The Need for Less:

Making Mission Command Nodes More Mobile, Discreet, and Survivable

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The U.S. military had just ended a long, costly counterinsurgency and found itself out of practice in waging large-scale combat operations. A conflict then ignited in a far-flung corner of the world as the birth of a new generation of conventional warfare came to fruition and painted a grim picture of what the United States' next war could look like. It is 6 October 1973, and as Israel defended itself against a coalition of 12 other nations, the United States and the Soviet Union furiously took notes.

The lessons the U.S. Army learned from the Yom Kippur War helped fuel an age of innovation and change in our Army that led to landmark success in Desert Storm. Now, almost exactly 50 years later, the world finds itself in a similar position as the Russo-Ukrainian War continues to rage, and our Army is faced with the same decision every military must make in times of relative peace: grow or die.

This sentiment is no less valid for any aspect of warfare than it is for our mission command nodes and how we employ them. The days of static forward operating bases and fires supremacy have been violently cast aside as the war in Ukraine illustrates the stark reality of mass artillery barrages and ever-shifting front lines. The U.S. Army must change the way it employs its mission command nodes in response to the evolving nature of war as evidenced by the Second Nagorno-Karabakh War and Russo-Ukrainian War. To address this need, 1st Battalion, 38th Infantry Regiment sought to employ a new kind of tactical operations center (TOC) during National Training Center (NTC) Rotation 23-10 — a more mobile, discreet, and survivable mission command node.

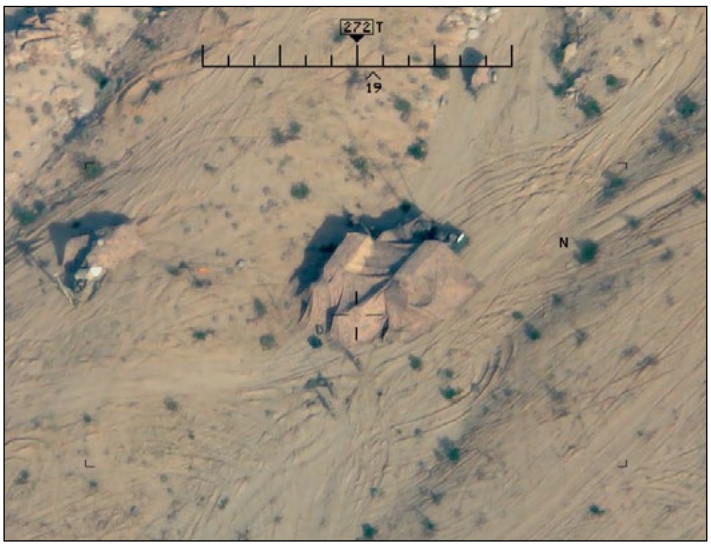
The 1st Battalion, 38th Infantry Regiment's tactical operations center consists of two Light Medium Tactical Vehicles that are covered with camouflage nets to minimize signature and create shade for staff. (Photos courtesy of authors)

After years of seeing the Army employ costly pop-up tents supported by maintenance-intensive environmental control units that staffs could not quickly tear down, the leaders of 1-38 IN desired a TOC free of these limitations. To achieve this, the unit built its TOC into two existing Light Medium Tactical Vehicles (LMTVs) that could be pulled up alongside each other and covered with camouflage nets to minimize their signature and create shade for the staff. The two LMTVs carried a payload of four Advanced System Improvement Program (ASIP) radios (with mounts and speakers), two Joint Battle Command-Platforms (JBC-Ps), a Secure Voice Over Internet Protocol (SVOIP) system tied to a Tactical Communications Node (TCN), and a handful of tables, chairs, and whiteboards. A 15-kilowatt generator was installed into the bed of one of the LMTVs for power generation, but 1-38 IN also purchased multiple commercial off-the-shelf (COTS) battery generators prior to the rotation to minimize the need for this generator. The unit would use the 15K generator to quickly charge the quieter, more discreet COTS generators which would be used to run the TOC's systems. The last aspect of this new design is its minimal signature. Multiple techniques were used to lessen the TOC's signature such as utilizing camouflage nets, deterring the enemy's ability to detect it on the electromagnetic (EM) spectrum, and attempting to disguise the TOC as a lower-priority target. With these measures in place, 1-38 IN deployed to NTC to test its new TOC.

Signature

In *The Dynamics of Military Revolution, 1300-2050*, the editors explain that the modern world has undergone five military revolutions.[1] These revolutions were not simple changes in military affairs so much as they were political, economic, and societal paradigm shifts that had unpredictable and dramatic effects on how wars were fought. Arguably, we find ourselves amid a sixth military revolution as digital systems continue to play a larger role on the battlefield. The rising use of drones in both conventional and unconventional warfare has provided armies, ranging from world powers to insurgents, cheap and easy-to-use systems to sense, shape, and act on the battlefield. As a result, a commercially available drone can now identify and target a mission command node several kilometers behind the front line. In response to this threat, 1-38 IN minimized the signature of its TOC during NTC Rotation 23-10 to attempt to deprive the opposing force (OPFOR — 11th Armored Cavalry Regiment "Blackhorse") the ability to target its primary command and control (C2) node. The effectiveness of this new TOC setup was measured across the visible light and electromagnetic spectrums as well as how it was perceived by Blackhorse. The results were mixed.

As 1-38 IN's TOC used camouflage nets instead of tents for shelter, light was able to radiate from outside of the planning area. In response, the unit employed red lens flashlights and a larger, tripod-mounted red



A small unmanned aerial system photographs 1-38 IN's TOC during National Training Center Rotation 23-10 at Fort Irwin, CA.

light for illumination. This solution was adequate but far from perfect. While it did appear to help prevent the OPFOR from locating 1-38 IN's TOC at night (the TOC never came under direct fire contact), planning under the red light's low illumination was an arduous process, often dragging out the planning process and making shared understanding difficult to achieve. One advantage of the design was its minimal signature. Based upon feedback from the NTC, the unit's EM emissions were approximately 40-percent less than other battalion TOC footprints. This smaller signature made the 1-38 IN TOC a lower priority target for Blackhorse. While it was targeted with indirect fire during the rotation, feedback from the observer-coach/trainers (OC/Ts) revealed that these fire missions were often delayed as the Blackhorse targeting cell misidentified the TOC as a company-level command post.

Power Generation

The Army's current method of power generation involves heavy, fuel-powered, and often trailer-pulled diesel generators. These generators provide exceptional durability but fall short in terms of logistical requirements (i.e., fuel, maintenance, and mobility), noise and thermal signature, and ease of use. The 1-38 IN recognized these shortfalls and purchased two different portable power stations with lithium-ion batteries. The first of these systems was the Eco Flow Delta 2 Portable Power Station with an additional Smart Battery. This configuration produced up to 3,600 watts and could power four ASIP radios and a JBC-P TOC kit for nearly seven hours with an A/C recharge time of only one hour. The battalion purchased and employed two of these sets (power station and smart battery) for our NTC rotation and were able to fully operate the battalion's main command post with these systems.

The second power station system was the Goal Zero Yeti 3000X. At nearly 90 pounds, the Goal Zero power station was a slightly larger solution than the Eco Flow but provided 3,000 watts of power without the need for an additional battery. The Goal Zero's biggest drawback was its seven-hour recharge time compared to the one-hour Eco Flow recharge time. During the rotation, 1-38 IN used its Army-issued 15-kilowatt generator to charge its Goal Zero power stations and then utilized the Goal Zero to power the Eco Flow batteries. While this solution did allow 1-38IN to power its entire TOC for up to 24 hours without needing to use its 15-kilowatt generator, it was an overly complicated arrangement. To refine this, the unit identified that purchasing four additional Eco Flow generators would allow it to employ and charge the systems in shifts, while sustaining operations indefinitely with only three hours of recharge per day.

The employment of lithium-ion batteries carried multiple benefits. First, the portable power stations were nearly silent; stations only charged for five to 10 hours every two days through the 15-kilowatt generator. This ensured briefings and operations were uninterrupted by generator noise. Most importantly, this also greatly reduced the TOC's signature during nighttime when ambient noise was at its lowest. Second, the use of smaller, lighter power generation systems provided enhanced mobility through the ease with which they could be dismounted to support urban operations. Lastly, the lithium-ion power stations were exceptionally easy to use. As opposed to standard Army generators that have an entire military occupational specialty (MOS) devoted to their maintenance, these power stations could be operated by a junior enlisted Soldier with only a few minutes of training. Given these facts, it's difficult to argue against the efficacy of using COTS power stations to augment battalion-level C2 nodes. Their ability to reduce a TOC's signature and relative ease of employment significantly contributed to the TOC's survivability.

Mobility and Survivability

Recently, C2 nodes have become increasingly vulnerable to enemy artillery missions, as evidenced in the Second Nagorno-Karabakh War and the Russo-Ukrainian War. In response to this threat, the 1-38 IN leadership sought a TOC design that could better react to indirect fire and quickly displace to an alternate location. Therefore, the ability to quickly set up and tear down the TOC was an integral requirement of this new low-signature design. During home-station training, the TOC could be set up in less than 11 minutes and torn down in seven minutes. These numbers increased to roughly 25-35 minutes during the rotation, which is more than likely attributed to fatigue, stress, and continued battle-tracking requirements. The

The TOC design included a handful of tables, chairs, and whiteboards.

greatest friction point during the setup process was the time it took to establish the JBC-P and SVOIP systems.

While additional training could enable faster set up, the time required to establish the digital systems and connections can only decrease so much. The biggest shortfall 1-38 IN observed in its new design was that adopting a faster, minimalist design sacrificed protection. Without sufficient overhead, side, and floor cover, the digital systems were largely unprotected from the elements. Severe weather could have severely degraded operations and rendered the JBC-Ps and SVOIPs inoperable. Balancing the need for faster TOC displacement while meeting protection requirements is an ongoing challenge to refine for the unit's upcoming training progression.

Conclusion

Throughout NTC Rotation 23-10, 1-38 IN gained invaluable feedback on its new TOC design. The minimalist structure reduced the TOC's signature, improved its power-generation capabilities, and greatly enhanced its mobility and ability to react to enemy indirect fires. The remaining problems to solve lie within its ability to manage light and offer protection from the elements. The proposed way forward is the inclusion of one to two small tents with floors that would serve as a planning bay and current operations cell. Should the unit incorporate this minor addition without significantly degrading the TOC's ability to displace, it would offer a remedy to the light pollution and protection shortfalls of the current design. The 1-38 IN leadership believes these relatively minor improvements will provide the innovation needed to thrive in a large-scale combat environment and represent the first steps toward adapting to the changing nature of modern warfare.

Editor's Note: *As with all* Infantry *articles, any mention of items does not constitute an official endorsement by the U.S. government or any of its departments or agencies.*

Note

[1] MacGregor Knox and Williamson Murray, eds., *The Dynamics of Military Revolution, 1300-2050* (Cambridge, UK: Cambridge University Press, 2001).

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