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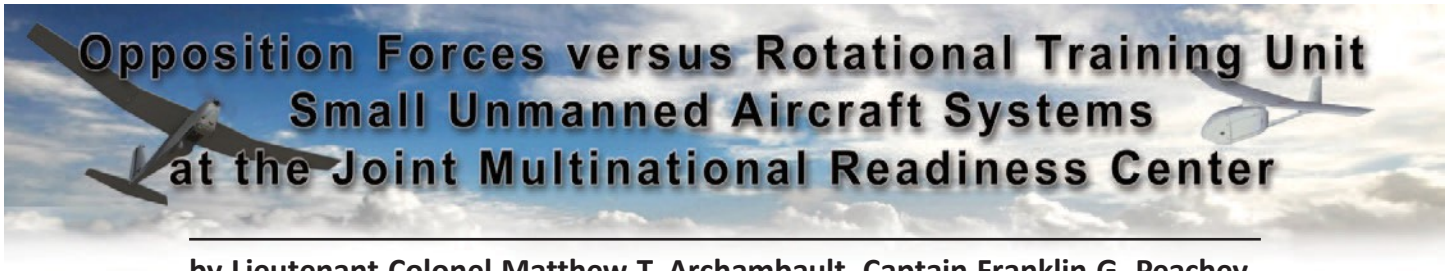


Opposition Forces versus Rotational Training Unit Small Unmanned Aircraft Systems at the Joint Multinational Readiness Center

by Lieutenant Colonel Matthew T. Archambault, Captain Franklin G. Peachey, Captain Sean D. Hayball, and Staff Sergeant Drew D. Lincoln

Introduction

The rapid expansion of the commercially available small unmanned aircraft systems (sUASs) enables many countries to easily collect information to support offensive and defensive operations. Employment of the sUAS is significant to modern operations because it provides collection for reconnaissance, target acquisition, and battle damage assessments. At the Joint Multinational Readiness Center, the 1st Battalion, 4th Infantry Regiment (1-4 IN) (known as the "Warriors")—the U.S. Army European Command's Opposition Force Battalion—replicates real-world threat tactics, techniques, and procedures (TTP) to engage and challenge rotational training units (RTUs). The Warriors' use of the sUAS as a collection and target acquisition asset is crucial to their success and provides lessons for the entire U.S. Army in terms of practical considerations as well as tactical employment.

This article is a broad assessment that—

- Focuses on the sUAS threat posed to RTUs.
- Briefly compares the relative combat power of the Warrior Battalion to RTU's.
- Discusses the factors limiting sUAS employment by RTUs.
- Describes best practices and preferred employment techniques from the 1-4 IN's perspective.
- Offers recommendations for future RTUs to effectively employ sUASs as part of the combined arms effort.

The sUAS Threat to RTUs

In the last three decades, technological advancements have revolutionized the modern battlefield. Today, commanders have more information about the battlefield than at any other point in history. One of the most important links in this transformation is the proliferation of sUASs in increasing quantities and capabilities. Today, these assets can provide a real-time stream of information that feeds commanders' decision making and their accurate targeting of enemy assets. Despite this significant impact, RTUs lack an appreciation for the lethality tied to information collected from sUASs.

This lack of appreciation has been repeatedly observed in the training environment, where Soldiers often ignore the sUAS completely or assume a 1-4 IN Raven system is friendly.[1] Incoming units receive briefings on the presence of enemy sUASs; however, activity is routinely not reported or countered. Units allow their battle positions, seams, attack positions, and schemes of maneuver to be reconnoitered. This unimpeded collection assists the 1-4 IN in answering priority intelligence requirements to exploit the RTU's vulnerabilities.

The 1-4 IN collection assets effectively acquire and pass-on time-sensitive targeting information, which queues the targeting cell, generally resulting in continual RTU losses. These largely unanswered reconnaissance and fires on RTU positions enable the 1-4 IN to effectively neutralize RTU courses of action both offensively and defensively. When all aspects of these collection opportunities are combined, a smaller unit is capable of rapidly neutralizing or defeating a much larger force. A timely real-world example occurred in Eastern Ukraine, where this reconnaissance and target acquisition ability combined with mass fires resulted in the destruction of two Ukrainian mechanized battalions in a matter of minutes by rebel forces.[2]

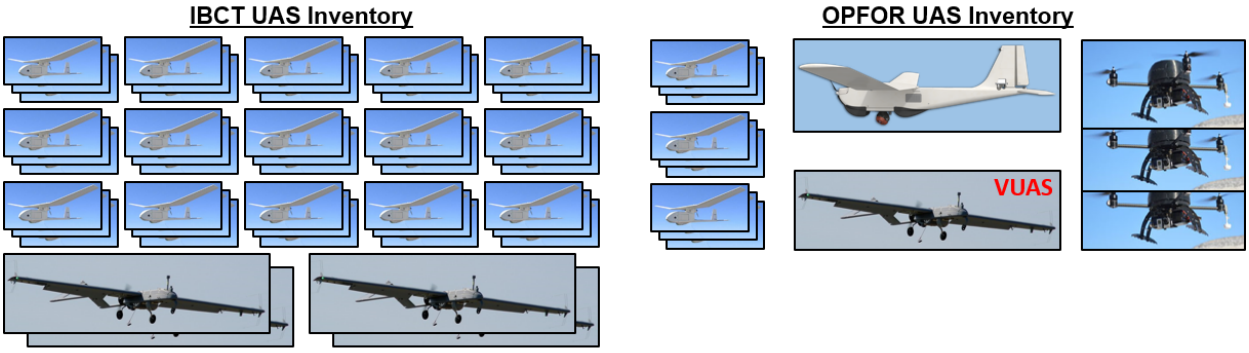
Another observed vulnerability in RTUs is poor password protection or operations security (OPSEC) procedures when employing sUASs. This enables open viewing of their sUAS feed and allows the 1-4 IN to better assess the current RTU common operational picture of its elements. The Joint Multinational Readiness Center has observed this OPSEC vulnerability across much of the RTU digital infrastructure. Despite the various threats outlined, RTUs can disproportionately exploit these capabilities based on their superior relative combat power to the 1-4 IN.

Comparison of Relative Combat Power and Results

RTUs have at least a two-to-one advantage in collection capability compared to the 1-4 IN's. In an infantry brigade combat team (IBCT), this collection capability usually comprises 15 RQ-11B Digital Data Link systems, each composed

of three Raven systems. A typical allocation includes three systems per reconnaissance squadron, four per maneuver battalion, two per artillery battalion, one per support battalion, and one system in the special troops battalion. An IBCT also has four Shadow RQ-7BV2 unmanned aerial vehicles in a tactical unmanned aerial vehicle platoon.[3] This provides an IBCT 49 airframes for employment across its area of operations.

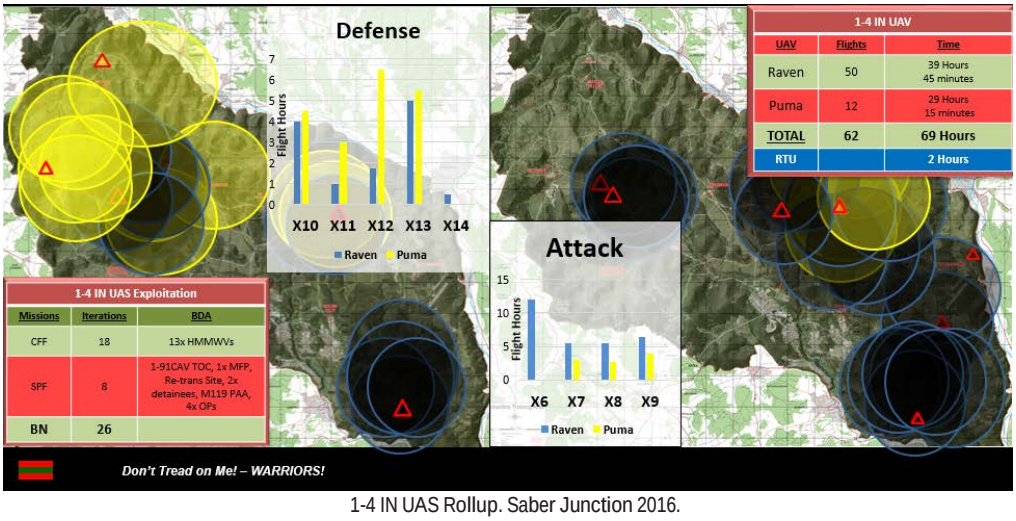
In comparison, the 1-4 IN has only three Raven systems, three rapidly deployable aerial surveillance systems (RDASSs), and one Puma system, giving the unit 13 airframes to employ. To replicate a near-peer capability accurately, the 1-4 IN also employs a virtual unmanned aircraft system (UAS) capable of two flights per day. Despite this advantage in sUAS capability, the 1-4 IN routinely outmatch RTUs in the employment of these systems.



2:1 Advantage in Relative UAS Combat Power

Based on the reporting of sUAS use in ongoing conflicts, the 1-4 IN has made a deliberate effort to accurately replicate an active sUAS environment. During the 14 days of Exercise 16-04, the 1-4 IN flew 69 hours of sUAS coverage compared to the RTU's 2 hours (See Saber Junction 2016 graphical UAS rollup). During the 13 days of Exercise 16-06, the 1-4 IN had aerial collection assets on station in the battle and disruption zones even longer, at more than 100 hours compared to the RTU's 4 hours (See Swift Response 2016 graphical UAS rollup on the next page).

The 1-4 IN's combat power is enhanced significantly due to its disproportionate advantage in information collection. The 69 hours or more of uncontested sUAS coverage enabled unfettered target acquisition, the accurate identification of emplaced RTU obstacles, and the exploitation of the RTU's coordination seams. By maintaining sustained and accurate fires, bypassing emplaced obstacles, and massing forces at the decisive point, the 1-4 IN successfully used sUASs to maximize its combat power. As the capability to employ sUASs expands within the 1-4 IN, the presence of sUASs on the battlefield and the battalion's combat power will grow.

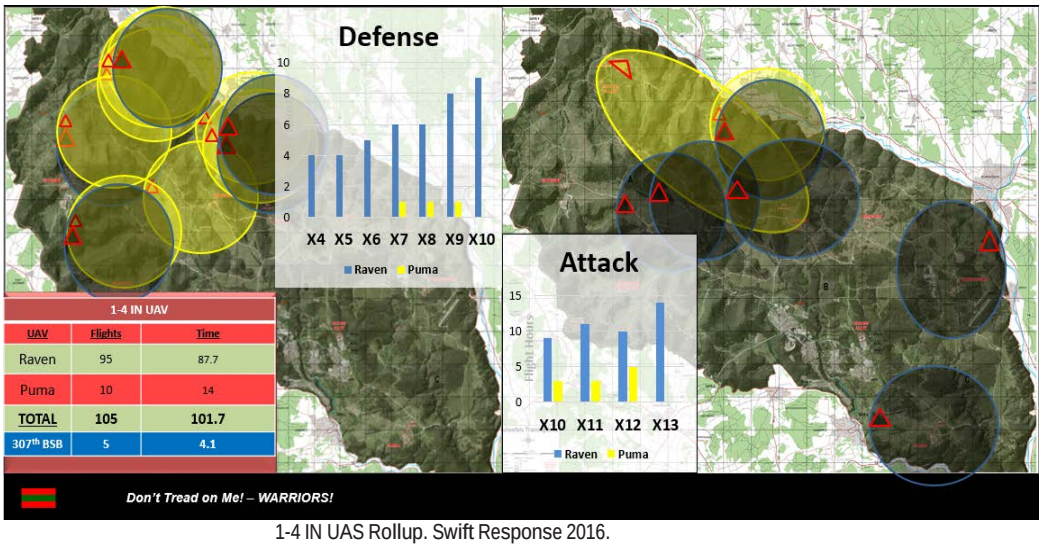


1-4 IN UAS Rollup. Saber Junction 2016.

Employment Limitations of the sUAS

A critical limiting factor to sUAS employment is the RTU's mindset toward sUASs. Most sUAS employment experiences stem from a largely permissive counterinsurgency battlefield. Many RTUs ineffectively transition their planning and training for operations in a competitive sUAS environment. Effective development and execution of vital tactical integration techniques and well-trained counter-sUAS procedures are lacking, resulting in ineffective or nonexistent communications within the RTU about friendly or enemy sUAS operations.[4]

A lack of prioritization of sUAS employment during a RTUs training cycle at the home station is another limitation resulting in untrained operators and undeveloped operating procedures. The effective employment of a RTU's sUAS capa-



1-4 IN UAS Rollup. Swift Response 2016.

bilities must begin, and be maintained at the home station. Only command-level emphasis ensures certification and training currency of sUAS operators, otherwise the sUAS will not reach its true capability as a force-multiplier for a unit's operations. Command-level emphasis should result in standard operating procedures that establish the roles and responsibilities of master trainers, pilots, and the chain of command through battalion and brigade levels.

An additional limitation to sUAS employment occurs during the airspace deconfliction process, and when synchronizing restricted operating zones (ROZs). Again, these processes and procedures must be coordinated and practiced to gain proficiency. Consistent employment of battalion-level graphic control measures on intelligence, surveillance, and reconnaissance overlays significantly aided in synchronizing tower operations. Ultimately, pre-coordination, while not always possible, is the best method of facilitating ROZ deconfliction and enabling simultaneous flights.

Another limiting factor is risk aversion. Many RTUs maintain their sUAS capabilities securely in their battle zone, limiting their range and collection potential. In comparison, the 1-4 IN accepts tactical risk by placing some of it sUAS operators forward with scout elements in the disruption zone or deeper to employ their capabilities fully. For the 1-4 IN, the risk associated with losing contact with a friendly company or the payoff of reconnoitering and targeting enemy positions significantly outweighs the risk faced by forward sUAS teams. To stay competitive, RTUs must adapt tactics that support the targeting and survivability of the brigade as a whole.

Best Practices and Preferred Employment Techniques of the Warrior Battalion

The 1-4 IN uses its three primary sUAS platforms differently, based on their respective capabilities. The rapid launch and return of the Raven system provides a company commander with quick target identification and the flexibility to maneuver Raven control station sites. The Puma system has a longer range and flight time, allowing for deeper operational views and support to fires as enemy elements enter 1-4 IN kill zones. Both systems have an infrared camera and laser target designation that support the 10-digit grid identification of a target. Depending on environmental factors (such as wind), 1-4 IN sUAS operators prefer using the Raven system in the of- fense and the Puma system in the defense, although pairing the systems to queue their capabilities has provided signifi- cant advantages if a Raven system is engaged. The newly im- plemented RDASS, which replicates a nonconventional UAS capability, has a high definition camera, but limited range and target support capabilities. UAS operators prefer using this system in a reconnaissance capacity, while in towns or along tree lines, to fully employ the system's abilities and minimize risks associated with detection.

In order to use these platforms, it is vital for the Warrior Battalion to maintain a master trainer. Currently, the 1-4 IN has one master trainer, a staff sergeant, who conducts all standards, currency, and proficiency tasks, and coordinates class IX support for 32 sUAS operators and 13 airframes. The master trainer plays a crucial role in planning and employing the battalion's sUAS capabilities. Alongside the reconnaissance company commander and intelligence section, the master trainer develops a sUAS scheme of maneuver and named area of interest overlay/observation plan. Simultaneously, the trainer coordinates with the installation tower chief to operate multiple sUASs while deconflicting for

Photo by SFC Michael Guillory

SGT Dane Phelps, from 2nd Battalion, 27th Infantry Regiment, 25th Infantry Division prepares to launch the Raven unmanned aerial vehicle during a joint U.S. and Iraqi cordon and search operation.

Photo by SGT Michael J. MacLeod

U.S. Army CW2 Dylan Ferguson, a brigade aviation element officer with the 82nd Airborne Division's 1st Brigade Combat Team, launches a Puma unmanned aerial vehicle June 25, 2012, Ghazni Province, Afghanistan.

live aircraft and fires throughout the training area. Although all of these tasks are important, the master trainer's most important role is instructing and certifying operators.

The master trainer is the only Soldier authorized to instruct and certify new operators. In addition to ensuring all Puma, Raven, and RDASS operators are current with their airframe, the trainer must also track Soldiers scheduled for a permanent change of station or expiration of term of service. Each company must maintain a total of six Puma/Raven operators and five RDASS operators. Therefore, the master trainer must find time between rotations to conduct the 10-day initial qualification course to replenish each company. Upon completion of this course, Soldiers go through an up to 60-day program to progress from mission preparation to mission qualified. After these formal training gates, the experienced operators practice more technical or new TTP gained from recent rotations. The unit trainer and master trainer mold their newest operators to fly unassisted. Outside of a rotation, the master trainer designates evaluation days to test operators on basic knowledge, skills, and emergency procedures required of experienced operators.

Prior to a rotation, the master trainer consolidates certified personnel into a sUAS squad-sized element covering the Puma and Raven systems and RDASS. The squad is divided into two-man sUAS assault teams responsible for specific airframes. Team members either are in military uniform or dressed as innocent civilians to penetrate deep into enemy territory. Most importantly, the teams are either accompanied by a forward observer or personally capable of effectively coordinating fire support, dramatically shortening the sensor-to-shooter timeline.

The night before each rotation, the master trainer and team conduct rehearsals, layouts, and final reconnaissance planning for their initial collection areas. Once the rotation begins, the master trainer takes the new operators into the fight so they can receive on-the-job training. Overseen by the master trainer, new operators construct a ROZ plan, route, flight path, and rules of engagement. After developing the plan successfully, the new operators execute their plan alongside the master trainer. The master trainer briefs experienced operators before operations and mentors them throughout the rotation. Throughout the rotation, the master trainer also links up with the teams to conduct a rolling after action review and to ensure they maximize their sUAS capabilities.

Once teams are in position, senior team members take charge and shift teams, as required, to provide the best security and overwatch for their positions. Each sUAS operator can fly in different types of environments and terrain. They operate by means of launching, driving, and recovering while mobile, working from rooftops in cities, camouflaging themselves to blend in with terrain, or operating in the tops of trees while working beyond the forward line of protection. At every position, sUAS teams conduct a short reconnaissance and fortify their positions for time to evade if discovered.

At the end of every rotation, the master trainer conducts a 100-percent inventory for each company to annotate all shortages and damages. The master trainer contacts Redstone Arsenal and branch movement control teams to coordinate shipping of replacement parts. When ordered, each replacement part is assigned to a specific company for proper tracking. At this time, the master trainer builds an in-depth after action report sUAS tracker detailing every flight, location, and battle damage assessment from the rotation. This report is submitted to the battalion commander and used for battalion rotational after action reviews. One week later, the master trainer resumes coordination of flights to qualify and progress operators.

Recommendations for Future RTUs

RTUs must embrace and prepare for the sUAS fight through aggressive training, planning, and employment of UAS assets. The following lists concise recommendations for RTUs to implement:

- Change the mindset—the RTU is fighting in a competitive UAS environment.
- Implement and train counter-UAS drills, including the consistent employment of cover, concealment, camouflage, and deception.
- Ensure adherence to OPSEC, and secure and protect all information technology systems.
- Ensure commanders emphasize and prioritize the certification and training currency of sUAS operators.
- Train at least two master trainers per brigade and two per battalion (master trainers are not limited by the modified table of organization and equipment); empower them to lead and coordinate their element.
- Ensure commanders enforce the development and implementation of sUAS standard operating procedures.
- Incorporate and practice the synchronization of UAS, fires, and maneuver elements at home-station training events.
- Ensure leaders aggressively employ sUASs and exploit the collected information.

Conclusion

The Warrior Battalion provides the toughest, most realistic threat to train United States and multinational partners. During mission execution, the Warriors constantly learn and refine their skills in the critical areas of the maneuver battlefield, collecting valuable lessons for Army units and our partners.

Endnotes

1. Former Joint Multinational Readiness Center (JMRC) senior intelligence officer LTC Eric Remoy noted this observation: "AWG training experiments…have been consistent with the findings at JMRC in similar training environments, the training units often ignore proximate UAS and assume it is operating in a friendly capacity." Eric Remoy, "Summary of Current Counter-Unmanned Aerial Systems Efforts." (information paper, JMRC, 18 February 2016).

2. "…a combination of artillery and MLRS, with the latter employing top-attack munitions and thermobaric warheads, caught two Ukrainian mechanized battalions in the open. This intensely concentrated fire strike created high casualties and destroyed most of the armored vehicles in a shelling that lasted only a few minutes…without having the means of real-time target acquisition, Ukrainian forces were at a severe disadvantage." Dr. Phillip A. Karber, "Lessons Learned from the Russo-Ukrainian War, Personal Observations," (information paper, Georgetown University, July 2015).

3. Scott R. Masson, "Unmanned Aerial Vehicle use in Army Brigade Combat Teams: Increasing Effectiveness across the Spectrum of Conflict," (master's thesis, Naval Postgraduate School, December 2006), http://www.dtic.mil/dtic/tr/fulltext/u2/a462656.pdf

4. "JMRC assessed that the Combined Resolve V training unit in November of 2015 lacked procedures to inform the tactical formation of friendly overflights as a first step in characterizing the airspace, lacked procedures to feed information from tactical units to higher headquarters about the presence of UAS, and lacked material solutions beyond engaging UAS with small arms and crew-served weapons.", Remoy, "Summary of Current Counter-Unmanned Aerial Systems Efforts."

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CPT Peachey is the battalion intelligence officer for 1st Battalion, 4th Infantry Regiment, Hohenfels, Germany. He served as a scout platoon leader during a deployment to Afghanistan and a military intelligence company commander at the National Security Agency. He holds an master of arts in diplomacy from Norwich University.

CPT Hayball is the Grizzly Team intelligence observer-coach-trainer, Joint Multinational Readiness Center, Hohenfels, Germany. His deployments include two to Afghanistan, where he served first as a signals intelligence platoon leader, and second as a Security Force Advisory and Assistance Team advisor. He holds a bachelor of arts in international studies from the University of St. Thomas, Houston.

SSG Lincoln is the 1st Battalion, 4th Infantry Regiment master sUAS trainer. His deployments include two tours to Afghanistan where he served as a scout team leader, personal security detachment team 1, fire team leader, and squad leader. He holds an associate of arts in criminal justice, and is finishing his bachelor of arts in unmanned systems applications from Embry-Riddle Aeronautical University.