Enabling the Scout: sUAS Proficiency in Rapid Launch, Recovery, and Sustainment

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Introduction

In modern warfare, crews successfully employ Group 2 small Unmanned Aircraft System (sUAS) by executing time-sensitive drills with precision and speed. Minutes and seconds determine whether an operator is an asset or liability. Crew effectiveness hinges on their ability to execute core tasks—rapid launch and rapid recovery—with reflexive speed and precision. Time spent on assembly or troubleshooting leaves the ground element[1] moving blind or, worse, halted and exposed. Achieving fluency in these time-sensitive drills is not just a training objective; it is the crew's primary responsibility that prevents the system from becoming a friction point and ensures the crew is always contributing to the reconnaissance tempo set by unit leadership.

Operators build proficiency through disciplined, repeatable, and standardized crew drills. From the moment the crew receives notification to launch, their focus must be on rapid employment to get the aircraft airborne, rapid sustainment to keep it on station, and rapid recovery to get the section moving again. Whether it's a windy launch, a hot battery swap under pressure, or troubleshooting a lost link, the crew's ability to perform under demanding conditions of ground reconnaissance is what provides effective, timely cueing. This article is about more than just flying; it's about sUAS crews mastering their craft to protect fellow Soldiers and drive the mission forward.

Rapid Launch and Rapid Recovery

Launching the Group 2 system involves two distinct phases: preparation and execution. To prepare for launch, the crew assembles the aircraft, completes pre-flight checks, verifies controls, checks batteries, and emplaces a retransmission node—all within five minutes to avoid mission compromise. On the command to execute launch, the team performs final arming, adjusts for wind, and displaces to the control site, putting the platform airborne in under two minutes to stay ahead of enemy detection and preserve reconnaissance tempo.

Air operator teams often lose the most time and disrupt their tempo when recovering the system and subsequently displace before the enemy can deduce their location. The recovery team should retrieve the aircraft, secure components, and move to concealment in under two minutes. Counter-UAS operations are always present, and the air operator team often incurs the most risk from visual overhead contact by aerial counter-reconnaissance methods via thermal, infrared, or photographic observation[2]. The crew's ability to quickly yet correctly break down and store the system that optimizes a future launch within an acceptable window of exposure is the core skill that enables the crew to execute reconnaissance as opposed to only surveillance.

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[1] Army Techniques Publication (ATP) 3-20.98 *Scout Platoon.* 4 December 2019. https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN44397-ATP_3-20.98-001-WEB-2.pdf

[2] Field Manual (FM) 3-98 *Reconnaissance and Security Operations.* 10 January 2023. https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN37194-FM_3-98-000-WEB-1.pdf

Rapid Sustainment as a Sub-Task

Sustainment subtasks within launch and recovery are critical for the scout section air operator team that keep the platform mission-capable during extended operations. These actions focus on reconstitution and stowage so the system can observe multiple prescribed areas, support rapid displacement, and avoid disrupting tempo or increasing potential compromise.

Technical expertise of expendable components and how to manage them is an important enabling skill. Battery management, replacement, and munition rearming are often the lead causes of disruption during launch operations at the team level. Crews must drill these sustainment subtasks separately while viewing them as extensions of the launch process.

A crew's ability to disassemble and stow their system rapidly is a hallmark of an effective aerial reconnaissance asset. Understanding which crew member carries which component and what is the optimal sequence for breaking down the system will significantly reduce exposure time and keep the crew from disrupting its own tempo due to hesitation and confusion. The air operator team must determine how to stow components across the team to optimize rapid stowage and launch.

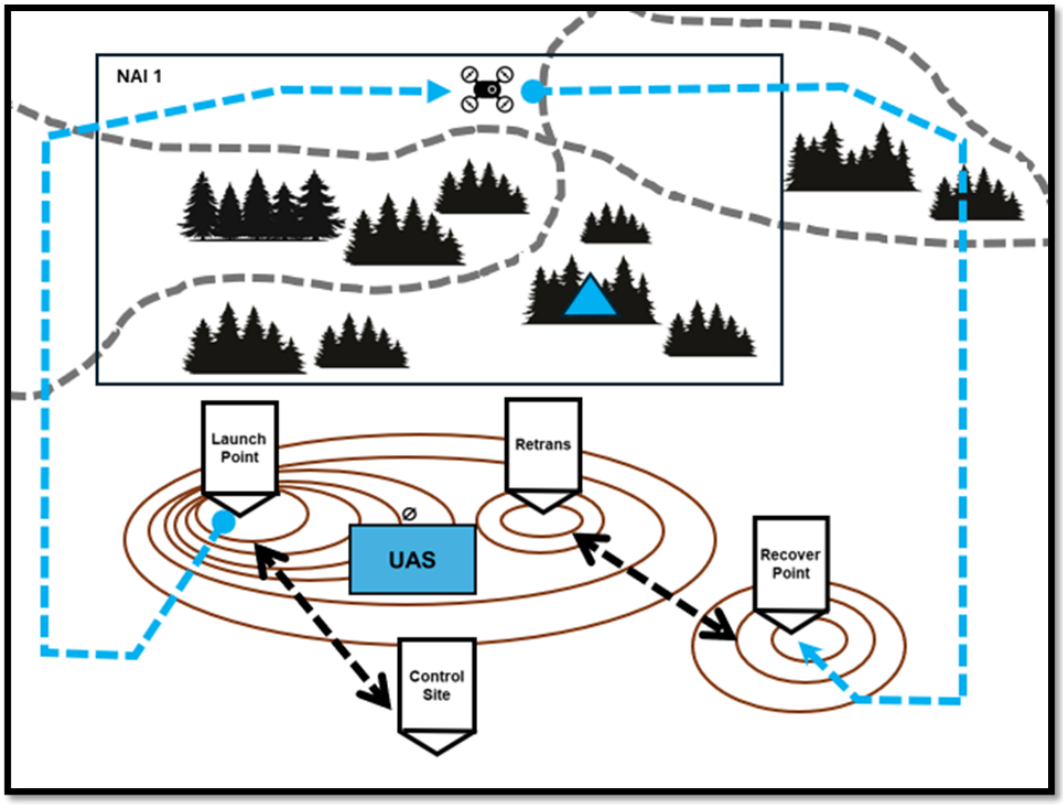

Figure 1. Disposition of sUAS Air Operator Team.[3]

[3] CPT Micah Roubideaux. Joint Multinational Readiness Center.

Rapid Troubleshooting as a Sub-Task

The air operator team must be able to properly diagnose and correct technical failures. Due to the nature of where a scout section operates, mastering troubleshooting is a critical skill for survival. Troubleshooting competencies focus on restoring connectivity and signal integrity without significantly delaying information collection before latest time information is of value. The loss of the aerial reconnaissance asset alone will not jeopardize answering priority intelligence requirements, but losing the ability to link overhead sensors to ground assets by cueing them to confirm contact will lose time by making ground reconnaissance less efficient.

The individual operators must understand the technical aspects and system components of controller links, antenna alignment, retransmission node configuration, purposes of each cable, and power distribution. A basic understanding of how terrain masks signal and reduces range is critical. Diagnosing symptoms, isolating faults, and quickly applying fixes minimizes lapses, ensures continuous aerial reconnaissance, and helps the scout section maintain contact.

Flexibility

Organic retransmission capabilities in support of the sUAS air operator team are the means a scout section can develop the situation rapidly and continue to fight for information when prescribed areas do not yield the detailed information a commander needs to make a timely decision. Both the air operator team and ground scouts require this technical proficiency to extend the section's detection radius in any direction. This skill is critical in multiple situations to include quickly detecting potential contact if a prescribed area is fruitless, when new information requires quick observation where ground assets cannot reach the location in time, or when enemy contact is likely.

Two means of technical proficiency demonstrate this capability. The first option would be with a concealed ground base retransmission beacon where the section selects terrain, emplaces the node with an antenna, and verifies signal integrity within ten minutes while maintaining a low signature, enabling the air operator team further range to detect and cue ground reconnaissance methods rapidly. The second method would utilize older tree-based retransmission methods as a cost effective, reliable, and expedient solution. Either the ground scouts or air operator team may run communication wire into a tree to create an immediate retransmission node.

Best Practices

Observations from training rotations at the Joint Multinational Readiness Center (JMRC) highlight several best practices for sUAS preparation, launch, and recovery that directly impact survivability, range, and operational tempo. While rapid launch and recovery drills form the foundation of effective sUAS employment, their success ultimately depends on deliberate planning, disciplined site selection, and the ability of air operator teams to manage energy, mobility, and exposure throughout the mission cycle. Units that deliberately plan these factors before launch are far more likely to maintain reconnaissance continuity and avoid compromise by enemy counter-UAS systems.

Preparation Best Practices

Preparation begins with deliberate launch site selection that balances survivability, communication requirements, and operational geometry. Terrain analysis is particularly critical in restrictive environments such as JMRC, where terrain masking often reduces effective radio line-of-sight (LOS) and significantly shortens operational range. Units must account for the terrain's impact on antenna placement, retransmission nodes, and controller connectivity when selecting sites. When possible, using the long axis of open areas allows operators to extend LOS connections and push aircraft toward maximum range while maintaining signal integrity.

A key lesson observed during rotations is that the site requirements for small unit command posts and sUAS operators are fundamentally different. Attaching air operator teams directly to platoon or company command elements often forces operators into terrain that either degrades signal connectivity or exposes them to detection. Effective employment frequently requires separating launch and control sites from the primary command element so operators can select terrain that supports both signal strength and concealment.

Energy management is another critical planning factor. Temperature, flight profile, payload weight, and the number of spare batteries available affect battery life. Units must calculate expected flight endurance and charging timelines to determine whether continuous aerial coverage or pulsed reconnaissance is feasible. Without this planning, teams risk losing aircraft due to battery depletion or forced to pause reconnaissance during critical moments.

Finally, preparation must consider the mobility requirements of dismounted reconnaissance. During observed operations, air operator teams successfully conducted dismounted movements of up to two kilometers before assembling and launching company-level UAS platforms. However, some systems lack articulating arms or transport cases, limiting how many aircraft carried during dismounted operations. Units should account for these physical limitations when planning reconnaissance concepts and sustainment loads.

Launch Best Practices

Launch operations require balancing survivability with system performance. Concealed launch sites within wood lines provide excellent protection from aerial detection and thermal observation but can create uncertainty about whether the aircraft will achieve adequate signal connectivity due to terrain masking and vegetation interference. Conversely, launching from open terrain improves LOS communication and range but increases vulnerability to enemy observation and targeting.

One effective technique observed during rotations involved separating the antenna from the physical launch point. By positioning antennas at elevated or exposed locations while launching from concealed terrain, teams maintained signal integrity while minimizing exposure at the launch site itself.

A critical lesson learned from rotations is that teams should never launch or recover a UAS from the center of a maneuver formation. Enemy forces frequently observe friendly aircraft and track

their return path to identify friendly positions. When launch or recovery occurs within the formation, this can expose the entire element to indirect fire or direct engagement. Launch and recovery operations must therefore occur outside the formation footprint to protect the maneuver element.

While operators often prefer static locations that offer strong LOS and established restricted operating zones (ROZs), remaining in one location throughout a battle period increases vulnerability to enemy counter-UAS targeting. Effective teams continually evaluate their signature and displace as required to prevent enemy forces from identifying and targeting their operating location.

Recovery Best Practices

Recovery operations are often the most vulnerable phase of sUAS employment. A particularly effective technique observed at JMRC is the **three-location concept**, where launch, control, and recovery occur at separate sites. This approach significantly reduces the risk of enemy forces tracking aircraft back to friendly positions and enables teams to maintain mobility while avoiding compromise.

At a minimum, launch and recovery should occur at separate locations to prevent enemy forces from identifying a single point of origin. Mobility is essential to this concept. Air operator teams not tied to specific terrain or key terrain are able to continually reposition and maintain survivability during extended reconnaissance operations.

In situations where recovery must occur in open terrain to maintain LOS with the aircraft, teams should minimize time spent in exposed positions and maintain pre-planned egress routes that allow rapid displacement immediately after aircraft recovery.

Recommendations

Observations from JMRC rotations indicate that several doctrinal, training, and materiel improvements would significantly improve the effectiveness and survivability of sUAS employment at the small unit level.

Immediate Actions (0–6 months)

Focus on implementing the **three-location employment concept** as a standard technique for launch, control, and recovery. This method prevents enemy forces from tracking aircraft back to friendly positions and reduces vulnerability to indirect fire and counter-reconnaissance targeting. Units can implement this concept immediately through updated SOPs and training without requiring new equipment, though it does require improved coordination and communication between dispersed operator teams.

Additionally, the Army should establish **standard launch site selection criteria** for sUAS employment. These criteria should include terrain masking analysis, geometry optimization for LOS communications, antenna placement considerations, vulnerability assessments against

enemy counter-UAS systems, and pre-planned displacement routes. Incorporating these planning factors into doctrine and training would standardize site selection across units and improve both survivability and range performance.

Teams should also improve energy management planning through both training and materiel solutions. Units require better forecasting tools for battery life based on environmental conditions and mission profiles, along with improved field power solutions such as portable power banks and extended-endurance battery systems. These improvements would enable sustained reconnaissance operations and reduce the risk of losing aircraft due to power depletion.

Mid-term Actions (6–18 months)

Focus on improving the ability of sUAS teams to operate in dismounted environments. Procurement priorities should emphasize aircraft with articulating arms, ruggedized designs, and modular carrying systems that allow teams to transport and assemble aircraft after extended movements. This capability is critical for reconnaissance forces operating in terrain with limited vehicle access or that requires stealth and mobility.

Finally, the Army should establish **division-level sUAS academies** to provide unit-specific training and increase operator proficiency through repetition and experimentation with emerging tactics, techniques, and procedures. Many sUAS operators currently perform these duties as an additional task, limiting the time available to develop advanced skills. Dedicated training programs would allow units to refine tactics and maintain proficiency as technology and enemy counter-UAS capabilities continue to evolve.

Conclusion

A scout section's operational effectiveness hinges on its ability to gather information without compromising its position or losing momentum. The integration of a group 2 sUAS is a powerful force multiplier, but only if the air operator team are technical masters on its core tasks. The disciplined practice of rapid launch and rapid recovery transcends mere procedural repetition; it is the foundational skill that enables the entire section to maintain a high reconnaissance tempo. By minimizing exposure[4] at launch and retrieval sites, the team not only protects itself from counter-reconnaissance threats but also ensures the drone serves as a seamless extension of the ground element, rather than a logistical bottleneck or a "friction point" that disrupts movement.

Furthermore, the embedded sub-tasks of rapid sustainment and troubleshooting are what grant the team resilience and self-sufficiency in austere environments. Expertise in battery management, optimized stowage, and swift fault isolation means the sUAS remains a persistent asset, capable of supporting extended operations and adapting to unforeseen challenges. This technical self-reliance ensures that a minor equipment failure does not derail the mission or nullify the section's ability to answer a commander's priority intelligence requirements.

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[4] FM 3-90 *Tactics* 1 MAY 2023. https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN38160-FM_3-90-000-WEB-1.pdf

Ultimately, the collective mastery of these technical skills—from launch and recovery to sustainment and flexible retransmission—transforms the sUAS from a simple surveillance tool into a dynamic reconnaissance asset. This proficiency allows the scout section to not only see but to *understand* the battlespace, to develop situations rapidly, and to cue ground assets with precision and speed. This is the critical capability that allows a commander to make timely, informed decisions, turning detailed information into a decisive position of relative advantage.

Therefore, the investment in training these time-sensitive, highly disciplined drills is paramount to unlocking the full potential of the sUAS and ensuring the scout section can successfully fight for and win the information battle.