OPFOR vs RTU

Small Unmanned Aerial Systems at JMRC

LTC MATTHEW T. ARCHAMBAULT
CPT FRANKLIN G. PEACHEY
CPT SEAN D. HAYBALL
SSG DREW D. LINCOLN

The rapid expansion of commercially available small unmanned aerial systems (SUAS) enables many countries to easily collect information in support of offensive and defensive operations. SUAS employment is significant to modern operations due to its ability to provide collection for reconnaissance, target acquisition, and battle damage assessments. At the Joint Multinational Readiness Center (JMRC) at Hohenfels, Germany, the 1st Battalion, 4th Infantry Regiment (Warriors) — U.S. Europe's (USAREUR's) opposition force (OPFOR) battalion — replicates real-world threat tactics, techniques, and procedures (TTPs) to engage and challenge rotational training units (RTUs). The Warriors' utilization of SUAS as a collection and target acquisition asset is crucial to their success and provides lessons for the larger Army in terms of practical considerations as well as tactical employment.

This article focuses on the SUAS threat posed to RTUs, briefly compares the relative combat power of the Warrior Battalion to RTUs, discusses the factors causing a lack of SUAS utilization by RTUs, describes best practices and preferred employment techniques from the perspective of 1-4 IN, and offers recommendations for future RTUs to effectively employ SUAS as part of the combined arms effort.

A Soldier with the 1st Armored Brigade Combat Team, 3rd Infantry Division launches a RQ-20 Puma Unmanned Aerial Vehicle while conducting training during Combined Resolve V at the Joint Multinational Readiness Center in Hohenfels, Germany, on 22 October 2015. (Photo by SPC John Cress)

Threat

Over the last three decades, technological advancements have revolutionized the modern battlefield. Today, commanders have more information about a battlefield in their possession than at any point in history. One of the most important links in this transformation is the proliferation of SUAS in increasing quantities and capabilities. 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 SUAS.

A clear example of this lack of appreciation is repeatedly observed in the training environment where Soldiers often ignore SUAS either completely or assume an OPFOR (1-4 IN) Raven SUAS is friendly.[1] Incoming units receive briefings on the presence of enemy SUAS; 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 1-4 IN in answering priority information requirements (PIRs) to exploit the RTU's vulnerabilities.

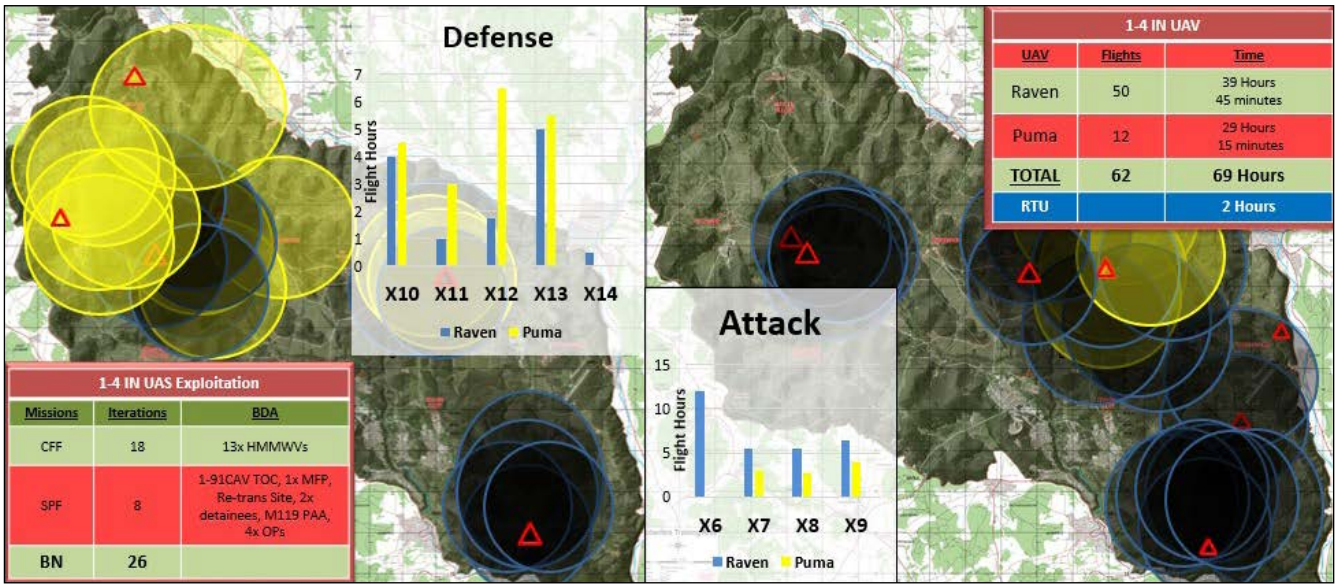
The 1-4 IN's collection assets effectively acquire and pass on time-sensitive targeting information, which queues the targeting cell — generally resulting in continual RTU losses. These largely unanswered reconnaissance and fires actions on RTU positions enables1-4 IN to effectively neutralize an RTU course 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 resulting 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 SUAS, which enables open viewing of their SUAS feed and allows 1-4 IN to better assess the current RTU's common operating picture of its elements. JMRC has observed this OPSEC vulnerability across much of the RTU digital infrastructure. Despite the various threats outlined above, RTUs have the capacity to disproportionately exploit these same capabilities based on their superior relative combat power to 1-4 IN.

Relative Combat Power and Results

Rotational units have at least a two-to-one advantage in collection capacity compared to 1-4 IN. In an infantry brigade combat team (IBCT), this collection capacity typically consists of 15 RQ-11B Digital Data Link (DDL) systems, each composed of three Raven aircraft. A usual allocation includes three 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 (UAVs) in a tactical UAV (TUAV) platoon.[3] In total, this gives an IBCT 49 airframes for employment across its area of operations.

Figure 1 — 1-4 IN UAV Rollup - Saber Junction 2016



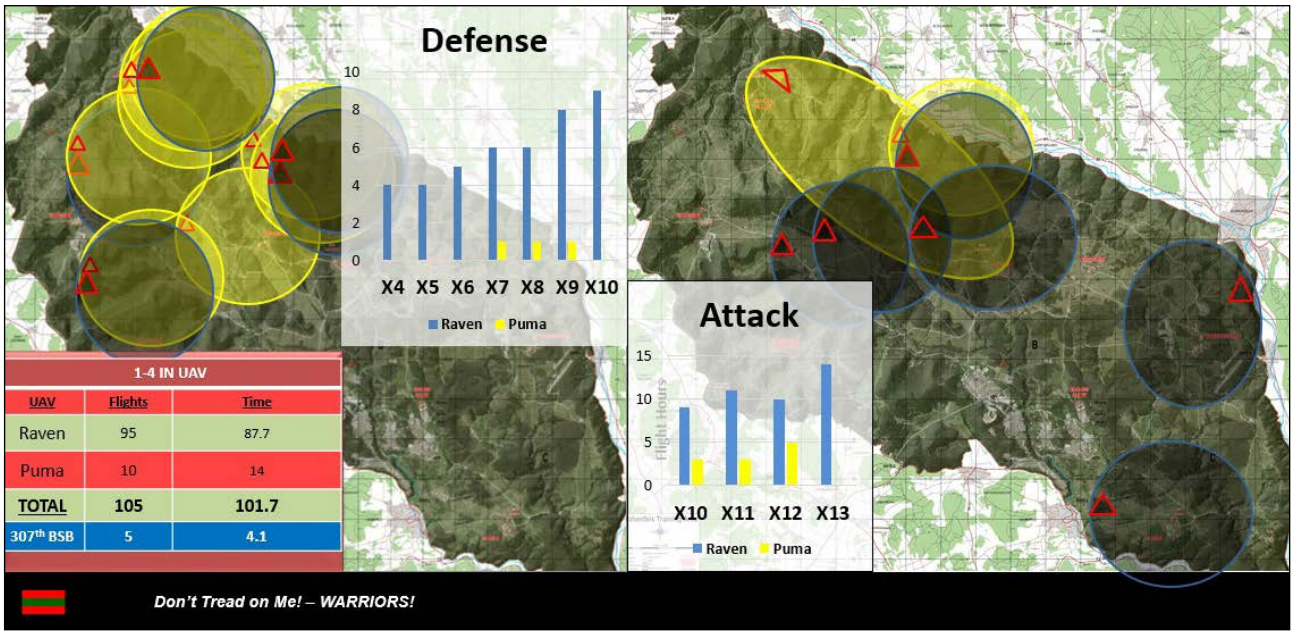


Figure 2 — 1-4 IN UAV Rollup - Swift Response 2016

In comparison, 1-4 IN currently has only three Raven systems, three Rapidly Deployable Aerial Surveillance Systems (RDASS), and one Puma system — a total of 13 airframes to employ in response. To more accurately replicate a near-peer capability, 1-4 IN also employs a virtual UAS capable of two flights a day. Despite this advantage in SUAS capacity, RTUs are routinely outmatched by 1-4 IN in the employment of these systems.

Based on the reporting of SUAS use in ongoing conflicts, 1-4 IN has made a deliberate effort to accurately replicate an active SUAS environment. During the 14 X-days of exercise 16-04 (Saber Junction 2016), 1-4 IN flew 69 hours of SUAS coverage compared to the RTU, which only flew two hours (see Figure 1). During the 13 X-days of exercise 16-06 (Swift Response 2016), 1-4 IN had aerial collection assets on station in the battle and disruption zones even longer — more than 100 hours compared to the RTU's four hours (see Figure 2).

The combat power of 1-4 IN is significantly enhanced 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, 1-4 IN successfully used SUAS to maximize its combat power. As the capability to employ SUAS expands within 1-4 IN, the presence of SUAS in the battlespace and the battalion's combat power will grow.

SUAS Employment Limitations

One of the critical limiting factors to SUAS employment is the training unit's mindset toward SUAS. Almost all SUAS employment experience stems from a largely permissive counterinsurgency battlespace. Many training units 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. The result is ineffective or non-existent communication within the RTU about friendly or enemy SUAS operations.[4]

A lack of prioritization of SUAS employment during an RTU's training cycle at home station is another limitation that results in untrained operators and undeveloped operating procedures. The effective employment of an RTU's SUAS capabilities must begin and be maintained at the unit's home station. Command-level emphasis and command-level emphasis only will ensure certification and training currency of SUAS operators; otherwise SUAS will not reach its true capability as a force multiplier for a unit's operations. Command-level emphasis ought to result in a standard operating procedure (SOP) which establishes the roles and responsibilities for master trainers, pilots, and the chain of command through battalion and brigade.

An additional limitation to SUAS employment occurs during the airspace deconfliction process and when synchronizing restricted operating zones (ROZs). Again, these are processes and procedures that must be coordinated and practiced in order to gain proficiency. Consistent employment of battalion-level graphic control measures on intelligence, surveillance, and reconnaissance overlays significantly aids in the synchronization of tower operations. Ultimately, pre-coordination, while not always possible, is the best method to facilitate ROZ deconfliction and enable 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, 1-4 IN accepts tactical risk by placing some of it SUAS operators forward with scout elements in the disruption zone or deeper to fully employ their capabilities. For 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 Methods of the Warrior Battalion

As discussed earlier, 1-4 IN has three primary SUAS platforms, all of which are used in different ways based on their respective capabilities. The rapid launch and return of a Raven 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 the 1-4 IN kill zones. Both systems have an infrared camera and laser target designation that support 10-digit grid identification of a target. Depending on environmental factors such as wind, 1-4 IN SUAS operators prefer to use Ravens in the offense and the Puma system in the defense, although pairing the systems to queue their capabilities has provided significant advantages if a Raven is engaged. The newly implemented RDASS system, which replicates a non-conventional UAS capability, has a high-definition camera but limited range and target support capabilities. UAS operators prefer to use this system in a reconnaissance capacity while in towns or along tree lines in order to fully employ the system's abilities and minimize risks associated with detection.

In order to use these platforms, it is vital that 1-4 IN maintains a master trainer. The Warrior Battalion currently has one master trainer (a staff sergeant) who conducts all standards, currency, 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 (NAI) overlay/observation plan.

OPFOR Soldiers from the 1st Battalion, 4th Infantry Regiment perform pre-checks on a Raven UAV during Saber Junction 16, which occurred 31 March to 24 April 2016 in Hohenfels, Germany. (Photo by SSG Josiah Pugh)

Simultaneously, he coordinates with the installation tower chief to operate multiple SUAS systems while deconflicting for live aircraft and fires throughout the training area. While 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, he must also keep track of Soldiers who are scheduled to complete a permanent change of station (PCS) or expiration of term of service (ETS). 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 a 10-day initial qualification course (IQT) to replenish each company. Once Soldiers have completed this course, they go through an up to 60-day program to progress from mission preparation (MP) to mission qualified (MQ). After these formal training gates are passed, the experienced operators practice more technical or new TTPs gained from recent rotations. The unit trainer (UT) and master trainer mold their newest operators to eventually fly unassisted. When outside of rotation, the master trainer designates evaluation days where operators are tested on basic knowledge, skills, and emergency procedures that an experienced operator is required to know.

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

The night prior to each rotation, the master trainer and his 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. With the oversight of the master trainer, the operators then construct a ROZ plan, route, flight path, and rules of engagement. Once the plan is developed successfully, the new operators execute their plan alongside the master trainer. The experienced operators are briefed prior to operations by the master trainer and are subsequently mentored throughout the rotation. In addition, the master trainer also conducts a linkup with each team during the rotation to conduct rolling after action reviews (AARs) and ensure teams are maximizing their SUAS capabilities.

Once a team is in position, the senior team member takes charge and shifts the team as required to provide the best security and overwatch for his position. 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 roof tops 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 the SUAS teams conduct a short reconnaissance and fortify their positions to give them 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 then contacts Redstone Arsenal and the movement branch control team to coordinate shipping of replacement parts. When ordered, each replacement part is assigned to a specific company to ensure its proper tracking. In addition, at this time the master trainer builds an in-depth AAR SUAS tracker detailing every flight, location, and battle damage assessment (BDA) report from the rotation. This report is submitted to the battalion commander and is used for battalion rotational AAR. The following week, the master trainer resumes the coordination of flights to qualify and progress operators.

Recommendation Roll-up

RTUs must embrace and prepare for the SUAS fight through aggressive training, planning, and employment of UAS assets. Below is a concise list of 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 OPSEC is closely adhered to and all information technology (IT) systems are secure and protected.
- Commanders must emphasize and prioritize the certification and training currency of SUAS operators.
- Master trainers are not limited by modified table of organization and equipment (MTOE); train at least two master

Soldiers with the 3rd Armored Brigade Combat Team, 4th Infantry Division launch an RQ-7B Shadow UAV during live-fire exercises at Rose Barracks in Vilseck, Germany, on 9 April 2017. (Photo by SSG Ange Desinor)

trainers per brigade and two per battalion. Empower them to lead and coordinate their element.
- Commanders must enforce the development and implementation of a SUAS SOP.
- The synchronization of UAS, fires, and maneuver elements must be incorporated and practiced at home-station training events.
- Leaders must aggressively employ SUAS and exploit the collected information.

Conclusion

The Warrior Battalion's mission is to provide the toughest, most realistic threat to train U.S. and multinational partners. Additionally, during mission execution, the Warriors are constantly learning and refining their skills in the critical areas of a maneuver battlefield, gathering lessons valuable to all units in the U.S. Army and our partners. We hope this article demonstrated how to leverage the SUAS to support maneuver as well as provided some helpful TTPs for maximizing the capability.

Notes

[1] "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" — LTC Eric Remoy, former JMRC senior intelligence officer, "Summary of Current Counter-Unmanned Aerial Systems Efforts," (JMRC information paper, 18 February 2016).
[2] "…a combination of artillery and MLRS (multiple launch rocket system), 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," (6 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).
[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." — LTC Eric Remoy, former JMRC senior intelligence officer.

At the time this article was written, **LTC Matthew T. Archambault** was serving as commander of the 1st Battalion, 4th Infantry Regiment in Hohenfels, Germany. He previously deployed to Iraq and Afghanistan where he served as a rifle company commander, maneuver planner, battalion S3, and brigade S3. He earned a bachelor's degree in political science from the U.S. Military Academy at West Point, NY, and a master's degree in theater operations from the School of Advanced Military Studies.

At the time this article was written, **CPT Franklin G. Peachey** was serving as the intelligence officer for 1-4 IN. He served as a scout platoon leader during a deployment to Afghanistan and a military intelligence company commander at the National Security Agency. He earned a master's degree in diplomacy from Norwich University.

At the time this article was written, **CPT Sean D. Hayball** was serving as the Grizzly Team intelligence observer-coach-trainer at the Joint Multinational Readiness Center. His deployments include two to Afghanstan, where he served first as a signals intelligence platoon leader and second as a security force advise and assist team advisor. He earned a bachelor's degree in international studies from the University of St. Thomas in Houston.

At the time this article was written, **SSG Drew D. Lincoln** was serving as 1-4 IN's master small unmanned aerial systems 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 earned an associate's degree in criminal justice and is finishing his bachelor's degree in unmanned systems applications from Embry-Riddle Aeronautical University.