



Geoffrey Brooks Memorial Essay Contest

Concours d'essai commémoratif Geoffrey Brooks



Fires of The 2020s: What's Old is New Again

Essay written by Captain Brendan Hogan
First Place

Has NATO lost the fires “edge” against our adversaries? Does the Royal Regiment of Canadian Artillery have the proper equipment and weapon systems to meet our adversaries on the battlefield on equal terms? How do we survive on a battlefield under persistent observation from unmanned aerial systems (UAS) in range of adversary artillery? Are our doctrine and tactics, techniques, and procedures (TTPs) outdated? These questions rankle fire supporters in the 2020s. While the challenges are many and there is the temptation to worship the problem, few of the difficulties are novel. The issues are relatable to those that confronted our predecessors who fought in the world wars and prepared to fight during the Cold War. This essay considers these questions, examines the conduct of fire support, command and control of fires assets, and survivability of our artillery in the contemporary operating environment. The central finding is that many of the solutions already exist in doctrine or require minor adaptation to account for technological developments. Our instruction on courses and our TTPs tested during exercises must be adapted to reflect the contemporary operating environment's realities – what's old is new again.

The artillery's role – “destroy or neutralize the enemy with indirect fire as part of the all-arms battle”¹ – has remained fundamentally unchanged since the First World War. The fire support plan must be integrated and synchronized with the manoeuvre plan to maximize fires' effectiveness. While NATO forces rely on fires to fix the enemy to enable manoeuvre units to destroy their adversary, the Russians, with their artillery-centric army, use armour and infantry to fix their enemies and then use massed fires to effect their destruction. In July 2014, the Russians used their rocket artillery to destroy two Ukrainian army brigades, who were preparing to attack the Russian-backed separatists' lines of communications.²

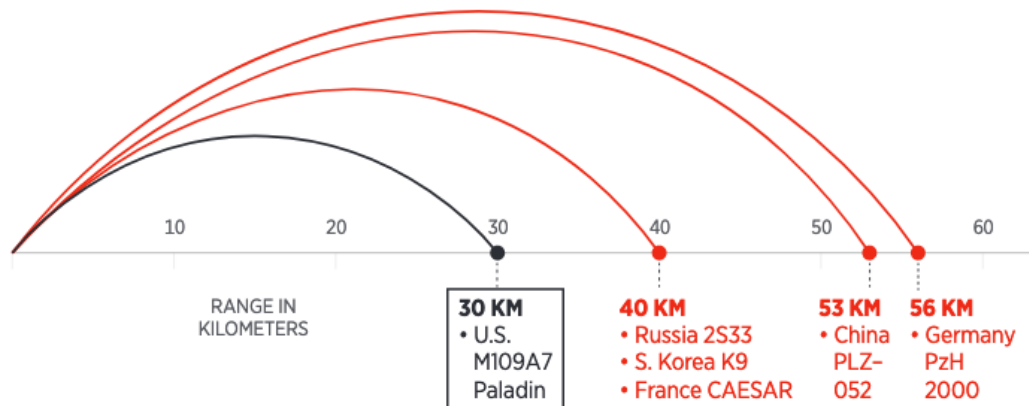
The effective conduct of fire support against a near-peer adversary is no simple feat. Targets must be acquired, evaluated, and prosecuted promptly. Otherwise, these targets will move or harden their position and therefore be less vulnerable to a strike. Other than the man-portable surveillance and target acquisition radar in Canadian observation post parties, their ability to acquire targets is limited to their vehicles' optics and dismounted kits. The Canadian Army should reconsider the reallocation of the Raven-B mini UAS. Attaching this asset to the forward observers would enable them to acquire targets in defilade and beyond their optics range. The current system for the clearance of fires is onerous. It relies on maintaining unimpeded communications between the forward observation officers (FOO), the firing unit, and the fire support coordination centre, which needs to contact the higher headquarters to confirm that the airspace is clear. This system is practicable and sensible for counterinsurgency operations, where there is almost always close air support aircraft on station that ground-based fires need to protect from fratricide. Against a near-peer enemy, however, close air support is less frequently available, and the adversary's electronic warfare assets could disrupt the fires clearance system. It also slows the responsiveness of artillery for air assets that will be the exception rather than the norm. Artillery staff should pre-clear airspace, as much as possible, during the operation's planning phases to expedite the engagement of targets. The artillery commander must consider the necessity of engaging the target or the advantage to be incurred from striking the target against the high counter-battery threat. If the adversary destroys friendly fires assets following a low priority target's engagement, the artillery will not be available when the ground force commander requires fire support or when friendly forces identify a higher-value target.

¹ Department of National Defence (DND), B-GL-371-004/FP-001, Field Artillery, Volume 4, *Duties at Regimental Headquarters and the Gun Position* (Ottawa: Chief of the Land Staff, 1998), 2.

² Edward A. Guelfi, Buddhika Jayamaha, and Travis Robison, “The Imperative for the U.S. Military to Develop a Counter-UAS Strategy,” *Joint Forces Quarterly Issue 97* (April 2020): 6.

U.S. Artillery Falls Short—Literally—Compared to Rivals

The U.S. M109A7 Paladin artillery system, in the U.S. Army's arsenal since 2015, has a maximum range of only 30 kilometers—10 kilometers less than the range of Russia's 2S33 system and 23 kilometers short of China's PLZ-052.



The ranges of the artillery in the orders of battle of NATO's adversaries is concerning. A recent graphic titled "U.S. Artillery Falls Short – Literally – Compared to Rivals" provides a stark comparison between the principal American howitzer, the M109A7 Paladin (the Canadian M777A1 howitzer has a similar range), the Russian 2S33, and the Chinese PLZ-052.³ The 2S33 outranges the American gun by 10km, while the Chinese gun has nearly twice the Paladin's range (see chart above). Russia's inventory of rocket artillery also outranges comparable American systems. NATO will not have a conventional munition to match the 500km range of the 9K720 Iskander until the American Long Range Precision Fires project is operational in 2027 (see chart below).⁴ NATO is at a considerable disadvantage compared to its adversaries due to its preference for air assets to conduct deep fires.⁵ Indeed, Oana Lungescu, a NATO spokesperson, recently remarked:

For almost 70 years, airpower has been a core part of NATO's military capabilities. From deterring the Soviet Union during the Cold War to operations in the Balkans in the 1990s and the fight against international terrorism in the deserts of Afghanistan, airpower has helped to protect our people and achieve our political objectives.⁶

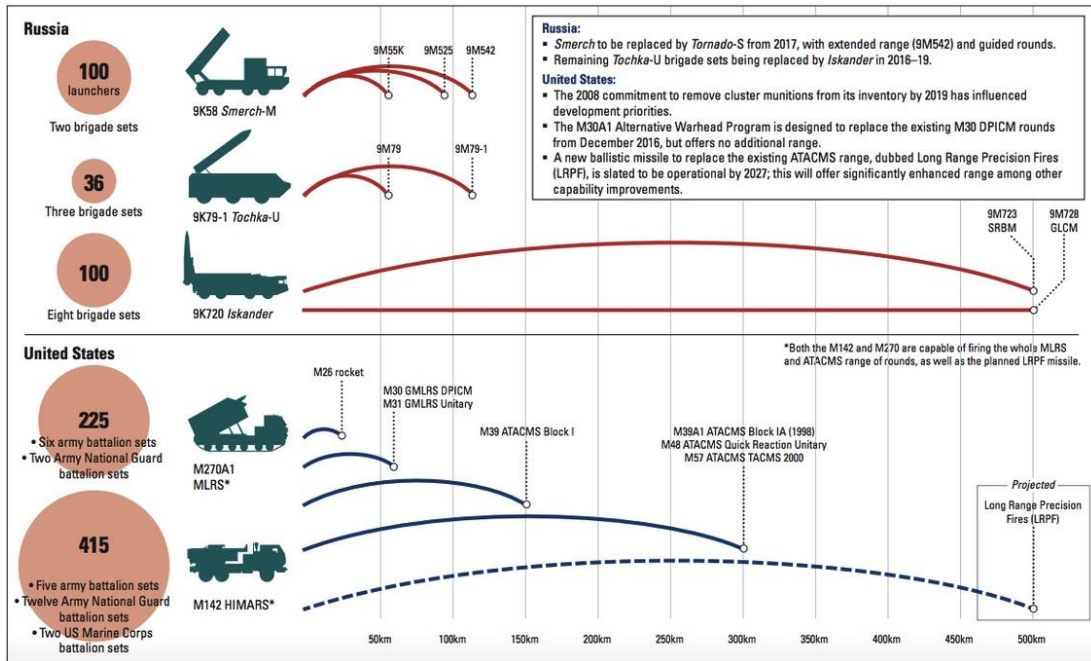
Canada currently has no ground-based assets to conduct deep fires. If the CF-188s are unable to support ground forces due to the air situation, air defence threat, or weather, the Canadian Army relies on our NATO allies to conduct deep fires on our behalf.

³ Major Peter Dahl, "Neighbouring Russian Artillery – A Soviet Mindset," *The Baltic Amber Multinational Corps Northeast Magazine* (June 2020): 53.

⁴ Ibid, 54.

⁵ DND, B-GL-371-002/FP-001, Field Artillery, Volume 2, *Duties of the Battery Commander and the Observer* (Ottawa: Chief of the Land Staff, 1998), 128-129.

⁶ Quoted in Dahl, "Neighbouring Russian Artillery," 55.



For the conduct of fire support, two other aspects – counter-battery fire and interoperability with NATO allies need our consideration. Doctrine often described the counter-battery programme in attritional terms. The attritionist approach is problematic for NATO since our adversaries have many more guns and rocket launchers in their order of battle. The attritionist process to the counter-battery fight also requires prodigious amounts of ammunition. In the Normandy campaign, the 21st Army Group deluged German batteries with 20 tonnes of shells on average.⁷ A manoeuvrist approach to counter-battery is more helpful. It enables us to overcome the numerical superiority of guns that our adversaries have and is more efficient with ammunition required quantities. Rather than attriting the adversary’s artillery, tube by tube, the focus should instead be on the command-and-control nodes and logistical units that support the guns and rocket launchers. It is almost certain that Canada will fight in a coalition with its NATO allies in the event of a conflict. For the artillery specifically, interoperability between allies would be enhanced if NATO members freely shared firing tables and data amongst themselves. The sharing of technical data would facilitate logistics by giving firing units the necessary data to accurately fire ammunition from other countries. We should adapt our fire discipline to match the AArtyP-1 *NATO Land-Based Fire Support Procedures* or instruct our personnel in the command post and at the observation post in NATO procedures to enable smoother integration with our allies on operations.⁸ Currently, the United Kingdom and Canada are the only NATO members who use fire discipline that differs from the NATO call for fire. The advantages of all NATO allies using the same call for fire and procedures are clear. During the Gothic Line attack in the late summer and fall of 1944, British, Canadian, Indian, and Polish guns supported the attack launched by I Canadian Corps. Due to their standardized calls for fire, it did not matter which guns the Eighth Army allocated to calls for fire, which afforded the commanders and staff greater flexibility with the command and control of their fires assets.⁹

Speaking the same “language” and using the same procedures is only part of the command and control of fires assets. Another is the communications that enable artillery to be commanded at the

⁷ David French, *Raising Churchill’s Army: The British Army and the War against Germany, 1919-1945* (Oxford: Oxford University Press, 2000), 256.

⁸ North Atlantic Treaty Organization, AArtyP-1, *Land-Based Fire Support Procedures*, Edition C, Version 1 (Brussels: NATO Standardization Office, 2015).

⁹ Douglas E. Delaney, *The Imperial Army Project: Britain and the Land Force of the Dominions and India, 1902-1945* (Oxford: Oxford University Press, 2017), 286-287.

highest level but controlled at the lowest. Using amplified very high frequency (VHF) radios allow artillery commanders to direct their guns and FOOs to call for fire. However, our adversaries can easily detect the transmission with their electronic warfare assets and use the detection to target the guns with rocket artillery. NATO fires assets must either have gun pits dug by the engineers or move within minutes of the radio transmission to be targeted by the adversary's rocket artillery. This situation is problematic. The engineers often do not have enough time to dig gun pits, and towed howitzers, such as the M777A1, are not suited for conducting "shoot and scoot" tactics. High-frequency data links and tactical satellite communications systems enable signallers to transmit artillery data without the same risks of electronic warfare detection, but more extant solutions exist. The laying of line, which is prescribed in *Duties at Regimental Headquarters and the Gun Position* during the gun position preparation, should be extended to include the manoeuvre force command post and, time permitting, the observation post.¹⁰ Laying line would enable communications during restrictive emission control states. Reports and returns and other artillery-specific products, such as target lists and fire plans, can be disseminated to the batteries via signals dispatch service (SDS). Line and SDS may seem archaic, but they enable command and control while minimizing the fires units' electromagnetic signature.

In the same way that VHF radio transmission exposes the guns to targeting by the adversary's rocket artillery, the recently concluded Nagorno-Karabakh conflict between Azerbaijan and Armenia has highlighted the threat posed by adversary UAS. Despite digging in, camouflaging, dispersing and deploying decoys, Armenian forces, particularly their tanks, were targeted by Azerbaijani deep fires directed by UAS. The persistent observation from UAS has led one expert to describe the modern battlefield as "naked."¹¹ Despite the Azerbaijani success, we should not discount passive air defence measures, such as digging in, camouflaging, and dispersion for the gun position's local defence. While an alert operator can see through these measures with infrared optics, the operator's ability to detect targets will degrade as they become fatigued. An exhausted operator will not remain as attentive to their screen as a well-rested operator and may not see well-camouflaged positions. Indeed, some counter-UAS experts have argued that the July 2014 Russian rocket attack results would have been less severe if Ukrainian forces had better employed passive air defence measures, such as dispersion and camouflage.¹² Passive measures, such as camouflage and decoys, require discipline and ingenuity, but they can be useful when done correctly.¹³ During the Second World War, British forces in North Africa dispersed their forces to minimize their losses from air attacks. However, dispersal made it challenging to concentrate forces and firepower at the decisive point.¹⁴ Attriting the adversary's UAS can also be useful, but NATO forces have largely neglected their short-range air defence capabilities. Consequently, NATO forces rely upon expensive air defence systems for counter-UAS.¹⁵ Often, the missiles cost much more than the UAS they are targeting, and the adversary can afford to send swarms of cheap UAS that NATO's air defence lacks the density to defeat and shield ground forces.

How do we make sense of these findings to refine our TTPs to practice during exercises and instruct on courses? Gunners should include readings on the contemporary operating environment in their professional development library. Learning from others' experience through reading enables us to learn from others, who have first-hand experience with the challenges faced by fire supporters in the 2020s, without having to muddle through and repeat mistakes that others have already made. Lessons

¹⁰ DND, *Duties at Regimental Headquarters and the Gun Position*, 68-70.

¹¹ Jack Watling, "The Key to Armenia's Tank Losses: The Sensors, Not the Shooters," *RUSI Defence Systems* Vol. 22, no. 1 (6 October 2020).

¹² Guelfi, Jayamaha, and Robison, "The Imperative for the U.S. Military to Develop a Counter-UAS Strategy," 9.

¹³ Aaron Jensen, "Deception is the Key to Chinese Military Strategies," *The Diplomat*, 8 August 2020, <https://thediplomat.com/2020/08/deception-is-key-to-chinese-military-strategies/#:~:text=By%20Aaron%20Jensen&text=Despite%20this%20long%20tradition%2C%20few,the%20widespread%20use%20of%20deception.>; and Walker Mills, "A Tool for Deception: The Urgent Need for EM Decoys," *War Room*, United States Army War College, 27 February 2020, <https://warroom.armywarcollege.edu/articles/tactical-decoys/>.

¹⁴ French, *Raising Churchill's Army*, 215.

¹⁵ Guelfi, Jayamaha, and Robison, "The Imperative for the U.S. Military to Develop a Counter-UAS Strategy," 8.

learned from expeditionary operations, such as Operation REASSURANCE and Operation UNIFIER, are also useful sources of knowledge from the Canadian Army and our allies' experiences. Codify these lessons in the lessons learned process enables gunners to apply them to TTPs tested during exercises and assessed on courses. Not only will testing these TTPs in training increase the realism of that training, but it will also enhance the confidence that soldiers have in their equipment and tactics to succeed on the battlefield.

In summary, the challenges confronting NATO fire supporters in the 2020s are significant. However, it would be incorrect to conclude that NATO has lost the fires "edge" against our adversaries. The Royal Regiment of Canadian Artillery may not have the optimal guns, air defence assets, and rocket artillery to fight our adversaries on the battlefield. However, gunners in the First and Second World Wars and the Cold War likely shared the same sentiments. Solutions already exist in doctrine or only require minor adaption to account for technological developments. This examination of the conduct of fire support, command and control of fires assets, and survivability of our artillery in the contemporary operating environment has demonstrated that the transition from nearly a decade of counterinsurgency to preparations for a conflict against a near-peer adversary requires more of an intellectual shift than anything else. As TTPs and doctrine are updated to reflect the contemporary operating environment's realities, gunners must not forget the lessons learned from Canada's Afghanistan mission. This intellectual shift must be accompanied by a robust cognitive ability that enables gunners of the Royal Regiment to revert to tactics and techniques suited to counterinsurgency if that is the mission assigned by the Government of Canada.