

Frontline Robotics:

Enhancing the Situational Awareness of Junior Leaders through Small Unmanned Aircraft Systems

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On 7 November 2004, approximately 10,500 U.S. Soldiers and Marines initiated what would prove to be one of the most dangerous and heavily scrutinized missions of the Iraq War. The task of clearing Fallujah, dubbed Operation Phantom Fury, pitted American and allied forces against well-prepared and highly dedicated insurgent defenders scattered throughout the sprawling urban landscape. For days on end, Soldiers and Marines scoured the city, often pressing ahead without knowing what waited for them around the next corner, in the next room, in the next house, or down the next alleyway. Small unit leaders were often forced to move forward while contending with an extreme lack of situational awareness (SA). The inability of squad and platoon leaders to see their surroundings, visualize the fight before them, and to make decisions based on real-time data introduced elevated risk to an operation already fraught with risk. In the end, 95 U.S. service members lost their lives in the fight for Fallujah and, while it is certainly impossible to mitigate all risk in a combat operation, organic SA assets at the lowest echelons likely would have proved invaluable to mission success and saving American lives. Fortunately for today's Army, efforts are underway to rectify that gap in capability, and the answer lies in the promise of robotics.

The nature of warfare is changing and so too is the fight that we can expect in the future. That does not mean, however, that we can ignore the lessons learned from previous conflicts. The battle for Fallujah taught us much about the complexities of modern warfare and revealed some glaring capability gaps. One of those gaps centers upon the lack of organic SA tools accessible to leaders at the battalion and below echelons — the tactical edge — and proved costly for American forces executing Operation Phantom Fury. More than 15 years later, that gap has not been entirely filled. It is becoming increasingly clear that rectifying this lack in capability is essential. Future conflicts are only going to become more complex, lethal, and dominated by technological innovation.

The fight we are now preparing for will be one against highly capable peer adversaries, and the future operating environment (FOE) will be characterized by an intersection of instability and disruptive technologies that will serve to degrade the comparative advantage in combined arms maneuver that the Army has enjoyed for decades. The



The Soldier Borne Sensor weighs less than six ounces and excels in highly complex and restrictive environments. (Photo courtesy of author)



An Experimental Force Soldier hand-launches a Short Range Reconnaissance SUAS during operational testing at Fort Benning. (Photo by Tad Browning)

results of sending Soldiers to combat today without the ability to accurately see their surroundings in order to gain the time and space to make decisions have the potential to be far more deadly than the results of Operation Phantom Fury in 2004. It is imperative, therefore, that the Army commits to modernization priorities that support the preservation of our tactical overmatch in current conflicts and those to come. Junior leaders should be aware of and begin planning for the integration of the Army's ongoing modernization efforts. One of those efforts is aimed at eliminating the small unit SA capability gap and will be achieved by providing lower echelons across the Army with small unmanned aircraft systems (SUAS). Two SUAS capabilities in particular, Soldier Borne Sensor (SBS) and Short Range Reconnaissance (SRR), will be delivered to formations across the Army in the very near future.

The effective employment of the SBS and SRR capabilities requires an understanding of SUAS fundamentals. An SUAS is a small, light, inexpensive unmanned aircraft capability employed by battalion and subordinate maneuver, maneuver support, and maneuver service and sustainment units to accomplish information collection in reconnaissance and other enabling operations. They enable operators to see and understand the battlefield beyond their visual line of sight — providing an organic reconnaissance and security (R&S) capability that supports information collection at lower echelons. When employed at the squad and platoon levels, SUAS greatly enhance the SA of our leaders and enable freedom of maneuver while reducing risk to the warfighter. As such, militaries worldwide are identifying the value of SUAS and are actively exploring how to best employ them to gain tactical and operational advantages.

The SBS is a squad-level asset that is currently being fielded to infantry, cavalry, and engineer squads across the Army. A highly effective SA and "quick look" tool, the SBS minimizes transportability burdens on the Soldier through weight minimization. The air vehicle weighs less than six ounces, and the total system weight is less than three pounds. The SBS provides SA to one kilometer yet excels in highly complex and restrictive environments. It reduces a squad's exposure to potential threats and enhances freedom of maneuver by providing actionable information to support decisions at the lowest echelon. The SBS enables infantry squads to surveil target areas, develop a scheme of maneuver, and enhance survivability in and out of enemy contact. For scout squads, SBS provides the ability to surveil danger areas and areas of interest in the performance of reconnaissance or screening tasks both in and out of enemy contact. Squad leaders who train with and employ SBS are certain to enhance the combat effectiveness of their squads. Furthermore, the SA gained at the tactical edge will contribute to the overall success of higher echelons by driving decentralized decision-making and expanding leader initiative.

The SRR is a platoon-level UAS that the Army will begin fielding to infantry, armor, cavalry, engineer, chemical, and special operations forces in 2021. It is capable of flying for more than 30 minutes at a range of three kilometers.

SRR provides the warfighter with enhanced SA and a standoff capability in urban and complex terrain, enabling accurate reconnaissance and the detection and acquisition of targets of interest. This capability allows the platoon to engage the enemy at a time and on terrain and conditions favorable to the platoon. For scout formations, the SRR identifies enemy reconnaissance or security elements and follow-on enemy forces during R&S missions to enable the platoon to target and defeat them, allowing the supported unit to maneuver out of contact or remain undetected from enemy ground reconnaissance elements. It is critical that platoon leaders understand these operational benefits of SRR and maximize their effects through deliberate usage across a varied array of mission sets. The end result will be the development of platoons that are more lethal and safeguarded from unnecessary risk.

To be sure, the advantages of fully integrating SBS and SRR into a wide range of operations are many. Providing improved SUAS capabilities at the small unit level enables leaders to organically obtain timely and actionable intelligence while preventing a reliance on the limited assets of higher headquarters. As a result, leaders at lower echelons are able to quickly gather and assess the information needed to act decisively in any circumstance. The SBS and SRR capabilities provide mounted and dismounted squad and platoons with the ability to conduct reconnaissance and collect information about conditions and enemy activities taking place beyond line of sight. They enable leaders at these echelons to use the information gained to enhance their awareness and understanding of the conditions and to develop the situations immediately faced. The information that can be gained through the dedicated and deliberate employment of SBS and SRR systems also informs a common operating picture that leaders use to develop SA. Ultimately, the SBS and SRR capabilities are combat multipliers. They are tools that enable small units to overcome limitations presented by terrain and circumstance, such as those seen in Operation Phantom Fury, and quickly employ capabilities forward to increase the forces' influence across larger portions of assigned areas of operation.

The ability of our adversaries to compete with us on the battlefield — across all domains — has never been greater. We simply cannot expect success in fighting tomorrow's conflicts with yesterday's tactics, weapons, and equipment. We should make no mistake that our adversaries understand this and are moving out rapidly to capitalize on ever-advancing technologies wherever possible. We must do the same in the arena of SUAS and so many more. Platoon and squad leaders, those at the tactical edge of the fight, must prepare for and embrace the tremendous combat multiplying capabilities provided by systems such as SBS and SRR. Maintaining our long-standing tactical overmatch in the conflicts to come is at stake.

For more information on SBS or SRR, or the Army's SUAS Strategy in general, contact MAJ Christopher Sanders at christopher.w.sanders.mil@mail.mil.

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