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The Infantry Battalion and Its Need for Uncrewed Aerial Vehicles

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> What we see is that there was a factor of invincibility that Armenia had tried to propagate over many years … but they relied too much on old military doctrine and thinking: tanks, heavy artillery and fortifications. It simply reminded us of the Second World War … instead, mobile forces, drone technology and a modern approach has been applied by us.

- Hikmet Hajiyev, foreign policy advisor to Azerbaijani President Ilham Aliyev[1]

AIM

1. The aim of this service paper is to describe the gradual hollowing-out of the Canadian Armed Forces (CAF) Regular Force (Reg F) infantry battalion with the removal of its organic combat enablers since the 1990s and the repercussions this has had on its ability to fight. More precisely, a critical component of 21st century warfare, namely the Uncrewed Aerial Vehicle (UAV), is missing from the infantry battalion's Table of Organization and Equipment (TO&E), from the rifle section to the battalion command level, creating a deficiency which our enemies can currently exploit.

INTRODUCTION

2. Canada's infantry battalions were reduced in size during the 1990s as part of the government's budget reduction measures and restructuring of the CAF, what many termed 'The Peace Dividend' due to the savings incurred by reducing the defense budget. Members of the CAF have described this period of austerity as "The Decade of Darkness'.[2] The reduction in size of the infantry battalions was driven by several factors, including the end of the Cold War and a decrease in global tensions, which led to a reassessment of Canada's military needs. As a result, the Canadian government embarked on a program of defense spending cuts, which included a reduction in the size of the Canadian Armed Forces. In addition to budgetary pressures, the restructuring of the Canadian Armed Forces in the 1990s also aimed to create a more flexible, mobile, and modern military capable of responding to a wider range of threats and challenges. This involved a shift away from large, traditional combat formations towards smaller, more specialized units.

3. As part of this restructuring, the size of infantry battalions was reduced from approximately 1,000 soldiers in 1994 to around 600 soldiers by 2023. This was achieved through a combination of downsizing, reorganization, and the elimination of some units and their capabilities altogether. Despite the reduction in size, Canada's infantry battalions remained highly trained and capable of carrying out a range of missions, including peacekeeping, humanitarian assistance, and combat operations. The reduction in size was meant to improve the efficiency and effectiveness of the Canadian Armed Forces, enabling it to operate quickly and

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[1] Antal, John F. *Seven Seconds to Die: A Military Analysis of the Second Nagorno-Karabakh War and the Future of Warfighting*. Philadelphia: Casemate, 2022, 68.

[2] Gloria Galloway, "Hillier Decries Military's 'Decade of Darkness'," The Globe and Mail (The Globe and Mail, February 16, 2007), https://www.theglobeandmail.com/news/national/hillier-decries-militarys-decade-of-darkness/article20393158/.

nimbly within the changing global security environment of the 1990s and beyond. While this sounds positive, it proved disastrous for the Reg F infantry battalion. Where the infantry battalion once had a fourth rifle company, a Direct Fire Platoon (read: Anti-Armor), an Assault Pioneer Platoon, and an Indirect Fire Platoon (equipped with 81mm mortars), the contemporary infantry battalion has but three under-crewed rifle companies, a reconnaissance platoon with a sniper section, and a reduced administration company. While much has been written about the need to give back to the infantry battalion its enablers from a previous generation, one new enabler is often left out of the discussion: the UAV.[3]

DISCUSSION

General Advantages of UAVs

4. Canadian Regular Force infantry battalions may require UAVs in the current operating environment for several reasons. First, UAVs can provide real-time situational awareness to troops on the ground, which is critical in modern warfare. With UAVs, soldiers can quickly identify potential threats, monitor the movements of enemy forces, and assess the terrain and surrounding areas for any potential hazards. Second, UAVs can extend the range and reach of infantry units, enabling them to cover more ground and operate more effectively over larger areas. This is particularly important in areas where the terrain is difficult to traverse or where access is restricted. Third, UAVs can reduce the risk to soldiers by allowing them to gather intelligence and conduct reconnaissance from a safe distance. This is especially relevant in urban environments, where soldiers may be exposed to a range of threats, including improvised explosive devices (IEDs) and snipers. Lastly, UAVs can also provide support to infantry units in a range of other ways, such as delivering supplies, transporting equipment, and providing medical assistance.

5. Given these factors, it is clear that UAVs can play a crucial role in enhancing the capabilities of Canadian regular force infantry battalions in the current operating environment. As such, increasing the number of UAVs available to these units could improve their ability to carry out their missions safely and effectively. This increase in UAVs should begin at the lowest level of command possible, that is, starting with the infantry section commander.

UAVs at the Section Commander Level

6. Micro UAVs can provide significant benefits to infantry section commanders in their command and control across the spectrum of operations. Due to their light weight (some micro tactical versions weight around 250 grams)[4] these micro UAVs do not significantly add to a section commander's weight load, and with a range of only 1-2 kilometers to travel 'there and

[3] Barker, R.E. Organic Indirect Fire Capability for Infantry Battalions, 2016. Canadian Forces College.
[4] Sanchez, Wilder Alejandro. "How Will Drones Affect Infantry Tactics?" Defence IQ. International Quality and Productivity Center, October 5, 2022. https://www.defenceiq.com/defence-technology/articles/how-will-drones-affect-infantry-tactics.

back', these micro UAVs are perfect for supporting the section within its maximum kinetic effective range. There are several ways micro UAVs can be helpful in the section fight.

7. Micro UAVs can provide real-time information to the section commander by streaming live video feed from the UAV's onboard cameras. This enables section commanders to get a better understanding of the battlefield and make more informed decisions. As battles rage across the modern battlefield, especially in the urban environment, the ability for small teams to operate independently and obtain their own situational info in their immediate vicinity without risking the lives of its members with reconnaissance missions is crucial. Micro UAVs equipped with cameras and sensors can be used for target acquisition, enabling commanders to identify and track enemy positions, movements, and activities. This information can be used to plan and execute effective attacks and maneuvers. Micro UAVs can be used for reconnaissance and surveillance, allowing commanders to gather information about enemy positions, terrain, and other important features of the battlefield. This information can be used to plan and execute missions, as well as to identify potential threats and hazards. Micro UAVs can be used to enhance force protection by providing early warning of potential threats, such as potential ambushes, conducting reconnaissance on IEDs, and other dangers. This can enable commanders to take proactive measures to mitigate risks and keep their troops safe. Micro UAVs can also be used to support communication between sections, enabling commanders to share information, coordinate activities, and provide situational updates in real-time. Overall, micro UAVs can provide infantry section commanders with a significant tactical advantage, allowing them to gather critical information, make better decisions, and execute missions more effectively. Now let us look at their utility at the platoon and company level.

Platoon and Company-Level UAVs

8. Providing infantry platoon and company commanders with their own UAVs can be an effective way to enhance their situational awareness and command and control capabilities in contemporary operating environment, above and beyond the needs of the rifle section. There are several reasons why. By using UAVs, platoon and company commanders can gain real-time situational awareness of the battlefield, allowing them to better understand the tactical situation and make informed decisions to more rapidly command their dispersed sections. As the War in Ukraine has demonstrated, there is no longer any sanctuary in the modern battlefield and that the only way to improve survival is to conduct dispersed operations and to never mass enough troops to become an economical target to the enemy's fires.[5] UAVs could greatly help platoons and companies maneuver on the battlefield by assisting the commanders locate their objectives more easily without sacrificing speed and momentum to conduct individual reconnaissance of an objective, the infamous 'leader's recce'. The Israeli Defense Force has been fielding UAVs for almost 20 years for this specific purpose due to the undulating terrain found in their operating environment, and with great success.[6] UAVs can also be used to support communication between platoons/companies and higher-level commanders, enabling the sharing of information,

[5] Zabrodskyi et al., 2022, 53.
[6] Puttre, Michael. "Israeli MoD to Acquire Mini-UAVs for IDF." *Journal of Electronic Defense* 27, no. 3 (03, 2004): 26.

coordination of activities, and provision of situational updates in real-time. UAVs required at the platoon and company level (with a range of 2-3km) would be relatively inexpensive compared to larger battalion and operational-level UAVs, making them more accessible to commanders who may have limited resources allocated to them. As the Ukraine war has shown, the typical frontage of a rifle company is now over 3km long with just as wide a depth; UAVs could invariably help control this enlarged battlespace.[7]

9. UAVs are not a cost-less panacea for all the woes of the modern battlefield. There are also some potential challenges to providing sub-unit tactical commanders with their own UAVs, including training requirements, logistical considerations, and the need for effective integration with other battlefield systems. Additionally, the effectiveness of UAVs depends on factors such as weather conditions, terrain, and the capabilities of the UAV itself. Overall, providing infantry sub-unit commanders with their own UAVs can be an effective way to enhance their command and control capabilities in contemporary operating environments. However, it is important to carefully consider the potential challenges before implementing such a drastic initiative.

Issues with Costs of UAVs

10. One way to mitigate some of the resource constraints imposed on these levels of command would be to leverage the local economy and obtain commercial off the shelf (COTS) UAVs by treating them as a consumable such as ammunition, rations, or small equipment which infantry battalions typically purchase, such as small 1k generators for field exercises. COTS UAVs are useful in today's battlefield despite not being specifically designed for military procurement for several reasons. COTS UAVs are widely available and easily accessible, making them a convenient option for military forces. Many civilian drones can be purchased online or at retail stores, allowing military forces to quickly acquire the technology they need without going through lengthy procurement processes. If UAVs were designated as a ‘consumable’ such as rations or small portable generators bought at Canadian Tire, the ability to procure them would be far easier than having them classified as an air platform with all the baggage that designation brings it. UAVs will need to be bought at bulk and cheaply in the contemporary operating environment for one major reason: battlefield attrition. With the perennial example of the current Ukraine War, initial estimates of attrition for UAVs at the tactical level was over 90% during the first six months of the war.[8] Luckily, COTS UAVs are generally less expensive than military-grade UAVs, making them more affordable for military forces with limited budgets who otherwise could not afford a 90% attrition of a bespoke UAV fleet. This can allow military forces to acquire more UAVs and deploy them more widely across their operations. The rapid pace of innovation in the civilian drone market means that COTS UAVs often incorporate cutting-edge technologies that can be adapted for military use. This can provide military forces with access to the latest advancements in UAV technology without the need for expensive in-house research and development. COTS UAVs are often designed to be interoperable with other civilian technologies, such as smartphones and tablets. This can allow military forces to easily integrate UAVs into their existing communication and control systems. COTS UAVs can be used in a variety of applications, from aerial photography and surveying to

[7] Zabrodskyi et al., 2022, 37.
[8] Zabrodskyi et al., 2022, 37.

search and rescue missions. This versatility can make COTS UAVs useful for a wide range of military operations, including intelligence gathering, surveillance, and reconnaissance. However, it is important to note that COTS UAVs may not always meet the specific needs and requirements of military forces. They may lack certain features or capabilities that are necessary for military operations, such as encrypted communications, advanced sensors, or extended flight times. Therefore, it is important to carefully evaluate the capabilities of COTS UAVs before deploying them in military operations.

Benefits of UAVs for the Battalion Level

11. UAVs in an infantry battalion are probably most useful in reducing the length of a unit's kill-chain, provided that battalion has been given indirect fire (IDF) assets, which is another whole topic of discussion outside the scope of this paper but has been heavily written on.[9] UAVs can reduce the kill-chain length in infantry battalions by providing real-time information that enables more efficient targeting and engagement of enemy forces. Here are some ways UAVs can help reduce the kill-chain length. UAVs can be used to locate and track enemy positions, movements, and activities, allowing infantry battalions to quickly identify potential targets. This reduces the time and resources needed to conduct ground-based reconnaissance and surveillance. UAVs can provide real-time video feeds and other sensor data to ground forces, enabling them to quickly and accurately assess the tactical situation and make informed decisions. This can reduce the time needed to coordinate and execute attacks, minimizing the risk of friendly fire incidents. UAVs equipped with precision-guided munitions can be used to engage targets with high accuracy and minimal collateral damage. This reduces the need for multiple strikes or prolonged engagements, shortening the kill-chain length and reducing the time needed to neutralize enemy forces. This reduces the likelihood of prolonged engagements and can shorten the kill-chain length. The examples in the current Ukraine conflict prove this point. Since 2015, Ukrainian battalions have been receiving a wide array of UAVs within their lines, specifically the 'Furia', 'Leleka', and PD-1 and PD-2s. Over that time period, the ability of battalions to engage in fire missions with supporting indirect fires was reduced by over 90%, allowing for fire missions to be executed within 3-5 minutes of positively identifying viable targets, vs. up to 48 hours at the operational level.[10]

CONCLUSION

12. Conclusively, different types of UAVs have tremendous value-added for every level of command in the infantry battalion, from the rifle section commander to the battalion command post. With its ability to improve situational awareness, increase communications between dispersed groups of soldiers, increasing the reach of an organization, enhance battlefield survivability, and reduce the length of kill-chains. With the proliferation of UAVs across the world due to their reduced costs and improved technology, infantry battalions are at a disadvantage if they do not master this ubiquitous device quickly. The slow adoption of contemporary technology by armies has historically led to their defeats. The Russians failed to

[9] Haire, K.F. Re-Establish Organic Fire Support in Infantry Battalions, 2016. Canadian Forces College;

[10] Zabrodskyi et al., 2022, 16.

incorporate the telegraph and the train in the Crimean War, much to their chagrin. The Allies in France in 1940 did not fully embrace the potential of combining tanks with mechanized infantry and close support airplanes, leading to the rapid fall of the Third Republic. We would be remiss to not fully embrace this new fact of life in the contemporary battlespace, which is that UAVs are everywhere, and they are here to stay.

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