Maintaining Interoperability While Pursuing Innovation

Transformation in Contact

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The Army's Transformation in Contact (TiC) initiative is the most dramatic coordination effort between industry and the tactical edge in the past decade. By driving innovation and organizational change across warfighting functions at brigade and below, the Army delivers more agile capabilities to the warfighter.

Leaders are currently putting higher emphasis on rapidly fielding systems and prototyping to ensure Soldiers and civilians are empowered to learn and experiment with new equipment during Combat Training Center (CTC) rotations. This leads to more lethal, survivable, and mobile formations. Here at the Joint Multinational Readiness Center (JMRC) in Germany, there is an additional criterion used to judge unit readiness and technology on multinational interoperability.

Units rotating through JMRC receive an assessed rating of 0 to 3, based on the effectiveness of their communication, collaboration, and cooperation with multinational units, across the three interoperability domains of human, procedural, and technical factors. With the rapid change of pace and innovation, I recommend that the interoperability domain assessments expand from solely multinational units to include U.S. maneuver brigade interoperability, especially when working with joint forces and multi-domain enablers like Army Aviation. Task-organized as a division level asset, the aviation task force, in a CTC exercise, often operates in direct support of the maneuver brigade. To leverage aviation capabilities, it is essential to be interoperable with battalions, brigades, and division-level echelons.

The core competencies of an aviation task force are summed up by "see/sense, strike, move, and extend" (FM 3-04). These competencies increase a ground commander's understanding of the battlefield, enable more agile movement and maneuver, and increase lethality through sustainment and combined arms fires. Ground brigades who do not integrate manned aviation assets into their scheme of reconnaissance, maneuver, and fires, fail to gain air domain dominance. Without air dominance, brigades rarely leverage multiple forms of contact against adversaries. Considering the current aggressive fielding of new systems ground units are experiencing – such as drones, artificial intelligence, electronic warfare, and command and control (C2) systems – how are maneuver brigades able to maintain interoperability with an aviation task force that is not receiving the same systems?

Communications equipment fielded to ground units involved with TiC include the Tactical Assault Kit (TAK) to maintain a common operating picture (COP), and the Integrated Tactical Network (ITN). Two key waveforms associated with ITN are the Tactical Scalable Mobile Ad hoc network (TSM), a line-of-sight network whose key feature is the simplified use of an organic, self-healing mesh; and the Mobile User Objective System (MUOS), an over-the-horizon capability that replaces the legacy Integrated Waveform (IW).

TAK offers enhanced situational awareness by incorporating position data fed to it through TSM, Long-Term Evolution (LTE) cellular network, and legacy Blue Force Trackers (BFT-2). Of those listed above, aviation units are only equipped with BFT-2. Despite the equipment and capability gaps between ground brigades and aviation task forces, observations made during JMRC fiscal year 2025 exercises provided insight on how units can overcome these challenges and increase interoperability.

During a recent JMRC TiC exercise, the ground brigade, with assistance from the Regional Cyber Center and U.S. Army Forces Command enabled its TAK services to be transported over Non-secure Internet Protocol Router Network (NIPR), allowing non-organic units without TAK devices to view and contribute to the brigade COP using a Windows-based TAK application (WinTAK). Using this method, the brigade and aviation task force achieved a shared understanding of both an airspace picture and friendly situation to successfully deconflict manned and unmanned aerial systems and limit air-to-ground fratricide. During deep attacks in support of the division, the aircraft could be tracked over WinTAK using the aircraft's BFT-2 system. While this position data shared between BFT-2 equipped aircraft and WinTAK systems was successful, the aircraft could not achieve over-the-horizon voice communications with any supported units on ground.

While providing direct support to the brigade during close attacks, position data shared between TAK end user devices and the BFT-2 in the aircraft proved invaluable for pilots, enabling them to understand friendly locations and avoid fratricide. However, air-to-ground voice communications were entirely dependent on joint terminal attack controllers using an unencrypted, ultra-high frequency (UHF) radio, and this voice-only link limited helicopter lethality and sensor-shooter handovers. Even with the successes observed during recent TiC exercises to overcome interoperability challenges, more could be done to achieve higher integration with COPs to enable both brigade fighting and division-shaping operations.

A COP creates shared understanding across echelons and enabling units. For units pushing the limits of innovation, experimentation, and going beyond doctrinal boundaries during TiC, a recommendation is to share TAK data across the Multinational Partner Network and provide access through the Maven Smart System (MSS). This would require the cooperation of several organizations, at echelon, to not only build the cross-domain solution necessary to move TAK data from its native Secured-but-Unclassified Network–Encrypted (SBU-E), but to also build the data connections within MSS. While difficult, I think this is the appropriate direction to better support the warfighter with a unified network, to maintain interoperability with U.S. forces who are behind on fielding C2 systems, and to ensure success with allies.

When coordinating with aircraft during the brigade close fight, three recommendations to improve communications are: make full use of ITN radio capability; include time for testing and troubleshooting TAK messaging to aircraft during the mission command validation exercise; and integrate Link-16 capability at the battalion, brigade, and division level.

We must utilize the dual-channel capability of ITN radios, dedicating one channel for internal communications over TSM, and the second channel to talk on the legacy Single Channel Ground and Airborne Radio System in the aircraft. It is also crucial to engage the Mission Command Support Center and Nett Warrior team to assist with troubleshooting text messages sent from the aircraft's Joint Variable Messaging Format to the ground units' TAK end user devices and Mounted Mission Command-Systems, which is the software upgrade to the ground based Joint Battlefield Command Platform. If lower echelons include ground-based Link-16 stations with battalion and brigade level tactical air controller parties, as well as with the Division Joint Air Ground Integration Center, the maneuver brigade would wield an additional avenue for processing targets. A more robust air-to-ground communications plan during the brigade close fight is critical for increasing lethality while mitigating the risk of fratricide.

When conducting deep attacks in the division area, having voice communications with aircraft is vital. To accomplish this, prepare early by making the satellite access requests for MUOS, including the bridging solution for IW. To accomplish this, the maneuver brigade coordinates with enabler units like the Aviation Task Force to determine the number of users and radio platform types using IW, ensuring a patching solution to improve voice communication with the aircraft is in place. This enables the division and brigade to be more dynamic in taking advantage of opportunities created by the aviation task force.

Technical solutions are feasible but not easy; the correct procedures must also be in place to enable them. Starting during the planning cycle, the unit of action should include all multinational, joint, and enabler units in discussions on capabilities to develop a realistic and robust communications plan across warfighting functions. The Primary, Alternate, Contingency, and Emergency (PACE) communications plan must also be tested at realistic distances. As the plan becomes more defined, communication cards and signaling instructions must be codified and distributed to all stakeholders.

Finally, after publishing the communications annex, enablers must take part in the information collection/fires rehearsals and combined arms rehearsals at echelon. For aviation units to integrate properly, we must also go beyond normal rehearsals and C2 validations and complete to the equivalent of aviation technical rehearsals. Helicopters must test live sensor-shooter handovers between medium and long-range reconnaissance drone operators at a distance. This will ensure greater lethality.

As we continue to transform organizationally as an Army, aggressively pursuing innovation and experimentation, we must maintain interoperability as a high priority consideration during acquisition, fielding, and training to ensure synchronization with our partners and enablers. Otherwise, maneuver brigades risk losing opportunities to increase lethality through combined arms and multidomain operations on a dynamic battlefield.

About the author

Capt. Ryan Pidcock is currently the S6 observer, coach and trainer for the Falcon Team at the Joint Multinational Readiness Center in Hohenfels, Germany. He holds a Bachelor of Arts in political science from Miami University, and a Master of Science in information systems from Depaul University. During his career, he has served as a platoon leader and battalion S6 in the 2nd Infantry Division in Washington; J6 director for the Special Mission Wing, Special Operations Advisory Group in Afghanistan; and company commander in the 516th Signal Brigade in Japan.