The Army Needs to Quickly Adapt to Tactical Drone Warfare

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In the contemporary operating environment, small unmanned aerial systems (sUAS) have emerged as transformative battlefield assets, providing militaries an unprecedented blend of low-cost intelligence, surveillance, target acquisition, reconnaissance, and precision strike capabilities. These sUAS have proven their potential to disrupt mechanized formations' advances, neutralize fire support systems, and eliminate strategic assets with minimal expense.¹⁻² To take advantage of this transformative, low-cost capability, U.S. Army brigade combat teams (BCTs) need to be quickly modernized to conduct tactical drone warfare.

For the purposes of this article, I define "tactical drone warfare" as the employment of Department of Defense group 1-3 sUAS endowed with kinetic capabilities.³ These systems fall into three distinct categories: modified commercial off-the-shelf (COTS) drones, first person view (FPV) drones, and loitering munitions (LMs). Additionally, I characterize "tactical formations" as brigade/regiment-size organizations and below that are specifically task-organized for offensive and defensive large-scale combat operations. Tactical formations in the Russo-Ukraine and Second Nagorno-Karabakh wars have proven the effective-ness of sUAS in attriting mechanized and motorized formations, destroying command posts, and neutralizing fire support systems.⁴ The use of lethal sUAS in combat operations at the tactical level has significantly impacted tactics, techniques, and procedures for mechanized and motorized formations and is changing the way militaries fight.⁵ Militaries worldwide are adapting and reorganizing to seamlessly incorporate sUAS into their tactical formations.⁶⁻⁷

One of the most striking examples of sUAS impacts on the battlefield is the use of FPV attack drones, which, for an investment of less than \$400, have demonstrated destructive capabilities against armored assets that can cost in the millions to produce a single unit.⁸ These instances are becoming a daily occur-



A destroyed Russian tank is photographed in Mariupol, Ukraine, on 7 March 2022. (Photo courtesy of the Ministry of Internal Affairs of Ukraine via Wikimedia Commons)

rence on today's battlefields and are changing the economic and technological advantages large militaries have enjoyed. Furthermore, militaries operating on budgets of less than \$6 billion (less than 0.008 percent of the U.S. defense annual budget) are now equipping their tactical formations with aerial intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) capabilities, underscoring the cost-effective-ness and force multiplication effect of these technologies.⁹

LMs and FPVs have become essential tools for tactical commanders, enabling them to target and eliminate high-value assets with speed and precision never seen at the tactical level and thereby shifting the momentum of a combat operation within minutes by controlling its tempo. During the Second Nagorno-Karabakh War, Azerbaijan used LMs to rapidly disintegrate the Armenian air defense network, establishing air supremacy within the first few days of war, and then began to use tactical drones to systematically destroy artillery, electronic warfare assets, and armor.¹⁰ Azerbaijan's ability to employ LMs to autonomously engage high-value targets has showcased the value of tactical drone warfare to military leaders around the world.

Tactical Drone Warfare

"If you don't like change, you'll like irrelevance even less."

- GEN (Retired) Eric Shinseki 34th Army Chief of Staff

Drone warfare is not new to the battlefield; UAS equipped with full motion video sensors, flown by operators at ground control stations, first saw action in the 1970s with the U.S. "Firebees" and the Israeli "Scouts" flying combat missions in the Yom Kippur War.¹¹ Today, drone warfare conducted with precision strikes is an occurrence found on nearly every battlefield. The United States operates the most advanced UAS platforms in the world, such as the MQ-9 Reaper, RQ-4 Global Hawk, and the future MQ-20 Avenger, costing on average of more than \$30-plus million per unit.¹² However, the systems described above are expensive, targeted by adversary air defenses, and exclusively used at the division level or above. The emergence of drone warfare at the brigade level and below has changed today's battlefields by shortening kill chains with devastating effects.

A revolution in military affairs is described as a period in time where there are profound changes in military doctrine, strategies, tactics, and technologies, leading to an irreversible transformation in the conduct of warfare.¹³ The year is 2024, and the proliferation of sUAS at the tactical unit level has transformed the conduct of warfare in Europe, Africa, and the Middle East. Modified COTS drones are devastating infantry in open and urban terrain, and FPV drones enable a light infantry squad to halt an armored company literally dead in its tracks. One-way attack unmanned aerial vehicles (UAVs) developed and produced by Iran have attacked bases housing American troops, while LMs are destroying high-value targets autonomously in the Middle East and Europe.

Tactical drone warfare is no longer a conceptual image of the future — it has already been written in the history of recent conflicts and is being executed in wars fought today. The adaptation to tactical drone warfare has already occurred within our adversaries and allies' military formations. The U.S. Army needs to break the bureaucratic acquisition process that merely upgrades 1980s-era platforms to deliver relevant, innovative equipment to the warfighter when it is needed most — during combat operations.

Before offering a few realistic solutions that could rapidly innovate U.S. Army BCTs, I will first provide more detailed descriptions of the three categories of kinetic-capable drones in group 1-3 sUAS, which can be employed at the brigade level and below:

1. Modified COTS Drones: Group 1-2 sUAS are commercial drones that have been modified to drop ordnance such as fragmentary grenades, mines, or mortars. Ukrainian and Russian forces have repurposed COTS quadcopters, such as the DJI Mavic series, to carry out attacks by dropping munitions on ground



Ukrainian soldiers from the 17th Separate Kryvyi Rih Tank Brigade train on the use of modified quadcopters to drop munitions onto targets in July 2022. (Photo courtesy of the Ministry of Defence of Ukraine via Wikimedia Commons)

targets. These modified drones have reshaped the battlefield, providing tactical units with precision-strike and ISTAR capabilities.¹⁴

2. FPV Drones: Group 1-2 sUAS drones are characterized by their low cost, simple employment and demonstrated lethality when paired with military munitions. FPVs have proven to be a cost-efficient strategy when compared to traditional warfare tools (e.g., FGM-148 Javelin), allowing small units to target and incapacitate expensive military hardware with precision and efficiency. FPV drones are COTS drones that have a payload capacity of 1.2 kilograms or higher and are launched with the intension of expending the munition on a target. Formations with COTS sUAS paired with anti-tank munitions provide a paramount low-cost expendable option to military forces. The human controller of FPV drones delivers a precision capability that has devastated armored vehicles on today's battlefields. Examples of FPVs include the Pegasus, Bucephalus, or Russian-made Lancet drones. However, it should be noted that any COTS FPV sUAS with a 1.2 kilogram capacity or higher can fit this category.



A Ukrainian soldier displays a modified quadcopter with attached payload in February 2023. (Photo courtesy of the Ministry of Defence of Ukraine via Wikimedia Commons)



A Naval Special Warfare Operator fires a Switchblade 300 during ground mobility training exercises in Nevada on 15 July 2023. (Photo by PO1 Chelsea D. Meiller)

3. Loitering Munitions: The LM concept is not new; however, its pairing with advanced sensors, autonomous capability, artificial intelligence (AI) integration, and relatively affordable production price provides militaries with a decisive capability at the tactical level.¹⁵ For the purposes of this article, LMs are divided into three different categories based on their size and preferred targets. *Mini-LMs* are man portable, launched and recovered by individual Soldiers, and primarily used to target light armored vehicles or personnel. Examples of these are the Switchblade 300, Rotem, Hero-90, STR-35 Silent Thunder, or WARMATE. *Tactical LMs* require vehicular movement (tubed or rail launched), have extended endurance (in comparison to mini), and can perform ISTAR in addition to offering a precision-strike capability. Examples include Mini-Harpy, Hero-120, Skystriker, and the Orbiter 1K. *Long-range LMs* are launched from land, air, or sea-based platforms and used to attack strategic-level targets. Examples are the Hero-1250, Harpy, and Harop. Not all loitering munitions have recoverable options, can perform ISTAR functions, or have endurance times enjoyed by legacy UAS platforms.

Advancing the BCT: A Proposal for Tactical Drone Warfare Modernization

"Change before you have to."

— Jack Welch Former CEO of General Electric

The U.S. Army is composed of 32 active-duty BCTs and 27 Army National Guard BCTs, a total force of 59 BCTs.¹⁶ The following proposed modernization plan will highlight the organization of an active-duty infantry brigade combat team (IBCT). However, the equipment and organization plan can and should be applied to Stryker and armored brigade combat teams (SBCT/ABCTs) with minor adjustments.

The IBCT organically contains seven subordinate battalions that provide the brigade its ability to perform close combat operations with all warfighting functions internal to the organization. IBCTs should immediately undergo doctrine, organization, training, and materiel modernization within these areas:

- 1) The tactical UAS (TUAS) platoon,
- 2) The field artillery battalion, and
- 3) Battalion mortar platoons.

At echelon, each of the areas described above could provide tactical drone warfare capabilities to the brigade in areas that best fit its employment. The TUAS platoon that currently operates the RQ-7 Shadow could divest of this equipment and employ tactical or long-range LMs in its place. The employment of tactical or long-range LMs by the TUAS platoon easily transfers training for UAS operators (Military Occupational Specialty [MOS] 15W) and requires little organizational and doctrine changes, with the only fiscal cost being materiel solutions that cost significantly less per unit then the RQ-7 Shadow. The field artillery battalion could equip its company fire support teams (FISTs) with modified COTS and FPV drones to enhance the lethality of maneuver company-size elements on the battlefield while also employing the fires network to quickly prosecute targets trapped in the kill-web. Infantry battalions could also equip their formations with mini-loitering munitions, providing maneuver battalions with organic ISTAR and precision-strike capabilities to complement their organic mortar systems. A more in-depth overview of this proposed modernization is provided in the following paragraphs.

The TUAS Gets Teeth

The TUAS platoon resides in the military intelligence (MI) company that is assigned to the IBCT's supporting engineer battalion. The platoon contains 22 Soldiers with UAS operators (15W) and Unmanned Aircraft Systems Operations Technicians (warrant officer - 150U). The platoon is organized with a headquarters element, a mission-planning and control station element, and a launch and recovery element. The platoon's current organization and mission — to provide intelligence, surveillance, and reconnaissance (ISR) by launching, operating, and recovering UAS — make it the ideal element to modernize with tactical or long-range LMs; weapon employment would depend on the BCT's role to support the division function (reinforced, armor, airborne, air assault, light, or motorized). For the IBCT, tactical LMs are the weapons of choice for the TUAS platoon. Tactical commanders should note that a change from the legacy UAS RQ-7 Shadow to LMs would be a change in functional mission for the TUAS platoon. The TUAS would no longer overlook named areas of interest for nine-plus hours in periods with the benefit of near-perfect weather conditions. In today's operational environment, I believe RQ-7 Shadows would likely be shot down within their first 24 hours of employment as part of LSCO and provide little or no answers to a commander's priority intelligence requirements. The IBCT TUAS, changed into an LM mission function, would enable a precision top-attack capability at the BCT level by employing low-cost tactical LMs to destroy high-payoff targets on the battlefield.

I recommend replacing the RQ-7 Shadow with an LM that can perform limited ISTAR functions for the IBCT while it primarily serves as an option for kinetic low-cost precision strikes. The SkyStriker, for example, is a catapult-launched tactical LM that can carry a 5 or 10-kilogram warhead, has a two-hour loiter time to perform limited surveillance, and is parachute recoverable.¹⁷ The TUAS platoon should be modernized with 20 LMs, along with two catapult launch trailers.

Aerial Advantage: Elevating Fire Support

The field artillery battalion provides the IBCT with an organic fires kill chain that expands across the entire BCT, serving as the backbone of the BCT's "kill web." The battalion's mission of delivering fire support — which includes cannon or rocket artillery, Army attack aviation, and joint fires to suppress, neutralize, or destroy enemy forces — makes it an ideal choice for employment of tactical drones. Fire supporters assigned to the fires battalion are integrated into every maneuver formation from the platoon to brigade headquarters, totaling more than 160 MTOE-authorized fire support professionals in maneuver formation.

tions across the IBCT. Each of the IBCT's 15 frontline maneuver companies have FISTs composed of six Soldiers — a fire support officer (13A) and fire support sergeant (13F) at the company headquarters level, and forward observers (13F) at the platoon level.

Equipping each of the 15 IBCT company FISTs with modified COTS and FPV drones that are backpackable and have kinetic capabilities enable precision-strike capabilities at the platoon level — and provide realtime ISTAR to the company headquarters. The "hip-pocket" relationship of U.S. Army's fire supporters and their maneuver leaders at echelon enables rapid employment of munitions against high-payoff targets. The recommended "kit" per company FIST is six FPVs and two mini-LMs per company, allowing the company commander to task-organize assets as required on the battlefield.

Training for tactical drone employment could occur at the MOS 13F-specific Advanced Individual Training (AIT) and Advanced Leader Course (ALC) at Fort Sill, OK. Instruction would provide the force with Soldiers who have the skills to operate sUAS to be integrated into training with maneuver formations from platoon live-fire exercises through Combat Training Center (CTC) rotations. Fires battalions should evolve fire support coordination exercises (FSCXs) to integrate the use of tactical drone warfare to validate their ability to support maneuver operations on today's battlefields. Furthermore, Fort Sill is also the home of the Joint Counter-sUAS University, which provides the installation with the resident experts to implement a change to the 13F program of instruction for integrating tactical drone warfare.

Mortar Revolution (Infantry Battalion Mortars)

Maneuver battalions and cavalry troops employ 120mm and below mortar systems that enable maneuver companies to accomplish their tactical mission tasks. The mortar platoon is doctrinally controlled by the maneuver battalion headquarters through the battalion's fire support element. Equipping maneuver battalion mortars with an LM would provide organic ISTAR and precision-strike capabilities while also enabling a mortar section to observe targets organically for prosecution with organic mortar systems.

The Hero-90, for example, is a backpackable mini-loitering munition with a 40-kilometer range and 45-minute endurance; it operates between 1,200-3,000-feet — below the current max ordinate of 120mm mortars. It also uses the same common launch tube as tube-launched, optically tracked, wire-guided (TOW) missiles. The 1.5-kilogram warhead can be used against light and armored vehicles, command posts, and personnel. An advantage of an LM such as this is its anti-tank capability, which would enable light battalions to shape the battlefield for their maneuver companies.

Infantry battalions can cross-cue sensors such as ground motion indicators, acoustic sensors, or echelon above brigade assets to rapidly employ LMs against high-value targets in the offense or in the defense. Mortar Soldiers (11C) could be trained on this system during One Station Unit Training and ALC, ensuring the institution provides baseline training for Soldiers to implement this capability into any organization's training progression.

IBCT Modernization Summary

The necessary tools to initiate the modernization of the IBCT exist today. The proposed modernization of the TUAS platoon, battalion mortars, and company FISTs within the fires battalion offers the most efficient transfer of training from a Soldier skillset perspective and tactical employment from an existing kill-web architecture. Materiel solutions provided by industry are being fulfilled by the U.S. Marine Corps, as well as other NATO and non-NATO members. Fort Moore, GA, and Fort Sill are already equipped with the leadership and expertise to pivot to such an innovative change within the IBCT organizational, materiel, and training advancement. Doctrine will undergo updates following materiel and organizational solutions, leveraging iterative learning processes from our Army's operations, training, and insights from current and past conflicts. Internal IBCT training will evolve at home stations, integrating tactical drone warfare into offensive and defensive operations at the platoon level and higher.

Conclusion



Proposed Tactical Drone Modernization for Infantry Brigade Combat Teams

The U.S. Army's BCTs need to be modernized to conduct tactical drone warfare. Wars of the past and those ongoing today have proven the revolution in military affairs that tactical drone warfare has brought to the modern battlefield. Our adversaries and allies alike have already implemented tactical drones into their orders of battles, instituted training academies, and begun production at mass domestically. Materiel solutions already developed and tested in combat are being produced by our allies and can solve our current capability gap on the battlefield. Reorganizing and equipping the IBCT's TUAS platoon, company FISTs, and battalion mortar platoons to conduct tactical drone warfare will enable them to fight and win in the close fight.

The U.S. Army must modernize its warfighting formations to prevent BCTs from facing an asymmetric disadvantage on the battlefield. Leaders must acknowledge that winning the "deep fight" is unattainable without the capability to win the "close fight" at the BCT level. With global tensions on the rise, and our adversaries already implementing this capability, the U.S. Army must adapt to tactical drone warfare now before it is forced into change on the future battlefield.

Editor's Note: As with all Infantry articles, the views expressed in this article are those of the author and do not reflect the official policy or position of the U.S. government or any element of it. Any mention of items does not constitute an official endorsement by the U.S. government or any of its subordinate departments or agencies.

Notes

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