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# THE JOURNAL OF **MILITARY OPERATIONS**

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DISCUSSIONS ON THE CONDUCT OF WAR

## FEATURING

EADO HECHT

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PHILIP STACK

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SEBASTIAN LANGVAD

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PAUL EASTER

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GERRY LONG

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JOHN ARTHUR

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Ha'Neviim 26  
Number 11  
64071  
Tel Aviv, Israel

Website: <http://www.tjomo.com>  
Email: [info@tjomo.com](mailto:info@tjomo.com)

**Editor** Dr Jim Storr  
editor@tjomo.com

**Deputy Editor** William F. Owen  
william@tjomo.com

**Publisher** A.E. Stahl  
aestahl@tjomo.com

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DISCUSSIONS ON THE CONDUCT OF WAR

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# A NOTE FROM THE EDITOR

July 2014 is notable across Europe (and more widely) for being the 100th anniversary of the 'July Crisis' of 1914: the events following the assassination of the Austrian Archduke Franz Ferdinand which led to the First World War. In the fifty months of conflict that followed, the world probably learnt more about warfare than in any comparable period in history. That is particularly true of land warfare. It is, however, sad that many armies seem to be relatively unaware of what was actually learnt.

To be fair, that is history, and history is not the core business of armies. In many countries the history of warfare is largely overlooked as a serious intellectual discipline, and the history of warfare in the First World War almost completely so. In Britain and a few other nations there are a small number of historians, largely grouped in a small number of academic departments, who do pay considerable attention to warfare in the 'Great War'. But if serving soldiers often lack historic knowledge, academic historians sometimes lack military insight.

In a sense, however, we may be looking at the wrong period. The centenary of the Great War is relevant mostly because of commemoration. Whilst the British Army, for example, is commemorating the centenary of the Great War, it is also embarking on a rare strategic pause. For the first time in many decades it now faces the prospect of not being deployed on operations for a number of years. The Army, and its historians, might do better if they looked at the decade before the Great War.

In 1902 the British Army withdrew its forces (at their peak, nearly 500,000 men), from a short and messy war in South Africa. There was an awareness that 'not all had gone well' (a typically British piece of understatement). There was then an extensive and (at times), heated debate, which led to significant reform. A General Staff was created. Field Service Regulations (the first high-level printed doctrine), were published. The volunteer reserve was reorganised and tied in to the standing army. Doctrine was reviewed across the Army. For example, the cavalry doctrine of 1904 was highly perceptive and resulted in significant debate, which served the Army very well in the Great War.

There were many such reforms. But perhaps the most important single aspect was a clear recognition that improvements were needed and that now was the time to do it. What is worrying today is that there does not seem to be a clear recognition that changes are needed, nor a willingness to put improvements in place. If anything, there seems to be a lack of self-confidence in the Army's ability to reform itself. That might be because the Army is not the master of its own future to the extent it was in, say, 1910. I strongly suspect that much the same applies to several of the armies which are currently withdrawing from Afghanistan.

Seventy years ago this month, Britain was in the midst of a sustained rocket bombardment. About 3,250 V1s were fired at England from continental Europe. In addition, about 1,000 of the larger, more deadly V2s were launched at England. The V1's warhead contained 850kg of HE; the V2's about 1,000kg. V1s destroyed or damaged over a million structures. They killed or wounded 22,892 people, mostly civilians. V2s killed or wounded a total of about 120,000 people.

Airpower alone was not effective in suppressing V1 and V2 launches. The offensive was brought to an end when the launch areas on the Continent were overrun. To quote, '[e]ven the most effective and efficient anti-rocket operation will need time to achieve results. The home front must be prepared: not only physically, to live through bombardment; but also psychologically, to understand that results will not be immediate or perfect. Some rockets will get through even at the last minute. That is not a sign of the general failure of the operation. An operation's success can be deduced only in retrospect: measured by the continuation, reduction, or complete cessation of enemy attacks.'

That quote, however, does not relate to V1 and V2 attacks. It comes from Eado Hecht's analysis of Operation Defensive Pillar in this edition of Military Operations. 'Defensive Pillar' was Israel's military response to rocket attacks from the Gaza Strip in November 2012. The Israelis have learnt that airpower alone was not effective in suppressing rocket launches. That often requires the launch areas to be overrun. Please note that the article was written well before the rocket attacks of July 2014. As I write this Editorial, Israeli armed forces have just entered the Gaza strip. Eado Hecht's remarks seem remarkably prescient.

The similarities between the German rocket bombardment of Britain in the Second World War and the ongoing bombardments of Israel are marked. They tell us much about the importance of military history, both generally and specifically. No two wars are ever the same, but important lessons can be found.

In a similar vein, Philip Stack observes that 'commanders and staff officers are developed through formal training and experience. In today's under-exercised armies, the opportunities to learn from experience are limited, and those teaching in staff colleges are themselves lacking in experience of conventional operations. If training and experience is lacking, there is a temptation to over-impose control.' His article on control measures also points out that unnecessarily restrictive control measures can serve to calm the nerves of a higher commander.

It would be nice to think that such commanders could be identified (perhaps through the use of the sort of digital technology used in training and on operations), and weeded out. The phenomenon of senior commanders promoted in peacetime being found wanting in war was seen repeatedly in the Boer War, the First and the Second World Wars. It was by no means limited to the British Army. Philip Stack's article looks at battlespace control measures, and traces their origins from the First World War. There is still much we can learn from the events of a century ago.

The background to two of the articles in this seventh edition of Military Operations are quite remarkable. Sebastian Langvad looks at one particular application of swarming tactics and considers how they might add considerable value in the context of NATO and potential coalition operations. The article makes a valuable contribution to an area which Military Operations has not yet explored. But what makes it remarkable is that the author is a cadet in a military academy. His article demonstrates that good military ideas are not the sole preserve of greybeards of great experience.

Conversely, Paul Easter, the author of an article on Jihadist use of technology, is a serving lieutenant colonel. The article is a shortened version of his master's dissertation, which was recently awarded the Imbert Prize by the UK Association of Security Consultants. The Imbert Prize is awarded annually for the best dissertation submitted by a student at the four British universities with the best reputation for postgraduate work in the field of security. What makes the work all the more remarkable is that it is clearly relevant both to private consultants in the security sector and to a military audience. Military Operations congratulates Paul Easter for his achievement.

In the fifth edition of Military Operations, William Owen sought to promote (or possibly provoke), a discussion about tactics, and why people seem reluctant to discuss them in print. In this edition, Gerry Long continues the subject with a look at 'why we wrestle with the basics'. Tactics should, basically, be a simple issue; albeit one capable of infinite variation in practice. Gerry Long suggests that, among other things, armies should trust their junior commanders – particularly their NCOs – to train their soldiers for war. They should trust them when they innovate, and they should then validate and adopt the insights that emerge. To be fair, the article presupposes a cadre of long-service NCOs capable of conducting such training; and who possess the knowledge, experience or both to know what forms of innovation may be productive. Perhaps the article is really saying that:

- a. Armies should seek to generate such a cadre of NCOs; and
- b. Armies lucky enough to have them should trust them to do their job.

War is unutterably complex, yet effective commanders have repeatedly been able to bring about success on the battlefield with remarkably short orders. Patton, commanding 3rd US Army of up to five corps and at times eighteen divisions, was in the habit of writing orders for his Army on one side of one piece of paper (so that the other side could be used for a graphic or a sketch). The sixth article in this edition of Military Operations, by John Arthur, focuses on orders at the lower levels of command (up to battalion), and orders which are quick, rather than short. But there are clear similarities between Patton, writing in the 1940s, and John Arthur writing in the 21st Century.

**Jim Storr**  
Editor, Military Operations  
July 2014

# CONTENTS

OPERATION 'DEFENSIVE PILLAR' OR THE SECOND GAZA WAR: A YEAR LATER EADO HECHT	4
---	---

THE COMMANDER'S TOOLBOX - USE AND ABUSE OF BATTLEFIELD CONTROL MEASURES PHILIP STACK	8
---	---

NORWEGIAN SWARM: HOW UNIQUE NATIONAL DOCTRINES CONTRIBUTE TO A MORE FLEXIBLE NATO SEBASTIAN LANGVAD	13
--	----

JIHADIST USE OF TECHNOLOGY PAUL EASTER	17
---	----

STORMING BACK TO THE FUTURE: WHY WE WRESTLE WITH THE BASICS GERRY LONG	22
---	----

THE THREE STEP ESTIMATE JOHN ARTHUR	27
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# OPERATION 'DEFENSIVE PILLAR' OR THE SECOND GAZA WAR: A YEAR LATER



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**Eado Hecht**

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The advent of cheap, simple-to-manufacture artillery rockets has added an effective new tool to the arsenal of both state and non-state armies. They out-flank the ground, sea and aerial defences which block access to their opponents' rear areas. Simultaneously, the survivability of the shooter is significantly enhanced: they are difficult to locate. This tactical capability has strategic repercussions, enabling the organization procuring them to strike its rivals' supposedly safe strategic and national assets.

The first cross-border rocket attack by Palestinians on Israel occurred on 16th September 1968. Eight rockets were fired by Palestinians from northern Jordan into the Israeli town of Beyt Shean. Since then many thousands of rockets of various ranges and payloads have been fired into Israel from Jordan, Lebanon, the West Bank, Gaza and Sinai.[i] Over the decades Israel has responded variously with: preventative or retaliatory aerial, artillery and ground raids; temporary invasions of launch areas; and development of counter-rocket defences.[ii] Strategically, offensive responses to rocket attacks have rarely been different from those against other cross-border attacks on Israel. Collectively they are termed 'Deterrence Operations'.[iii] They do not aspire to achieve a final, lasting solution to the conflict; only to reduce or temporarily stop those bombardments. As such, Operation 'Defensive Pillar' in Gaza (November 2012) was the latest in a long succession of Deterrence Operations conducted by Israel. Some of these operations were limited to stand-off fire only ('Accountability' in 1993, 'Grapes of Wrath' in 1996). Others also included greater or lesser involvement of ground forces ('Days of Repentance' in 2004, the Second Lebanon War in 2006, 'Cast Lead' in 2008-2009).

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## Operation 'Defensive Pillar'

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Operation 'Cast Lead' achieved some months of relative calm on Israel's border with Gaza. Later there was a gradual re-escalation in rocket attacks. Then, between 1st January 2012 and 14th November 2012 Palestinians fired approximately 725 rockets and mortar-bombs into Israel and conducted 23 cross-border raids and ambushes. On 14th November 2012 Israel retaliated by killing the commander of Hamas' military forces and destroying the majority of Hamas' and other groups' long-range rocket launchers and rockets. Both these actions were intelligence successes of the first order, since both the commander and the rockets were well hidden, but the immediate consequence was an escalation in Palestinian attacks. Over the following week Israel and Hamas engaged in a small war, named Operation 'Defensive Pillar' by Israel and the Second Gaza War by the Palestinians. During that week, Hamas and its smaller rivals in the Gaza Strip fired approximately 1,500 rockets and mortar bombs at Israeli towns and villages. Most of the rockets missed their intended targets, landing in unpopulated areas. About 150 rockets failed to cross the border and landed on Palestinian territory – some of them on Palestinian homes causing local casualties. 422 rockets were intercepted by Israel's 'Iron Dome' anti-rocket defence system. 58 rockets landed in targeted areas, killing three Israeli civilians and three soldiers and wounding 232 Israelis (approximately 210 civilians and 20 soldiers). Another 29 civilians were wounded when a hand-delivered bomb exploded in a bus in Tel-Aviv.[iv] Israel responded by dropping guided bombs on Hamas' and other armed groups' launch-sites, headquarters, storage facilities, commanders, launch teams and smuggling tunnels (a total of approximately 1,500 targets all told). Palestinian casualties amounted to approximately 120 combatants killed, 900 combatants wounded, 30 to 50 civilians killed and 320 wounded.[v]

The war ended in a ceasefire mediated by Egypt, at the time headed by Hamas' Egyptian patron, the Muslim Brotherhood. Hamas

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promised to cease attacks in return for more lenient border controls at the Egyptian border and fewer Israeli restrictions on Palestinian farmers and fishermen working close to the Israeli border.

### A Year-Long Aftermath

The ceasefire was immediately followed by unarmed riots instigated by Hamas, which attempted to break down Israel's border fence and test its political resolve to prevent Palestinians from entering Israeli territory. In one case a Palestinian armed with a knife infiltrated an Israel village near the border and attacked a woman in her home. She managed to escape and called the security forces. Towards the end of December, about five weeks after the ceasefire was declared, the Palestinians fired two mortar bombs into Israel. There is also an unconfirmed report that a rocket failed to cross the border and landed in Gaza.

Later, Palestinians gradually returned to attacking Israel, albeit on a much reduced scale. From the beginning of the ceasefire on 22nd November 2012 until 22nd November 2013 Palestinians conducted the following:

- Fired 59 rockets and 14 mortar-bombs into Israel (including the two mentioned above).
- Conducted six small-arms attacks on Israeli patrols and civilians near the border.
- Conducted 6 IED attacks on Israeli border patrols.
- Dug a number of tunnels into Israel. To date three tunnels have been discovered. There may be more. They were intended either to infiltrate attack teams into Israeli villages, or to place large bombs to be exploded under Israeli targets.
- Thrown two petrol bombs on Israeli border patrols.

Fortune smiled on the Israelis. In all these attacks only five soldiers were wounded in a single IED incident. However, a month later, in December 2013, an Israeli civilian was killed by a Palestinian sniper and the frequency of rocket and ground attacks increased.[vi]

Until the shooting of the civilian, Israeli responses attacks were intermittent and limited. On some occasions they did not respond; on others they responded with economic sanctions (when the tunnels were discovered, Israel refused to allow the import of building materials of the kind used in the tunnels but also needed for other civilian projects for a couple of months). In a few cases, Israel carried out preventative or retaliatory air strikes on launch teams or bases. Palestinian casualties are not clear: they have apparently been fairly few. The majority of casualties were wounded when they attacked the border fence or tried to cross it into Israel. IDF orders are to first warn Palestinians off with megaphones, then shoot nearby to scare, and finally shoot to wound. In some cases the wounds were perhaps fatal: Hamas sometimes reports fatalities caused by Israeli fire, but they are not reliable as a source. After attacks escalated in December, Israeli responses have become more aggressive. Each rocket or ground attack brings an air strike on the perpetrators, their commanders, or arsenals.

### Analysis

The arsenal of Hamas and its smaller rivals contained thousands of rockets when the fighting ceased, and they have received more since. So the reason for the reduced rate of attacks is not lack of capability. Therefore, the question arises: what has maintained the relative quiet – deterrence (fear of Israel's response), or other factors?

Without listening in on Hamas government discussions, it is impossible to give a definite answer. However, as far as can be ascertained from official Hamas statements, Palestinian media reports on the situation in Gaza and information released by the Israeli authorities, the answer is apparently 'both'. Some attacks were by Hamas, but most were by its smaller rivals. Hamas often tries to prevent attacks by these other groups, though certainly not for love of Israel. In addition to the heavy casualties they suffered they face a number of serious problems which they prefer to deal with without suffering the cost of Israeli military and economic retaliations:

- Falling out with the Muslim Brotherhood government in Egypt. That government was angry at Hamas for allowing Gaza to be used by more extreme Sunni groups who attacked Egyptian police in Sinai. In the most severe incident, *prior* to 'Defensive Pillar', a group from Gaza crossed into Egypt, attacked an Egyptian police station, killed 16 policemen, and stole their weapons and vehicles (including an armoured vehicle). They then used that vehicle to break through the Israeli-Egyptian border fence, and attempted to drive to an adjacent Israeli village. They were intercepted by Israeli forces. Most were killed in the ensuing firefight without Israeli casualties.
- The falling-out with the Muslim Brotherhood government in Egypt was an internal family spat. After the Egyptian armed forces reassumed control, Egyptian anger has had major consequences. The mainstay of Hamas economic power and military supply were the hundreds of supposedly clandestine tunnels dug under the Gaza-Egyptian border. The Mubarak regime pretended not to know their location (emphasis on 'pretended'), allowing uncontrolled import of civilian and military goods into Gaza in violation of the Israel-Egypt Peace Treaty. When the Morsi regime got angry with Hamas, the Egyptian army 'suddenly' located some tunnels, closed them, and imposed other sanctions. The resurgent military regime then 'suddenly' discovered the rest of the tunnels and shut almost all of them in a matter of weeks. Some were physically destroyed and some were just blocked. This has precipitated a financial crisis for the Hamas government in Gaza. 'No imports' means a severe reduction in income from customs taxation. Hamas employees are suffering severe wage delays, public projects are stopped half way through, etc. The Gaza population is not pleased, and Hamas' popularity has declined. This is not a good time to start another war with Israel – especially since military imports are blocked as well.
- To add to their troubles, Hamas also fell out with its former allies, the Syrian regime and Iran. Both had supplied funds and weapons to Hamas, but stopped after Hamas declared support for its Syrian Sunni brethren fighting the regime in the Syrian Civil War. Recently Hamas decided that, given its troubles with the Egyptians, it has no choice but to change its tune on Syria in order to reconnect with Iranian financial and military support.

Hamas is struggling. It has other, more pressing issues than fighting Israel. It is also trying to recuperate its severely hurt armed forces. The success of the initial Israeli air strike was a severe shock. How



did the Israelis know where all the long-range rockets and launchers were located, as well as the other 'secret' bases and sites that they attacked? What other supposed 'secrets' do they know? The success of the 'Iron Dome' negated their most powerful weapon. They need to think of new tactics for the future war, tactics which will cause more Israeli casualties. Hence the increased focus on digging tunnels under the border towards Israeli villages.

Hamas' rivals do not care about Hamas' economic and political woes. Their problem is getting the equipment they need. If Hamas is hurt by Israel, they gain political and military points in their rivalry with it. Also, by firing at Israel they get funds and support from other international Sunni jihadi groups. They do have to tread a thin line between doing something and doing too much, as that might goad Israel into a big response that would hurt them or compel Hamas into an all-out 'cleaning-up' operation against them, in order to save it from Israeli wrath.

So, to summarize: the relative quiet is the result of a mix of deterrence and other unrelated issues.

The time has come to assess Israel's actions in the war. Without a doubt, the Israelis got what they wanted on the political level: relative quiet. 'Relative quiet' rather than 'complete quiet' because the Israelis are too experienced to expect more. As an Israeli joke, loosely translated, goes: 'On coffee-breaks you drink coffee; on lunch-breaks you eat lunch; on smoke-breaks you smoke cigarettes; so why expect that on fire-breaks [the literal translation of the Hebrew term for 'ceasefire'] the fire should cease?' In that sense Israel's strategy for Operation 'Defensive Pillar' was a resounding success, even though Hamas also made some minor face-saving political gains (such as access to farming land and fishing areas adjacent to the border). Those measures have since proved troublesome for the Israelis, by facilitating attacks on Israeli patrols and Israeli farmers working adjacent to the border. The attackers approach the fence masked as innocent Palestinian farmers, to collect intelligence, prepare ambush sites and place bombs near to the fence. As long as they don't actually touch the fence or carry arms overtly, Israeli troops have orders not to shoot.

However, individual Israeli tactics were less successful. There were of course some successes. The initial surprise attack enabled the destruction of the long-range rocket arsenal. Hamas and other groups suffered approximately 1,000 killed and wounded, including some 30 senior commanders; not an insignificant percentage of casualties and an excellent rate of exchange when compared to Israeli casualties. But, the real measure of *tactical* (rather than strategic or political) success or failure is that the attempt of the Israeli air force to suppress rocket-launches failed miserably. Despite continuous aerial surveillance and strikes, Hamas and the other groups still managed to fire 1,500 rockets in seven days (double the average daily rate fired by Hizbullah in 2006). Israeli air strikes seem to have barely affected the rate of rocket launches. Admittedly, except for three or four rockets, all those fired could reach 'only' three major cities, a dozen towns and several dozen villages in southern Israel (750,000 Israelis rather than the two million threatened by the bigger rocket types), but launches continued unabated to the last minute. Had it not been for the 'Iron Dome', approximately 480 of these rockets would have hit Israeli civilians, instead of 'only' 58. Israeli civilian casualties would probably have been some eight times higher, unless the population abandoned their homes and places of work

and fled out of range.

Given the cost of 'Iron Dome' systems, and especially the interceptor missiles, Hamas will probably simply try to acquire so many rockets and launchers (costing only a fraction of Iron Dome) they can inundate the 'Iron Dome' with more than it can handle simultaneously, and then keep on firing until Israel runs out of interceptor missiles. Even if the Israeli air force *doubles* its launcher-hitting success rate in a future war, it still will not be able to suppress the launches to a bearable level. This teaches us that the stand-off aerial suppression tactic will simply not work if Hamas or Hizbullah are determined to conduct a lengthy exchange (as in the 34 day Second Lebanese War), as opposed to a short strike which they then end of their own volition. At the rate Hamas fired in 'Defensive Pillar' (double Hizbullah's rate of fire in 2006), Hizbullah (with its present stocks) can maintain continuous fire every day for *nine months* without resupply!<sup>[vii]</sup> Without Iron Dome's success in 'Defensive Pillar', convincing Hamas to cease fire before incurring prohibitive Israeli civilian casualties and damage to economic infrastructure would have required either a ground invasion to capture the launch-areas or political concessions tantamount to an Israel surrender. In a future exchange, if Hamas or Hizbullah succeed in inundating or outlasting Iron Dome this harsh dilemma will confront the Israel government.

In 1991 Iraq launched some 40 missiles in six weeks – almost all at night. The Patriot anti-missile defence failed and the Coalition aerial missile-hunting campaign merely delayed launches. Tens of thousands of Israelis left their homes in targeted areas to sleep elsewhere, returning to work during the day. Israel chose not to respond because casualties and damage were minimal and the American-led Coalition was expected to defeat the Iraqis. In 2006 Hizbullah fired 4,000 rockets and mortar bombs into northern Israel in 34 days, threatening about a million Israelis. Many moved south temporarily. Then too the Israeli air force succeeded in destroying most of the longer-range rockets but failed completely against the shorter-range types. On 12th August 2006 the frustrated Israeli government ordered the IDF to conduct a major ground offensive into Lebanon but on the same day the UN declared a ceasefire to begin within 48 hours, which Hizbullah accepted, so the offensive was stopped.

## Conclusions

Israel's experiences are partly unique to its specific political, geographic and strategic situation. They can, however, be used as a basis for learning lessons relevant to others as well. Israel is a small state located close to most of its enemies. The wars of the USA and Europe are conducted overseas: their 'home front' is not exposed to rockets. However, conducting a war overseas makes them logistically dependent on airports and seaports, requires them to build large logistical and headquarter bases, and to defend the infrastructure and civilians of the host state. These may not be as politically important or militarily crucial as their own civilians, but when facing an enemy capable of firing a couple of hundred fairly accurate rockets a day, they do need to be defended.

Cheap, easily manufactured, long range rockets enable small military groups to strike their enemy's hinterland easily, but are simultaneously a sign of military weakness. Conventional rocket warheads are less effective at producing mass casualties than hand-delivered



suitcase bombs or close-range small-arms fire in a crowded civilian setting. They are preferred when the attacker cannot penetrate the enemy's ground defences. The effectiveness of rockets is limited by the compromise between survivability on the one hand and range and payload on the other. Greater strategic effect requires longer range and larger payloads, so the launchers need to be bigger. This transforms them into easier targets for air power, thereby reducing the actual number that can be fired before the enemy air force locates and destroys the launchers. Smaller rocket launchers are easily hidden and very cheap and easy to manufacture, making the rocket force based on them almost impervious to air attacks.<sup>[viii]</sup> The strategic effect of smaller rockets depends on how close important targets are to the border and the number of rockets fired.

As Israel's experiences have repeatedly shown, aerial power alone is not an effective tactic except in a limited set of scenarios. Unless overwhelmed by enormous salvos, anti-rocket defences can be effective. However, being very expensive to manufacture, these will probably be exhausted before the attacker's store of rockets is depleted. Before that happens the defender must either achieve a favourable ceasefire agreement or conduct ground operations to capture launch sites within range of one's civilians. Therefore, for

many scenarios, armies must retain the ability to rapidly capture ground to a depth equal to the range of most of the enemy's rockets and then comb the entire area in order to locate and destroy launchers and rocket stores. Even when facing guerrilla-style enemies, this requires a regular mechanized offensive capability. It needs to attack through the anti-armour and anti-personnel fire that many of these groups are now acquiring;<sup>[ix]</sup> to advance deeply; and then split up into self-contained battlegroups to conduct combing and clearing operations. Rockets and launchers are easier to replace than proficient personnel, so killing the manufacturers and the launcher teams is more effective than destroying the launchers and rockets, both for the short term (reducing the rate of fire) and for the long term (achieving deterrence).

Even the most effective and efficient anti-rocket operation will need time to achieve results. The home front must be prepared: not only physically, to live through bombardment; but also psychologically, to understand that results will not be immediate or perfect. Some rockets will get through even at the last minute. That is *not* a sign of the general failure of the operation. An operation's success can be deduced only in retrospect: measured by the continuation, reduction, or complete cessation of enemy attacks.

*Eado Hecht is a member of Military Operations' Editorial Advisory Panel*

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[i] The exact number is moot, but is probably in the order of 25,000 – more than half of them since 2000.

[ii] 'Preventative Actions' are conducted when intelligence provides early warning; 'Retaliatory Actions' are conducted after the fact to punish the group launching the rockets or mortar-bombs.

[iii] For a brief description of the development of Israel's strategy vis-à-vis these attacks see: Hecht, E., 'Israeli Strategy in the First Lebanon War, 1982-1985', Strategic Misfortunes – Infinity Journal Special Edition, October 2012, pp 16-20.

[iv] There were also a handful of attacks on Israel from other directions (the West Bank, Jerusalem, Syria and Lebanon) but only two more Israelis were wounded. Both were civilians.

[v] The numbers are based on official Israeli and Palestinian accounts. There are discrepancies between the accounts as to the exact number of Palestinian casualties, so the figures should be regarded as approximate.

[vi] Since then several dozen more rocket, mortar, sniping and border-ambush attacks have taken place.

[vii] According to published official Israeli intelligence figures Hizbullah has 80,000 to 100,000 rockets. Most of them are short-range types, but some thousands are medium- or long-range types.

[viii] They are almost invariably hit only after launching and are extremely cheap and quick to replace. They can be regarded as single-shot launchers.

[ix] In 2006 Hizbullah fired a couple of hundred anti-tank missiles (mostly Sagger, but also Fagot, TOW and Kornet). Hamas too has a variety of anti-tank missiles and so do the rebel forces in Syria.

# THE COMMANDER'S TOOLBOX - USE AND ABUSE OF BATTLEFIELD CONTROL MEASURES



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**Philip Stack**

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The requirement for the coordination of units across wide frontages has long been an essential condition for the successful employment of ground forces. The key differences between an armed and violent rabble (an urban riot mob) and a military unit include the execution of a design for the use of force: feinting, blocking, attacking in a coordinated fashion to achieve success. Once the span of operations became too wide for a single commander supported by a team of messengers to supervise, the design of operations required increasingly sophisticated battlefield control measures. The structure of the military commander's creative operational plan is built from battlefield control measures. Used wisely, they enable it to unfold as envisaged, in a scheme of manoeuvre and to be adaptable to changing circumstances.

In this article I will look at the development of battlefield control, using the British Army as my source of examples, and go on to look at how the requirement for control can be met today and in the future. I will argue that battlefield control measures are an essential part of the design of an operation, and that well-designed controls should be seen as permissive rather than restrictive factors in planning.

## **The Development of Battlefield Control Measures**

The British Army entered the First World War with extensive operational experience from the Boer War. That experience was distilled into the Field Service Regulations of 1909, which provided the doctrinal underpinning in the first years of the war. The small professional pre-war Army emphasized the principles of delegation and giving freedom of action ('An operation order should contain

just what the recipient requires to know and nothing more. It should tell him nothing which he can and should arrange for himself').[i] Where a superior commander felt it necessary to impose control measures they would be brief and basic: (in the attack) 'the actual limits of frontage should be specified as far as possible... the direction of the attack to be made by each body should be distinctly stated'. [ii] At the Battle of the Aisne in September 1914, 'cooperation... was confined generally to that fortuitously arranged by commanders on the spot'.[iii]

By 1917, the necessity for the intimate coordination of indirect fire and troop movement had been addressed through the use of the rolling barrage. The need for precise coordination of movement and fire created a requirement for clear control measures expressed in space and time.

The essential tool for command in this system is the linear control measure: a boundary; a line of departure; or a limit of exploitation. The introduction of gridded maps in October 1914 had increased the ability to refer to spatial features (before the War, locations would be referred to as 'the wood 200 yds SW of the junction at x'). In doing this, and overlaying the timed artillery plan, the staff laid down a 'combat clockwork': a design to be 'wound up' by the assembly of forces and supplies, and then unwound at the defined time according to a pre-described direction and rate. Conditions and technology combined to require a new and comprehensive set of control measures.

The use of battlefield control measures developed through the Twentieth Century. The Battle of Alamein of 1942 bears a close resemblance, in terms of structure, to the opening battles of the Passchendaele campaign in late 1917; but as advances in command and control enabled more economical targeting of artillery, the pre-planned element of battlefield control receded in prominence.

During the Battle of Normandy in 1944, large formations were

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manoeuvring in close terrain. Despite the development of artillery command and control, the timed barrage still played a role. It was used for break-in operations, such as a 110 minute barrage on a 1.5 mile frontage fired during 8 Corps' Operation BLUECOAT in July 1944, advancing at 100 yds every 4 minutes. BLUECOAT also shows the importance of land/air coordination, as can be seen by the waves of heavy bombers that were sequenced throughout the first day of the operation for each successive phase. At this stage of the war, the point of land/air coordination was to ensure the safety of ground forces, by designating safe distances from the targets. Safety of air forces - obtained by the close control of ground-based air defence - was not an issue that the ground force HQs sought to control.

Heavy bomber sorties in close support of ground forces were very difficult to amend. They required close control of movement for safety purposes, as well as to support the exploitation of the shock effect of the bombing. Terrain, narrow frontages and limited routes meant that control of movement was now a critical aspect of overall control. This required assembly areas, designated routes and a movement control organisation to ensure effective use of road space.

The technology, organization and tactics of Allied forces at the conclusion of the Second World War were subsequently adopted by NATO ground forces. This process was supported by the NATO standardization mechanism which ensured common terms and interoperable doctrine. Allied interoperability required that there was a common approach to battlefield control measures, with common definitions being laid down in NATO publication AAP-6, supported by common graphical symbols disseminated as AAP-6A. However, command and control technology showed little development for many decades. This lack of progress was most pronounced at the lower tactical levels, implying that the techniques for employing battlefield control measures remained little changed from the close of the Second World War. Despite the fact that the British Army introduced a step change with the introduction of the WAVELL computer system from the 1970s, it was confined to formation headquarters at brigade level and above. Battle groups continued to use insecure combat net radio throughout the Cold War (and beyond) with the implication that battlefield control measures needed to be all-encompassing and established prior to the start of an operation. Amendment was problematic with low confidence in full and timely transmission.

## Controlling the Battlespace

Spatial battlefield control measures offer the advantage of being simple to demonstrate on maps and traces, a shorthand notation that permits rapid dissemination and enables the control measure to be related to the mission and the terrain. Sectors of operation are allocated to units to give them the space to achieve the allocated mission and role in the higher commander's plan. Having decided to give a task such as 'secure Hill Z' to a unit, the lateral boundaries should be drawn in a manner that gives the unit commander sufficient freedom of action to execute that task as seen fit, rather than constraining him or her to a single course of action. Having allocated a mission in terms of a task and its purpose, and allocated resources, battlefield control measures control the use of time and space in the execution of the plan.

Spatial battlefield control measures can be categorized as one of several forms, imposing either permissive or restrictive control, or being aimed at the synchronization of time and space.

## Permissive and Restrictive Control

The corollary of giving a commander freedom of action is that others must be restricted to avoid interference. Unit flank and rear boundaries define a zone of freedom for the nominated commander, while fire control measures, such as Restricted Fire Lines, reduce the chances of engaging friendly forces. Other fire control measures (such as the Fire Support Coordination Line) serve to designate the lead authority for targeting and employing weapons systems. The concepts of 'permissive' and 'restrictive' control are therefore complementary, and one unit's freedom of action is another's constraint.

In employing spatial control measures the commander is actually doing far more than merely avoiding fratricide or dividing up terrain. Control measures are employed to bring a scheme of manoeuvre to life. For example, unit sector widths (defined by lateral boundaries) are the most straightforward way of concentrating or dispersing firepower and therefore of adjusting the distribution of combat power in space.

Similarly, the establishment of fire co-ordination lines can have profound effects on the development of the battle. Northern Army Group (NORTHAG) employed a well orchestrated planning process (the 'Rover Group') that enabled planning staffs from five or six Corps, a Tactical Air Force and the Army Group staff to produce new plans in less than a working day. The location of the key fire co-ordination lines, such as the Reconnaissance and Interdiction Planning Line (RIPL) and Fire Support Coordination Line (FSCL), which designated the targeting responsibilities for the Land and Air commanders, was often keenly discussed, as the staffs attempted to fulfill the requirements of their respective commanders. This tension tended to focus on the allocation of resources to the concurrent conduct of Offensive Counter Air operations against opposing air forces and Air Interdiction against second echelon ground forces. This imbalance would normally result in different targeting priorities, and the location of the coordination lines became critical in the development of planning.

## Synchronization of Time and Space

Other control measures have the purpose of synchronizing movement of forces with each other or with other activities. The purpose of a Line of Departure is to enable activities, due to happen before and after a certain point in time (the H Hour in NATO parlance) to be coordinated, through the knowledge that at a pre-determined time, forces will be in a certain place. This enables indirect fire and the movement of forces to be coordinated. Other synchronizing lines (often known as Phase Lines or Report Lines) are used for similar purposes.

Although H Hours and Lines of Departure are fundamental to the practice of battle procedure, other synchronizing lines have often attracted adverse comment for constraining initiative by imposing restraint. This is a criticism that should more correctly be laid at the



scheme of manoeuvre rather than the control measures imposed. Phase Lines are a means of maintaining control, enabling the full weight of pre-planned combat power to be applied at each stage of the battle. Whether this is appropriate is dependent on the prevailing situation. For every example of the decisive use of momentum and shock action by a small force, there will be a countervailing example where it leads to failure (the destruction of the Fife and Forfar Yeomanry during Operation GOODWOOD in 1944 being one notable example). The ability to judge the dividing line between boldness and recklessness remains a key attribute of successful military leadership. However, there can be little doubt that over-imposition of control measures, to ensure synchronization, often serves to calm the nerves of a higher commander, giving confidence that his formation is operating coherently.

A commander's need for situational awareness can therefore have a negative side, constraining subordinates and reducing momentum. This is an area where modern command and control technology enables battlefield control measures to be relaxed. With 'Blue Force' tracking, the commander can remain confident about the disposition of his forces while maintaining the pace of the operation.

The widely used synchronization matrix provides a mechanism for visualizing the coordination of resources, space and time, and a very efficient form of communication of a plan. As a tool for planning and for managing changes to a plan, it formalizes previous ad-hoc methods to achieve similar ends.

### Battlefield Control Today

Following the tactical euphoria, verging on irrational exuberance, which followed the devastating turning movement employed by the US Army and its allies in the First Gulf War, questions were asked of the traditional battlefield control measures that had evolved, and served well, for nearly a century. British officers returning from the experience of the desert questioned whether unit boundaries were in fact serving as constraints on creativity and the free flowing development of operations. Could not operations be planned by designating unit axes alone, leaving out the clutter of boundaries, route networks and real estate control? These discussions centred on the developing doctrine establishments. In HQ 1(BR) Corps, there was a failure to notice the significant factors of environment and context in determining the requirement for control measures on the battlefield.

The relatively featureless area of operations of the First Gulf War lacked clutter and significant high points or obstacles and had few routes. In such an environment, the ability to move dispersed across multiple axes of advance, then concentrate for combat actions, as well as protect open flanks is key. Friendly fire incidents can be reduced by good recognition measures. Axes do indeed become more important than boundaries, providing the centre line for movement. The situation is very different in the cluttered environment that prevails elsewhere, in areas where the natural or man-made landscape constrains movement and visibility. The problems of cross country movement and inter-visibility require more positive controls in order to deconflict space and reduce uncertainty in the identification of forces.

In the two decades since the First Gulf War, battlefield control has been subject to factors and influences that both complicate and simplify the task. Technology speeds up the dissemination of instructions and the situational awareness of all HQs in the network. This enables more dynamic control of the operations, but also increases the demands on HQs as expectations of real-time control grow. The spread of UAV operations, in particular, has made the integration of the land-air battle a key concern of HQs at all levels. The land-air coordination task was formerly a concern of higher formations that were dealing with air operations and battlefield helicopters. However, the spread of UAV and mini-UAV operations, and counter-rocket and mortar systems, has created the need for HQs at all levels to operate in a network which coordinates land-air operations on a short-term basis.

### Conclusion

The range of command and control measures employed by advanced armies has evolved from a requirement to deconflict and coordinate multiple activities occurring in a turbulent and dangerous environment. Once measures were set before the start of an operation, it was difficult to make changes, since until recently, command and control systems did not permit this level of dynamic control.

The inter-unit boundary, rather than being seen as a constraint, can be seen as an enabler. Within the given boundaries, the designated commander has freedom of action, subject to any limitations specifically imposed (such as areas of real estate being reserved for certain users) and without the need for liaison with any flanking units.

This article started with the British Field Service Regulations 1909, and the guidance that it contained. It stated that operation orders should 'contain just what the recipient requires to know and nothing more'. That phrase continues to resonate today, recognizing that freedom of action cannot be given without also imposing some constraint. Clarity and simplicity should be the aspiration of military planners, following the maxim that if a plan cannot be drawn as an unambiguous operational trace then it is unlikely to work as an operation.

Well-crafted battlefield control measures continue to have an essential place in operations. If they are carefully structured, they offer freedom of action by imposing the minimum necessary constraints on battlefield activities. Experience shows that there is a further category of control measures beyond this: controls that are imposed for the benefit of the controlling headquarters to aid it in imposing order. Until recently, this form of control had a purpose, due to the limitations of technology. It was necessary to monitor the activities of forces in order to maintain a clear picture; preventing fratricide and ensuring that the full force of available combat power was deployed at each stage. However, as command and control systems have developed, this form of control can now move from positive to negative control: by automatically tracking forces the controlling HQ can intervene only when necessary. The same technology offers the ability to make changes in the control measures as required, with confidence that the changes will be transmitted throughout the force.



There is a clear vulnerability in relying on unconstrained use of the electro-magnetic spectrum for blue force tracking and the ability to amend control measures. The likelihood of enemy exploitation, interference or denial implies that an operation should still be set up with battlefield control measures. These should be robust to the loss of the free use of the EM spectrum. If EM superiority or parity is maintained, battlefield control measures can then be treated as dynamic, and amended as the operation develops, if this offers benefits.

Commanders and staff officers develop through formal training and experience. In today's under-exercised armies the opportunities to learn from experience are limited and those teaching in staff colleges are themselves lacking in experience of conventional operations. If training and experience is lacking, there is a temptation to over-impose control. This implies a need for careful attention by trainers and doctrine writers to historical examples, studies and experience; realizing that well-applied battlefield control measures are key elements of the commander's toolbox.

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*Philip Stack is a recently-retired infantry officer in the British Army. He is now a political risk analysis.*

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# NORWEGIAN SWARM: HOW UNIQUE NATIONAL DOCTRINES CONTRIBUTE TO A MORE FLEXIBLE NATO



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**Sebastian Langvad**

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NATO is not as flexible as it could be when preparing for future contingencies. In a recent article, Gerry Long raised the issue of western military tradition's obsession with achieving tactical decision, i.e. winning the battle[i]. He is not the first to do so, but insights like his tend to go unheeded. It is disconcerting that western nations seem to be lagging behind potential and current adversaries in understanding this important topic. Both widely recognized and largely unrecognized shortcomings in the application of force by western militaries can be traced back to this intellectual failure. The following article will highlight these shortcomings. It will then present a concrete, albeit nationally specific, example of how to address them. The motivation is to inspire a broader debate among those concerned with improving the utility of military capability.

## Expeditionary quagmire

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The widely recognized shortcoming alluded to above needs little elaboration. The wars in Vietnam and Afghanistan are well known examples of conflicts where the weaker side avoided pitched battles. In this article, what is meant by the terms 'tactical decision' or 'winning a battle' is what Jim Storr refers to as causing the 'withdrawal of participation' by the enemy[ii]. The local enemy in question believes himself defeated and either retreats or surrenders. The weaker side in Vietnam and Afghanistan were not geared towards this effect, as they opted for light infantry forces employing raiding tactics. They avoided presenting their enemy with concentrations that could be readily fixed. Their actions were too limited to cause a perception of defeat in their immediate opponent. These limited engagements did, however, result in cumulative strategic effects. The perception of

defeat and the resulting withdrawal of participation then occurred on the strategic level. Thus, the materially far superior military was unable to bring its weight to bear in a relevant way. A historical study has shown that when a significantly smaller actor achieves this asymmetry, there is a 63.6% probability of the smaller party achieving its war aims[iii]. To current military professionals, this result probably comes as no surprise. Indeed, a significant portion of military theoretical discourse during the last decade has focused on how to counter this phenomenon. What is puzzling, though, is that western militaries seem to have arrived at the answers to this question several times. Yet they are forgotten in time for the next war. The Congressional report on the conduct of the Vietnam War provides a telling example. It formulated the conclusion that rather than conventional forces designed to fight for a tactical decision, what was needed were 'small, mobile, lightly equipped units of the ranger or commando type. It requires different weapons, command systems, communications and logistics'[iv]. Such changes in both training and equipment would counteract the elusiveness of light infantry who employ raiding tactics. When these opponents *can* be fixed in battle, material, technological and professional superiority remain deciding factors. It is logically inescapable that, with all other factors being equal, success will most likely go to the stronger side. Gerry Long refers to a similar observation of how 'guerrilla tactics augmented by [superior] firepower' would produce tactical success[v].

With the need identified, and knowledge of that type of warfare abundantly available, why are western armies not better at it? The answer, of course, is that unconventional forces are not the only challenge facing these militaries. Direct, conventional threats to national sovereignty, though more infrequent, are rightly seen as the defining task for these organisations. Historically, focus has tended to oscillate between defeating symmetric and asymmetric opponents. And so, timeless lessons are forgotten only to be relearned when the need arises once again. Unfortunately, this process of rediscovery is marked by a hefty human, material and strategic price. Expeditionary

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commitments are now drawing down and (re)emergent great powers are shaping an increasingly multipolar world. The pendulum of doctrinal focus might, thus, very well be swinging towards more direct, national defence. At the same time, western intervention abroad is by no means an unlikely scenario in the coming decades. Our enemies in these conflicts must be expected to strive for the same asymmetry that has proven so effective in the past.

### National defence

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The solution to this seemingly contradictory doctrinal challenge can be found in a less recognized consequence of western obsession with the decisive battle. Gerry Long, among other military thinkers, focuses on how this cultural disposition inhibits the West from responding relevantly to an opponent avoiding pitched battle. However, a different angle to the problem has gone largely unmentioned. The supposition that an operational concept is somehow tied to culture is as illogical as it is uncritically accepted in many circles. A superficial glance at history, from Catholic Spaniards through Communist Vietnamese to Muslim mujahedin, reveals that culture is a weak predictor of when unconventional warfare is seen as a rational choice. This, at least, is commonly accepted; unconventional war is the way the weak fight the strong. An obvious implication has been ignored in western military thought. The size and strength of western nations and their militaries are as varied as any such relationship in other parts of the world. Why, then, is it obviously assumed that all western militaries should be trained and equipped to fight a conventional opponent with symmetric capabilities in search of a tactical decision. The root cause of this assumption is easy to imagine. The ideas and theories that make up the military portion of western cultural heritage build almost exclusively on the experiences made by great powers with strategically offensive ambitions. John Lynn points out that the western army style has evolved after the pattern of one nation's army gaining notoriety, causing other nations to emulate that model[vi]. The most recent role model was the Prussian/German army, before the role was assumed by the US Army. For smaller nations, however, it might not be in their best interest to match so completely an organization resting on a wholly different resource base. Granted, they would maintain a breadth of capabilities not far removed from their bigger counterpart. Depth of capacity, on the other hand, would approach (or even fall below) critical mass. The result is a military that is unacceptably fragile on its own. Smaller nations should therefore seek greater capacity for national defence by ruthlessly cutting capabilities that are only necessary for the political ambitions of the bigger role model. The resources released should then be channelled into capabilities that have proven to benefit small, defensive actors. Raiding forces have already been mentioned as such a capability, and this will be considered below.

Finland and Switzerland are prominent examples of small states that have not gone the way of bigger contemporaries. That these are alliance-free nations illustrates the most common, current counter-argument to small NATO-members developing unique doctrines; small alliance members must align their military forces with those of their larger partners. By preparing to fend for one self it is feared that that contingency will become a self-fulfilling prophecy. While this might appear eminently logical, it is a flawed assumption caused more by a lack of military creativity than by objective necessity. Fundamentally, it is questionable for a sovereign state to design its military in such a way that it is likely to fail should it have to stand alone. What is more, by conforming to the operational concept of the strongest alliance partner, the alliance as a whole is deprived of the flexibility that a new breadth of capability would yield. Allied

doctrines should be compatible, not identical. Compatibility comes from common terms and procedures and interoperable technology. It should not come from superimposing concepts of operation unsuited for a given context.

From this line of reasoning it should now become apparent that a critical look at the value of winning the battle reveals how to handle an unconventional opponent. Additionally, it tells us that NATO can expand its capacity to do this without compromising its members' capacity for direct national defence. This article will now present an example of how a small NATO member, in this case Norway, might design its land power to contribute to this more flexible alliance.

### Maladapted doctrine

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Current Norwegian military doctrine is in every meaningful way a copy of the American AirLand Battle concept. In this regard, the country has gone the same way as most other NATO members. Doctrines that have proven informative to its practitioners are the ones designed to counter a specific threat in a specific operational context. In the case of AirLand Battle, the threat and context was the Warsaw Pact in Central Europe. It is interesting to note that the Americans themselves considered ALB to be an unsuitable option in the Norwegian context[vii]. That opinion is well founded. When you push heavy, mechanized forces into the canalizing valleys and coastal roads of northern Norway, you are left with combat that diverges fundamentally from the principles of manoeuvre warfare. Rather than avoiding strength and striking weakness, mechanized forces are locked in a frontal confrontation with a numerically superior opponent. They are unable to access the enemy's flank or rear, except at the lowest tactical levels. The whole endeavour devolves into a material slugging match, one which a small country like Norway is likely to lose on its own. This last point highlights the burden one member's maladapted doctrine places on the alliance. For Norway's doctrine to achieve the goal of protecting the country's territory, the alliance must divert sufficient resources to allow the force to prevail in this slugging match. This ties up resources which might be needed elsewhere. What is needed is a Norwegian doctrine that sets its military up to pursue a strategically defensive ambition with minimal allied support. Any assistance the alliance is able to provide would be valuable, but its absence would not be decisive. The fundamentals of such a doctrine are likely to be found in Norway's historical light infantry-tradition. Here, rugged terrain and a harsh climate are turned to an advantage, not an obstacle.

### Norwegian Swarm

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Swarming behaviour has gained increased attention during the last decade, parallel to the advances in information technology. Sean Edwards has studied a range of historical cases where swarming was observed on the battlefield[viii]. His conclusion was that with the right combination of the factors *elusiveness*, *superior situational awareness* and *stand-off capability*, a swarming force can defeat a heavier opponent. The defining characteristic of a swarming force is one composed of small, semi-autonomous units that rely on dispersion for protection while they conduct aggressive reconnaissance to locate vulnerable targets. When a target has been acquired, the locating unit informs nearby units that then converge on the target from multiple directions. Jim Storr has referred to simulations that demonstrate that such tactics greatly increase the likelihood of achieving surprise against the enemy[ix], with the attendant positive effects on combat outcome. When the element of surprise is expended, however, the units in contact should



disengage. Thus, they do not exploit the surprise with the aim of instilling systemic shock in the enemy organization. The swarm will maintain surveillance of its opponent, and if the opportunity arises it pulses in for additional attacks along new axes. This behaviour puts the swarming force clearly in the 'raiding' category according to Archer Jones' model referred to by Storr[x]. When Storr raises doubts about the effectiveness of relying solely on forces unable to conduct decisive shock action on the enemy[xi], we return to this article's initial argument: the need for a tactical decision primarily belongs to the strategically offensive side. The materially weaker, defensive side can, and indeed should, aim to achieve its political goals by avoiding decisive battles.

In the Norwegian context, the same factors that hinder the effective implementation of AirLand Battle greatly favour a swarming force fighting a mechanized opponent. A Norwegian swarm will use helicopter or small boat insertion of light terrain vehicles with signature-reducing technology into the mountains of its northern province. The force will use dispersed manoeuvre to mitigate a likely enemy air threat. It will infiltrate to positions which threaten the few roads available to the mechanized enemy. Superior situational awareness is gained through a combination of aggressive ground reconnaissance, a sympathetic local population and higher level, or allied, intelligence support. All this is connected by real-time network communications. Based on the resulting information superiority, the swarming units will avoid the enemy's main combat units. They will seek out vulnerable targets in the tactical or operational rear instead. When suitable targets are located, available forces converge and engage them with portable, precision guided munitions from multiple directions. Manually portable air defence systems are employed to counter potential enemy vertical envelopment. Before the enemy can mount a concerted response, the swarming units disengage to preserve combat power and seek out new opportunities for attack. The enemy is faced with a seemingly 'amorphous' and

'ubiquitous'[xii] adversary, both tactically and strategically. He will experience increasing frustration as casualties mount without being able to respond relevantly. Eventually, his offensive ambitions are abandoned as the price starts to exceed the value of the goal.

## Conclusion

If the last paragraph appears to describe what many term 'guerrilla warfare', that is because the fundamental principle is the same: refuse to fight a stronger enemy on his own terms. However, swarming involves a higher degree of coordination, albeit decentralized self-coordination. Hence, its effect is more controllable. In addition, John Arquilla and David Ronfeldt argue that modern advances in information technology, both in weapon systems and communications, are poised to reveal an unprecedented potential for dispersed, networked units[xiii].

With its swarming force, Norway would possess the means with which to deter attacks even when operating with minimal allied support. Another aspect of this force might, however, be more relevant in the near future. It would contribute to NATO's solution to the challenge of defeating enemies that refuse to enter into decisive battle. The Norwegian swarm would consist of personnel trained to operate independently in small teams, with weapons to make these teams a formidable threat and with mobility support allowing unpredictable courses of action. This highly mobile force would not offer its raiding opponent the warning time he needs in order to refuse a battle that is not to his liking. In short, the swarm would be able to confront unconventional opponents symmetrically, bring superior equipment and training to bear and defeat them at their own game. Both as direct contributors to allied operations, but also as concept and competence developers in the alliance, this nationally adapted doctrine could be one piece of a more flexible NATO.

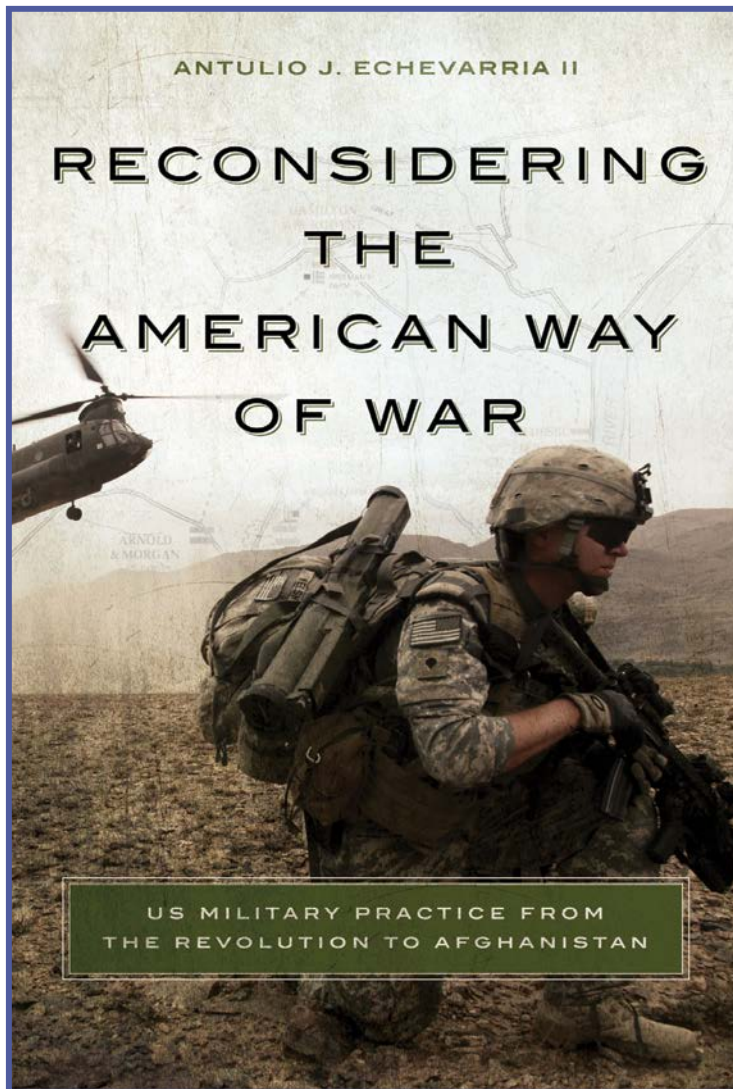
*Sebastian Langvad is a cadet at the Norwegian Military Academy.*

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# JIHADIST USE OF TECHNOLOGY



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**Paul Easter**

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Islamic extremism is not a new phenomenon. In the 1100s, the Nazari Isma'ili sect – later known as the Assassins – started a 200-year terrorist campaign, murdering Crusaders and Muslims to further political ends and exact vengeance on unbelievers or Muslims 'apostates'[i]. While the Assassins' weapon of terror was the dagger, for the modern Islamic extremist, technology has progressed.

Much has been made by governments, non-government agencies and the media of Jihadist[ii] groups' ability to conduct effective attacks, particularly how they use technology within their *modus operandi*. As a consequence, technological innovation is regarded by many researchers as central to how Jihadists redress the imbalance in combat power of the conventional forces facing them.

This article focuses solely on the Jihadists' use of technology in Improvised Explosive Devices (IEDs). It will show that, despite the hype, their use of technology remains conservative and mirrors common usage trends. It will also demonstrate that technological advances have largely been driven by state intervention or intra-group transfer (often with state origins) rather than local invention.

In reviewing the huge range of literature on this subject, ranging from government sources to self-produced Jihadist material, it is notable that the majority seeks to play up the capability rather than provide a critical assessment. Much of this literature appears credulous regarding the threats, routinely presenting 'worst case' scenarios as 'most likely'. Additionally, the literature on Iraqi and Afghan insurgents' attack methods is often too generic for an in-depth analysis of how quickly they adapted to technological advances by the Coalition.

Describing this game of 'cat and mouse' for technological supremacy

between the Coalition and the insurgents, much of the literature alludes (again through generic language) that entire insurgent groupings adopt sweeping change in their tactics simultaneously. Also possible, however, is that just one experimental attack by a local sub-group was the only example of the innovation which authors subsequently credit to all terrorists. In the current literature, it is common for a single incident to be interpreted as a terrorist capability.

## Jihadist Use of Weapons and State Sponsorship

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Like everyone, Jihadists have been shaped by advances in technology. Terrorists groups have traditionally been good at improvising weapons, as often (particularly for campaigns in their infancy) they found themselves unable to source sufficient or appropriate weaponry for their needs.

Of note is that location can improve a group's access to weapons. In the last twenty years, small arms and conventional military explosives have been available to Middle Eastern and Asian groups as a legacy of conflict. In 2003 in Iraq, US forces securing arms in the 'newly liberated' state learned that nearly 380 tonnes of high explosive had been looted from a single facility, which represented less than one percent of Iraq's stockpile[iii].

The problem of weapon and component procurement is more acute for groups based in countries with stricter weapon-control laws. In Britain and Europe, for example, the requirement to modify civilian technologies for military use is more pressing, and Jihadists here have become skilled at exploiting new technology by:

- Using the technology as intended.
- Adapting the technology for military use.
- Creating a device using the technology as a base component.

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It is also noteworthy that the use of technology to execute attacks varies geographically and within networks. Reasons for these variations include the ability of the designers and modifiers, the availability of material and tools, and the type of attack required. The latter, more than other factors, has driven design requirements, particularly with adapting existing technologies and employing new technologies. Successful adoption of this technology depends on two factors:

- Explicit knowledge such as blueprint, designs and recipes and protocols.
- Tacit knowledge i.e. that derived from experience.

The first can largely be transferred by knowledge disseminators such as the internet. The second is more difficult to codify as it is borne from the practical of experience of the bomb makers and operators. By this we mean the understanding of the nuances of operation that come from carrying out a function as opposed to merely studying it. This requires a more hand-on approach by direct transfer between individuals or within a specific training programme.

### Use as Originally Designed

In conflict zones such as Iraq and Afghanistan, the use of conventional weapons for military set-piece confrontations has occurred, but these routinely result in defeat for the insurgents. Consequently, they have learnt that fighting 'symmetrically' is ineffective and that conventional weapons are more effective in support of adapted technologies in an asymmetric fight.

Insurgents in Iraq, Pakistan, Yemen and Afghanistan have staged 'complex' attacks using a mix of conventional weapons and IEDs. The typical approach is to swarm an installation to overwhelm its defences. This approach requires little training (other than basic tactics) and the devices can be rudimentary and intergroup in origin or taken from internet type designs.



Figure 1: US Stryker vehicle post IED attack in Iraq 2003  
(Source: Wikipedia)

### Jihadist Adaptation of Technology – The IED

IEDs are a cornerstone of the Jihadist arsenal. UK military doctrine defines an IED as 'an explosive device, constructed using non-commercial methods, usually in a domestic setting; or a device using ammunition modified to be initiated in a non-standard way and for a

purpose not envisaged by the original equipment manufacturer'[iv].

They can be constructed from conventional, military or civilian explosives. Many use military munitions such as shells and mines, but they can employ homemade explosives (HME), typically from nitrate fertilisers or hydrogen peroxide. Where conventional munitions are available, they are preferred, given their more powerful TNT[v] equivalence.

### IED Usage and Typology

Since the invasion of Iraq in 2003, there has been a well-documented arms race between Jihadist insurgents and Coalition Forces. This occurred first in Iraq but later spread to Afghanistan. IEDs are the most effective weapons used by Jihadists. From July 2003 to October 2007, they caused 1,600 Coalition fatalities in Iraq.[vi] In Afghanistan, they are responsible for more Coalition fatalities than any other weapon[vii]. Several individuals have been jailed in the West for disseminating IED construction techniques using the internet. Typically these are 'would-be' Jihadists[viii], or seek to profit financially[ix]. The majority of the devices described on the Internet are at the more rudimentary end of development and lack the sophistication of many of the devices described below.

Vehicle Borne IEDs (VBIEDs) have become a common method of IED emplacement. Devices range in size from bicycle-borne through to tanker trucks. While the 9/11 aircraft represent the largest device but threat reporting has detailed plans to hijack commercial shipping to use as floating bombs. In Iraq, VBIEDs have also carried chemical material such as chlorine. From 2006 to 2007, at least 16 attacks employed chlorine-gas canisters with conventional explosives. However, such innovation does not always produce the intended effect. A study by the New America Foundation identified that the 16 chlorine attacks caused no fatalities by chlorine inhalation but only by the explosive effect of the devices[x].

Boat-borne IEDs have been used with some success. In Iraq, US and UK troops have been killed using this method, and the attacks off Yemen against the USS Cole[xi] and tanker MV Limburg[xii] demonstrate their effectiveness.

Aside from VBIEDs, the other common delivery method is person-borne IEDs, i.e. 'suicide bombers'. The device itself is usually a waistcoat or a backpack with fragmentation provided by ball bearings or junk metal.

In an effort to circumvent increased security protocols, particularly on aircraft, Jihadists have devised increasingly sophisticated concealment methods, such as Richard Reid's attempt to hide a non-metallic IED in his shoes on a US airliner. Other attempts have seen devices hidden in everyday objects like photocopier cartridges[xiii], laptops or toys. Another plot in 2006 sought to bring liquid explosives on board commercial aircraft in an attempt to bring down several aircraft simultaneously[xiv].

Jihadists have also staged attacks by implanting IEDs in a bomber's body cavities. A Saudi prince and an Afghan intelligence officer were targets of such attacks[xv]. In both cases, the low amount of explosive, the absence of shrapnel, and the blast-dampening effects of the bombers' bodies reduced the effectiveness. These devices have been seen in limited numbers, suggesting that they have not been adopted across the whole network.

## Mortar Devices

In another technological offshoot, insurgents in Iraq have experimented with Improvised Rocket Assisted Mortars (IRAM), also known as 'Lob Bombs'. Constructed from propane-gas tanks packed with explosives and powered by 107-mm rockets, they are similar in construction to the improvised mortars called 'Barrack Busters' designed and used by PIRA in Northern Ireland. While relatively inaccurate and with a limited range, their ability to overcome static defences like blast walls makes them devastating. Shia groups have used such devices, and it has been suggested they originally received construction assistance from Iranian state organisations. [xvi] This represents a step up in technological sophistication that requires tacit as well as explicit knowledge, which only external support is likely to bring.

## IED Initiation Methods

Many Jihadist insurgent groups have become skilled at using a range of IED-initiation methods. In early campaigns, initiation was generally by command wire. Here an operator was remotely from the IED by a long wire. The operator triggered the IED by completing a circuit. It was simple and impervious to ECM, but risky to set up. Coalition Forces quickly learned to detect activities associated with IED emplacement, such as hostile reconnaissance, use of spotters, and disturbed ground. As a result, groups moved to wireless initiation methods, such as infrared car alarms and garage openers. Devices with GSM initiation soon followed, but the majority were defeated by Coalition advances in ECM. As bombers used radio-frequency detectors and trial and error to find unjammed parts of the radio spectrum, so Coalition technology moved to counter it. As the Coalition developed jammers for low-powered devices like garage-door openers, the Jihadists moved to higher-power devices. This battle for electronic supremacy also spanned two-way radios, extended-range cordless phones and mobile phones from 1G to 3G. As devices increased in sophistication, explicit knowledge gained solely from the internet is unlikely to have enabled groups to climb the technological steps needed. While it is conceivable that those with appropriate skills could innovate effective changes on a limited scale, it is doubtful this could be disseminated organisation-wide, not least because of the disaggregated nature of the groups involved. As has been seen repeatedly in business management studies function, dissemination of new technology effectively across an organisation requires significant human resources. Given the small size and limited survivability of many of the organisational structures being discussed, it is doubtful this could be achieved internally. It is more probable that such changes were effected with external support.

## Explosively Formed Projectiles (EFPs)

Explosively Formed Projectiles (or Penetrators) (EFPs) employ a 'shaped charge', which comprises a concave metal hemisphere (the 'liner') backed by high explosive shrouded in a steel or aluminium casing. When the explosive detonates, the liner compresses and squeezes forward, forming a hypersonic molten jet. Moving at Mach 10, it strikes with enough energy to transform armour to liquid by a process called 'hydrodynamic penetration'. If aimed correctly, it penetrates the armour and hits the crew.

Initially developed in WW2[xvii], EFPs were first used by terrorists (Red Army Faction) in 1989. Subsequently, the technology was utilised by Hezbollah (with Iranian state sponsorship) in the 1990s

and has since spread among other Jihadist groups. The most effective use of this technology has been as an off-route mine. The use of EFPs was most prevalent in Iraq, and it was highly effective against Coalition armour. At one point, EFPs were responsible for the greatest number of Coalition casualties. At the time, the UK and US made it clear they knew the technology had been transferred from Iran[xviii] with state support. Accordingly, well-machined EFPs became a 'clear fingerprint' of Iranian state support, and this is a possible reason why EFPs did not proliferate in any meaningful numbers into Afghanistan.

## Powerful roadside bomb

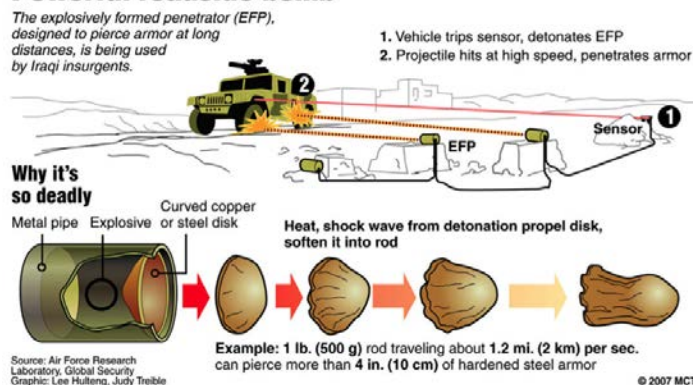


Figure 2: EFP schematic and illustration of use[xix]  
(Source: CIA)

## Low Metal or Non-Metallic Mines (NMM)

In Iraq and Afghanistan, the use of rudimentary victim-operated mines is commonplace. However, most mines are metallic and are susceptible to metal detectors. Therefore, insurgents developed mines with less metal content to render the Coalition route-clearance teams' detectors less effective[xx]. In 2009, NMMs were introduced. With no metal whatsoever in their construction, NMMs rendered metal detectors completely ineffective.

However, NMMs had a technical flaw in that the initiator was extremely unstable and required careful emplacement to avoid premature detonation. After a few Jihadists were killed burying them, emplacement became unpopular, and those tasked did it badly. Consequently, the devices were easily spotted by search teams and defused.

Another facet in this device's development was the influence of Iran. Intelligence showed that the technical know-how and training for NMMs was provided to insurgents by Iranian Republican Guards Corps (IRGC) members. The US subsequently sent a demarche to Iran demanding an end to manufacture, and the activity ceased soon after. Since, other variants with less-volatile initiators have been seen in small numbers.

Western weapons-intelligence organisations know that technology transfer has been occurring for a number of years, among groups and between states and groups. The current techniques of Jihadist bomb-makers appear to be the product of two interlinked processes. The first is the technology exchange between terrorist organisations and insurgent groups (e.g., innovation by the Provisional IRA (PIRA) in the 1970s which was disseminated to ETA and subsequently appeared in Iraq). The second is state sponsorship.



### State Sponsorship - the Root of All Evil?

'State sponsorship of terrorist groups' is terminology originally applied by the US State Department to countries that 'repeatedly provided support for acts of international terrorism'. While a number of countries (like Syria and Iran) remain on the US's list, this does not tell the whole story. Pakistan has long aided a range of Islamic terrorist groups fighting against India in Kashmir and is a major sponsor of the Taliban fighting the Coalition-backed Afghan government. Additionally, governments in Lebanon, Iraq, Yemen, Somalia and the Palestinian territories create security vacuums, either by active support or passive inaction, which allow Islamic groups to operate. This sponsorship can take many forms, such as providing safe havens, financing, training, equipment and, ultimately, direction. There appears to be a qualitative link between group allegiance to state organs and the level of technology transfer. Often it is the direct transfer of explicit and more importantly key tacit knowledge that enables effective organisational adoption of the technology. Perhaps unsurprisingly studies have indicated that state support makes terrorist organisations more effective[xxi].

Direct state sponsorship of Islamic terrorist groups, such as Hezbollah by Iran, has resulted in the direct transfer of military technology in areas such as providing Surface-to-Air Missiles (SAMs)[xxii], training in infiltration techniques like diving[xxiii], and Unmanned Aerial Vehicles (UAVs). However, this level of technology transfer and control is unique and probably due to Hezbollah being a quasi-organ of state rather than an autonomous group. Iran's support of other groups (e.g. Taliban or Palestinian Islamic Jihad) is typically less generous, covering areas such as training and IEDs.

The competition between terrorists and state-backed countermeasures has been running for years. Whilst the Jihadists' pace of development has been marked, claims that they have survived due solely to their technological agility (despite the huge financial, technological and material resources available to the Western states) overstates the case.

Occasional observers of the battle between Western security services and Jihadists might believe the fight for technological superiority in Iraq and Afghanistan is taking place in high-technology laboratories (for Western players) and makeshift 'kitchen laboratories' (for the Islamic fundamentalists). This is unlikely to be an accurate description. While some simple, local evolutionary modifications (principally in the IED field) have occurred in 'kitchen laboratories', the major revolutions in design and wider usage have flowed from external sources such as state sponsorship.

We must also guard against crediting Jihadist designers with an impressive pace of development, since as this ignores other variables. Claims that Jihadist groups have taken 18 months to do what took PIRA 30 years to achieve in developing the RF spectrum are overblown.[xxiv] Such claims do not recognise that PIRA was innovating as the digital age began. Jihadists were in a fortuitous position where they could replicate past achievements. Whilst it is true that the internet has assisted with the proliferation of ideas and that ideas have bled across theatres 'on foot', it is likely that state sponsorship has been behind the speed at which Jihadists have evolved. Explicit knowledge will only take you so far in development terms. Iran, Syria and Pakistan are all known to have provided training and material to Islamist groups, and the degree of allegiance to the state appears correlated to the level of capability transfer.

As has been previously stated, there is a considerable body of literature describing Jihadist groups as innovative or early adopters of technologies that have been used to give them the 'edge' against state counter-terrorist capabilities. In actuality, as for all organisations, the effective adoption of a new technology is not a simple matter. While the internet has been a useful disseminator of explicit knowledge, it is also often riddled with errors (some accidental, some deliberate). Given the subject matter, this can have fatal consequences. It also remains a poor mechanism for responding to technical innovation and ensuring this is disseminated through existing organisational blockages.

A more effective mechanism for addressing both these issues is external support (sometimes by experienced terrorist groups, but more usually through state support). Here explicit and key tacit knowledge can be disseminated in a more structured and deliberate way throughout the organisation. This, coupled with material supply, can create effective organisational change and develop or enhance a capability.

To conclude: even with IEDs (which remain a highly lethal technology for Jihadists) revolutionary improvements and their effective dissemination occur through state support. Even then, given the disaggregation of their structures and their limited survivability, Jihadists often struggle to percolate developments across their organisations. Lastly, it should be recognised that, outside combat theatres, Mumbai-style and Kenya Mall-style attacks have proven the most effective recent tactic used by Islamists. Ironically, these were low-tech attacks. This supports the notion that governments and the media routinely overstate Jihadist technological abilities in order to secure funding or sell newspapers. Looking forward, less hype and more-rigorous research (which is more specifically directed at state influence) are needed to uncover the true state of Jihadist capability.

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*Lieutenant Colonel Paul Easter is a British military intelligence officer.*





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# STORMING BACK TO THE FUTURE: WHY WE WRESTLE WITH THE BASICS



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Gerry Long

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*'War is an option of difficulties'*

- General James Wolfe

*'... much of modern military tactics is geared toward maneuvering the enemy into a position where they can essentially be massacred from safety'*

- Sebastian Junger

*'All armies of the world learn, in peace time, how to write beautifully constructed orders ... but we must never lose sight of the fact that, in a war of movement, our orders will be brief and simple'.*

- Adolf Von Schell

In his article 'The Tactics Gap'[i] Wilf Owen started a debate as to why we seek equipment solutions rather than training solutions to the problem of basic tactics. In my view, Wilf is correct in his assumptions that we struggle to have a coherent debate over tactical doctrine. Like most decisions, it's easier to look to technology for the answer rather than look within ourselves or to the past. Many armies are like teenage boys at heart; looking to a quick fix of technology rather than going through what is perceived as a long, boring study. However, on the eve of the hundredth anniversary of the Great War, we need look no further than the German application of infiltration tactics to understand how to fill the tactics gap in the training of infantry in the twenty-first century. As always, in order to advance we should understand where we have come from; and how we got here.

The importance training infantrymen in tactics so as to be first rate, highly motivated and competent has never been higher. To paraphrase Clausewitz, everything in war is simple, it's just that the simplest things become very difficult. This is never truer than for training infantry in tactics in a transforming environment. Tactical innovation is often unruly, spasmodic, and to a certain extent uncontrollable. That is the opposite environment from that which directorates and arms of service schools like to work in. Service schools and headquarters tend to prefer a lull in the battle before embarking on transformational change; especially when budgets are tight and when 'flexibility' is liberally used in budget managers' vocabulary to mean 'be prepared to do more with less'.

To effectively link doctrine and current in-theatre tactics, techniques and procedures (TTPs) one must overcome and then combine the dynamism of the 'modern battlefield' with the natural caution of conservative military culture. This is not a condemnation of the military mind: soldiers are inherently cautious because the stakes in their profession are usually very high. Success or failure is often measured in human lives. Operational doctrine and organizations must be flexible enough to embrace new TTPs arising from operations in complex terrain. Taking practical battlefield advantage of new ideas is the responsibility of all those involved in the development of doctrine. To do this, the military culture must at times be prepared to take a leap of faith with tactical innovation. They should establish meaningful paradigms for frontline soldiers to employ, from starting points that may appear unreachable at first. At the same time, the prevailing military culture should be discerning enough to reject irrelevant or unnecessary tinkering around the edges, when only bold innovation is required.

In this environment, why turn to the innovation of an army defeated nearly 100 years ago? Firstly, like pornography, good tactics is often hard to define but when you see it you know what it is. The basis of all modern light role infantry doctrine was born out of the hard lessons learned in the Great War. On the British side this led to

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the development of the combined arms battle of the 'Hundred Days'. On the German side it led to the development of elastic defense and 'stormtrooper' tactics. That involved seeking of gaps in the enemy's defense and attacking from a flank, fixing the enemy by fire (either direct (machine gun) or indirect (artillery) or then closing with the enemy under that fire. That has been the mainstay of low-level infantry doctrine ever since. The training employed to deliver that doctrine was just as dynamic as the resulting change in tactics. It was built on distributed training, trust at the lowest levels, and (above all) high standards of personal soldering skills.

### Germany Tactical and Training Innovation

Like most wartime marriages of doctrine and strategy, German stormtrooper tactics were driven as much by military necessity as by a desire of the military elite to embrace change. Out of the broken strategy of 1914 came the establishment of position warfare, which yielded slowly but inevitably to trench warfare. This strategic stalemate characterized most of the conflict until 1918. Although the battlefield was static it was, paradoxically, a hotbed of innovation and tactical hybrid warfare, where low-level commanders grappled with the necessity of holding ground whilst maintaining offensive spirit. It became obvious that the doctrine the German Army went to war with in 1914 was suicidal when opposed by modern weapons[i]. A solution was needed that would decrease the vulnerability of the infantry unit whilst increasing its firepower. Accordingly the Germans fielded new weapons, developed new infantry tactics, and emphasized coordination with supporting arms. These new aspects first came to the fore in the Argonne sector of the Western Front. The Argonne was the true crucible of the war: never at peace, always at strife.[ii] The most intense period was in the summer of 1915. This heavily wooded area would, at first sight, seem to negate the Germans' advantage in artillery and machine guns. Small-unit tactics were the norm, and initially the Germans found it tough going. New tactics took time to develop. At first they were conducted on a small scale, but the tactics developed were simple. A small section of the front was selected as the target. The artillery bombardment was massive but very short in duration. Then a mixed force of engineers and infantry infiltrated into the pulverized position, followed by more infantry and machine gunners. When the new light mortar entered service, mortar crews followed along.[iv] This innovation, largely unnoticed by the Allies, gave the Germans the opportunity to develop new tactics to go with their new weapons. [v]

Having initially stumbled into combined arms tactics as a result of the need to neutralize the French and Belgian fortifications in 1914, the German Army embraced the result. The necessity of invention forced the infantry, for the first time, to be organized around the application of enormous amounts of high explosive delivered by an array of platforms. The Germans were perfectly aware that linking the infantry to the application of high explosives was solving only part of the problem. As long as the infantry were armed with bolt-action rifles there was not much they could do when they ran into small fortified positions or dug-in opposition. And, as any infantryman can attest, at ground level the 'precision delivery of high explosive' is an oxymoron. The Germans had already reintroduced hand grenades. German assault troops in the Argonne were scuttling along the ground carrying spades and sacks of grenades early on. The French positions were a great stimulant for innovation because the terrain was too rough to allow easy movement of heavy weapons. The resulting unit was a sort of hybrid of *Jaeger* and *Pionier*[vi], consisting of a machine gun detachment, mortar detachment and a flamethrower detachment, as well as a lot of infantry who were

increasingly grenadiers rather than riflemen. That is to say, they no longer paid much attention to the rifle as an offensive weapon.

This test-bed infantry unit with its increased firepower led to infantry divisions being decentralized. The resulting 'storm troops' or 'assault troops' would operate almost independently. Just as revolutionary was the use of these units to disseminate these new tactics. They were promptly rotated and passed on their experience to other units, in effect creating mobile battle schools. In the Vosges, the French lost more than vital territory and their best troops. Conceptually, they lost the war (and the next one) by failing to grasp that the nature of combat had been changed dramatically, and irrevocably.[vii]

At the lowest level, the assault squads modified their personal weapons to meet their unique situation. They also made excellent use of the hand grenade as a close-quarter weapon.[viii] The stormtroopers also conducted live-fire training exercises using the new tactics behind the lines in carefully-constructed copies of the objectives of future operations. Assault squads conducted extensive rehearsals with live-fire, including supporting artillery, prior to any attack. Independent sub-unit movement was demanding, and the NCO in charge was empowered to make battlefield decisions. This harsh, exacting training took a toll on the soldiers, and some could not meet the physical requirement.[ix] Nevertheless, it was precisely that training which gave assault troops confidence in their supporting artillery and their individual weapons. Most importantly, it gave NCOs the confidence to become battlefield leaders. The tactics were totally dependent on initiative at their level. Without a confident NCO leading the assault, the new tactics were doomed to failure.[x]

After World War I, General Hans von Seeckt, commander of Germany's much-reduced post war army, set out a plan to extend those successful tactical innovations. It resulted in the formalization of 'stormtrooper' infiltration tactics. Debate ensued inside the officer corps, which ultimately produced tangible reforms. These reforms reshaped training, modernization, organization and personnel management. This climate of institutional reform was made possible by a military culture that encouraged real innovation and out-of-the-box thinking amongst junior officers.[xi] It led directly to the successes of the German Army in the early stages of the Second World War.

### Training the Infantry: Future Battle Drill

In response to Wilf Owen's article on 'The Tactics Gap', what have Great War German infiltration tactics to do with the training of infantry in the twenty-first century? Does their application have any relevance to any army's current tactical doctrine? Lessons of the past are as relevant as they were nearly a hundred years ago: the essence of tactics is the technique of employing the resources of war in battle. The actual functions performed in war are quite simple. They are the same whether it is one man engaged in mortal combat, or an entire army. The simplest weapons system of all is the man himself. An effective weapons system must locate its target, transmit its characteristics through a communications system, set in motion the force available to destroy the target, follow with an evaluation of the results achieved, and prepare for the next action. In their simplest forms, these functions may be defined as a communications system, firepower and mobility. Their application in battle may become complex,[xii] but training for them is just as simple as it always been:

**1. Trust Leaders to Train their Soldiers:** The need is to deliver quality training wherever it is required, regardless of where the



directorate school or the centralized training facility is located. The answer lies in the combination of demanding, distributed training delivered by experienced soldiers. Any army which fields light role infantry can take the basic tactical template and use it to deliver competent individual soldiers. The key requirement is capable and highly-motivated NCOs who are also competent instructors.

**2. Training for War:** Explicitly this means you have to train for 'a war', not 'the war.' Unless combat formations continually and systematically exercise for combat, they will always be found wanting come the day.[xiii] SLA Marshall observed in 'Men Against Fire',

'In the whole of the initial assault on Omaha Beachhead, there were only about five infantry companies which were tactically effective ... at their backs was the power of the mightiest sea and land forces ever to support an invading army in the history of the world. But in the hour of crisis for these infantry companies, the metal, guns and bombs of these distant supporters were not worth three squads from that small band of men which had gone to work with grenades and rifles'.

This has been reinforced by recent experience on many battlefields. Warfare in Afghanistan has reoriented soldiers to fight in small, cohesive, self-contained groups that possess all the arms of combat (or can call on them). It demands a high standard of personnel battle drill, and robust tactical discipline. Both war and 'transformation' require subordinate initiative which pulls soldiers into the fight, not fighting via detailed plans which mean we miss opportunities to exploit success on the battlefield. Effective action in the confusion of battle requires independent judgment and initiative at the lowest level. Otherwise, army formations will become inert masses: paralyzed, rather than empowered, by new technologies.[xiv]

**3. The 'band of brothers' approach:** The surest way to reduce casualties among close-combat units is to place in harm's way only soldiers trained through a 'band of brothers' approach: groups who, over a period of years, have worked collectively to achieve physical fitness, emotional maturity, technical competence, and confidence in their leaders.[xv] Nothing nurtures confidence more than the sense of belonging to a 'band of brothers'. That requires the ingraining the habits, built on battle drill, that when conducted day in, day out with the same team builds invisible ties of cohesion. Battle drill, the physical act of responding to a situation, minimizes the randomness of battle and gives the soldier a familiar point of reference in an uncertain environment. As von Seeckt observed: 'true military discipline extends not from

knowledge, but habit.'

Battle drills should be robust, practiced frequently, and above all **simple**. We don't see much of any of that today.

### Tactics Gap or a Gap of Trust?

New doctrine should be integrated with tactical organization, techniques, and procedures. This is easy to articulate in the lecture hall or classroom but more difficult to accomplish in practice. Prevailing attitudes, service and regimental rivalries along with sheer bloody mindedness go hand in hand with the fog of war, which sometimes undermines common understanding and tactical development. It requires strongly-managed and directed interaction of positive leadership linked to an open tactical forum within an open military culture to deal with the realities of the modern battlefield. Common-sense doctrine is usually driven from the bottom up, based on combat imperatives and lessons learned. Cumulatively, they shape two key expectations. The first is: does the current or planned model for the infantry add value? Does it result in equipping the man for the role, or merely manning the equipment? The second is then: what are the implications for training and education? Can, for example, 90% of a mortar platoon revert to being a rifle platoon, given three weeks' notice, or one week of in-theatre emergency training? If this cannot be done, what does it tell us about a concept predicated on the need to adapt?[xvi]

Tactics are proven on the ground, but it's how we got to the current tactical employment of men and equipment that is often forgotten. The innovation in training, the flexible nature of that training, and the ability to adapt that training quickly is often lost in the peace time. Bureaucracy stifles most modern armies, even though the armies involved in the 'coalition of the willing' have been at war for over 10 years. A plethora of overlapping HQs which all have a stake in the training of soldiers and exercise centralized control hamper the development of low-level doctrine. The maxim of modern military training should be 'he who controls everything controls nothing, and produces very little'. The amount of paper and time needed to produce a change to tactics and training negates a basic principle of war: flexibility! The basic tenet lost in the training environment today is **trust**: trusting subordinates to get on and train soldiers. No leader wants to train bad soldiers nor train them badly. That is the biggest lesson to be learned from the German innovation of stormtrooper tactics. 'The Tactics Gap' that Wilf Owen identified at the start of this debate is largely a 'gap of trust' between those soldiers with recent tactical experience and those of the Cold War generation of soldier-managers who hold the doctrinal and training purse strings.

*Gerry Long is a member of Military Operations' Editorial Advisory Panel.*



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- [vi] Literally 'light infantryman' and 'pioneer' respectively, but 'pionier' has overtones of 'sapper' (as in combat engineer) as well - Ed.
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# THE THREE STEP ESTIMATE



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**John Arthur**

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This article describes a method for planning military operations quickly and effectively at battlegroup level and below. This planning method enables orders to be delivered within 60 minutes of the receipt of orders from the higher formation. It is intended for all combat operations, regardless of enemy, own ORBAT or terrain. It will appeal to anyone who needs to produce simple and effective plans quickly.

The Three Step Estimate is not new. It is essentially the product of historical research. It is an updated and re-worked version of the planning and orders process which would have seemed completely normal in British and Commonwealth infantry battalions in the 1940s. Commanders from the 1970s and even the 1980s would be more familiar with this method than they would be with current practice. This is because it is focused on outcome, not process.

All the elements of the Three Step Estimate have been successfully employed on operations. Why they fell from grace is unclear. There is no evidence that they did not work, and significant evidence that they did. It seems that fighting third-rate enemies, and long periods of peace (during which battalion-level combat operations were not routine) led to the over-thinking of processes. This commonly occurs in peacetime training. Intuitive decision making gradually died under the weight of Staff College Directing Staff (DS) reinventing the wheel.

In Britain, children are taught to cross roads safely using the Green Cross Code. Imagine allowing the Health and Safety Executive to constantly revise the Green Cross Code for thirty years without ever crossing a road; or occasionally crossing a road which has no traffic. The resulting code would be forty pages long, cover every eventuality, and be totally impractical. Something similar seems to have happened to the British orders process.

The motivation to develop the Three Step Estimate comes from historic evidence, which stresses rapid planning in order to deliver quick and effective orders. Contemporary military operations may lack motor rifle or panzer regiments, but that does not negate the need to plan quickly and effectively.

The Three Step Estimate uses the 5-Paragraph orders format as an aid to planning. It enables a single officer, working alone, to plan an operation and then give orders quickly and effectively. Those orders should typically be no more than one page long, supported by a few annexes, such as a map overlay and the fire plan. The Three Step Estimate dispenses with all but absolutely essential process.

Possible courses of action are tested against a simple question about the enemy, and possibly against a few quick and simple mnemonics. The Three Step Estimate explicitly does not seek to predict the enemy's course of action, because you cannot predict what the enemy will do. (If you are confused about that last sentence, please read it again.)

It also makes no attempt to synchronise complex activities. Coordination is delegated to subordinates as far as possible. It avoids explaining the obvious to subordinates. It aims to allow the maximum possible cooperation at lower levels of command.

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## The Three-Step Estimate

The process uses the 5-paragraph orders format in order to both make the plan and generate the orders, as simply as possible. The 5-paragraph orders format is:

1. Situation
2. Mission
3. Execution:
  - a. Concept of Operations
  - b. Mission Statements
  - c. Coordinating Instructions
4. Command and Signal
5. Combat Service Support

**Step 1: Extraction.** This identifies the relevant detail from the superior commander's orders. The situation is written down, as it is known, or judged by Intelligence. It is not an Intelligence summary. It is a brief description of the emerging situation, which implicitly explains why new orders are needed. Locations of boundaries, objectives and enemy and friendly forces are marked on maps. The mission given by the superior commander is written into Paragraph 2. Stated timings are written down in Paragraph 3c. Essential details for Paragraphs 4 and 5 are copied down.

**Step 2: Planning.** This has three stages, which will tend to overlap.

- a. Mission analysis. The commander **writes down** what his superior's plan is, and his own part in it. He lists stated and implied tasks. He then lists freedom and constraints. Finally, he asks himself if anything has changed since his superior gave his orders. If something has, he considers the consequences.
- b. Reconnaissance. The commander creates three options. He does so at an OP if possible. If not, he does so from an aircraft, or using a map or a digital battle management system. His three options may be alternatives of place (for example, left flanking, right flanking or frontal), time (for example, night or dawn attack, or sequence), activity (ie, attack, infiltrate or bypass); or some combination.
- c. Decision. He compares those three options. He then asks himself: *'based on the situation as I understand it, what could the enemy do to prevent me from achieving my mission?'* He does this for each option. He might compare his options against the core functions, functions in combat, an aide memoire for a particular task, or similar.

None of the three options will be perfect. Comparing them will indicate which is the most promising, and what modifications need to be made in order to achieve the mission. At the battlegroup level, this comparison should be made in discussion with a subordinate, such as the 2ic or battery commander. An option is selected and modified, verbally, as the basis of the plan.

**Step 3: Production of orders.** The orders are the plan. The commander writes Paragraph 3a. and b. in person. Each subordinate grouping is given a mission statement which is one (repeat: one) task, together with its purpose. Each paragraph is then completed, or re-written,

to reflect on the chosen option as a set of orders. If the result is materially longer than one page it is pruned. Often there will be nothing, or little, in Paragraphs 4 and 5. Orders are then given.

The content of the orders will vary, depending on the type of operation. River crossings will require headings not used for a 'relief in place' operation, etc. This suggests the need for an Aide Memoire to provide the relevant headings and to guide planning. That means a short and simple one-page card to cover each type of operation.

## Testing

This looks simple. It is. It, or something very much like it, worked for decades. It would be simple to trial it against other methods. But remember: the Three Step Estimate can produce battlegroup orders within 60 minutes. To compare 'like with like' requires a trial which requires commanders (with their staffs where necessary) to do just that. If the Three Step Estimate produces broadly the same plans as more lengthy and complex processes, then this method is all you need.

The Three Step Estimate was tested in a planning exercise set by a retired officer who had no knowledge of the process. The people who took part in the exercise had very varied military backgrounds in terms of rank and experience. They worked alone and independently. They all produced broadly the same plan. Two did so in under 60 minutes. The least experienced member of the team took roughly 70 minutes.

A critical aspect of the process is the question *'based on the situation, as I understand it, what **could** the enemy do to prevent me from achieving my mission?'* This question does not seek to predict enemy action. It is very different from *'what is the enemy trying to do and why?'* It is designed to examine the consequences of actions which the **enemy is thought to be capable of, and likely to carry out, based on experience**. It does not ask 'what is the enemy doing', because until and unless the enemy is observed doing something, you cannot know what they are trying to do. You should have no interest in *why* the enemy would do anything. You are only interested in *what* he might do to prevent you from achieving your mission. You bend the enemy to your will. You do not bend to his.

Answering the question *'what could the enemy do to prevent me from achieving my mission?'* should also prompt you to consider the possibility that Intelligence about enemy strengths or locations, or both is wrong. Because of that possibility, simple but flexible plans are best. Simple, flexible plans need less planning than plans which are not.

## So What?

If you need a quick and simple method to plan and write battlegroup orders in less than an hour, the Three Step Estimate is all you need. The weight of history and some simple testing tells us that it can do just that. However, it needs repeated practice before being used. History tells us that, with practice, battalions could write **and give** orders in an hour, with complete confidence in the results.

Exercises to test and practise the Three Step Estimate are extremely simple to plan and conduct. DS should not dissect each and every plan that officers submit. Instead, they should explore how students saw the problem and what they chose to do as a result.





Trials have revealed a fairly natural and intuitive process of planning which asks: 'what have I been told to do?' (the mission); 'how will I do that?' (the plan); then 'what can the enemy do to stop me?' (modify the plan). That process generates the orders directly.

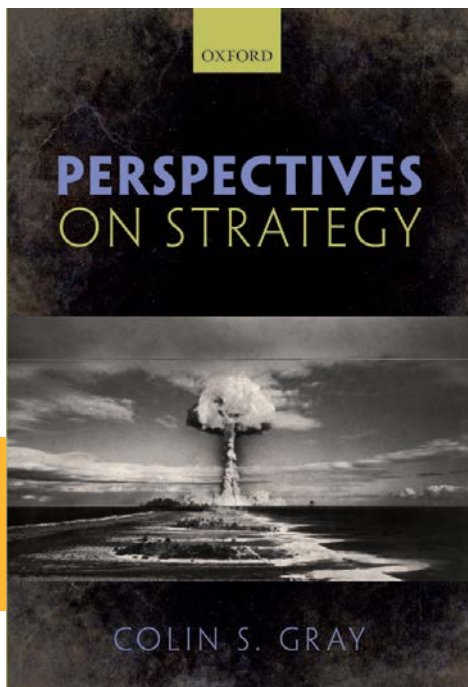
Practice will transform the Three Step Estimate into second nature. It contains almost no explicit process, and is judged entirely by output. Providing that the method is carried out broadly as described, the

precise details of how anyone does it are irrelevant. They will, and should, vary from person to person. Students learn by doing. They learn to do it *well* through practice, and by comparing their plans with their colleagues. They quickly find out what works and what does not; what is good and what is not; and whose ideas to listen to. If one officer seems to be good at it, and others want to learn from him, they should do so over a couple of beers: not through Death by PowerPoint.

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*John Arthur served in the British Territorial Army for almost 20 years and commanded an infantry company. This article is published posthumously.*

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