Robots and Reconnaissance:
We May Never Be Stealthy and Deliberate Again

by COL J. Frederick Dente and CPT Timothy Lee

From iron blades and crossbows to armored vehicles and precision-guided munitions, the character of war is constantly evolving. Nations expend massive amounts of energy and capital to present new dilemmas for adversaries across multiple domains. Often these technical advances occur in a vacuum, and we fail to develop the tactics and doctrine to fully leverage the new capability. At an even more fundamental level, we often fail to examine how these new technical capabilities change the underlying assumptions about the character of war in the first place.

Semi-autonomous ground-based robots, once a dream of the past, are the next change in warfare the U.S. military and its adversaries are developing to gain and maintain dominance on the battlefield. However, the proliferation of advanced technology such as the Robotic Combat Vehicle (RCV) on the battlefield at the lowest level will fundamentally change the way Soldiers fight tomorrow's battles, and it will call into question the very doctrine and methodology the Army uses to train its warfighters. While there are varying opinions on whether the use of RCVs will ultimately enable or hinder reconnaissance and security (R&S) operations, the Army must continue to address the inadequacies of its ability to execute ground R&S operations to fight and win the next major ground war.

This article will highlight the foreseeable changes in doctrine that must be considered by first examining the advantages and disadvantages of three long-standing ideas in cavalry doctrine and then describe how these ideas will inevitably change with the integration of the RCV to effectively move forward into the 21st Century.

Tactical mobility

Cavalry formations have long served as a catalyst to transform the concepts of maneuver warfare into a battlefield capability. As maneuver is the essence of U.S. fighting doctrine, it requires the means to seize or retain the initiative and to create or exploit offensive opportunities.

Commanders require a high degree of situational awareness and the time to mass and concentrate superior combat power against the enemy at the right time and place for maneuver to be successful. For centuries, the power of mobility has enabled cavalry formations to accomplish this task. By remaining mobile and retaining freedom of maneuver, cavalry formations can provide a continuous flow of combat information and intelligence to commanders, helping them cope with uncertainty, make contact under favorable conditions, prevent surprise and facilitate timely decision-making. Serving as the brigade commander's "eyes and ears," cavalry formations can deploy quickly, fight for information and secure key terrain far in front of the main body to provide it with reaction time and maneuver space.

However, commanders are frequently forced to sacrifice the amount of detail collected about the operational environment to maintain their speed, as formations never seem to maneuver fast enough. Moving quickly increases the risk by forcing Soldiers to potentially expose themselves to enemy contact while trying to develop the situation. Yet moving more slowly may increase the risk to the mission, as the cavalry may not secure key terrain before opposing forces begin their initial attack. This problem has plagued commanders for centuries.

Stealth

While reconnaissance doctrine includes the capacity for cavalry formations to fight for information, the best way to perform reconnaissance has long been argued to be by stealth. By remaining hidden and maximizing the use of cover and concealment to conduct R&S tasks, cavalry formations can detect and observe enemy developments well forward of the brigade combat team's (BCT) main body while also retaining their mobility. Stealthy reconnaissance prevents the cavalry formation from becoming decisively engaged and greatly enhances its survivability. By only engaging the enemy when absolutely necessary, cavalry formations can gain and maintain contact with the enemy from a position of relative advantage before executing a reconnaissance or battle handover as the relative priority between BCT elements shifts.

Yet despite these advantages, even stealthy reconnaissance requires an ability to survive a chance contact or an ambush that may occur with little warning. Historical examples such as Operation Desert Storm provide an excellent study for this. Divisional cavalry organizations at the time lacked the combat power to conduct their traditional R&S roles. Because tanks were not organic to the squadrons, many commanders were forced to task-organize tank companies from the maneuver brigades to provide the division's primary reconnaissance asset with the resources needed to fight for information and survive on the battlefield.

The experience in Desert Storm reinforced the lesson of the North Africa campaign during World War II – effective reconnaissance must often include fighting. Commanders in the deserts of North Africa in 1943 suffered heavy casualties while employing light-reconnaissance formations to fight for information. With that historical lesson in mind, some commanders in the deserts of Iraq in 1991 simply chose not to use them.

Economy-of-force

Cavalry formations have long protected and preserved the BCT's combat power during security operations, allowing the commander time to decide where to concentrate forces. This time provided by cavalry formations provides the BCT with a critical capability based on a principle of war: economy-of-force. Economy-of-force is the principle of employing all available combat power in the most effective way possible. The flexible capabilities of the cavalry allow commanders to conserve the combat power of their BCTs to use at a time and place of their choosing. By expending minimum essential combat power on secondary efforts, commanders can maximize the most combat power on primary efforts. In other words, by serving in an economy-of-force role, cavalry prevents premature deployment and attrition of combat power before the BCT reaches its objective.

However, because an economy-of-force, by definition, is to expend the minimum amount of combat power on secondary efforts, the ability of a cavalry formation to shape the battlefield, influence key actors and consolidate gains and efforts is severely limited. Although properly task-organized cavalry formations can produce effects that far outweigh the diversion of combat power from the main body, dedicating these additional capabilities comes at the risk of fewer capabilities for potential follow-on operations. As a result, cavalry formations often find themselves limited in what they can do for the BCT, reacting to the enemy instead of creating the conditions to create and exploit the initiative.

Integration of RCV

The proliferation of the RCV on the battlefield at the lowest level will fundamentally change these long-standing core beliefs in cavalry doctrine. They will potentially enable commanders to push past these previous restrictions that have plagued BCTs for centuries while also imposing restrictions of their own.

First, commanders have been frequently forced to sacrifice the amount of detail collected about the operational environment to maneuver quickly; RCVs can effectively mitigate this gap entirely. Commanders, once limited not only by the enemy and terrain but also by the human dimension, both physically and mentally, now find themselves able to consistently maintain their overall operational tempo. Unlike their manned fighting vehicle (MFV) counterparts, RCVs are not limited by Soldiers' lack of sleep or endurance to maintain speed. The RCV can move ahead of the MFVs and quickly secure key terrain, while scouts can move more deliberately behind the forward-line-of-robots (FLOR) and forward-line-of-unmanned-aerial-vehicles (FLUA) to collect on terrain, civilian and even infrastructure information requirements. (See Figure 1.)

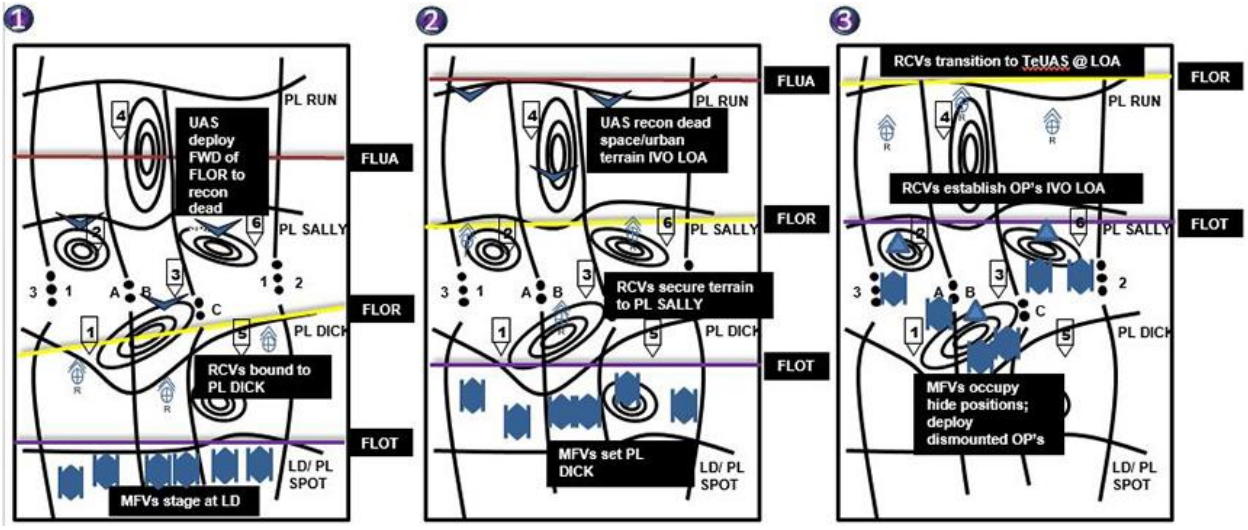

Figure 1. RCV zone reconnaissance.

By allowing RCVs to make first contact with the enemy and secure key terrain in front of the BCT, commanders ultimately can mitigate both the risk to force and to mission that was previously identified. Yet, while the RCV does enable commanders to maintain tactical mobility, it comes with its own mobility limitations that will fundamentally change how reconnaissance doctrine, specifically intelligence preparation of the battlefield (IPB), is taught. Traditional instruction on IPB at the reconnaissance schoolhouse focuses on how to best use terrain and how to use intervisibility (IV) lines to conceal movement – whether mounted, dismounted or even aerial to retain a position of relative advantage.

However, as stated, RCVs are being used in front of formations to reduce risk and increase situational awareness. As a result, IPB on the type of terrain that best suits robots may need to be more emphasized than IPB for traditional mounted and dismounted maneuver. Furthermore, as these RCVs must operate within line-of-sight to the control vehicle, a greater emphasis must be placed on the three-dimensional aspect of the terrain and how it affects not just frequency-modulation communications but also connectivity from the RCV to the control vehicle. This essential change in the way scouts are taught IPB may not only be relevant, but it's absolutely necessary.

Finally, because the basic capabilities for the RCVs used by the Army's Next Generation Combat Vehicle-Robotic Combat Vehicle (NGCV-RCV) team include artificial intelligence-assisted target detection/recognition and anti-tank guided-missile capability, the ability for a cavalry formation to fight for information is greatly increased. Commanders may never need to operate "stealthy" again, as the RCV essentially mitigates the risk for a commander to expose his Soldiers to enemy direct fire. The RCV ultimately provides the squadron commander with his own reaction time and maneuver space and negates the need to be "stealthy." Whereas current doctrine uses dismounts in front of vehicles in a covert manner to make first contact with the enemy, the RCV enables the commander to make first contact with robots. By operating in a more "forceful" capacity, these RCVs develop the situation through action and can potentially suppress or fix the enemy while the commander maneuvers his scouts to a position of relative advantage to engage and destroy the enemy. Also, the RCV provides the cavalry commander with more firepower while still maintaining economy-of-force to prevent decisive engagement.

Figure 2. The Army's Ground Vehicle Systems Center and NGCV cross-functional team demonstrate the mission-enabling technologies demonstrator and RCV surrogate at Camp Grayling, MI, Aug. 22, 2019. *(From a video by Douglas Halleaux, Combat Capabilities Development Center's Ground-Vehicle Systems Center)*

However, despite these advantages, RCVs operating in a "forceful" manner are not without their own inherent limitations. While future RCV capabilities must adhere to stringent requirements and at least mirror their manned counterpart in terms of mobility and thermal signature, using RCVs ahead of Soldiers and MFVs in a "stealthy" manner may not even be possible. While the RCV may possess the same or even less thermal and noise signature of their manned counterparts, it becomes extremely difficult to mimic the same physical and electromagnetic signature as a dismounted scout moving in front of his vehicle to observe an IV line. Consequently, the cavalry commander may never actually be able to specify "stealthy" as a reconnaissance tempo because he must account for the RCVs. The impacts of this change would be astronomical; forcing cavalry formations to operate solely in a forceful tempo increases the risk that RCVs were designed to mitigate. Furthermore, organic task-organization to cavalry formations may also need to be reconsidered, as they may need more firepower to serve only in a forceful tempo.

Conclusion

When rifled muskets were first introduced, no army recognized how the dramatic increase in range and lethality would impact massed formations of infantry. Few armies recognized the impacts of the telegraph and railroad on modern war until it was too late. Too often, our tactics and doctrine lag far behind the dramatic advances in lethality and mobility. Like these previous advances, the integration of RCVs into our scout platoons and cavalry troops must fundamentally change the way leaders conduct R&S operations in the near future.

To win the next major ground war, our R&S doctrine must adapt. Not only should we incorporate these new systems into our current organizations and our existing training models, but we must also be prepared to challenge the underlying assumptions that drive our current tactics. It is only through this rigorous and professional dialogue that we can fully leverage the new capabilities and opportunities the RCV offers.

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Acronym Quick-Scan

BCT – brigade combat team
CLC – Cavalry Leader's Course
FLOR – forward-line-of-robots
FLOT – forward-line-of-own-troops
FLUA – forward-line-of-unmanned-aerial-vehicles
FWD – forward
IPB – intelligence preparation of the battlefield
IV – intervisibility
IVO – in vicinity of
LD – line of departure
LoA – line of advance
MFV – manned fighting vehicle
NGCV-RCV – Next Generation Combat Vehicle-Robotic Combat Vehicle
OP – observation post
PL – phase line
R&S – reconnaissance and security
RCV – Robotic Combat Vehicle
UAS – unmanned aerial system

Figure 3. RCVs on display at Camp Grayling, MI.