

Melding Mechanized Assets and sUAS

Offensive-minded reconnaissance

by Capt Spencer S. Waters

“Information is valueless unless it be delivered to the commander in time for him to act on it. This means that reconnaissance elements must be speedier than the troops following them and must possess highly effective means of communication.”

—Major General Heinz Guderian¹

Reconnaissance elements in modern warfare have changed drastically with the expanding developments in small unmanned aircraft systems (sUAS), but the timeless principles from General Guderian remain the same. Providing reconnaissance in support of M1A1 tanks moving at an average of 25 kilometers per hour necessitates sUAS, which have extended range, endurance, and speed. By making substantial tactical improvements in implementing the RQ-20B Puma over the RQ-11B Raven, the Marine Corps now has a relevant sUAS that can keep up with tanks that seek to “close with and destroy the enemy by using armor-protected firepower, shock effect, and maneuver.”² The Raven’s limited range (10km), endurance

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The introduction of sUAS has changed the composition of reconnaissance units. (Photo by author.)

(90 minutes), and archaic fixed sensor have proven inadequate for maneuvering tanks. In an offensive engagement greater than ten kilometers, the utility of the Raven is negligible as soon as tanks are beyond its range.

It is no surprise to Marines today that sUAS technology is accelerating beyond its initial expectations. In light of lessons learned from Iraq and Syria, we understand the significance of countering commercial off-the-shelf (COTS) drones and emerging enemy sUAS tactics.³ The Marine Corps has sought to defend against this multi-dimensional threat using man-portable Drone-Defenders, improving early warning radars, and updating defensive counter air doctrine.⁴ Incorporating sUAS with our mechanized assets will aid in the development of defensive countermeasures concurrent with their infantry brethren; however, a rapid maneuvering tank force must prioritize the sUAS with respect to its offensive capabilities.

Doctrinal Effects

Marine Corps tank battalions are equipped with a scout and TOW platoon that provide “an organic mounted capability.”⁵ 1st Tank Battalion continues to retain these assets, but 2d Tank Battalion must request outside agencies to provide ground-based reconnaissance. Whether in combat or training, it is crucial to cover a tank battalion’s flanks and ensure resources are provided for effective reconnaissance. Additionally, Group 1 sUAS require minimal coordination outside of a unit’s fire support coordination center.⁶ The RQ-20B Puma can sufficiently find enemy flanks, locate obstacles, see dead-space in rural and urban areas, reconnoiter multiple routes simultaneously, provide observation for call for fire, conduct beyond-horizon targeting for fire support teams, and fill other roles traditionally held by scout platoons. In the near future, sUAS will *not* be able to fill the roles of the manned and armed scout platoon. If allocated correctly, enlarging the sUAS presence among tracked vehicles will undoubtedly *expand* the battalion’s reconnaissance ability.

Providing organic reconnaissance in the form of sUAS gives unit com-

manders an all-weather aerial reconnaissance capability. For instance, the cloud coverage over northern Norway is overcast to mostly cloudy 70 percent of the year.⁷ These conditions will often prohibit traditional UAS and fixed-wing multi-sensor imagery reconnaissance assets from effectively identifying and engaging targets throughout the battlespace. Because of their low visible and auditory signatures, sUAS can operate at much lower altitudes to provide effective multi-sensory imagery reconnaissance despite unceasing cloud coverage. If we truly want “persistent sensors above, on the flanks, and, at times, below our forces,” we ought to build the sUAS program and train sUAS operators at the lowest level.⁸

In the training employments of sUAS with tanks, intelligence, communications, and air, officers were able to not only provide realtime updates to the forward combat operations center with the RQ-20B but enable the networking on-the-move (NOTM) kit to receive the sUAS full motion video (FMV). With satellite communications, the NOTM kit is capable of transmitting sUAS FMV across the battlespace to provide re-

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altime reconnaissance. Additionally, tank commanders conducted force-on-force training in which the opposing force utilized sUAS. With this extra dimension added to the training, commanders were forced to develop methods for defeating and mitigating the enemy sUAS threat. The mere addition of sUAS to the enemy’s capabilities would alter the entire friendly scheme of maneuver. Lastly, even though the Puma has a larger physical footprint than the Raven with its multiple Pelican cases, this was determined to be a non-issue when launching the Puma from a forward combat operations center or with a tank company’s logistical

“The only thing that is unmanned with this system is a little teeny tiny piece of fiberglass that’s on the end of this very long, people-intensive spear.”

**—LtCol Bruce Black,
USAF⁹**

trains. The mere presence of the Puma during company training prompted the continuous development of inventive tactics, techniques, and procedures. By providing the M1A1 tank commanders with an equitable sUAS, we enhance their overall lethality, situational awareness, and confidence in battlespace management.

Manpower Concerns

Our peer, near-peer, and non-state adversaries’ use of sUAS is forcing American forces and our allies to *look up*. Nearly all of our enemies can provide guided munitions to attack our vehicles, planes, and bases through sophisticated and COTS sUAS. Therefore, by continuing to train Marines in acquiring FMV from a sUAS, we can establish a collective knowledge base in the GCE regarding the sUAS capabilities to creatively defend against this threat.

Recently, there has been a push to increase the size of the traditional twelve-man rifle squads in order to provide an additional Marine to act as a “squad systems operator”¹⁰ who could potentially improve sUAS capabilities at the rifle platoon and company level. Early in calendar year 2018, this movement, named “Quads for Squads,” sought to procure hundreds of quad-copters, specifically the Instant Eye, for every squad.¹¹ Unfortunately, because of cybersecurity concerns, this program has been temporarily halted, and the training for over 600 COTS handheld drones has been significantly delayed.¹² In order to build



The Marine Corps should consider increasing its number of sUAS operators by training using unit personnel. (Photo by author.)

its sUAS operator force, infantry units are training with the steadfast RQ-20B Puma and RQ-11B Raven, creating an outsized demand on sUAS operator training. Prioritizing and diversifying these limited opportunities across the GCE is inherently difficult, and these few class seats are a limiting factor to the Corps' sUAS training. Regardless of whether Instant Eye and other COTS sUAS are approved to fly again in the next calendar year, there is no question that our Commandant's guidance to increase our sUAS capabilities has put increased demands on our contracts with the personnel aboard training and logistics support activity (TALSA) facilities. The near-term resolution to this problem is simple: increase the class seats of initial sUAS operator training, and develop TALSA operations to the maximum extent possible.

By increasing our sUAS presence and demanding the requisite knowledge needed to operate these assets safely, we must consider aviation safety and the increased potential for mid-air collisions with rotary and tilt-rotor aircraft. Because producing more forward air controllers (FACs) infringes on the limited manpower of our pilot population, the

answer for reducing/mitigating these aviation safety risks is to *immediately* surge our population of joint fires observers (JFOs). This resolution is no surprise to the formal trainers of Marine JFOs, who constantly seek to promote their program to unit commanders. The JFO's role is much the same of sUAS operators, a customarily ground-centric Marine who has received formal

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courses regarding aircraft deconfliction and airspace management. Whether it is managing final attack headings for CAS, acquiring targeting data, recommending weapon-to-target solutions, or understanding the three-dimensional problems of routing aircraft, JFOs unquestionably serve a vital role in providing an air support expertise to the GCE. JFOs inherently have working relationships with their respective FACs or joint

tactical air controllers (JTACs) and can provide necessary supervision to sUAS operations. In a tank or rifle company, the high-demand, low-volume FACs/JTACs cannot always be at the point of aviation friction. Therefore, talented and forward-thinking Marines who possess technical skills and high levels of proficiency should be recommended for sUAS and JFO training.

To compound this aviation safety problem, unit commanders often do not prioritize this JFO and sUAS training because manning numbers for these personnel are not tracked via the Defense Readiness Reporting System. This largely affects personnel quality control because commanders often do not account for whether sUAS operators are current or whether their JFOs have completed their vital battalion-organized designation phase of training. If our Corps wants *safe*, numerous, and proficient aviation experts in the GCE, we need to monetarily boost the training facilities designed for sUAS operators and JFOs and prioritize these programs by requiring formal reports via the Defense Readiness Reporting System.

As for micro-manpower decisions specific to tank battalions, Marines who operate with a tank company's logistical/combat trains should be considered for sUAS training. Traditionally, sUAS operators come from our intelligence personnel, and rightfully so, considering their prescribed collections instruction. However, by incorporating Marines at the lowest level possible, we can build the corporate sUAS awareness. This will create journeyman and apprentice relationships between the battalion's intelligence and air officers and provide decentralized resources and aviation experts for tank unit commanders.¹³

On the Way

The future of sUAS and mechanized forces will develop concurrent with emergent technologies, and the top-down dissemination of improved aircraft will meet the new needs of unit commanders. Tank and rifle companies alike still seek extended times-on-station, higher fidelity electro-optical/infrared sensors, reduced equipment footprints, functionality with tacti-

cal tablets, increased range, and—of course—some type of munition. The primary purposes of Air Force UAS assets are to: (1) provide reconnaissance and intercept electronic emissions, and (2) provide “light attack” capabilities.¹⁴ Without question, Marines on the ground would love for the Corps’ UAS program to adopt the light-attack purpose. In a perfect world, Marines would own and operate a sea-deployable UAS comparable to the MQ-9 Reaper, which could provide 30+ hours of direct support multi-spectral intelligence, surveillance, and reconnaissance; communications relay capabilities; and *offensive* air support capabilities.¹⁵ Group 1 sUAS most likely will not delve into CAS capabilities in the near term, but this ever-present need to *destroy* with sUAS could be facilitated with improvements to the established AeroVironment Switchblade, a disposable Kamikaze-like guided sUAS.¹⁶

For range, developments in beyond visual line-of-sight can radically increase the reach of sUAS with advanced autopilot technologies, detailed 3D mapping, and more powerful communications links. The technology exists for satellites to relay ground control station inputs to the aircraft, to the point where the sUAS is only limited by its battery and maximum flight time. With a sUAS no longer limited by its communications link, an aircraft can be available for the possibility of being tasked between separate units. Lastly, beyond visual line-of-sight can also make sUAS operations safer, considering the requirements to be seen and tracked on regional radars and satellites.¹⁷

In capabilities, expect sUAS to perform advanced signals intelligence and electronic warfare functions, counter and detect improvised explosive devices, and provide a defensive against chemical, biological, radiological, and nuclear threats. The next generation of sUAS must be easily compatible with all tactical tablet applications such as KILSWITCH and the improvement of digitally aided CAS concepts. As a communications relay, sUAS must be able to provide VHF/UHF and ANW2 communication relay payloads. In the same way tanks can outrun sUAS coverage

when using the smaller RQ-11B Raven, tracked vehicles can also outrun line-of-sight communications capabilities, and relays would prove vital in maneuver warfare tasks. In the near future, the current RQ-20B will need to improve its battery life for extended time-on-station, and hopefully the next-generation RQ-20B will increase its wind envelope to improve its all-weather abilities and infrared night sensor capabilities.

In Closing

Our next major fight will not include warfighting, where we have been able to assume air superiority. In many ways, our near-peer adversaries have matched and surpassed us in sUAS and mechanized asset integration. Developing and improving our tank platoons’ capability to maintain tactical relevance is of the utmost strategic importance to our Corps and our allies. To enable effective sUAS for our Marines leading mechanized forces, our Corps ought to prioritize JFO and sUAS operator training efforts to reflect the intent of the Commandant,¹⁸ maintain and improve doctrinal relevance into the near future, and provide adequate, timely, and decentralized intelligence and reconnaissance to key decision makers.

Notes

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3. Mark Pomerleau, “How \$650 Drones Are Creating Problems in Iraq and Syria,” *C4ISRNET*, (Online: March 2017), available at <https://www.c4isrnet.com>.
4. Jeff Schogol, “Marines Seek to Destroy Enemy Drones,” *Marine Corps Times*, (Online: March 2017), available at <https://www.marinecorpstimes.com>.
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7. See annual weather report and cloud cover categories graph for Tromsø, Norway, available at <https://weatherspark.com>.

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13. For more on journeyman apprentice relationships and UAS, see Capt Guy R. Nelson II, “Unmanned Aviation: It’s All about the People,” *Marine Corps Gazette*, (Quantico, VA: November 2016).

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