

Counterfire operations against peer competitors

Recalibrating sensory requirements?

Captain drs. Daan van den Wollenberg*

*'Enthusiasm for counterfire operations usually grows as casualties from enemy artillery mount' —
MG J.B.A. Bailey¹*

Since 2014, Western militaries renewed their focus from peacekeeping to combat operations against advanced opponents. Russian tactics, as demonstrated in the conflict in Ukraine, relied on massed indirect fires. Facing a (near-) peer adversary keen on using artillery on a massive scale raises the question of how to defend against these tactics. Is the Royal Netherlands Army able to conduct counterfire operations against a peer competitor?

*A Dutch PzH2000 howitzer during
exercise Dragon Supremacy*

PHOTO MCD, PAUL TOLENAAR



The involvement of Russian military forces in the illegal annexation of Crimea in 2014 has had serious implications for NATO and Western military focus areas. Western nations – up to then primarily involved in peace enforcing and peacekeeping missions – renewed their focus on combat operations against (near-) peer adversaries.²

Within the physical domain particularly the use of indirect fire was perceived as startling; widely available reports and pictures left little to the imagination.³ In one of these attacks, near Zelenopillya on 11 July 2014, Ukraine's Ministry of Defence confirmed 19 personnel killed and 93 wounded.⁴ Allegedly, approximately 80 per cent

of the losses in the Donbass area were caused by indirect fire.⁵ RAND branded the Russian tactics with emphasis on massed indirect fires as the

* The author held various operational positions within the fire support branch and currently works at the Netherlands Defence Academy in Breda.

- 1 J.B.A. Bailey, *Field Artillery and Firepower* (Oxford, The Military Press, 1989) 51.
- 2 Jamie Shea, 'NATO at 70: An Opportunity to Recalibrate', *NATO Review*, 5 April 2019. See: <https://www.nato.int/docu/review/articles/2019/04/05/nato-at-70-an-opportunity-to-recalibrate/index.html>.
- 3 Oksana Grytsenko, 'Remembering the Shelling: "We Saw a Glow, They Were Burned Alive"', *The Guardian*, 17 February 2015.
- 4 'Ukraine Conflict: Many Soldiers Dead in "Rocket Strike"', *BBC News*, 11 July 2014. See: <https://www.bbc.com/news/world-europe-28261737>.
- 5 Liam Collins and Harrison Morgan, 'King of Battle: Russia Breaks out the Big Guns', *Ausa.org*, 22 January 2019. See: <https://www.ausa.org/articles/king-battle-russia-breaks-out-big-guns>.



'new' Russian way of warfare.⁶ Russia reportedly values long-range strike weapons combined with ISR-means, decentralizing artillery to tactical levels, and integrating firepower into anti-access/area denial (A2AD).^{7,8}

Facing a (near-) peer adversary keen on using artillery on a massive scale raises the question of how to defend against these tactics. Can an adversary's artillery be countered, while air superiority is very likely to be contested in such

conflicts?⁹ The idea of targeting an opponent's artillery is a specific task for artillery units: counterfire (CF). The concept was raised more often during conflicts, but was rarely fully institutionalized and otherwise readily forgotten after conflicts ended.¹⁰ However, when facing an opponent that is particularly enthusiastic about artillery, countering its assets should take centre stage.¹¹

Purpose and scope

This article aims to renew the concept of counterfire and to place it in the contemporary context. It aims to do so by answering the question: can the Royal Netherlands Army conduct counterfire operations against a peer competitor? In order to generate an answer, this article will first address (1) the definitions concerning counterfire, (2) the significance in counterfire operations in historical perspective, (3) the composition and requirements of these operations, (4) the tactical dilemma's involving counterfire operations, and (5) how the Netherlands Royal Army relates to these aspects.

- 6 Scott Boston and Dara Massicot, 'The Russian Way of Warfare: A Primer', *Rand Corporation*, 2017. See: <https://doi.org/10.7249/pe231>.
- 7 Jack Watling, *The Future of Fires: Maximising the UK's Tactical and Operational Firepower* (London, Royal United Services Institute, 2019) 6; Boston and Massicot, 'The Russian Way of Warfare: A Primer'.
- 8 Anti-access/Area denial (A2AD) refers to an extensive integration of defensive mechanisms across air-, naval-, and ground domains by primarily using the electromagnetic spectrum for detection and long-range missiles to strike. Thus, denying adversaries to close in.
- 9 G.E. Jansma and M.R.C. Van Ockenburg, 'Ontwikkelingen bij de Grondgebonden Vuursteun van de Koninklijke Landmacht', in: *Militaire Spectator* 187 (2018) (2) 114.
- 10 G.T. Starnes, 'Eliminating the Counterfire Void', in: *Marine Corps Gazette* 74 (1990) (10) 20; Neil E. Nelson, 'The Role of the Field Artillery Brigade in Counterfire' (Carlisle Barracks, 1990) 31.
- 11 Starnes, 'Eliminating the Counterfire Void', 22; Keith W. Dayton, 'Field Artillery Survivability: The Soviet Perspective' (Garmisch, 1981) 3.



The structure of this article proceeds in line with these elements and formulates an answer to the main question in the conclusion.

The main question is framed towards the role of the army and, for the Netherlands specifically, that means within the scope of combined-arms ground operations at brigade-level. To be sure, other operational domains can contribute to counterfire operations. RAND underlines that armies need 'a seamless joint counterfire' solution.¹² However, an adversary's anti-access/area denial capabilities imply a limited availability of, for example, aerial assets.¹³ Recently RUSI added: 'if anything, the RAF [Royal Airforce] will be looking to ground forces to provide supporting firepower to open windows in enemy air defences'.¹⁴ Such strains may be limited to specific phases of a conflict and will differ among domains. Nevertheless, as RAND points out, 'much of the attrition of enemy ground maneuver [sic] units will be left to the Army.'¹⁵ The scope of this article does not encompass 'seamless joint counterfire' operations. Rather it lays the groundwork to enable counterfire within the frame of ground operations as starting point, thereby providing a steppingstone for further development towards a joint counterfire framework.

Definitions

Internationally similar terms are utilized for related concepts: counterfire, counterbattery fire, counter mortar fire, or counter bombardment.¹⁶ Some deem it a matter of national semantics.¹⁷ However, the terminology used by the US and UK deviates from NATO's definition, adding to the confusion. NATO defines counterfire as: 'fire intended to destroy or neutralize enemy weapons', and counterbattery fire as: 'fire delivered for the purpose of

destroying or neutralizing the enemy's fire support system'.¹⁸ Thereby, NATO places CF as a sub activity within the scope of counterbattery fire, differentiating over whether the supportive system¹⁹ is included. In contrast, the US defines counterfire as: 'fire intended to destroy or neutralize enemy weapons. Includes counterbattery and counter mortar fire'²⁰, adding that 'counterfire contributes by providing fires against the enemy indirect fire system'.²¹ Thus, the U.S. Army determines that CF encompasses the supportive system in all cases, yet activities could be further specified based on the type of system it aims to counter – artillery or mortars. That is a sensible separation as howitzers and mortars have distinctive modus operandi and typically deploy in different areas.²² This article follows the definition utilized by the U.S. Army as (1) the majority of the available sources adopts the same terminology, thus preventing confusion over the interpretation, (2) our largest Anglophonic allies utilize these definitions, and (3) relating the terminology to its purpose seems the most logical separation of concepts.

Additionally, this article limits the classification of ground-based indirect firing platforms to three generalized categories: mortars, cannon-systems²³, and rockets. Granted, these can be divided into subsets to the extent of distinct combinations of (1) type of system with (2) a

Russian BM-21 MLRS. Facing a (near-) peer adversary keen on using artillery on a massive scale raises the question of how to defend against these tactics

PHOTO VITALY V. KUZMIN

- 12 John Gordon et al., *Army Fires Capabilities for 2025 and Beyond* (Santa Monica, RAND Corporation, 2019) 107. See: <https://doi.org/10.7249/rr2124>.
- 13 Gordon et al., *Army Fires Capabilities*, 176; Jansma and Van Ockenburg, 'Ontwikkelingen bij de Grondgebonden Vuursteun van de Koninklijke Landmacht', 114–15.
- 14 Watling, *The Future of Fires*, 3.
- 15 Gordon et al., *Army Fires Capabilities*, 107.
- 16 The latter is, to my knowledge, only utilized by the Australian armed forces. See: Alan H. Smith, *Do unto Others: Counter Bombardment in Australia's Military Campaigns* (Newport, Big Sky Publishing, 2011).
- 17 For example, Bailey, *Field Artillery and Firepower*, 51.
- 18 NATO, 'AAP-06 NATO Glossary of Terms', 2019, 34.
- 19 I.e., command and control, sensors, platforms, and logistics. See: U.S. Department of the Army, 'FM 3-09: Field Artillery Operations and Fire Support' (Washington D.C., 2014), 1–46.
- 20 U.S. Department of the Army, Glossary-4.
- 21 U.S. Department of the Army, 1–46.
- 22 Bailey, *Field Artillery and Firepower*, 63.
- 23 Cannon-systems encompass self-propelled howitzers (e.g. PzH2000) and towed cannons (e.g. M777).

specific set of ammunition, each outlining particular pros and cons. For the argument in this article further subdivision is inapt. Moreover, when referring to *artillery* it means cannons and rockets. Mortars do provide an essential augmentation of firepower to manoeuvre forces and it is exactly that dedicated task which allows force commanders to shift the focus of artillery between close and deep operations. In general, however, mortars lack the inherently required range and flexibility in firing arches to conduct CF operations.

Perspectives on counterfire operations over time

Conducting CF operations is a specific task for artillery units intended to destroy or neutralize an adversary's indirect firing platforms.²⁴ To some extent this may appear to be a battle disconnected from ground manoeuvre which, during the First World War, commanders allegedly referred to as 'black art'.²⁵ That is a misunderstanding. The counterfire operation is especially relevant for the other arms as their protection from the adversary's fire support system depends on it. Moreover, depriving an adversary of his capabilities to conduct CF operations themselves allows for reassigning artillery assets to target their manoeuvre assets. Destroying an opponent's fire support capabilities is therefore a vital element of the combined-arms operation, which makes its integration within the combined-arms efforts the responsibility of the force commander.²⁶

The enthusiasm for this specific task has varied over the years since its conception. According to Bailey, many infantry assaults during 1915-1916 failed due to the inability to suppress the adversary's indirect firing assets, which left advancing formations easy targets for indirect fires.²⁷ Recognizing this issue, 1917 produced a surge in techniques to detect the positions of opposing indirect firing platforms, which would, at the time, remain static for long periods and thus did not require the speed considered essential today. Interest in the concept declined after the First World War; developed techniques and technology were considered inadequate for mobile warfare that emerged on the brink of the Second World War. Ironically, the concept was quickly revived in 1942 when the British Army realized that the majority of casualties were inflicted by indirect fires instead of small arms fire.²⁸ Roughly one decade later, in the Korean War, the relevance of CF was still crystal clear. Estimates suggest that up to 70 per cent of all available artillery assets were assigned to CF operations during the conflict.²⁹

Interest declined again afterwards. Nelson accounts for the US CF operations in Vietnam, illustrating that within the few intermediate years the US ability to successfully conduct such operations had already waned.³⁰ Curiously, the reason was similar to that of the aforementioned interbellum period between the First and Second World Wars: target acquisition capabilities had not been kept technically current. At the same time some older techniques, e.g. flash ranging, were at the time not fast enough to produce effective results.

By contrast, the Soviets did not lose track of the role of CF operations, insisting that 'enemy artillery must be destroyed before the close battle is joined.'³¹ Their perception was to attain victory through superior firepower by exploiting the success of fire support with manoeuvre.³² During the Cold War the Soviets were expected to allocate up to half of their available artillery assets to the purpose of CF.³³ As a response NATO studied the effects of incorporating CF operations in their own *modus operandi* as deep interdiction by conducting various simulations

24 Bailey, *Field Artillery and Firepower*, 51; U.S. Department of the Army, 'FM 3-09: Field Artillery Operations and Fire Support', 1-46.

25 Bailey, *Field Artillery and Firepower*, 51.

26 U.S. Department of the Army, 'ATP 3-09.23 Field Artillery Cannon Battalion' (Washington D.C., 2015), 5-8; Kevin E. Finch, Henry S. Larsen III, and Vincent J. Bellisario, 'Counterfire for the IBCT', in: *Field Artillery* 6 (2001) 15; Starnes, 'Eliminating the Counterfire Void', 20.

27 Bailey, *Field Artillery and Firepower*, 51.

28 Ibidem, 51

29 Ibidem, 52.

30 Nelson, 'The Role of the Field Artillery Brigade in Counterfire', 31.

31 Bailey, *Field Artillery and Firepower*, 56.

32 Nelson, 'The Role of the Field Artillery Brigade in Counterfire', 8.

33 M.L. O'Hagan, 'The Soviet Artillery and the Group of Soviet Forces in Germany', in: *Journal of Royal Artillery* 105 (1978) 16-20; Bailey, *Field Artillery and Firepower*, 53.



A Lithuanian target observer scouts for targets. Engaging a target starts with its acquisition with sufficient precision to effectively direct fire towards it

PHOTO NATO

of five days warfighting in a high intensity conflict situation. The findings were noteworthy. Successful deep interdiction of the opponent's artillery through CF operations directly affected the close battle as the exchange ratio of own infantry fighting vehicles increased three- to fivefold due to the opponent's inability to bring its artillery into battle effectively.³⁴ Thus, the study underlined the relevance of integrated CF operations for other combined-arms assets. Moreover, CF operations would be more effective given the ability to strike deep into an opponent's territory, which led to the development of the Multiple Launch Rocket System (MLRS) system.³⁵

During Operation Iraqi Freedom the U.S. Army conducted a limited and one-sided CF operation. One account estimates the result at over 150 enemy indirect firing systems destroyed along with 700 personnel killed.³⁶ However, it again highlighted the relevance of adequate sensors. For example, during the initial thrust towards Baghdad one of the CF radars broke down, allowing an Iraqi artillery battalion to pound US positions for an hour, despite fixed-wing aircraft being employed to neutralize them.³⁷ Only when the radar was repaired could the threat be detected and neutralized. Although air assets

possess adequate striking capabilities, their often visually focused sensors to detect ground targets leaves pilots searching for a needle in the haystack – making them a slow responder for CF operations in comparison with artillery.³⁸

As confirmed in Ukraine, the Russian Federation still adheres to the black art.³⁹ Reports concerning Russia's military tactics refer to its reliance on indirect fires combined with various sensors – e.g. layered unmanned systems and electromagnetic equipment.⁴⁰ Following the demonstration of Russia's capabilities, the U.S. Army revitalized the necessity of counterfire operations, which Western armed forces generally neglected whilst focussing on the wars in Iraq and Afghanistan.⁴¹ RAND illustrates that lacking counterfire capabilities would lead to

34 Bailey, *Field Artillery and Firepower*, 53.

35 Ibidem, 53.

36 Brian L. Borer and Noel T. Nicolle, "Acquisition!" 3D ID Counterfire in OIF', in: *Field Artillery* 5 (2003) 42.

37 Timothy M. Ratliff, 'Field Artillery and Fire Support at the Operational Level: An Analysis of Operation Desert Storm and Operation Iraqi Freedom' (Fort Leavenworth, 2017), 39–40.

38 Borer and Nicolle, "Acquisition!" 3D ID Counterfire in OIF', 46.

39 Gordon et al., *Army Fires Capabilities*, 75–76.

40 Boston and Massicot, 'The Russian Way of Warfare: A Primer'.

41 Collins and Morgan, 'King of Battle: Russia Breaks out the Big Guns'.

Lacking counterfire capabilities would lead to ‘catastrophic failure’ whilst facing a peer

‘catastrophic failure’ whilst facing a peer and adds that ‘the capabilities of our allies and partners...tend to be weak in this area, and so should also play a role in the development of Army fires doctrine and concepts of employment.’⁴² The logical start to develop a counterfire doctrine would be exploring the most relevant aspects of conducting an effective counterfire operation. That is what this article will do next.

Composition of counterfire operations

The counterfire operation consists of proactive and reactive elements. Proactive measures aim to ‘identify, locate, and attack to eliminate the enemy’s strike capabilities before it can impact friendly operations.’⁴³ The reference to ‘strike capabilities’ seems limited to firing platforms; however, the sensors these platforms rely upon are of equal importance to strike proactively. Implementing these measures takes place during the decision-making process by analysing the adversary’s total fire support system and

contemplating scenarios to counter its use. In general, proactive CF measures are executed during the deep operation to shape the upcoming battlefield. Targets that are taken out in that phase will no longer influence future operations.⁴⁴ During that phase reconnaissance assets will scout the environment to locate assets of, amongst others, the opposing fire support system. Combining recon elements with artillery is remarkably effective in such operations.⁴⁵ Accordingly, proactive components primarily require (1) capabilities to detect the adversary’s assets whilst being inactive, and (2) range and lethality to strike effectively.

Reactive measures direct fire against the opposing fire support system as soon as their action enables detection of their positions, thereby providing a response to an opponent’s fire support assets that are employed in battle.⁴⁶ Although reactionary in nature, these measures also rely on the decision-making process as platforms and sensors have to be positioned and connected accordingly to maximize chances for a successful response. This type of action requires (1) sensor capacity to detect active systems, (2) range and lethality to strike effectively, and (3) a very fast sensor-shooter link to hit the targeted system before it changes position.

A clear delineation between proactive and reactive measures in time or space, however, is impossible. As soon as the close operation commences, the force commander may want to direct his fire support assets accordingly. But that does not preclude the need for reactive measures against hostile artillery during the close operation, nor the exploitation of incoming intelligence with proactive measures in depth. Consequently, the CF operation is a composition of various capabilities integrated within the scheme of the force commander’s manoeuvre.⁴⁷ This paragraph has highlighted the prerequisites to enable CF operations: (1) sensors, (2) range and lethality, and (3) speed.⁴⁸ Next, a closer look at them will reveal the dilemmas they amount to.

Sensors

Engaging a target starts with its acquisition with sufficient precision to effectively direct fire

42 Gordon et al., *Army Fires Capabilities*, 106.

43 U.S. Department of the Army, ‘FM 3-09: Field Artillery Operations and Fire Support’, 1–46.

44 R. Sijbrandi, ‘“Never Send a Man, If You Can Send a Bullet”. De Diepe Operatie op Brigadeniveau’, in: *Militaire Spectator* 187 (2018) (2) 67.

45 Finch, Larsen III, and Bellisario, ‘Counterfire for the IBCT’, 16.

46 U.S. Department of the Army, ‘FM 3-09: Field Artillery Operations and Fire Support’, 1–47.

47 U.S. Department of the Army, 1–47–48.

48 Speed could be divided into a fast sensor-shooter link and fast C2. Moreover, the U.S. Army outlines ‘target acquisition’ and ‘information processing’ as critical aspects. In its perception ‘range and lethality’ are no concerns as the acquired target would dictate the asset to execute the attack. That vision is, however, only reasonable if air assets would be in the picture, but, as we determined in the introduction, they are not against peer competitors. See: U.S. Department of the Army, ‘ATP 3-09.23 Field Artillery Cannon Battalion’, 5–8.

towards it.⁴⁹ As fire support platforms operate behind the position of manoeuvre forces such sensors have to detect them beyond the line of sight. The ability to do so is becoming increasingly important.⁵⁰ Sensors, or target acquisition systems, can be divided into two categories, namely active and passive ones. Their distinction is based on whether the system requires action or emits signals versus 'listening' to its environment.

Active target acquisition systems typically entail (1) reconnaissance units, (2) weapon location radar, and (3) (un)manned aerial systems.⁵¹ Passive sensors usually refer to (1) acoustics, and (2) signal intelligence. Additionally, some explore the possibilities of seismic sensors, yet results are still inconclusive.⁵² By triangulation of respectively sound⁵³ or electronic emission⁵⁴ these sensors generate a probable location of its origin.

The difference between active or passive systems may seem rudimentary but it is quite relevant. In general, active systems outrange their passive counterparts, are less subjective to weather conditions, and produce more accurate location data. But, by their activity, these systems emit detectable signals as well. Passive sensors do not have that drawback. Both types must be intricately balanced as overreliance on either is risky. For example, passive sensors are reliant on the opponent to emit detectable signals. These signals, however, can be reduced and/or manipulated to hamper detection and avoid effective engagement. Exclusive liability on active sensors may result in detectable sensory efforts by an adversary's inactive sensors.

During operations in Iraq and Afghanistan, adversaries generally did not possess the capability to locate active sensors to contest their use.⁵⁵ So, balancing active and passive sensors was less relevant. Peer-competitors, however, are equally technologically advanced. In an A2AD environment it is hard to determine which assets will be able to contribute to the operation. That logically implies rebalancing active and passive sensors, which involves a different challenge: instead of focusing on detecting firing platforms, the first issue that

arises is who has the most advanced sensor capabilities to detect the opposing side's sensory efforts? This issue is discussed further with the dilemmas of counterfire operations.

Range and lethality

The relevance of range is twofold: in an absolute sense and a relative sense. First, future battlefields are anticipated to become larger.⁵⁶ As fire support platforms are required to swiftly support different units, spread over that area, their effective range needs to increase accordingly.⁵⁷ Second, the relative distance between own and opposing artillery dictates the possibility to conduct CF operations. The more extended its range, the more assets it can counter; for example, howitzers have little to fear from CF from mortars as howitzers outrange them by far.⁵⁸ Moreover, artillery may have difficulty dealing with opposing counterparts when ranges

- 49 U.S. Department of the Army, 'FM 3-09: Field Artillery Operations and Fire Support', 2-16.
- 50 Jansma and Van Ockenburg, 'Ontwikkelingen bij de Grondgebonden Vuursteun van de Koninklijke Landmacht', 118.
- 51 I.e. fixed-wing aircraft, helicopters, various UAV's, and satellites. The activity refers to the use of these platforms. The sensors of these platforms could be categorized as either passive or active as well, however, that does not circumvent the detectability of these platforms in their use.
- 52 See for example Alain Lemer and Frederique Ywanne, 'Acoustic/Seismic Ground Sensors for Detection, Localization and Classification on the Battlefield', in: *Battlefield Acoustic Sensing for ISR Applications* (Neuilly-sur-Seine, 2006), 17-1-17-12; Others underline the military relevance of seismic activity. See for example A. Pakhomov et al., 'High Performance Seismic Sensor Requirements for Military and Security Applications', in: *Unattended Ground Sensor Technologies and Applications VII 5796* (2005) (Bellingham: SPIE) 117-24, <https://doi.org/10.1117/12.604358>. These authors conclude that it would be difficult, if not impossible, to develop an all-in-one seismic sensor that would suit all military needs. Nonetheless, it would seem logical that the recoil from firing mortars or howitzers would be measurable through the earth's surface. But, even then, it remains undetermined how seismic intelligence relates to data produced by other sensors. Supposedly, Poland reinforced its border protection with seismic sensors. See: Defence24.com, 'Polish Border Reinforced with a Seismic Detectors Network?', *Defence24.Com*, 9 November 2017, <https://www.defence24.com/polish-borders-reinforced-with-a-seismic-detectors-network-analysis>.
- 53 For example, firing artillery, small arms, or moving columns of vehicles.
- 54 For example, radio or radar signals.
- 55 Jeffrey S. Wright, 'Field Artillery and the Combined Arms Team : A Case for the Continued Relevance of American Fire Support' (Fort Leavenworth, 2015), 53.
- 56 HCSS, 'The NATO Warfighting Capstone Concept: Key Insights from the Global Expert Symposium Summer 2020', 2020, 3; Jansma and Van Ockenburg, 'Ontwikkelingen bij de Grondgebonden Vuursteun van de Koninklijke Landmacht', 119.
- 57 Nelson, 'The Role of the Field Artillery Brigade in Counterfire', 34.
- 58 Wright, 'Field Artillery and the Combined Arms Team : A Case for the Continued Relevance of American Fire Support', 46.

are comparable.⁵⁹ Consequently, artillery can avoid the effects of CF by increasing the relative distance.⁶⁰ However, increasing the relative distance also reduces the ability to conduct effective CF operations, which allows an adversary to direct all its fire support assets

towards own manoeuvre forces.⁶¹ Rocket artillery – or specifically Multiple Launch Rocket Systems - is often referred to as the go-to option for CF operations, as they were developed for exactly that.⁶² And with good reason: its rockets range up to 70 km, while its missiles exceed 300 km.⁶³ Additionally, the various munition types guarantee the lethality that other systems may lack.⁶⁴ These assets, however, are too scarcely available. RUSI recently concluded: 'In short, the UK's ground forces are comprehensively outgunned and outranged, leaving enemy artillery free to prosecute fire missions with impunity. This must ultimately fix and suppress British guns and manoeuvre elements, and thereby lead to the defeat of UK units in detail.'⁶⁵ Logically, multiple nations are now seeking to expand or reintroduce rocket capabilities.⁶⁶

59 Daan van den Wollenberg and A.W. Van Adrichem, 'Swarming Fires - Een Haalbaar Concept?', in: *Sinte Barbara 70* (2018) (1) 29.

60 Watling, *The Future of Fires: Maximising the UK's Tactical and Operational Firepower*, 7.

61 Nelson, 'The Role of the Field Artillery Brigade in Counterfire', 34.

62 Boyd L. Dastrup, 'Modernizing the King of Battle, 1973-1991' (Fort Sill, 2003), 60.

63 U.S. Department of Defense, 'JP 3-09 Joint Fire Support', 2019, III-9.

64 Watling, *The Future of Fires: Maximising the UK's Tactical and Operational Firepower*, 21-22; Dastrup, 'Modernizing the King of Battle, 1973-1991', 18.

65 Watling, *The Future of Fires: Maximising the UK's Tactical and Operational Firepower*, 2.

66 Jansma and Van Ockenburg, 'Ontwikkelingen bij de Grondgebonden Vuursteun van de Koninklijke Landmacht', 119-20; Yaakov Lappin, 'IDF Introducing New Artillery Doctrine', *IHS Jane's Defence Weekly*, 4 August 2016.



Speed

The final prerequisite for effective CF operations is rapid engagement. Its significance originates from improved survivability procedures: concealment, mobility of platforms, frequent changing of firing positions, dispersed deployment of formations, and roving guns and sensors make platforms difficult to pinpoint and leave a small window of opportunity, thus, necessitating a rapid engagement.⁶⁷ Undeniably, protracted firing procedures, e.g. registrations, adjusting fire, smoke screens, or illumination, make fire support assets vulnerable to an opposing CF operation.⁶⁸

Counterfire would be most effective if the response is fired within 75 seconds after the enemy's first round.⁶⁹ The engagement itself

can be swift by designating specific artillery units to perform CF and directly linking them to target acquisition capabilities.⁷⁰ Moreover, the amount of analysis done by supportive systems could be intensified by shifting from the 'man in the loop' to the 'man on the loop'.⁷¹

However, processing the target acquisition data into an engagement order takes time. During Operation Iraqi Freedom the U.S. Army managed an average of 6m37s from detection to engagement.⁷² The difference was primarily due to interpretation of the rules of engagement and extensive risk mitigation.⁷³ When facing a peer such timeframes may be too slow for effective engagements. That means effectiveness may become at odds with preventing collateral damage. Striking too fast could produce unwanted results. On the other hand, being too cautious may hinder effectiveness, which, ironically, may increase the risk of collateral damage as the same target would require multiple engagements to ensure its neutralization. That process could be careful yet fast by, for example, incorporating preliminary automated risk estimations by support systems, developing a 'risk map' in which the force commander designates in which areas certain risks are acceptable, or connecting risk acceptance to high pay-off targets can help diminish collateral damage.⁷⁴ Consequently, a careful balance between optimal effectiveness and minimizing potential collateral damage is required to ensure risks are justifiable.

Multiple Launch Rocket Systems from the 2nd Republic of Korea/United States Combined Division exercise in South Korea. Rocket artillery – or specifically Multiple Launch Rocket Systems – is often referred to as the go-to option for CF operations

PHOTO U.S. ARMY, SINTHIA ROSARIO



- 67 B. McConachy, 'The Roots of Artillery Doctrine: Napoleonic Artillery Tactics Reconsidered', in: *The Journal of Military History* 65 (2001) (3) 632; Bailey, *Field Artillery and Firepower*, 95–111; Jansma and Van Ockenburg, 'Ontwikkelingen bij de Grondgebonden Vuursteun van de Koninklijke Landmacht', 119; Dayton, 'Field Artillery Survivability: The Soviet Perspective', 5, 12–13; Victor Scharstein and Clarence Loomis, 'Modern Fires Environment: It's Time to Recognize the Changing Fires Environment', in: *Marine Corps Gazette* 102 (2018) (December) 14.
- 68 Dayton, 'Field Artillery Survivability: The Soviet Perspective', 15.
- 69 Bailey, *Field Artillery and Firepower*, 248.
- 70 Borer and Nicolle, "Acquisition!" 3D ID Counterfire in OIF', 43.
- 71 Jansma and Van Ockenburg, 'Ontwikkelingen bij de Grondgebonden Vuursteun van de Koninklijke Landmacht', 121.
- 72 Borer and Nicolle, "Acquisition!" 3D ID Counterfire in OIF', 44.
- 73 Ibidem, 44.
- 74 Neutralization of high pay-off targets is favourable for our own operation, whereas neutralization of high value targets results in unfavourable conditions for an adversary's operation.

An additional consideration is airspace deconfliction. On the one hand, A2AD presupposes a limited role for air support, especially in the early stages of a conflict. On the other hand, windows of opportunity could be created and may require a fast response from air assets nonetheless. However, clearing airspace during the operation would hinder a timely response of the ongoing CF operation and the potential deployment of air assets. That means that an optimum must be found between continuously guaranteeing a rapid CF operation, but also enabling a swift deployment of air assets. This potential coordination issue could, for example, be solved by shifting the authority over the required segment of airspace from the air component commander to the land component commander, enabling a rapid and flexible CF operation. He could then activate or deactivate transit routes for air assets to cross that portion of airspace. Conceivably, this requires the joint

force commander to decide which operation to prioritize during various phases of the conflict. How to do that in more detail is beyond the scope of this article, but every contemplated option has to facilitate fast engagements to allow both operations to be conducted effectively.

Dilemma of engagement

Having explored the relevance of sensors, range and lethality, and speed this article turns to the use of counterfire operations. These operations are composed of proactive and reactive elements, balancing them poses different risks leading to dilemmas for the CF operation. The first dilemma concerns timing of engagement and is explored in this section. Arguably, we could add a second dilemma: timing of detection. That dilemma is explored in the next section.



The first view on timing the engagement is that battles required a preliminary *artillery duel* – a fight in which other arms did practically not take part.⁷⁵ A successful duel meant that manoeuvre elements were spared advancing under enemy artillery fire. Additionally, it allowed all arms to focus their efforts on the opposing manoeuvre forces, which, in turn, enabled artillery to strike holes in the opposing force's defence to be exploited by manoeuvres.⁷⁶ If the duel did not produce the desired results, the artillery would have to make sure that the opposing artillery cannot engage undisturbed.⁷⁷ A focus on the adversary's artillery prevailed over support of manoeuvre elements. This question remains relevant to both sides in a conflict even today: commanders have to determine which assets support which operation during what timeframe.⁷⁸ However, the underlying issue is: when to start firing during CF operations, and with which assets?⁷⁹ For example, one side could fire with its howitzers at random, while having rocket artillery in position, to lure an opposing force into commencing their CF operations and give the position of their assets away. Employing rocket artillery, however, may invite the opposing force to do the same. Thus, the spiralling of an artillery duel commences. As an engagement may trigger a similar response, the positions of own artillery forces should be apt in size and deconflicted with other units.⁸⁰ However, prior to the ground manoeuvre all artillery assets could be committed to the duel, by which a force commander to some extent may avoid having to choose between the CF operation or supporting manoeuvre elements. The dilemma of the force commander may become harder when deployed reconnaissance elements report targets of interest in depth of the operation; catching them unawares is favourable, but potentially triggers the duel. When striking a peer competitor with artillery it is best to be ready for a duel; its

success is largely determined by the advantage in available sensors, range, and speed to act.⁸¹

On the other hand, one could argue that the CF operation is best conducted simultaneously with the ground manoeuvre.⁸² Several arguments support that line of thinking. First of all, combining both efforts produces multiple problems for the adversary, forces its commander to choose, and, thereby, increases his chances of making mistakes. Surprising an opponent with such choices could create the possibility of retaking or exploiting the initiative.⁸³ Second, conducting the CF operation during ground manoeuvres permits those elements to directly exploit the neutralization of enemy artillery assets, consequently making the problem management for the adversary even worse. These are considerable advantages; however, they require the force commander to choose which operation to support with which assets. Favouring one operation – deep or close – over the other is meaningful as loss in one operation makes the other increasingly difficult.⁸⁴ Any military that is outnumbered in terms of artillery will find this a hard choice as the opponent does not face the same problem. Larger numbers translate into the ability to simultaneously conduct CF efforts and support manoeuvre forces. To mitigate that advantage of the opponent one might opt for a duel instead. However, that may be the opponent's trigger to deploy the manoeuvre operation as well to counter that tactic. This thought experiment could be continued by contemplating even more

75 Bailey, *Field Artillery and Firepower*, 53–54; W. Balck, *Tactics Vol II: Cavalry, Field and Heavy Artillery in Field Warfare*, trans. Walter Krueger, 4th ed. (Fort Leavenworth: U.S. Cavalry Association, 1914).

76 Starnes, 'Eliminating the Counterfire Void', 23.

77 Bailey, *Field Artillery and Firepower*, 54.

78 McConachy, 'The Roots of Artillery Doctrine: Napoleonic Artillery Tactics Reconsidered', 624.

79 Bailey, *Field Artillery and Firepower*, 54.

80 U.S. Department of the Army, 'FM 3-09: Field Artillery Operations and Fire Support', 4–14.

81 Ratliff, 'Field Artillery and Fire Support at the Operational Level: An Analysis of Operation Desert Storm and Operation Iraqi Freedom', 44.

82 William M Campsey, 'Birth Of Modern Counterfire: The British And American Experience In World War I' (Fort Leavenworth, 1991), iii.

83 Campsey, iii.

84 Dastrup, 'Modernizing the King of Battle, 1973-1991', 5.

Multi Mission Radar. A modern second dilemma: timing of detection

PHOTO MCD, MAARTJE ROOS

if-then scenario's, but the aim of the argument here is to illustrate that commencing CF operations is subject to various factors that could be misinterpreted altogether. On this topic Smith concludes: 'correctly reading the artillery battle was most important'.⁸⁵ Next, we turn to the dilemma of detection.

Dilemma of detection

Its idea is similar to that of the question when to engage, but refers to the question when to initialize active sensors to conduct CF operations. The dilemma primarily arises from the development and implementation of weapon location radars and signal intelligence. This occurred during the later phases of the Cold

War, approximately in the 1970s and 1980s.⁸⁶ As discussed before, the largest disadvantage of active sensor technique is that its use is detectable as well due to its emission of signals. These assets could more or less be used uncontested during the conflicts in the Middle East, but this changes significantly when facing a peer competitor. Activating a radar, deploying air assets, and utility of omni-directional radios are likely to be detected and targeted by the opposing CF operation. That does not automatically guarantee an engagement as an opposing force may have similar considerations to determine the associated risks. Like the exemplification above, a radar could also be initialized to tantalize a response, in order to hit the opposing force even harder. That means that utility of active sensors is subject to the same consideration of the dilemma of timing, which takes place prior to deciding on the engagement itself. But on what basis will these assets be activated? That question underlines the

85 Smith, *Do unto Others: Counter Bombardment in Australia's Military Campaigns*, 94.

86 Bailey, *Field Artillery and Firepower*, 60–61.



relevance of a well-balanced system of both active and passive sensors; keeping them balanced is key for effective CF operations. A balance could materialize by developing a layered model for sensors. The first layer can consist of an abundant amount of dispersed passive sensors, for example acoustic sensors, that alert own forces and, dependent on the situation, can provide targeting data. If need be, an additional layer of powerful active sensors can be activated to acquire targets more precisely. Moreover, multiple sensory layers can increase survivability of active sensors as well. For example, the data from acoustic sensors could be used to specify the search area of active radar and thus reduces its risk of detection. Disregarding the number of layers and the exact sensors in them, it requires recalibrating our sensory needs to construct a balanced sensory system for counterfire operations.

Counterfire operations up to, and largely through, the Cold War were predominantly a dilemma of when to commence firing. Modern technological developments, however, also require force commanders to contemplate when to initialize active detection. This makes modern CF operations a closely tied two-step dilemma for force commanders: when to initiate active sensors and when to engage. Either choice can contribute to the operation but risks triggering a large calibre duel. Logically, guiding instructions can be formulated during the decision-making process prior to the operation, but these may not do justice to all intricate considerations that rise from real-life information. Thus, answering this two-step dilemma may require the force commander's intuition as well. Nonetheless, as soon as these dilemmas have to be answered the force commander should be ready to fight the duel once it commences.

Norwegian artillery vehicles under the northern lights. Modern CF operations face a closely tied two-step dilemma for force commanders: when to initiate active sensors and when to engage

PHOTO FORSVARET, OLE-SVERRE HAUGLI



To attain speed the first step would be embracing counterfire operations as an essential part of the combined-arms effort

Counterfire and the Netherlands

This paragraph turns to the current and anticipated capabilities of the Royal Netherlands Army and how these relate to the prerequisites of counterfire operations and the tactical dilemmas. The Netherlands Army fields a technologically dominant howitzer and the anticipated Assegai ammunition for the PzH2000NL expands its range up to 40 kilometres.⁸⁷ Furthermore, the Netherlands Army is currently introducing state-of-the-art weapon location radars.⁸⁸ Moreover, multiple units are experimenting and implementing various types of unmanned aerial systems. These assets enable both active and reactive elements of counterfire operations against a technologically inferior adversary. Without danger from A2AD capabilities, (un)manned aerial assets can monitor activity on the ground. Likewise, weapon location radars can monitor the horizon uncontested. Both air assets and artillery can freely engage targets. Thus, facing a technologically inferior adversary the dilemmas of firing and detection would most likely not exist for the Netherlands Army; engagements can be pursued without risking response from an adversary's counterfire operation.

This changes when facing a peer adversary. Howitzers could strike proactively, yet targets in

depth could be beyond their reach in absence of aerial assets. Moreover, as adversaries will conduct their own counterfire operations, each potential target prompts the dilemma whether to engage or not. Deciding to engage produces a one-sided risk for the howitzers as an adversary's rocket artillery outranges and outguns them. Consequently, an adversary does not suffer the same dilemma; the Netherlands lack the ability to counter modern rocket artillery, which allows an adversary to conduct reactive counterfire without much risk to their assets. That ability could be attained by reintroducing rocket artillery, which the Netherlands Army is envisioning in the future.⁸⁹ Until such assets are fielded, however, the dilemma of firing typically favours the peer adversary. Similarly, weapon location radars could be utilized for reactive targeting. But without a layered system of sensors their activation would be unsubstantiated. The dilemma of detection cannot be supported by sensory data and thus puts radars at a high risk of being detected and countered. Moreover, radars, while having apt detection range, would be at high risk while searching for targets that may not be countered by howitzers in the first place; possibly turning it into a high-risk counter mortar operation. Fusing active and passive sensor capabilities into a layered sensory system would provide ample data to address the dilemma of detection adequately. Studying the utility of acoustics is an important step in that direction, but has not resulted in a tangible solution yet.⁹⁰

Counterfire engagements also have to be fast. To attain speed the first step would be embracing counterfire operations as an essential part of the combined-arms effort. That includes practicing with short sensor-to-shooter links, balancing between effective CF operations and the risk of collateral damage, and developing methods to maintain speed whilst enabling CF operations and air support. Refined procedures could be further enhanced by implementing digital support to analyse data and recognize opportunities. Moreover, based on the experiences of U.S. combat training centres some suggest that 'the counterfire fight should be pushed down from brigade to fires-battalion headquarters' as units passing these centres

87 Jansma and Van Ockenburg, 'Ontwikkelingen Bij de Grondgebonden Vuursteun van de Koninklijke Landmacht' 116.

88 Ibidem, 116.

89 Ibidem, 117.

90 Ibidem, 119.

‘drastically reduced the time needed to return fire.’⁹¹ In the Netherlands that would mean the 41st Field Artillery Battalion would plan the integrated counterfire operation and becomes authorized to conduct it within the brigade-operation.

Conclusion

Fighting a peer competitor who relies on its fire support system necessitates the ability to counter that system.⁹² That is exactly what counterfire operations evolve around. This article set out to determine whether the Royal Netherlands Army is able to conduct counterfire operations against a peer competitor. More extensive studies on the role of firepower, conducted in the US and UK, were summarized by *The National Interest*: ‘If NATO airpower can’t knock out the Russian guns, then it’s up to the field artillery to do the job. And U.S. and British artillery may not be up to the task.’⁹³ To answer the main question bluntly, we may add: ‘and neither is the Royal Netherlands Army.’

Undeniably, the Netherlands Army fields a technologically dominant howitzer and is currently introducing state-of-the-art weapon location radars. Against a technologically inferior adversary these assets would suffice to conduct counterfire operations. That is not the case versus a peer. The Royal Netherlands Army lacks essential assets in its toolbox to turn the dilemmas of counterfire operations to their advantage. Although the current assets do not suffice forthwith, they do provide an ample foundation to build upon to include counterfire capabilities required to face a peer. Merging passive and active sensors into an advanced and layered sensor-system, reintroducing long-ranged firing platforms, and guaranteeing very fast sensor-to-shooter links are fundamental for successful counterfire operations. These steps would be a sound basis to start mastering the duel of large calibres. ■

91 Collins and Morgan, ‘King of Battle: Russia Breaks out the Big Guns’.

92 Gordon et al., *Army Fires Capabilities*, 106–7.

93 Michael Peck, ‘The U.S. Army’s Artillery Is Outmatched By Russia’s Big Guns’, *The National Interest*, 21 December 2019. See: <https://nationalinterest.org/blog/buzz/us-army-s-artillery-outmatched-russia-s-big-guns-107526>.

The Netherlands Army fields a technologically dominant howitzer

PHOTO VUURSTEUNCOMMANDO, ERIK MORREN

