

# Robotics in Infantry Battalions

Ready to be incorporated

by Maj Ted W. Schroeder

**W**ith recent improvements of optics, software, and the addition of weapons to ground robotics, the unmanned ground vehicle (UGV) has matured to the point that it is ready to be incorporated into the Marine infantry battalions. As the technology will only continue to develop, it is important that the infantry battalions do not ignore the importance that UGVs will play in the future of warfare. John Pike of GlobalSecurity.org put it best, “when they start fighting, no organized force could stand against them.”<sup>1</sup>

In World War I, politicians, military leaders, and scientists worked tirelessly to develop a weapon that would break the stalemate on the western front. As the Allied forces worked to develop a “machine-gun destroyer,” there were many who rejected the idea of the tank, including Lord Kitchener, the British Secretary of State for War. He had good reason to reject the early systems. The early prototypes were slow, unreliable, and prone to destruction by artillery fire, which inspired Lord Kitchener to call the tank a “pretty mechanical toy but [of] very limited military value.” The early advocates and developers worked tirelessly to find solutions to the tank’s defects and, on 15 September 1916, were able to put it into combat at the Battle of the Somme. Despite there being hundreds of tanks employed by both sides during the war, there was very little understanding about how to use the tank to its fullest.

In the years building up to World War II, designers were able to refine the tank so that it was the centerpiece of the fighting on both European fronts.

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**Like its tank predecessor, it will take time before UGVs are appreciated for both their capabilities and limitations. (Photo by LCpl Julien Rodarte.)**

To get to this point, developers refined the tank by increasing its speed, armor, and armaments. They also added radios and reduced the crew required to man the tank. Commanders developed the table of organization (T/O), the gunnery techniques and, just as importantly, techniques to destroy other tanks. Strategists saw how the speed and armor protected firepower could help them mass fires and then exploit the opportunities created on the battlefield. By the end of the war, tanks had

solidified their place in the world as a standard part of every major army in the world.

Today, the UGV is in the same place the tank was at the end of World War I. The DOD has purchased thousands of UGVs, but the Marine Corps has yet to integrate them into its organization, develop techniques to employ them, or developed techniques to destroy enemy UGVs. P.W. Singer reports that, “by the end of 2008, there were about 12,000 robots of nearly two dozen

varieties operating on the ground in Iraq.”<sup>2</sup> According to Total Force Structure Management System (TFSMS), a Marine Corps infantry battalion has four unmanned aerial vehicles (UAVs) and zero UGVs as part of its table of organization and equipment (T/O&E). The Marine Corps tank battalions and

systems to solidify the requirements of UGVs in combat. This will help drive the design of future systems, thus producing a better product. As the Marine Corps continues to work through the development, it will need to put the systems to the test. The Marine Corps will also need to test a UGV-equipped

should be tested on live fire ranges to see how well they could integrate fires and maneuver to close with and destroy an enemy target. This will clarify which battalion is able to produce the most effective fires and the quickest maneuver against targets. The second test should be force-on-force. The Marine Corps needs a definitive answer of how a battalion with fewer Marines reinforced by unmanned systems can handle fighting a thinking enemy. This test will bring to light how UGVs will work as a part of warfighting doctrine. The Marines should know if these systems are either benefiting or limiting a battalion engaged with a thinking enemy. Further, the manned battalion should be able to develop techniques of countering UGVs. As other countries develop their UGVs, the lessons learned will become invaluable.

There is no doubt that the current UGVs lack the ability to participate in a sustained battle. Whether it is battery life, fuel capacity, or ammunition storage, none of the current UGVs can compete with the length of time that a Marine can stay in the fight (although this will change). Current UGVs do have their advantages. A UGV only needs fuel and ammunition to continue its mission, which means a commander can get more “man-hours” out

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assault amphibious battalions also lack UGVs. The only units in the Marine Corps who have any type of ground robotics in significant numbers are the explosive ordnance disposal companies and combat engineers. Some of these systems are armed; however, most of these systems are weapons specifically designed for addressing unexploded ordnance.

There are some good reasons why the infantry battalions lack UGVs. It takes time to understand a new system and fully appreciate its capabilities and limitations in the modern battlefield. UGVs are now more than just a new system but have expanded into a new family of systems and a potential replacement for many of the weapons used today across the Marine Corps. The wide range of options makes it difficult to identify which designs will or will not become viable. It also takes time for a new weapon to mature enough to be viable on the modern battlefield. While the tanks had their debut in September 1916, they still had major changes enacted over the next 25 years. The wide range of options and the lack of a fully mature UGV is a potential reason why the Marine Corps has not fully accepted UGVs into its organization.

As the Marine Corps moves forward in developing its integration of UGVs, it needs to start with a few basic designs. The process of integration needs to focus its warfighting doctrine on how UGVs will help Marines in the execution of the doctrine. The Marine Corps could start with a few basic infantry supporting

infantry battalion against a pure human battalion. The goal would be to answer several questions. First, does the UGV have the potential to be beneficial to an infantry battalion, enough so that it could replace a Marine in a fight? If a UGV is good enough to replace a Marine, then what would a future T/O&E look like as newer UGVs come on line? Additionally, what are the techniques of integrating UGVs into the battlefield? Further, what changes in design are necessary to produce a refined product in the future?

The tests of the manned verses partially manned battalions should take on two phases. First, the two units



**Marines with a weaponized multi-utility tactical transport (MUTT) vehicle during experimentation at Camp Pendleton. (Photo by LCpl Julien Rodarte.)**



**Like UGVs, modern day tanks—such as the M1A1 Abrams tank—are the result of post-World War II innovations.** (Photo by LCpl Careaf Henson.)

of a UGV, making it a preferred asset for an economy of force mission. They are never suppressed by enemy fire, and they never allow fatigue to affect their fires or willingness to continue fighting. Current UGVs are very tough, a “Talon [UGV] serving with the Marines was once hit by three rounds from a .50-caliber heavy machine-gun” and continued working.<sup>3</sup> These attributes make UGVs very effective in a support by fire role or checking a danger area. In early marksmanship tests, one UGV “hit the bull’s-eye seventy out of seventy tries,” making it an excellent weapon in an ambush or when attacking by fire. UGVs have been built with ability to detect and “see the sniper before the smoke disappears from the shot,” according to the program lead, making it invaluable in a counter-sniper mission.<sup>4</sup>

Without using UGVs in operating units today, it is hard to account for maintenance hours. UGVs will require maintenance time, but as long as they require fewer than six hours of maintenance for every day of operation, a commander will be able to increase the unit’s man-hours by using UGVs.

Some would say that these experiments are not necessary and that UGVs have a limited future in war. It is easy to empathize with their feelings that it

is difficult to predict what weapons will be a part of the future of war. However, the same argument was made against the early tank. UGVs will be a part of any future war. Current off-the-shelf technology enables any country in the world to produce their own systems. The armed forces that develop, train, and implement UGVs today will be ready for the wars that they will fight tomorrow.

Like any new weapons system, it is hard to know if UGVs are the modern version of black powder and will change the face of warfare or if they will come and go having little effect. A third option is that the weapons system is so horrific that countries vow to never use it, similar to chemical, biological, radiological, and nuclear weapons. It is early in the development and integration of the UGV and, therefore, hard to say where in the spectrum of new weapons it will fall. What is clear is that the U.S. is not the only country with UGVs. The Marine Corps must prepare for the inevitability of facing UGVs in future combat. Heinz Guderian said it best by stating:

On many there still exist differences of opinion of us sometimes quite fundamental nature. Only time will tell who is right ... Actions speak louder than words. In the days to come the

Goddess of Victory will bestow her laurels only on those who prepared to act with daring.<sup>5</sup>

#### Notes

1. P.W. Singer, *Wired for War*, (New York: Penguin Books Ltd, 2010), 109.
2. P.W. Singer, “Military Robots and the Laws of War,” *The New Atlantis*, (Winter 2009), accessed at [www.thenewatlantis.com](http://www.thenewatlantis.com).
3. Singer, *Wired for War*, 29.
4. *Ibid.*, 111.
5. Heinz Guderian, *Achtung-Panzer!*, (London UK: Orion Books Ltd, 1993), 212.



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