE FOR SOLDIERS

The latest WIN-T NetOps software incorporates substantial enhancements based on soldier feedback to simplify planning and management of the WIN-T network, automate processes and consolidate information and displays.

Simplification

A series of user studies and focus groups have been conducted to ensure NetOps software intuitively matches with soldiers' workflows, highlights critical troubleshooting information, such as directional antenna usage and supplies intelligent defaults to simplify complex planning processes. The new wizard-based process to request and plan Network Centric Waveform (NCW) SATCOM reduces the number of planning steps by 50 percent and simplifies the assignment of satellite resources. New context-sensitive troubleshooting aids assist node operators in tracking down and resolving network issues.

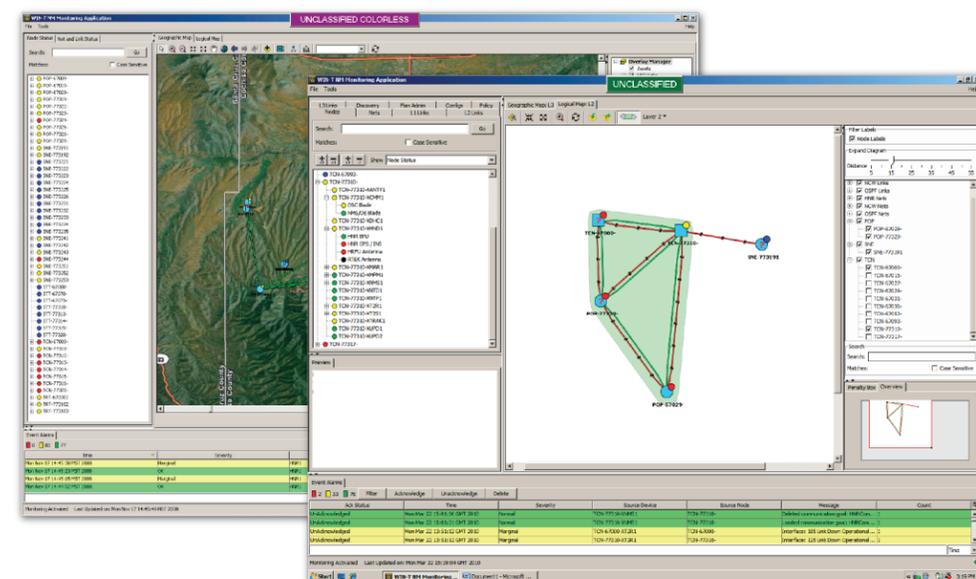
Automation

Other software improvements focus on automating complicated or repetitive soldier tasks: performing background calculations to accelerate radio frequency (RF) and other analysis, providing relevant recommendations to place radio relays to enhance and extend battlefield connectivity and automating the process of pointing the vehicles' Highband Networking Waveform (HNW) line-of-sight directional antenna—replacing a complicated manual process with a single click.

Consolidation

The third major theme of the NetOps enhancements is unification and consolidation of information from disparate domains to provide network situational awareness at a glance. Replacing a manual process of markers and whiteboards in the field, the web-based WAN Summary Board presents a common operational picture of network status and reachability information from multiple security enclaves consolidated via a secure guard, along with allowing users to keep track of vehicle identification and readiness information, such as bumper numbers or motor pool status. NetOps monitoring support has been expanded to include FDMA, TDMA and HCLOS terminals.

These NetOps enhancements provide WIN-T operators with an improved planning and management system that features increased ease of use, reduced steps to plan and configure the WIN-T network and a common, tailorable view of network assets and status.



WAN Summary Board consolidates information across security domains, replacing a manual whiteboard process.

NEXT GENERATION PoP/SNE

The Army's network in 2020 must provide leaders at all levels with access to all relevant combat information. The next generation of Point of Presence (PoP) and the Soldier Network Extension (SNE) will bring this vision to a reality by reducing the size, weight and complexity of individual components.

New technology will bring the suite of tools once confined to a command post onto a mobile, lightweight platform. Warfighters at the tactical edge and in tactical operations centers will have easy access to mission critical applications. Intuitive displays will show the status and availability of all other WIN-T assets, including available services. Commanders in the field will be able to tell at a glance what resources they have available.

Improvements to simplify and streamline the program will net a considerable decrease in the required number of cables and a significant reduction in the number of components, while also reducing overall cost and the frequency of maintenance. Having completed critical design review for the HMMWV platform and nearing the preliminary design review for integration into Stryker units, the next generation PoP and SNE is ready for introduction into IBCTs, SBCTs and National Guard units. The program is also working with other acquisition community offices on integrating next generation PoP and SNE nodes into armored units.

As a smaller, lighter, simpler and more affordable solution, the next generation PoP and SNE enhances functionality while providing more operational flexibility, especially for expeditionary units. PoP and SNE provide scalable solutions that will extend the network over the area where it is needed, both on-the-move and at-the-halt.



Recent WIN-T testing involved linking a coalition network over WIN-T so it can share information with our partner nations, enabling multiple nations to fight as one force.

WIN-T INC. 2 NEXTGEN PoP AND SNE: IMPROVES RELIABILITY AND SIMPLIFIES USABILITY & PLATFORM INTEGRATION

PoP AND SNE NETWORKING & COMPUTING ELEMENTS	% REDUCTION	FIELDED BASELINE	VIRTUALIZED SOLUTIONS & INTEGRATED HARDWARE	NEXTGEN BASELINE
NUMBER OF COMPONENTS	45%	LAN: ROUTING, SWITCHING, COMPUTING 	→	LAN: INTEGRATED COMPUTING ELEMENT
VOLUME	48%	WAN: ROUTING, SWITCHING, COMPUTING 	→	WAN: INTEGRATED COMPUTING ELEMENT
WEIGHT	52%	MODEM & TIMING 	→	MODEM & TIMING
POWER CONSUMPTION (AC/DC)	7%* <small>*ELIMINATES AC</small>	USER INTERFACE 	→	USER INTERFACE
NUMBER OF CABLES	~30%			

CYBER IMPROVEMENTS

WIN-T employs a layered security architecture, providing a cyber-resilient network to combat the emerging threat landscape and protect both soldiers and the mission. This capability provides Brigade Combat Team (BCT) and division networks with the cyber protection necessary to protect critical information before, during and after mission execution. Through the use of evolutionary and revolutionary technologies and capabilities, WIN-T provides the cyber defender with the appropriate information to rapidly detect and react to threats to the network. By shortening the "detect to react" cycle, soldiers are able to minimize the impact of any threats against the tactical network.

WIN-T employs the Risk Management Framework to assess and manage cyber security risks. Through this process, WIN-T continuously enhances the system's cyber posture through additional hardening measures tested with several independent events.

Emerging capabilities will allow the network to be more intelligent in how it protects itself, thus reducing the workload of the warfighter and allowing them to focus on mission execution. These capabilities will allow the defensive components of the network, including host-based, network-based and enterprise security management, to communicate seamlessly with each other. Signal staff is then alerted that a threat has been detected and acted upon by the system.

Advances in data analytics and visual presentation allow for the employment of a "Cyber Common Operational Picture" that provides the commander and their staff with a graphical depiction of the cyber posture of the unit. Cyber defenders are then able to drill down into lower levels of detail to hunt for adversaries attempting to penetrate the network.

At every node, WIN-T incorporates cyber protections to keep communications secure. Defensive firewalls are applied at every point in which WIN-T connects to DoD strategic networks (e.g., Secret Internet Protocol Router (SIPR)). At the mobile level, all user traffic is encrypted for transport through in-line encryptors at each node (i.e., individual vehicles with WIN-T capability). Routine updates to cyber defenses are conducted based on the Information Assurance Vulnerability Alert (IAVA) updates issued by U.S. Cyber Command.

Encryption: At the Heart of WIN-T Security

General Dynamics Mission Systems' colorless core technology and its NSA-certified TACLANE Network Encryptors are at the heart of WIN-T's cyber defense. Data transmitted across the entire WIN-T network is encrypted twice—once when the data reaches the network and then again when the data leaves a node. Previously, information sent across the network was coded differently: only classified data was encrypted. With colorless core data architecture, all data, classified and unclassified, is doubly encrypted, which increases the overall security of the network.

This level of cyber defense is comparable to premier fixed-site cyber centers, such as the Southwest Asia Cyber Center. General Dynamics Mission Systems has harnessed this level of cyber defense in a mobile network, integrating it on mobile platforms without sacrificing security. Moreover, Army leaders maintain that networks and cyber are fundamental to supporting the vision of Force 2025. WIN-T is uniquely positioned to provide robust defensive and offensive capabilities to the leaner, more expeditionary and agile Army force of the future.

Additional Cyber Capabilities

WIN-T can also help enable future tactical Cyber Electromagnetic Activities (CEMA). Extensive cyber defense capabilities are woven throughout WIN-T to defeat any threat to the network. Every node of the tactical network is secured with NSA-certified Type 1 encryption. This level of security is unique for a mobile network, and because of its prominence on the battlefield, WIN-T can play a vital role in full-spectrum mission planning, execution and assessment, including planned cyber posture stand-up, stepped-up cyber detection and accelerated cyber response.

Benefits to the Army User

The improved and expanded cyber capabilities of WIN-T make the network more intelligent and resilient. Timely reactions to detected threats rapidly alert Signal staff. In this way, the system reduces cyber complexity for the soldier. Minimizing the "detect to react" timeline also minimizes the impact of threats to the network, protecting soldiers and the mission.

WIN-T TRAINING

In 2020, the Army's network must support a force that trains as it fights. Several training enhancements have been deployed to provide rapid training for today's soldier. These improvements, which include enhanced Quick Reference Guides, YouTube-like videos and new simulations focused on sustaining operator efficiency, are more intuitive and feature mobile training content focused on the soldier's "learning point of need." These refined training efforts are positively impacting the unit's ability to effectively deploy and manage the network, while improving the unit's operational readiness.

By continuing to leverage our proven human-centered design concepts, enhanced Inc. 2 TCN/NOSC-Lites and NextGen PoP/SNEs showcase "soldier friendly" interface enhancements. From the PoP/SNE operators to the S-6 Network Operations staff, all program training packages have been significantly enhanced with new training technologies and practices.

The maturing of human-centered design concepts has enabled General Dynamics Mission Systems to reduce the WIN-T new equipment training window from six to ten weeks. This new approach combines new learner friendly content and course design that is especially formulated for the 21st-century soldier.

General Dynamics Mission Systems continues to work directly with units and the program offices to identify training needs that require additional emphasis. New and dynamic virtual training products allow units to focus on training shortfalls. These training tools increase organic unit training solutions instead of reliance on field support staff. PEO C3T and General Dynamics Mission Systems took a comprehensive look at the Army's Training Enterprise to ensure that program-related resources work toward the consolidation of today's fragmented training solutions, while also improving readiness through effective unit leader engagements.



FT. GORDON (GA) CYBER CENTER OF EXCELLENCE

The LandWarNet School, part of the Ft. Gordon Cyber Center of Excellence, trains soldiers to operate the WIN-T Inc. 2 system as they prepare for future deployments.



FT. POLK (LA) / FT. IRWIN (CA) JOINT READINESS TRAINING CENTER / NATIONAL TRAINING CENTER

JRTC is the Joint Readiness Training Center at Ft. Polk. Its sister training station is the National Training Center (NTC) at Ft. Irwin. Home station training allows units to focus on their mission essential task; training to prepare for the missions assigned to them. Typically, but not always, units will rotate to one of the aforementioned training centers on an annual basis to certify their collective proficiency in executing their assigned missions.

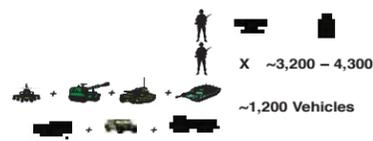
APPENDICES

“We are able to receive back reports with better clarity and fidelity to allow commanders at the battalion and brigade levels to make faster decisions with better resolution and less risk to the overall force.”

—
A COLONEL WITH THE 2ND BRIGADE,
1ST ARMORED DIVISION COMMANDER



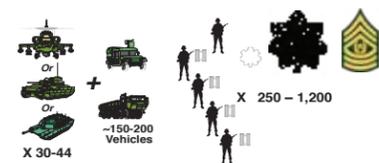
Source: U.S. Army.



THE BRIGADE COMBAT TEAM

Russell Crowe's Roman Legion in "Gladiator" was about the size of a Brigade.

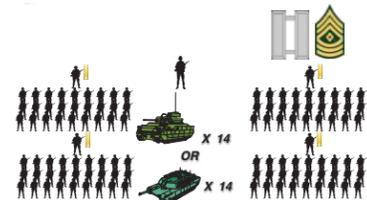
- » The Brigade Combat Team consists of two maneuver battalions, a reconnaissance squadron, artillery battalion and support battalion
- » It can operate independently for 96 hours
- » Normally commanded by a Colonel



THE BATTALION

In "We Were Soldiers," Mel Gibson leads an Infantry Battalion. In "Courage Under Fire," Denzel Washington leads a Tank Battalion.

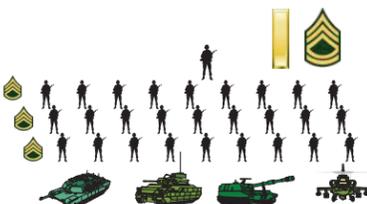
- » The Battalion consists of several Companies
- » It has several hundred vehicles
- » Normally commanded by a Lieutenant Colonel



THE COMPANY

In "Saving Private Ryan," Tom Hanks leads a Ranger Company ashore on D-Day.

- » The Company consists of several Platoons
- » Consists of 60–200 soldiers
- » Travels in ten to thirty vehicles
- » Normally commanded by a Captain



THE PLATOON

The movie "Platoon" is about a fictionalized Infantry Platoon in Vietnam.

- » The Platoon consists of several Squads
- » Consists of 16–40 soldiers
- » Travels in four to six vehicles
- » Normally led by a Lieutenant



THE SQUAD

In the series "Band of Brothers," the patrols are conducted by Squads. In "Black Hawk Down," most of the fighting occurs at Squad level.

- » Patrols are usually performed by Squads
- » Lowest level unit that acts independently
- » Consists of 4–10 soldiers
- » Combat crews usually travel in one vehicle
- » Normally led by a Staff Sergeant

WIN-T Inc. 2 is made up of 11 components that together form the Army's on-the-move tactical network backbone.



TACTICAL COMMUNICATIONS NODE (TCN) AND TCN-L

Provides mobile communications and networking capabilities servicing division, brigade and maneuver battalion command post operations with high-capacity secure IP voice, video and data services. With an on-the-move capability, the TCN allows the commander to stay connected to the network wherever they are on the battlefield. The TCN also hosts the battle command server stack with critical situational awareness applications. The TCN-L is an updated version of the TCN integrated on a HMMWV that greatly reduces its footprint and offers improved transportability (C-130 roll-on/roll-off and CH-47 sling loadable) for expeditionary operations. The TCN-L is expected to enter operational testing in 2017.



NETWORK OPERATIONS & SECURITY CENTER (NOSC) AND NOSC-L

Provides full suite of network operations (NetOps) applications and information assurance (IA) protection for the network. The NOSC delivers powerful network planning, monitoring and management tools that allow the commander to understand the health and reach of his network in making informed battlefield decisions. The NOSC-L is an updated version of the NOSC integrated on a HMMWV that greatly reduces its footprint and offers improved transportability (C-130 roll-on/roll-off and CH-47 sling loadable) for expeditionary operations.



POINT OF PRESENCE (POP)

Provides a mobile connection to the WIN-T network using both Highband Networking Waveform (HNW) LOS and Net Centric Waveform (NCW) satellite communications, offering VoIP and a number of mission command applications that provide commanders with situational awareness and instant, direct communications all the way up the chain of command. This capability is currently fielded on MATVs, HMMWVs and Strykers. The NextGen PoP under development will reduce the size, weight and complexity to operate.



SOLDIER NETWORK EXTENSION (SNE)

Connects dismounted and downrange soldiers to the WIN-T network through their legacy combat net radios while also providing commanders in or near the vehicle access to the wide area network. Extends the network to the forward-most position of the unit, providing real-time situational data to company commanders over large distances. This capability is currently fielded on MATVs, HMMWVs and Strykers. The NextGen SNE under development will reduce the size, weight and complexity to operate.



VEHICLE WIRELESS PACKAGE (VWP)

Using a Local Access Waveform (LAW) the VWP extends the SIPR network from the TCN while on-the-move for critical real-time tasks such as fire support operations. Delivers a short-range wireless "hot spot" on VWP-installed vehicles.

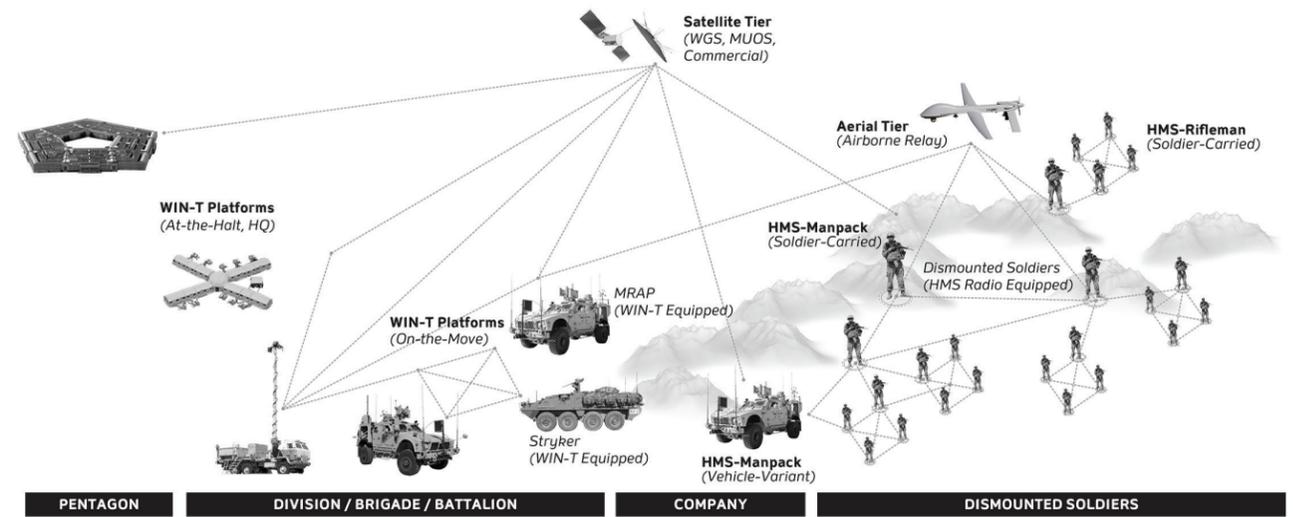


SATELLITE TRANSPORTABLE TERMINAL + (STT+)

Towed satellite terminal supporting commercial and military satellite communications, leveraging both the FDMA and NCW waveforms. The STT+ provides higher bandwidth for the TCN when supporting the command post in an at-the-halt (ATH) configuration.



THE SOLDIER'S NETWORK



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The information contained within this report has been culled from publicly approved General Dynamics and U.S. Army resources, as well as other publicly available materials.

“General Dynamics Mission Systems is proud to support our Army customer in the development and fielding of the WIN-T network. By learning from the combat experience of today’s soldiers, we have reduced the complexity to install, operate and maintain the Army’s mobile communications network and fielded new capabilities. This provides our soldiers a more agile, secure network with greater expeditionary reach, while reducing logistics and maintenance costs.”

—
CHRIS MARZILLI, PRESIDENT OF
GENERAL DYNAMICS MISSION SYSTEMS

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