

# A Look at the Impact of ITN Equipment in the LSB

## *Transformation in Contact*

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In Military Review’s article, Continuous Transformation, Gen. James E. Rainey states, “As technology makes warfare more complex, the difference between skilled and unskilled armies becomes more pronounced. The real impact of technology is that it will increase punishment of unskilled commanders and untrained formations. The consequences of failure to adapt will be severe” (Rainey, 2024, p.11).

The 225th Light Support Battalion (LSB) is doing Transformation in Contact (TiC) in the near-term, which will inform deliberate transformation and concept-driven transformation in the long-term. This article will highlight the implementation and impact of fielding Integrated Tactical Network (ITN) and commercial off-the-shelf (COTS) equipment in the LSB, within a light brigade combat team (LBCT) prototype.

It is crucial to develop strategies and foster a culture of innovation to ensure 225th LSB remains adaptable and connected. The 225th tried and tested its new “Light” concept with mission command (MC) and command and control (C2) during real-world exercises Nakoa Diamond 24-04, Nakoa Fleek 24-04, and the Joint Pacific Multi-Readiness Center (JPMRC) 25-01 international exercise on the Island of Oahu.

### **Background of Brigade Support Battalions**

Brigade support battalions (BSBs) are the backbone of logistical, medical, and maintenance support. They enable brigade combat team (BCT) commanders to maintain freedom of action, operational reach, and prolonged endurance. TiC transformed 225th BSB to 225th LSB. The drive to be lighter, faster, and more dispersed to support the LBCT altered the communication system requirements for the organization. The LSB, formerly task organized as a BSB, historically operated collocated in a brigade support area (BSA). The shortened kill chain, as seen in Ukraine with unmanned aerial system attacks, as well as the LSB transformation, requires LSB commanders to transform their C2 structure to be lighter and more dispersed.

The 225th LSB has prototyped a ‘light logistic cluster’ concept, disaggregating the BSA into multiple C2 nodes to reduce their physical and spectral footprint. The cluster concept forces company and battalion headquarters to execute distributed MC by splitting into three separate light logistic clusters. Company capabilities are task organized to support maneuver battalions based on their requirements. The general support company’s (GSC) combat logistic platoons (CLPs) are under the operational control (OPCON) of the maneuver

task forces forward, who move autonomously from the LSB. This disbursement requires an increased reliance on communication capabilities in accordance with the Primary, Alternate, Contingency, and Emergency (PACE) plan to effectively communicate with the LSB, as well



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as the maneuver task forces they support. Not only does this require modernized equipment, but it also requires the battalion (BN) S6 team to diligently review equipment allocation as requirements change. The BN S6 team must continually monitor each BN C2 node, each CLP, and simultaneously support every company command post (CP) to ensure the LSB is fully operational. Once clustered and the S6 team is split to support each cluster, these requirements become increasingly challenging as the team is stretched across additional light logistic clusters.

### **Implementation of ITN**

ITN secures its place with the goal of having multiple means to communicate in case one link goes down. These multi-channel radios provide satellite communication (SATCOM), Mobile Ad-hoc Network (MANET), and resilient waveforms, all on one single radio platform, thereby providing the warfighter with multiple options. ITN provides a simplified, independent, and mobile network solution that is available down to the small unit dismounted leader, facilitating MC, situational awareness, and accurate position location information (PLI) air to ground. ITN includes several varieties of high-capacity, line-of-sight tactical radios, including both single channel radios and dual channel leader and manpack radios. It includes voice and data gateways, tactical cross domain solutions, variable height antennas, and small satellite terminals with capabilities that enable transmission between different formats and vehicle-based kits. ITN radios deliver applications through the Nett Warrior end-user device, Android Tactical Assault Kit (ATAK), to consolidate the air, ground, and fires into a single common operating picture. ITN technologies enable

communications through sensitive but unclassified-encrypted (SBU-E) enclave, providing a network that is more secure and resilient by offering units multiple network communication pathways in contested or congested communications environments.

The LSB's current Modified Table of Organization and Equipment (MTOE) is built around a centralized concept for a legacy infantry brigade combat team (IBCT) and does not support the light, fast, and disaggregated LBCT/LSB. The introduction of ITN provided modernized communication capabilities but also posed challenges in ensuring interoperability with legacy systems. With the desire to be light and mobile, legacy at the halt systems are no longer effective in 2LBCT (Prototype). We have shelved the Tactical Communications Node-Lite (TCN-L) and Satellite Transportable Terminal (STT) and integrated Starshield, Mobile Broadcast Kits, and Scalable Class of Unified Terminals (SCOUT) to provide end-users with a reliable and mobile non-classified internet protocol router (NIPR) connection. Each user accesses the NIPR network via a virtual private network (VPN). While legacy systems such as Advanced SINGARS System Improvement Programs (ASIPs) and Army Navy / Portable Radio Communications (AN/PRC-148) Multiband Inter/Intra Team Radios (MBITIRs) still have their place within platoons to assist the fielding gap of ITN equipment, ITN has solidified its place and relevance at the command levels and CPs. Understanding the new equipment, implementing it into the organization, and adapting to it are the exact goals of an 'Always Ready' unit that is transforming in contact.

Legacy systems required our CPs to spend a significant amount of time to setup a communication package. For example, the TCN-L package requires two vehicles with trailers, generators that need to be grounded, and power generation prior to any network setup. The mobile WiFi (MiFi) pucks can be pre-charged and provide on the move NIPR capabilities prior to the establishment of a CP. Alternately, the mobile broadband kit (MBK) and Starshield can be easily powered through solar generators or tactical vehicles through a power inverter kit. To fully setup a CP with a TCN-L, at least four Soldiers are required; with new ITN equipment, a single Soldier can setup an entire CP with three radios, three external antennas, one laptop, and a MBK or Starshield. With a significantly smaller and more user-friendly communication package, the S6 team can meet the disaggregated intent and split our shop throughout the clusters for technical support.

### **How the LSB Integrates these Systems**

Voice communications have been, and should always be, the bedrock of tactical communications. They must be seamless, BCT-wide, and at minimum

down to the team level. The ability to communicate in real time, with full mobility and regardless of terrain, is critical.

While the intent of the ITN fielding was to phase out legacy equipment through the implementation of ITN, the LSB still requires legacy systems to fill gaps across its formations to ensure seamless communication. When 2nd LBCT(P) received their initial ITN fielding, we utilized contractor support for vehicle kit configurations; contractors assisted with adapting the older components to work with new software and phased out some equipment entirely.

Mounted Mission Command-Software (MMC-S) is a software-only upgrade to Joint Battle Command-Platform (JBC-P), providing digital C2 and situational awareness at all echelons to the mounted, dismounted, and CP domains.

MMC-S provides all movement and maneuver applications and Warfighting Functions, including the integrated common operational picture (COP), Intel, Fires, Engineering, Medical, Logistics and several other third-party applications. It receives over-the-air updates for maps, software, security patches, and network keys. MMC-S utilizes the existing JBC-P components, requiring only a new software update to run. MMC crosses domains with the Tactical Assault Kit (TAK) network for instant message (IM) free text chat and PLI to monitor troop and convoy movement. The TAK network provides real-time PLI based off GPS locations.

Currently, we run our TAK software off MiFi pucks and mobile broadcast kits. The Windows Tactical Assault Kit (WinTAK) Nett Mission Planner (NMP) has been designed and developed to run on the Windows operating systems in both tactical and C2 environments. The ATAK software application runs on a Samsung end-user device, which is mounted to the individual user's Improved Outer Tactical Vest (IOTV). ATAK is an extensible, collaboration system that provides situational awareness by integrating imagery, maps, and information overlays over a tactical meshed network. WinTAK promotes information flow and communication from the tactical environment to command enterprise locations. Both TAKs share the same common operating picture, can send data packages, and cross domain.

The MBK, MiFi, and Starshield package have begun to replace the LSB's tactical network vehicles like the TCN-L and STT. This was a seamless transition for the LSB, especially with the NIPR Windows 11 upgrade providing every user a VPN through Cisco AnyConnect, enabling wireless NIPR connectivity anywhere. These wireless capabilities allow our users to connect to the NIPR network through WiFi (Cellular 4G/5G) on the MBK or MiFi, as well as WiFi via satellite on the Starshield. This transition

provided a much faster setup and on-the-move capability for the LSB.

The fight directly impacts the effectiveness and longevity of combat operations. Given the LSB's pivotal role, reliable communication becomes more than just a matter of tactical advantage; it becomes the lifeblood of the organization. To increase survivability, 225th LSB disaggregates into three clusters to shrink our physical and spectral footprint. This forces the S6 to reorganize communication asset distribution to ensure each BN node can effectively communicate with adjacent units. Each node must be able to execute seamless external and internal communications.

The introduction of ITN has created a robust network with a coherent communication groundwork to support these nodes. Disaggregating into these separate clusters and utilizing fewer radios and network assets to run a CP through ITN has majorly lowered our spectral footprint on the battlefield.

Currently, the LSB utilizes the AN/PRC-158 Harris Radio to dual channel frequency modulation (FM), TSM, and primarily Mobile User Objective System (MUOS). This radio is a modular dual channel radio, capable of running a wide variety of software communications architecture through narrowband and wideband waveforms. These waveforms include: MUOS, TSM, FM, ultra-high frequency (UHF), UHF SATCOM, integrated waveform (IW), Soldier Radio Waveform (SRW), and a robust tactical network. The LSB uses this radio in the main company and cluster CPs to talk beyond line-of-sight (BLOS).

Through the AN/PRC-158 and the AN/PRC-163, we utilize the TSM waveform which provides a self-forming, self-healing, and infrastructure-less MANET. It is designed from the ground up to support simultaneous voice, data, video, and position location information in a single tactical network. While using TSM, every radio is a receiver, transmitter, and relay; there are no restrictions to the number of radios that can be in a mesh MANET. TSM has a wide network coverage (depending on terrain and hops), and the network

will continually adapt in real-time as Soldiers move across the battle space, fall out of the mesh, or create a new hop between systems. 2nd LBCT(P) utilized VHAs and a K1000 drone with a repeater radio attached to extend this mesh during our exercises.

Each cluster is allocated three AN/PRC-158, one AN/PRC-160, one WinTAK, one Starshield, and one MBK at a minimum. One AN/PRC-158 radio supports external channels to other CPs across the island, the second radio supports internal channels within the cluster, and the third monitors and reports to higher echelons. Internal to each CP, we use the FM and TSM waveform; external to each CP, we use BLOS MUOS and FM with extensions or retransmission teams in place to relay FM communications.

The WinTAK at each CP provides the data IM feature to all leaders across the formation with ATAK. The MBK at each CP provides end-users a NIPR connection via VPN; this allows a staff that is dispersed across three locations to simultaneously participate in creating products and supporting military decision-making process (MDMP). The main cluster CP utilizes the Starshield and an additional radio to monitor and report on the brigade nets.

### **The Way Forward**

As the Army adapts and evolves its network to reduce complexity and tailor capabilities at each echelon, it relies on persistent experimentation, fielding, and Soldier feedback to refine network operational concepts.

Driven by TiC, 225th LSB is experimenting with new ideas and innovative efforts. Overall, the Army must prioritize communications modernization across the entire formation, or it risks sustainment formations with significant communication gaps. Sustainment formations require ITN in their formations to stay integrated with their maneuver counterparts. ITN has enabled 225th LSB to demonstrate C2 on the move. Integrating ITN into units is paramount to allowing units to tailor capabilities based on their needs and continue the desired transformation.

### **Bio**

1st Lt. Katie Szewczyk commissioned into the Signal Corps in 2021 after graduating from Youngstown State University, Ohio, with an undergraduate degree in English. She has supported or led signal domain operations from the tactical to the strategic level. Her previous assignment was in the 25th Infantry Division, 2nd Light Brigade Combat Team (Prototype), 225th Light Support Battalion as the S6 OIC. She is currently a student in the Signal Captains Career Course at Fort Eisenhower, Georgia.

### **Reference**

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