Utilizing the Integrated Tactical Network in Mobile Command Posts

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Traditionally, when infantry brigade combat teams (IBCTs) reference command posts, thoughts gravitate towards tents, comfort, and antennas. Over the last two decades of conflict in the Middle East, IBCT command posts have lost the art of mobility, survivability, and minimal connectivity while maintaining a common operational picture (COP) and the effective communication that is needed to combat acute threats. With the recent advances in targeting capabilities based on innovation in information, surveillance, and reconnaissance (ISR), and given the Army's focus on fighting near-peer threats, it is vital that command posts modernize with these features in mind. The Army's recognition of the imperative mission command transition towards survivability is highlighted in the current Command and Control (C2) Fix initiative. C2 Fix strives to define the critical communication capabilities that brigade combat teams and below need to efficiently communicate and maintain consistent situational awareness with the least possible electromagnetic and physical signatures. To address these mission command needs, the 2nd Mobile Brigade Combat Team (MBCT), 101st Airborne Division (Air Assault) is incorporating the Integrated Tactical Network (ITN) while simultaneously reducing command post size to increase mobility.

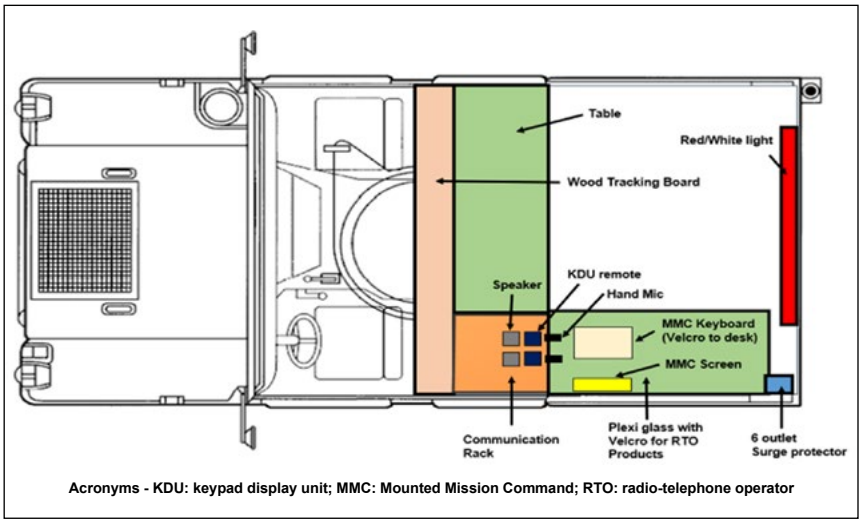


Figure 1 — HMMWV Mobile Mission Command Vehicle

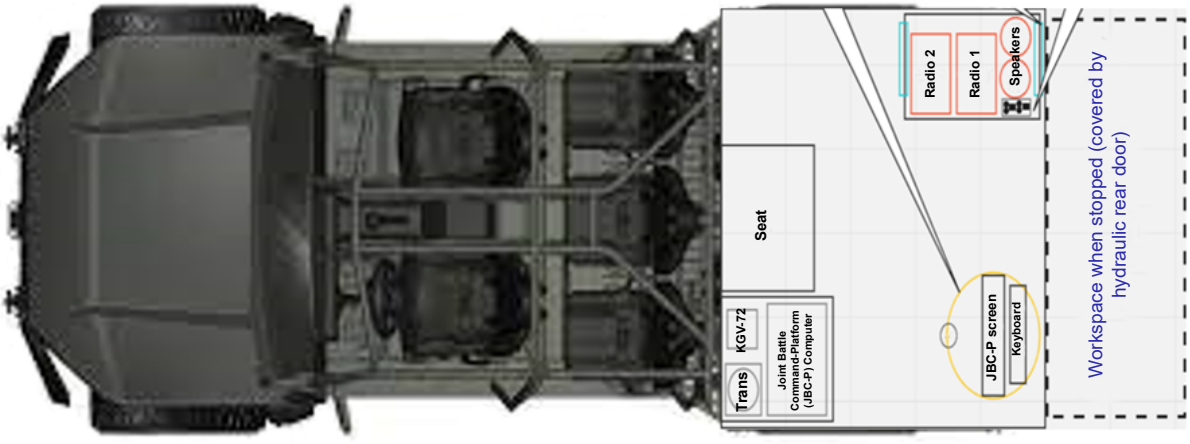
Figure 2 — Inside View of HMMWV MMC Vehicle

A deeper look at the attributes of mobility, survivability, and connectivity can raise awareness of how to incorporate ITN systems to create a shared understanding while maintaining a small and agile mobile command post (MCP) architecture to survive acute threats.

Mobility

Vehicle-based command posts provide constant mission command capabilities while reducing size but not limiting functionality. Critical to mission command mobility is the location of communication platforms that enable command and control on the move and placement of key personnel.

Current Construct: Vehicles (High Mobility Multipurpose Wheeled Vehicles [HMMWVs]) equipped with ITN architecture possess two to four PRC-163 nodes and Mounted Mission Command (MMC) screens and keyboards. These essential communication elements enable battalion and below operations to transmit voice via the Tactical Scalable Mobile (TSM) ad hoc network (PRC-163), operational graphics and COP via tactical ITN/Windows Team Awareness Kit (WinTAK), and messaging (chat) and position location information (PLI) awareness via MMC. Utilizing a mobile command post construct with multiple ITN-enabled vehicles provides redundant systems and a shared understanding across all warfighting functions. Placing these systems in the back of a HMMWV allows key personnel to maintain situational awareness while on the move, reduces setup



ISV Description

- 5x seats at front of ISV remain unchanged
- Back of ISV: enclosed space (hard shell) to house electronics
- Onboard ISV power system used to run C2 equipment
- Total height of ISV must stay the same as the standard variant to allow internal loading in a Chinook helicopter.
- Recommend single and dual point sling ability as well

C2 Components Layout

- Minimum 1x seat required inside back of C2 variant to monitor comms on the move
- Dual radio mount in back (2x 158s)
- Requires MMC, transceiver, and KGV-72 in back
- Keyboard and screen located on a turntable
- Turntable must lock in place while moving

Figure 3 — Infantry Squad Vehicle C2 Variant

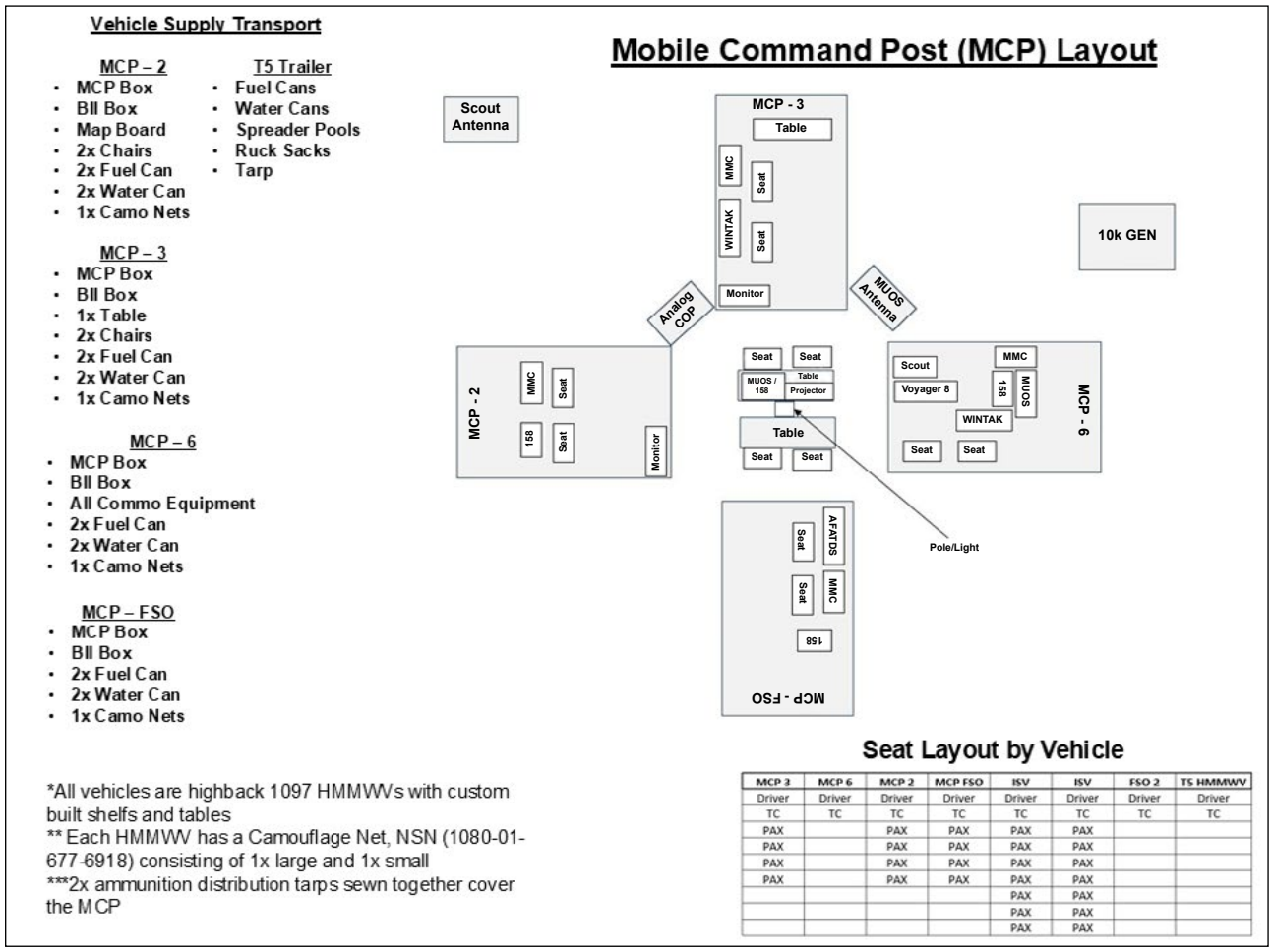
time at the long halt, and facilitates a shared understanding across the headquarters.

Recommendation: As 2/101 MBCT integrates new Infantry Squad Vehicle (ISV) variants into the mobile brigade concept, it is critical to retain this MCP capability with the C2 ISV variant. Communication mediums located in the rear of the ISV with a seat for a battle captain/radio-telephone operator (RTO) will maintain this same C2 on-the-move function. Once in the halt, the ability to rotate digital C2 mediums to the rear of the vehicle will facilitate the MCP concept. (**Editor's Note:** *The authors further discuss the C2 ISV as well as other ISV variants in a subsequent article in this issue.*)

Survivability

Small and camouflaged MCPs reduce setup and teardown time, prevent detection, and facilitate a shared understanding. Utilizing multiple MCP vehicles with a standardized packing list and camouflage scheme can reduce setup and teardown time to 12 minutes (four vehicles) or 18 minutes (five vehicles). Additionally, the ITN architecture alleviates the need for large Tactical Communications Node (TCN) satellites and antennas, reducing the need for additional vehicles/trailers and the size of the collective footprint. However, it is important to note that the ITN provides units the ability to connect to the Long-Term Evolution (LTE) network, creating an electromagnetic spectrum vulnerability. To reduce risk of detection,

Figures 4 and 5 — Interior and Exterior Views of Mobile Command Post



MCP 3	MCP 6	MCP 2	MCP FSO	ISV	ISV	FSO 2	TS HMMWV
Driver	Driver	Driver	Driver	Driver	Driver	Driver	Driver
TC	TC	TC	TC	TC	TC	TC	TC
PAX		PAX	PAX	PAX	PAX		
PAX		PAX	PAX	PAX	PAX		
PAX		PAX	PAX	PAX	PAX		
PAX		PAX	PAX	PAX	PAX		
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Figure 6 — MCP Layout

units can employ three practices: hide LTE Wi-Fi pucks to prevent collection, limit LTE network usage to certain time periods (e.g., morning and evening data synch windows), and offset decoy emitters that simulate the MCP construct (e.g., computers, printers, etc.) to reduce risk of the real MCP being located and correctly identified.

Connectivity

The traditional practice of having one voice and data PACE (primary, alternate, contingency, emergency) plan is unrealistic with ITN. This is not a hindrance but rather a benefit as multiple systems offer similar capabilities, albeit with different ranges. This allows units to plan near and far communication plans that reduce reliance on a single communication medium. Below is a list of ITN capabilities and benefits that create redundancy for MCP connectivity:

MMC-Software (MMC-S) PLI Federation — Two-way PLI and chat between MMC-S and Nett Warrior (NW) devices (TSM and LTE) can send and receive messages from MMC-S but not the Android Team Awareness Kit (ATAK). Two-way PLI sharing and chat is sustainable from the MCP to about 20 kilometers. This asset allows units to maintain communication with the forward line of own troops (FLOT) even though they are outside TSM range.

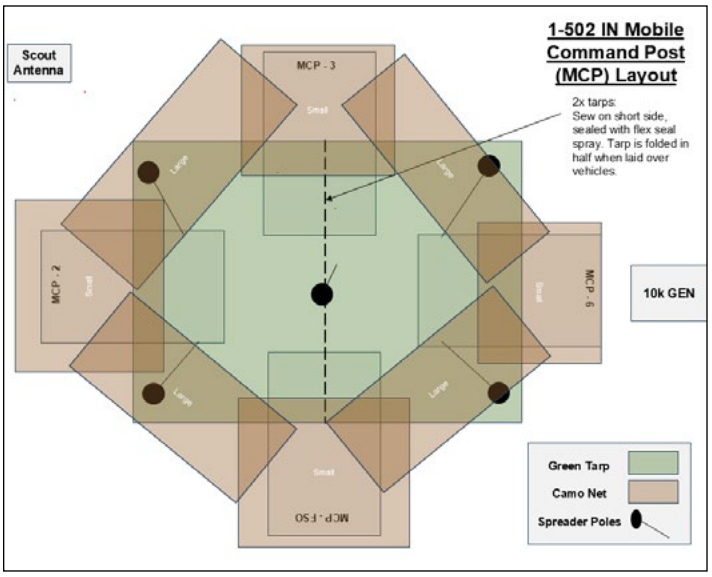

Figure 7 — MCP Camouflage Scheme

Scalable Class of Unified Terminal (SCOUT) — The SCOUT provides communication and data transmission capabilities in areas where cellular service is unreliable. The SCOUT can also use the mobile broadband kit (MBK) as transport, allowing hardline to be ran from the terminal

to the Non-classified Internet Protocol Router (NIPR), which negates the need to launch a virtual private network (VPN). Additionally, the SCOUT can be used as transport for the Tactical Radio Integration Kit (TRIK) Voyager 8 in areas with unreliable cellular service.

TSM Voice — Planning factor for TSM distance is 2.5 kilometers. With 10-plus nodes between the MCP and a distant end, units can increase the range by 1.5-2.5 kilometers. To connect TSM bubbles, units can use the 166 Ghost as a single node to connect multiple bubbles.

Mobile User Objective System (MUOS) — MUOS provides over-the-horizon communications that can be utilized at the halt or on the move. Communication over MUOS was confirmed to be sustainable from the MCP at about 20 kilometers. MUOS can be used to conduct command update briefs over a group call, which negates the need for in-person link up.

Power Consumption — ITN equipment creates an increased and unstable power consumption for mission command vehicles. To reduce vehicle battery consumption, the PTS base mount provides power and consolidates speakers to the MCP's 158. Additionally, the MMC tactical operations center kit's power supply allows the MMC to be converted back to generator power.

Figure 8 illustrates the overlapping ITN voice and data capabilities at different ranges for an infantry battalion.

Conclusion

Tactical units must be able to execute mission command on the move, communicate at distance via voice and data, and survive against acute threats. The recent conflicts in Ukraine and Nagorno-Karabakh, which involved adversaries armed with drones and long-range precision fires, raise awareness for the necessity of mobile command in future combat operations. Being able to mission command on the move with voice and data is no longer a convenience but a requirement. Units that adopt a mobile command post utilizing the near and far capabilities of ITN will not only create a common operational picture but, more importantly, increase survivability.

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Figure 8 — Example ITN Data and Voice Communication Plan for an Infantry Battalion

This course of action efficiently utilizes the capabilities of new and legacy equipment to provide sustained communication at every echelon. The company and platoon leaders' TSM preset is synched on one TSM preset (red), allowing faster/accurate reports. Brigade fires, battalion fires, and company fire support officer TSM preset was deconflicted by sharing one TSM preset (Gold), increasing TSM bubble and streamlining reports.

Key Points

1. TSM, MUOS, WINTAK, and FM from CO to BN.
2. Increases TSM Preset available hops
3. Increases CO and Fires C2
4. TSM utilized with intended purpose (CO>TM level)

Pros:
1. CO and PLT C2 increase
2. BN, CO intel and battle tracking is faster/accurate
3. Fires net deconflicted from CO>BDE
4. Increased range for FSO

Cons:
1. BDE C2 to CO CMD degraded
2. BDE intel and battle tracking relies on MMC and BN reports