

Kinetics in counterinsurgency: some influences on soldier combat performance in the 1st Australian Task Force in the Vietnam War¹

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Counterinsurgency is often characterized by large numbers of small fire-fights interspersed with a few larger battles. Heavy firepower contributes to the outcome of the larger battles but the smaller contacts are often fought by infantry without heavy weapons support. Infantry combat performance in these fire-fights is therefore a key concern. It has been fashionable to discuss soldier combat performance in terms of 'firers', 'non-firers', and 'posturers', but we argue that other factors have a greater impact. We provide a detailed statistical analysis of a selection of combat factors, using combat data collected by the 1st Australian Task Force (1ATF) during the Vietnam War. An accepted measure of soldier lethality is the 'shots per casualty' ratio. Using this measure we are now able to describe the combat performance of the Australian infantry section in Vietnam in much greater detail than has hitherto been possible.

Keywords: Vietnam war; counterinsurgency; combat performance; soldier lethality

During the Vietnam War the 1st Australian Task Force (1ATF) fought 3909 fire-fights against elements of the Viet Cong (VC) and the People's Army of Vietnam (PAVN). Of these, about 14 were major battles such as the battle of Long Tan (18 August 1966) in which D company, the 6th Battalion, Royal Australian Regiment (6RAR) fought off repeated assaults by an enemy force estimated at 2500 men. At the battle of Long Tan and other major battles the use of heavy indirect fire support and armour was vital to the outcome; it has been said of the battle of Long Tan that these 'saved the day'.² Yet the other 3890-odd contacts were fought generally with little in the way of heavy firepower or armoured support for reasons that we explain below. In these contacts, the combat performance of the infantry was crucial to the outcome. The infantry's ability to win this host of small encounters using its own resources determined whether it dominated the enemy and kept him off balance. For this reason, we believe that a better understanding of

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the combat performance of soldiers in counterinsurgency campaigns is of great importance.

The focus of this article is upon kinetic operations. But we do not mean to suggest that IATF conducted no non-kinetic operations or that those they conducted were of secondary importance. We would argue however, that high soldier combat performance remains a key factor whenever insurgents seek to use violence to secure their aims.

In *Men Against Fire*, S.L.A. Marshall made the now famous assertion that in the Second World War only about 15–30% of US infantrymen participated in the fire-fight by firing their personal weapons at the enemy.³ Marshall found that in the Korean War ‘the measure of willing participation is more than double World War II averages’ and in some night-time perimeter defence battles ‘the majority of those present’ returned fire.⁴ Later still, in Vietnam, Marshall’s analysis was that according to the available data, US infantry participation in the fire-fight frequently reached 100% and that within the rifle company, in engagements lasting several hours, participation rates remained at about 80%.⁵ Marshall’s analysis resulted in soldiers being characterized as ‘firers’ and ‘non-firers’.

Russell W. Glenn’s analysis has shown that in the Vietnam War, the number of ‘non-firers’ had substantially decreased and ‘over 80 percent of a unit could be expected to fire during any particular engagement’.⁶ Glenn went on to argue that better ‘preparation for combat’ would have encouraged even higher levels of participation leading to higher fire output, improved suppression of enemy fire and reduced US casualties.⁷ However, Roger Spiller and others have since raised questions about whether Marshall got it right in the first place. Spiller, for example, points out that sometimes soldiers do not participate in the fire-fight for valid reasons; they see no targets, they are busy with other duties, they are ordered not to fire, they wait for a more certain shot (perhaps at closer range) but the opportunity vanishes before they can take it, etc. For these reasons, categorizing soldiers as ‘firers’ and ‘non-firers’ is fraught with difficulty. Spiller identifies various other methodological problems with Marshall’s Second World War research and, it seems, Marshall may simply have guessed at the proportion of non-firers⁸.

More recently a further complication to the question of ineffective firers has arisen: those who fire their weapons in combat but with (apparently) no intention of killing. As Russell Glenn has pointed out, a high volume of fire (resulting from higher participation) in no way implies effectiveness.⁹ In *On Killing*, Dave Grossman argues that large expenditure of small arms ammunition for few hits has been a common feature of combat throughout history. He claims that part of the cause of this large expenditure of ammunition is that some soldiers, rather than intending to kill or wound their enemies, will instead posture, firing their weapons in the general direction of the enemy but without intending to kill.¹⁰ Grossman tells us that the achievement of 90–95% firing rates in Vietnam ‘do not tell us how many were posturing’.¹¹ He argues that the very high ratio of shots to casualties achieved by the US Army in the Vietnam War, which he claims to be 50,000 rounds of small arms ammunition per enemy killed¹² – others put the figure far higher¹³ – may

be explained in part by the posturing phenomenon.¹⁴ Thus, while the non-firer has been virtually eliminated (to the extent that he existed in the first place) there remains the problem of those soldiers who fire without intending to kill. Although other factors may also be at work,¹⁵ the apparently massive number of rounds fired by US forces in Vietnam to achieve an enemy casualty suggests that the posturing phenomenon is a very significant and possibly growing contributor to ineffective fire. But an indicator of true soldier combat performance is buried somewhere within the US forces figure. Masking it from view is the large volume of fire contributed by other factors, which, Grossman states, include tactical techniques (such as suppressive fire and 'reconnaissance by fire') and crew-served weapons (such as squad machine guns and aircraft mounted mini-guns).¹⁶ Grossman also notes that the 'universal distribution of automatic weapons is probably responsible for much of the large number of shots fired per kill', but, as we show below, there is reason to suspect that this is not as significant a contributor as might be imagined.

A problem with the posturing argument is that as with the non-firers that Marshall claimed existed, there are many valid reasons why soldiers may fire their weapons in combat yet not hit the enemy. In combat, small arms fire performs many functions. These include killing and wounding, but also suppressing enemy fire, establishing psychological dominance, preventing manoeuvre, preventing enemy use of dangerous ground and others. In challenging environments such as the jungle of Vietnam, when fire is opened, the enemy may present visible targets for only a second or two. Very quickly, all soldiers (whether enemy or friendly) in the vicinity of the contact, take cover and 'disappear' from view. Shooting to achieve killing effect then virtually ceases and the other functions of small arms fire come to the fore.¹⁷

In this article we do not deny that some soldiers who might otherwise have engaged the enemy did not do so. Neither do we deny that some soldiers who might otherwise have shot to kill may have deliberately aimed off. But if these things happened at all the number of men involved was likely to be very small and the effect of their behaviour was slight. In essence, the existence of these phenomena doesn't much matter. The core of our argument is that there were (and continue to be) many factors affecting the shooting performance of soldiers in combat and these had far greater effect on the platoon or section's ability to cause enemy casualties than might a few underperforming individuals. Factors like the type of weapon the soldier carried, the combat task he performed, whether he saw the enemy before the enemy saw him, whether the battle took place by day or night, were far more important than whether an individual or two did not participate in the fire-fight as effectively as they might.

The nature, detail and reliability of the data

In this type of analysis methodological issues can skew results. Therefore, we have set out here a description of the origin, nature, detail and reliability of the data we use.

Our research is based on records created during the Vietnam War by 1ATF and now held by the Australian War Memorial. 1ATF conducted operations primarily in Phuoc Tuy Province south east of Saigon in Corps Tactical Zone (CTZ) III from mid-1966 to late 1971.

At its peak 1ATF consisted of three infantry battalions of the Royal Australian Regiment (RAR), a regiment of artillery, a squadron of tanks, a squadron of APCs, a Special Air Service (SAS) Squadron and other supporting elements. The Task Force was supplemented by a contingent of the New Zealand Army which peaked at two rifle companies, an artillery battery and an SAS element.¹⁸ 1ATF established a Forward Operating Base at Nui Dat in the geographic centre of Phuoc Tuy Province, in mid-1966. The Province became the 1ATF Area of Operations and most of its combat operations (with the exception of some major operations during the Tet and 'mini-Tet' offensives of 1968) were conducted in or near the province until the Task Force withdrew from Vietnam at the end of 1971.

Standing Operating Procedures (SOP) for 1ATF required that any 1ATF element in contact with the enemy was to submit a combat after action report – commonly called a 'contact report' – up through the chain of command to reach Task Force headquarters.¹⁹ A contact was any encounter with the enemy in which an exchange of direct fire occurred.²⁰ An abbreviated form of the report was submitted by radio message within minutes of the conclusion of the contact. A full written report, complying with the format laid down in SOP and based on the initial radio report and details recorded in the commander's notebook at the time, was prepared on return to the Forward Operating Base at Nui Dat on completion of the operation perhaps up to three or four weeks later.²¹ These written reports included a sketch map showing salient features of the contact often including the locations of individual soldiers relative to each other and the enemy, and a critical evaluation of the commander's performance by more senior platoon and company officers. The written reports were signed by the patrol commander, the platoon commander and the company commander before their inclusion in the battalion commander's formal report to the Task Force commander.

The content of the contact report changed slightly from time to time over the course of the war but it generally required the commander to provide about 30 bits of information relating to the contact.²² These included the date, time and location, the sub-unit involved, friendly strength, an estimate of enemy strength and type (that is, whether main force, regional force or local guerrilla), a brief description of what happened, a description of the terrain, the range to the enemy when they were first sighted, who fired first, ammunition expended by number and type of rounds, friendly and enemy casualties, weapons causing the casualties, items captured and other tactical information.

The answers to many of the report's prompts were simple statements of fact. For example, the date and time of the contact, the unit involved and its strength, are unchallengeable. The location of the contact would be known within the limits of the navigation skills of the patrol commander. But other questions required that the patrol commander exercise judgement. It is unlikely that all soldiers recalled

exactly how many rounds they had fired, for example,²³ or were able to state with forensic precision which weapons had caused the casualties. But soldiers could report their ammunition expenditure by 'magazine'. That is, they could report that they had fired about 'half a magazine' (10 rounds) or 'a mag' and three-quarters' (35 rounds), so estimates of ammunition expenditure could be expected to be accurate to within small tolerances. And soldiers knew that there were potential penalties in both overestimating and underestimating ammunition expenditure so there was incentive to get the estimate reasonably right.²⁴ Likewise, particularly as they became more experienced, most soldiers examining enemy dead or wounded could be counted upon to identify with reasonable accuracy the weapons that had caused the wounds.²⁵ The exercise of judgement may raise questions about the accuracy of the data in some cases, but more accurate data about the weapons causing enemy casualties is unlikely to be found.

We estimate that our database contains over 95% of all 1ATF recorded contacts.²⁶ We have now commenced the statistical analysis of our database and some of our findings are presented in this article. The research findings described here are based on the analysis of 1648 of the contact reports in which details of ammunition expenditure are recorded. The findings present an accurate picture of essentially infantry and Special Air Service (SAS) soldier lethality. We have now built a database containing the details of 3909 contact reports created by 1ATF²⁷.

1ATF operations

Australian infantry platoons were organized into a small platoon headquarters and three 'rifle sections'. Each section nominally consisted of a corporal section commander and nine men. It included two scouts, a machine gun group of three men, one of whom was the section second-in-command with the rank of Lance Corporal, and five riflemen. The section commander and one scout usually carried the 5.56 mm M16 rifle capable of fully automatic fire. The machine gun group 'number 1' carried the 7.62 mm General Purpose Machine Gun (GPMG) M60. The remaining men were equipped with the 7.62 mm L1A1 self-loading (or semi-automatic) rifle known as the SLR.²⁸ One 40 mm M79 grenade launcher was carried per rifle section, sometimes as an individual weapon, sometimes as a second weapon for a man equipped with the SLR. By early 1970 grenadiers were issued with the M203 'over-and-under' 40 mm grenade launcher and 5.56 mm M16 combination thereby increasing the number of fully automatic weapons in the section to four.

Sections never went on operations at full strength. Six or seven men was, for practical purposes, the usual combat strength.²⁹ By late 1968, in response to changes in the usual enemy strength encountered and the desire to cover greater area with patrols and ambushes, most 1ATF infantry battalions reorganized their platoons from three sections into two 'half-platoon' patrols. Each half-platoon patrol was equipped with two M60s, three M16s, one or two M79s or later, M203s, while the remaining men carried the SLR.

The context of combat shooting

To understand the Australian infantryman's performance in combat in Vietnam we must first be clear about the strategic and physical context in which the combat took place. In fighting an insurgency the enemy enjoyed a major strategic advantage. By adjusting his level of commitment to the war the Viet Cong (VC) and the People's Army of Vietnam (PAVN) could wage war virtually indefinitely. The US and its allies, on the other hand, faced domestic political realities that required them to not only win the war, but to do so within an acceptable (and relatively short) timeframe. Domestic political support would not be sustained unless there were clear signs that the struggle would end in victory and that that end would not be too distant or too costly. It followed that the US and its allies (including Australia), were under pressure to win the war, but for the VC/PAVN it was acceptable to simply avoid losing.

These strategic imperatives had an impact on the conduct of operations including on the question of soldier lethality. The VC/PAVN, generally sought to avoid contact with 1ATF patrols unless under circumstances favourable to themselves. Their major units withdrew into the jungle³⁰ where their main force protection measures were wide dispersal, a marked preference to break contact and withdraw if confronted by a 1ATF patrol and the construction of bunker systems providing protection against artillery and air attack. They would occasionally leave the security of their base areas to raid South Vietnamese government forces or civil infrastructure and, less frequently, to conduct deliberate operations against elements of 1ATF. Except for these rare occasions,³¹ the burden of manoeuvre to get into contact fell upon 1ATF.

But 1ATF conducted operations in its own way. Drawing on years of counterinsurgency and jungle warfare experience ranging from the closing months of the Pacific War in Bougainville and New Britain, through the Malayan Emergency and Confrontation in North Borneo, the Australian army had a well-developed doctrine for the conduct of counterinsurgency in a jungle environment.³² This placed heavy emphasis on small unit operations and intensive ambushing and patrolling aimed primarily at achieving population security. Furthermore, most 1ATF officers holding command at company level or higher, and many volunteer army NCOs and private soldiers with more than a few years service, had previously served in earlier counterinsurgency operations in Southeast Asia. With this orientation towards counterinsurgency and jungle operations, 1ATF produced a pattern of operations rather different from that of the US Army in Vietnam.

Contacts by combat task

Table 1 shows 1ATF contacts by type as a percentage of total contacts and compares these to what is known of US forces contacts by combat task. The heavy emphasis 1ATF placed on patrolling and ambushing is evident in the table. Together, patrol encounters³³ and ambushes³⁴ represent 70% of all 1ATF

contacts. Attacks on enemy camps and bunker systems³⁵ or occasionally against enemy located in towns, amounted to a further 8% of contacts. Those forms of contact that were initiated by the enemy – attacks or probes against 1ATF positions and ambushes of 1ATF patrols by the enemy – amounted to only 22% of all 1ATF contacts³⁶.

The figures for the US forces in Table 1 need to be treated with caution.³⁷ That there is a significant difference in the way the two armies conducted operations should not be surprising. On the other hand, the data pertaining to US forces operations in Table 1 reflect, in part, the much larger scale operations conducted by the US Army and Marine Corps in I CTZ and in the western provinces of III CTZ. However, questions of scale do not fully explain the differences. For example, it is difficult to escape the conclusion that at least part of the sharp contrast between the two armies in terms of ambushing and patrol encounters is due to the use of different combat techniques. As we shall show, these combat techniques held implications for soldier lethality.

Before examining the implications of the Australian combat techniques on soldier lethality, it is necessary to consider the combat environment in the Australian area of operations.

Range of engagement

Range of engagement is a key factor differentiating counterinsurgency in a jungle environment from other types of combat. In Vietnam ranges of engagement tended to be uniformly short.³⁸ Table 2 shows the ranges of engagement for the forms of combat most frequently encountered by 1ATF.

The close battle in Vietnam was *very* close. Table 2 shows that nearly 80% of contacts were at ranges of 30 metres or less and nearly 50% were at 15 metres or less. Range of engagement was determined by two factors; the limits of visibility

Table 1. 1ATF contacts by combat task as a percentage of all contacts compared with US forces contacts.

Combat task	US forces ^a %	1ATF ^b %
Ambush (by enemy)	23.3	2
Ambush (of enemy)	8.7	34
Attack on enemy position	17.9	8
Defence of position	30.4	20
'Hot' landing zone	12.5	insignificant
Patrol encounters	7.1	36

Notes:

a. James F. Dunnigan and Albert A. Nofi, *Dirty Little Secrets of the Vietnam War*, 1999, p. 61. Dunnigan and Nofi refer to 'American engagements' or to 'US forces' rather than specifying the US Army or Marine Corps.

b. These and other tabulated data presented in this article are derived from the analysis of the 3909 contacts recorded in the Vietnam Combat Database and relate to 1ATF combat operations over the period mid-1966 to late 1971.

in dense jungle and the enemy's tactic of 'hugging' their opponents to defeat the use of heavy indirect fire support against them. Because ranges of engagement were so short, artillery, mortar or air support could usually be applied only against possible targets in depth to block or channel the enemy withdrawal.³⁹ They could not be applied to achieve killing effect at the point of contact because to do so would cause casualties to the 1ATF patrol. Thus, those contacts with a range of engagement of 50 metres or less – about 85% of all contacts – were effectively fought by the infantry using their own weapons and combat skills.

Duration of engagement

Duration of engagement influenced the infantry's ability to apply fire over time and to use fire and movement to close with the enemy. It also limited the application of indirect fire support. Table 3 shows the extent of the VC/PAVN success at keeping contacts very brief unless he found himself in a favourable position.

1ATF contacts lasting more than 30 minutes tended to be infrequent and were highly likely to be bunker system attacks where the enemy enjoyed the benefits of having chosen and prepared the ground. Over 60% of all ambushes and patrol contacts, which formed the bulk of all contacts with the enemy, lasted less than 10 minutes. Our analysis of 1ATF calls for artillery support show that it usually took about 10 minutes to get effective artillery or mortar fire onto a target in support of troops in contact.⁴⁰ Air support often took even longer. The VC/PAVN sought to break contact and escape into the jungle before this support arrived. He skillfully used his small arms – the AK47, RPD light machine gun and the RPG – to produce high volumes of fire and fragmentation effect to cover his withdrawal.⁴¹

Security encounters show a marked tendency towards short duration. This is probably because they were mostly probes against static positions (often at night) where artillery and mortar defensive fire missions had been pre-planned and would arrive promptly. The enemy knew this and tended to withdraw as soon as his probe was detected.

Table 2. Range of 1ATF engagement by combat task.

Range of engagement (metres)	Combat task			
	Ambush (of enemy) %	Patrol encounter %	Bunker system attack %	Security %
0–15	54	47	44	42
16–30	26	32	34	32
31–50	6	8	13	11
Greater than 50	14	13	9	15

Table 3. Duration of 1ATF engagement by combat task.

Duration of engagement (minutes)	Combat task			
	Ambush (of enemy) %	Patrol encounter %	Bunker system attack %	Security %
0-5	46	57	14	64
6-10	14	12	11	11
11-20	15	10	9	13
21-30	9	9	8	5
Greater than 30	16	12	58	7

In bunker system attacks the VC/PAVN had chosen the ground and prepared field defences with overhead cover. He had the advantages of mutual support between bunkers, depth, prepared fire lanes, carefully sited command detonated mines and unexploded bombs and other defensive advantages. However, the crucial difference was that his bunkers gave him overhead protection against 1ATF heavy indirect fire support. He could therefore loiter in contact. Bunker system attacks also took 1ATF units longer to prepare. They were dangerous operations often requiring the coordination of several infantry sub-units, armour, helicopter gunships, Fighter Ground Attack and artillery and mortar support. Assembling and coordinating these assets took time.

This analysis shows that 1ATF combat in Vietnam often took place at very short range against a fleeting enemy, in dense jungle or when visibility was otherwise limited. 1ATF infantry patrols relied upon their small arms to defeat the enemy and were under pressure to shoot quickly and accurately. More sustained combat tended to take place when the enemy held well-prepared positions with overhead protection. Indirect fire support could rarely be applied in the short range and short duration engagements. If it could be applied, as in bunker system attacks, its effects were largely nullified by the enemy's well constructed overhead cover.

Analysis of 1ATF soldier lethality

An accepted measure of soldier lethality is the ratio of shots fired per enemy casualty. Michael Clodfelter has asserted that, for US forces in Vietnam, as many as 200,000 rounds were fired for each enemy killed.⁴² This figure is based upon data derived from the US Department of Defense and from US After Action Reports. It does not include ammunition expended in training but does include ammunition expended by aircraft and vehicle-mounted machineguns and mini-guns. Clodfelter argues that the figure is not excessive if various tactical methods such as reconnaissance-by-fire and 'mad minutes' and the fact that every US infantryman (with the exception of grenadiers) was armed with a weapon capable of fully automatic fire, is taken into account.⁴³

In contrast, our analysis of 1ATF combat data shows that for 1ATF, an average of 485 rounds were fired to inflict each enemy casualty (that is, killed *and* wounded). This figure includes all small arms fire expended by 1ATF elements in contact with the enemy. It does not include fire expended by helicopter gunships or ammunition expended in training. The Australian Army did not favour tactical techniques such as 'reconnaissance-by-fire' or 'mad minutes' that tended to consume large amounts of ammunition for little effect in terms of enemy casualties. And, as we explained above, the Australian infantry carried a mix of fully-automatic and semi-automatic weapons. The 1ATF 'shots per casualty' ratio is broadly similar to the 'shots per casualty' ratio achieved by British Commonwealth forces during Confrontation in North Borneo and we believe that this is evidence that our analysis is broadly correct. In that campaign British Commonwealth forces achieved a shots per casualty ratio of 750:1⁴⁴.

For these reasons we are sceptical of the high 'shots per casualty' figures attributed to the US Army in Vietnam. We believe that the figure is rendered meaningless as a measure of soldier combat performance by the high proportion of ammunition expenditure attributed to causes other than the individual soldier in his attempts to defeat the enemy in combat. We suspect that the true US Army figure is likely to be similar to, but somewhat higher than the 1ATF figure.

The 1ATF generic 'shots per casualty' ratio establishes an important measure of soldier lethality and one that is potentially useful for comparative purposes, but far more information about soldier combat lethality can be extracted from the 1ATF data. In Table 4 we show the 1ATF 'shots per casualty' ratio for each of the main combat tasks by weapon, revealing that the 'shots per casualty' ratio is highly variable, depending on factors including the combat task and the mix of weapons used.

The changes in the average number of shots required to inflict a casualty shown in Table 4 are explained by changes in the combat task and the weapon employed. As one would expect, men armed with the GPMG M60 produced more fire for fewer enemy casualties than those armed with the M16 or the SLR.⁴⁵ The M60 was the infantry section's main fire-producing weapon. Its role was to lay down dominating fire to suppress the enemy and permit those armed with the SLR and the M16 to manoeuvre to positions where they could bring their fire to bear. Therefore the table shows the M60 having a relatively poor 'shots per casualty' ratio. The M16 and the SLR on the other hand, were more 'surgical' in the fire they produced, generating enemy casualties with fewer rounds. The M16, being fully automatic, shows a marginally higher 'shots per casualty' ratio than the semi-automatic 7.62 mm SLR but the difference between the two weapons is not perhaps as great as one might expect. The infantry section's lethality, as measured by shots per casualty, therefore depends heavily on the mix of weapon types, their capability and function in the fire-fight. In producing its fire, the section functions as a team. It is *because* the M60 lays down suppressive fire – at the cost of high ammunition consumption per casualty – that those armed with

Table 4. 1ATF average shots per casualty by combat task and weapon type.

Weapon	Combat task			Security or defence of position
	Patrol encounter	Ambush (of enemy)	Bunker system attack	
7.62 mm GPMG M60	619	495	1310	761
5.56 mm M16	232	319	679	307
7.62 mm SLR	187	222	517	174

Note: This and the following tables in this article refer to averages. Averages can mislead. Accordingly, we are able to provide cumulative frequency graphs showing the distribution of cases around the average, for any of the tables in this article.

the M16 and SLR can achieve more surgical, killing effect with lower ammunition consumption per casualty.

The 'shots per casualty' ratio also varies according to the combat task performed. The ratio in bunker system attacks was much greater than the ratio resulting from ambushes, for example. This difference reflects the advantage accrued by the side that selected and prepared the ground. Patrol encounters were 'neutral'; neither side deriving an advantage through choice of ground. The VC/PAVN derived a significant advantage in selecting and preparing bunker systems and 1ATF patrols expended high volumes of fire to overcome that advantage. However ambushes of the enemy, in which 1ATF had prepared the ground, showed only a slight advantage to the Australians. This is primarily because, unlike either patrol encounters or bunker system attacks, about half of all 1ATF ambushes took place at night.⁴⁶ As we discuss in more detail below, poor visibility at night tended to result in higher shots per casualty.⁴⁷

That soldier lethality changed according to combat task demonstrates that within certain limits, it was possible for commanders to so design operations as to place greater emphasis on those combat tasks likely to produce more advantageous shots per casualty ratios. A greater emphasis on ambushing (for example by choosing pacification operations over reconnaissance-in-force operations) tended to result in the achievement of higher soldier lethality. Returning to Table 1 (Contacts by type) it will be seen that 1ATF placed heavy emphasis on ambushing the enemy and patrol encounters. These two forms of contact represented 70% of all 1ATF contacts and produced the most favourable 'shots per casualty' ratios.

The statistical data we have presented in Table 4 shows *average* shots per casualty inflicted. Averages can be misleading. There were many contacts in which far fewer (and, for that matter, far more) than the average number of rounds were fired to inflict an enemy casualty. For example, in about 22% of 1ATF contacts, 30 shots or fewer resulted in an enemy casualty.⁴⁸ This is a low

‘shots per casualty’ figure and demonstrates that, under some conditions, 1ATF infantry achieved very high lethality.

In addition to weapon type and combat task, many other factors affect soldier lethality as measured by shots per casualty. Some of these factors include the relative strengths of the forces in contact, type of enemy force in contact (i.e. whether local guerrilla, provincial mobile battalion or PAVN main force), time of day, time on operation, time in theatre,⁴⁹ terrain (for example, whether the contact took place in jungle, rubber plantation or open paddy field) and depth of training.⁵⁰ In this article we report our research in just two of these; the effect of being the first to fire, and the effects of contact by day and night.

The effect of firing first

Table 5 reveals the effects on the ‘shots per casualty’ ratio of being the first to fire in contact.

This table shows that when 1ATF saw the enemy and opened fire first, it required relatively modest numbers of rounds to inflict a casualty on the enemy. But when the VC/PAVN fired first, the number of rounds required more than doubled across each of the combat tasks. The best example is when 1ATF ambushed the VC/PAVN. When this occurred, 1ATF troops required an average of only 321 rounds to achieve an enemy casualty when they saw the enemy first, but an average of 1343 – more than four times more rounds – when the VC/PAVN opened fire first.

The higher ammunition expenditure per casualty when the VC/PAVN fired first, suggests two factors may be at work. First, the side firing first receives the benefit of firing, even if fleetingly, at observed targets before all soldiers at the point of contact take cover. For the side fired upon, the vital first few seconds are taken up with seeking cover rather than returning aimed fire at visible targets. Second, the extra ammunition expended by the side fired upon is consumed in the section’s efforts to reclaim and assert its psychological dominance over the enemy. We can see this effect in the observation of Captain A.W. Freemantle, an SAS patrol commander, who wrote

When contact is initiated by the enemy the immediate retaliation with a heavy volume of automatic fire, even if only in the general direction of the enemy, serves not only to keep his head down but to create an illusion of a far larger force. Also the immediate operation of as many weapons as possible efficiently breaks the ‘spell’

Table 5. 1ATF average shots per enemy casualty by combat task and who fired first.

First to fire	Combat task			
	Patrol encounter	Ambush (of enemy)	Bunker Attack	Security
1ATF	275	321	679	373
VC/PAVN	634	1343	1404	708

that occurs momentarily on contact: it's also good for morale. It should not be supposed that this firing is entirely indiscriminate or completely uncontrolled, but rather that when contact is initiated by the enemy in close country, one probably won't see anything and will only have a fairly rough idea of where the enemy is; therefore it is vital that an immediate heavy volume of suppressive fire is laid down by anybody who can possibly direct his weapon into the general area⁵¹.

Infantry officers agreed. Major J.B. Healy, a company commander in 1RAR (1965–66 tour) commented that

Most contacts take place at close range, and the VC usually withdraws quickly, remaining in contact only long enough to evacuate his casualties and their weapons. The maximum small arms fire should be directed against the enemy during this period to cause him further casualties and to prevent him escaping. This fire is directed on to the positions from which the enemy is firing, or the area where he disappeared. . . . Greater firepower is the biggest advantage we have over the VC in close contact, and it should be fully employed⁵².

Table 5 shows that a very significant benefit in terms of lethality is conferred on the side that opens fire first. Studies have shown that for the US Army in Vietnam, '88 per cent of all engagements were initiated by the enemy'⁵³ but, once again, we feel that these claims must be treated with caution.⁵⁴ Table 6 shows the percentage of 1ATF contacts by task according to which side was first to fire.

It can be seen that 1ATF patrols dominated the enemy in the skills of seeing the other side and opening fire first, thereby reaping the benefits in terms of lethality. As one might expect, these skills peaked in ambushes where the Australians had chosen and prepared the ground. But even in the reverse situation where the enemy selected and prepared a bunker system site, 1ATF patrols still managed to achieve a respectable advantage in being first to initiate contact.

Once again, Table 1 (Contacts by combat task) shows the heavy emphasis 1ATF placed on achieving modes of contact likely to result in high lethality. One third of all 1ATF contacts were ambushes of the enemy where being first to fire was achieved in 96% of cases.

Dave Grossman and others have argued that improved training methods, particularly shooting at human-like targets, has reduced and perhaps even eliminated the non-firer. But it is noteworthy that the large benefit in terms of

Table 6. First to fire according to combat task.

First to fire	Combat task			
	Patrol encounter	Ambush (of enemy)	Bunker Attack	Security
1ATF	618 (78%)	772 (96%)	394 (82%)	121 (64%)
VC/PAVN	176 (22%)	34 (4%)	88 (18%)	68 (36%)
Total	794	806	482	189

soldier lethality derived from seeing the enemy and opening fire first comes not from marksmanship training, but from the achievement of high skill in field craft. That is, in military skills such as silent movement through the jungle, frequent listening stops, deployment of sentries and listening posts, and good self-discipline and junior leadership to ensure these skills are put into practice despite the strain and tedium of lengthy operations. The advantage of firing first (shown in Table 5) reflects, to a large extent, the advantage of good field craft training and holding the tactical initiative.

Combat shooting by day and night

The advantage in terms of shots per casualty of seeing the enemy first can be compared with the effects of combat shooting by day and by night. It might be imagined that the difficulty of engaging targets at night would result in a major blow-out in the number of rounds fired to achieve an enemy casualty. After all, combat shooting at night provides few, if any, opportunities for carefully aimed shots. In Vietnam, the main sources of illumination for night contacts were air or artillery delivered parachute flares, smaller flares provided by the infantry unit in contact, and trip flares. Parachute flares were useful in the open paddy fields, but performed poorly in jungle or timbered areas because they cast disorienting shadows as they descended. Trip flares, rigged for command detonation, were often best in jungle. They could be carefully positioned to illuminate the killing ground but keep 'friendlies' in shadow. The Starlight Scope, a first generation light intensification sight, was available usually on the basis of one per platoon. It was very useful in the open paddy fields, but useless in the jungle or under rubber trees where there was often insufficient ambient light to allow it to work⁵⁵.

Ambushes provide a useful insight into the effects of night and day on soldier lethality. 1ATF had 980 recorded ambushes of the enemy for which we have information on the number of rounds fired and casualties inflicted. Of these 414, almost half, were night ambushes.⁵⁶ Table 7 reveals the average number of shots fired per casualty in ambushes by day and night.

The effect of poor visibility at night, despite the use of illumination and night vision devices mentioned above, was to essentially halve soldier lethality requiring soldiers to fire nearly twice the number of rounds to inflict a casualty. This change was broadly uniform across all three weapon types.

A comparison of Table 7 (Shots per casualty for ambushes by day and night) with Table 5 (Shots per casualty by combat task and who fired first) reveals that shooting at night produced a relatively modest increase to the shots per casualty ratio despite the poor visibility. Allowing the enemy the opportunity to fire first, on the other hand, produced a far greater effect. The skills of camouflage and concealment, silent movement and protection at the halt and on the move were highly developed within 1ATF and these produced the results shown in Table 6. These skills were the results of intensive pre-deployment training based on the extensive experience of the Australian Army in counterinsurgency operations in

Table 7. 1ATF average shots per casualty for ambushes of the enemy by day and by night.

Weapon	Shots per casualty – ambushes	
	By day	By night
M60	388	604
M16	235	486
SLR	174	349

Malaya and North Borneo during Confrontation. The emphasis on these skills paid off handsomely in terms of a highly favourable shots per casualty ratio.

Strategic impact

To the extent that the phenomenon existed at all, the numbers of those soldiers deemed to be possible ‘non-firers’ within small units seems to have been quite small during the Vietnam War. However, others have asserted the existence of another group of underperforming soldiers – those that fire their weapons but without intending to hit the enemy. Grossman has claimed that this group may partly account for the apparently very high rate of ammunition expended by the US forces in Vietnam to inflict a casualty upon the enemy. However, we have shown that in the combat conditions prevailing in Vietnam most small arms fire was not expected to hit the enemy. It was intended to achieve other tactical purposes. Furthermore, the individual soldier’s influence upon the battle through non-effective participation is relatively small. The individual soldier carries a limited amount of ammunition – usually about 300 to 500 rounds. A ‘non-firer’ or ‘posturer’ can influence the outcome of the battle only by failing to make best use of his own limited ammunition load.

Furthermore, we have shown that for 1ATF in Vietnam (and, we suspect, the US Army) the actual ratio of shots per casualty was far lower than figures often cited for US forces. These low figures leave little room for underperformance of the soldier’s duty. We also show that factors such as the type of weapon used, the combat task performed, which side opens fire first and whether contact is by day or night, exerted a far greater effect on combat performance in 1ATF than the possible underperformance of an occasional posturer. We show that in some cases these factors doubled (or quadrupled) the shots fired to achieve a casualty, not just for an individual, but across the whole rifle section or platoon.

To some extent it was possible for commanders to control the lethality of their soldiers by designing operations in such a way as to produce greater emphasis upon combat tasks that tended to result in better shots per casualty ratios. Australian commanders favoured intensive patrolling and ambushing and these were the types of contact tending to produce the best shots per casualty results. Attacks on enemy positions, which tended to result in adverse shots per casualty

ratios, were relatively few in number. For 1ATF, ambushes by the enemy – which were likely to result in highly adverse shots per casualty ratios – hardly occurred at all. In future counterinsurgency operations commanders might recognize these effects and design operations to achieve high numbers of ambushes and low numbers of attacks on enemy defended positions. Since loss ratio tends to improve when shots per casualty improves, commanders can, within limits, design operations to control the rate at which casualties are accepted.

Counterinsurgencies tend to be wars of detail. Small things, like soldier combat performance, can be important to the outcome. In the plethora of small contacts that typify many counterinsurgencies it will be important to establish in the enemy's mind that he may be met anywhere, at any time, and that whenever he is met he will be defeated. This is a key outcome of combat and can best be achieved through maximizing soldier combat performance.

Notes

1. The research described in this article is part of a major project called 'Understanding Low Intensity Conflict' which is funded by the Australian Research Council.
2. Ian McNeill, *To Long Tan: The Australian Army and the Vietnam War 1950–1966*, 349. Artillery fire, the 'lie of the land' and the timely arrival of Armoured Personnel Carriers are said to have 'saved the day' for the infantry company involved in the battle.
3. S.L.A. Marshall, *Men Against Fire: The Problem of Battle Command in Future War*, 50–4. Marshall claims that his post-operations interviews revealed that 15–25% of soldiers actually fired their weapons in combat. However, he also seems to qualify this claim by adding that soldiers may perform above this baseline if 'compelled by overpowering circumstances' or encouraged by junior commanders.
4. S.L.A. Marshall, *Infantry Operations and Weapon Usage in Korea*, 4. See also, Peter Watson, *War on the Mind: The Military Uses and Abuses of Psychology*, 46.
5. S.L.A. Marshall, *Vietnam Primer*, 15.
6. Russell W. Glenn, *Reading Athena's Dance Card: Men Against Fire in Vietnam*, 39, 49.
7. Glenn, *Reading Athena's Dance Card*, 49. Lieutenant Colonel Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society*, 35. Grossman has also argued that improved training techniques helped to overcome the soldier's psychological resistance to killing resulting in improved combat participation.
8. Roger J. Spiller, 'S.L.A. Marshall and the Ratio of Fire', *RUSI Journal*, winter 1988, 63–9. Glenn also acknowledges that there are valid reasons why soldiers may not participate in combat.
9. Glenn, *Reading Athena's Dance Card*, 28. But note that Glenn goes on to raise serious doubts about the validity of the 'deliberate miss' school of thought. See pp. 31–3.
10. Grossman, *On Killing*, 9–16.
11. *Ibid.*, 181.
12. *Ibid.*, 12, 254. Grossman uses the figure of 50,000 rounds per enemy soldier killed. This figure is more often attributed to US forces in the Korean War. For example, see Stockholm International Peace Research Institute (SIPRI), *Anti-Personnel Weapons*, 91. However, note that whereas Dave Grossman writes in *On Killing* that 'more than

fifty thousand bullets were fired for every enemy soldier killed' (12), *Anti-Personnel Weapons*, citing studies by the Office of Operations Research (ORO) at Johns Hopkins University, gives the much more modest estimate that '10,000–50,000 bullets are fired for every man hit'. The distinction between 'killed' and 'hit' (i.e. both killed and wounded) is significant. US intelligence in Vietnam estimated that for every enemy killed in action there were 1.5 wounded (see The Senator Gravel Edition, *The Pentagon Papers: The Defense Department History of United States Decisionmaking on Vietnam*, vol. 4, 370).

13. Michael Clodfelter, *Warfare and Armed Conflicts: A Statistical Reference to Casualty and Other Figures, 1500–2000*, 777. Clodfelter states that 'an average of 200,000 rounds of small arms ammunition [was] fired by US units to kill each enemy soldier in Vietnam'. Furthermore, Clodfelter cites figures of 25,000 rounds per kill in World War II and 50,000 rounds per kill in the Korean war, giving the impression that the shots per kill ratio is increasing exponentially. Note also that like Grossman, Clodfelter refers to 'kills', not the broader category of 'hits' or 'casualties'.
14. Grossman, *On Killing*, 11–12.
15. *Ibid.*, 334, n. 2.
16. *Ibid.*, But note that Glenn argues that there is little evidence of the existence of the posturing phenomenon. See Glenn, *Reading Athena's Dance Card*, 49.
17. For a discussion of Australian Army combat shooting in Vietnam, see Bob Hall and Andrew Ross, 'Bang on target? Infantry marksmanship and combat effectiveness in Vietnam', 139–56.
18. The NZ rifle companies were drawn from the Royal New Zealand Infantry Regiment (RNZIR) and were attached to selected Australian battalions being designated as 'V' and 'W' companies of those battalions. The battalions thus reinforced were designated RAR/NZ (ANZAC) battalions.
19. ATF Standing Operating Procedures for Operations in Vietnam, appendix 4 to Annex D. Copy in the possession of the authors. The practice of completing a contact report after each contact became ingrained in the Australian Army during Confrontation in North Borneo when battalions of the RAR operated as part of the British Commonwealth Forces.
20. Not counted as 'contacts' were mortar or artillery fire missions, air strikes or mine incidents (unless these were in support of an exchange of small arms fire by ground forces). Artillery and mortar fire missions, air strikes and mine incidents had their own reporting requirements. Also not included were occasional long-range pot-shots at Australian patrols that otherwise generated no tactical response.
21. See, for example, 4RAR/NZ (ANZAC) Field SOPs dated 18 November 70. Copy in possession of the authors. Field SOPs were issued to commanders at all levels in weatherproof plastic booklets for quick reference in the field.
22. Australian Army Operational Research Group Interim Memorandum 2/69: Contact After-Action Reports Review of Format, August 1969. (Copy in possession of authors) Changes to the report format made as a result of this report were aimed at eliminating ambiguity in the questions asked thereby improving the quality of the data collected.
23. Indeed, estimates of ammunition expenditure show a marked tendency to end in zeroes indicating that the figures were 'rounded out'.
24. Platoon sergeants used estimates of ammunition expenditure to arrange ammunition redistribution and, if necessary, re-supply. Overestimating could result in the soldier being re-supplied with more ammunition than he could fit into his magazines and an unwanted extra load to carry. Underestimating could result in the soldier being left with insufficient ammunition.

25. For example, fragmentation weapons usually caused quite different wounds to bullets. The entry wounds of 7.62 mm rounds were much larger than those of 5.56mm rounds. The M60 tended to produce multiple hits while the Self Loading Rifle (SLR) produced single hits. These differences could result in a reasonably accurate estimation of the cause of wounds. Bodies with multiple wounds from different weapons and blood trails left by the wounded would require the exercise of judgement. But many soldiers knew where they had been firing and were keen, after the contact, to see the effects of their fire. They could often confirm that they had hit specific targets with their weapon even if the only evidence remaining in the killing ground was a blood trail.
26. We have also built a similar but smaller database of Commonwealth Forces contacts during Confrontation with Indonesia in North Borneo for comparative purposes. This database contains data on 850 contacts.
27. The database, built by A.T. Ross, is called the Vietnam Combat Database. For each of the 3909 recorded contacts, the database contains up to 30 bits of information including the date, time and place of the incident, the unit involved, friendly strength, enemy strength, range of visibility, range of engagement, weapons fired, ammunition expended, casualties to both sides and other details. The data is derived from Infantry Battalion and other major unit war diaries and thousands of contact reports contained in scores of Combat Operations After Action Reports held by the Australian War Memorial (hereinafter AWM) mainly in its record series AWM98 (records of Headquarters Australian Force Vietnam – Army component) and AWM103 (records of Headquarters 1st Australian Task Force). The database is a research tool and is regularly upgraded with new information.
28. The weapon's official title was Rifle Equipment 7.62 mm L1A1. It was a 'self-loading' rifle, hence SLR. It was held in high regard by infantrymen for its robust design, reliability and hard-hitting fire.
29. Chronic under-manning resulted from a range of factors including men recovering from wounds, attending courses, on leave, required for the defence of the FOB or because they were serving a period of detention in a military jail.
30. In this article we define the term 'jungle' to mean any dense vegetation that limits range of visibility to 30 metres or less and provides good cover from observation from the air. The term 'jungle' therefore includes primary rain forest characterized by trees growing to about 30 metres, re-growth in cleared or bombed primary jungle with trees to about 4 metres or more, dense mangrove forest, etc. and may include plantation crops such as rubber trees, under certain conditions.
31. Examples are the battle of Long Tan (18 August 1966), Operation Bribie (17–18 February 1967) and the battle of Binh Ba (6–8 June 1969).
32. See, for example, *The Division in Battle*, pamphlet no. 11, *Counter Revolutionary Warfare, 1965*, Military Board, Army Headquarters, Canberra, 1966.
33. A patrol encounter occurred when a 1ATF patrol encountered an enemy patrol. Neither side had selected or prepared the ground.
34. An ambush of the enemy occurred when a 1ATF patrol selected an ambush site and prepared it by siting weapons to cover a 'killing ground', deploying claymore mines, trip flares and other devices, preparing fire lanes and by taking other preparatory measures designed to give it an advantage over an unsuspecting enemy.
35. Bunker systems were dug-in enemy camps. They could consist of a few bunkers or hundreds of bunkers. Each individual bunker had overhead protection against artillery, mortar or air delivered weapons. Bunkers were usually sited to give mutual support and depth to the position. Defences were supplemented with claymore mines, unexploded bombs rigged for command detonation, crawl trenches, prepared fire lanes and security patrols.

36. Some encounter contacts were also initiated by the enemy but as we show later in this article, the great majority of encounter contacts were initiated by 1ATF.
37. While Dunnigan and Nofi, *Dirty Little Secrets*, 61 appears to treat these figures as though they apply generally to the US forces effort throughout the war, the figures seem to have been derived in turn from *The Pentagon Papers*, vol. 4, 461–2, where it is clear that they are based on the analysis of just 56 battles all of which occurred in 1965–66. The analysis of these 56 battles was ‘confirmed’ by two further processes; an ARCOV study of a different set of battles also in the 1965–66 period and an analysis of After-Action Reports collected by MACV which are described as ‘generally vague and incomplete’ but which broadly confirmed the trends identified in the analysis of the 56 battles. Despite these apparent shortcomings, the analysis of the 56 battles was considered sufficiently accurate and authoritative as to form part of the discussion between the Secretary of Defense and MACV about troop deployments to Vietnam. However, we remain unconvinced that the analysis of the 56 battles accurately reflects the pattern of US operations for the whole of the war.
38. By contrast, ranges of engagement in urban operations tend to very short inside buildings but long outside buildings. For example, see Bing West, *No True Glory: A Frontline Account of the Battle for Fallujah*, 144–6, 174 where West describes small arms fire during the second battle of Fallujah at ranges of 500 metres or more.
39. Blocking or channelling fire was of unknown value. Official records held by the AWM contain very few references to bomb damage assessments having been conducted on the impact areas for these types of artillery or mortar missions so very little is known of their effect.
40. Numerous official records show that the time between the initial call for fire support and the arrival of the first rounds of fire for effect was about 10 minutes or more. See, for example, AWM95, item 3/5/43, Commander’s Diary, 105 Field Battery RAA. Fire Control Centre Artillery Signals Log Book for the period 20 June 1966 to 19 August 1966 which records the receipt of requests for fire and the subsequent fire mission. Main causes of delay were the requirement to obtain clearances to fire and the time taken to adjust fire onto the target.
41. The AK47, RPD light machinegun and RPG7 were the principal weapons of enemy Local Force units such as D445 and D440 battalions as well as units of the People’s Army of Vietnam (PAVN) (often referred to in US and Australian army documents as the North Vietnamese Army (NVA)), such as 33 NVA Regiment. By contrast, local and village guerrilla units were sometimes armed with AK47s but often carried weapons of Second World War vintage such as Browning Automatic Rifles and Thompson sub-machineguns.
42. Clodfelter, *Warfare and Armed Conflicts*, 777. Clodfelter states that ‘an average of 200,000 rounds of small arms ammunition [was] fired by US units to kill each enemy soldier in Vietnam’.
43. Michael Clodfelter, personal communication with the authors dated 20 March 2009.
44. Peter Dennis and Jeffrey Grey, *Emergency and Confrontation: Australian Military Operations in Malaya and Borneo 1950–1966*, 261–2. Grey cites 17th Division training directive No. 8, n.d. as stating that ‘it took 750 rounds to kill or wound one enemy’.
45. As stated above, the machinegun group consisted of three men two of whom were armed with the SLR. The roles of these men were to command the machinegun group and to supply ammunition to the machinegun and in sustained fire-fights to ensure the machinegun continued to fire (for example, by changing the barrel or taking over the gunner’s role if he became a casualty). Thus these two members of the machinegun group were occupied with other tasks that to some extent limited their ability to participate in the fire-fight with their individual weapons.

46. The Vietnam Combat Database records a total of 980 identified ambushes of which 414 occurred 'at night'.
47. A further cause is the relatively high use of claymore mines in ambushes. On detonation these often produced a large cloud of obscuring dust and smoke.
48. Figures derived from analysis of the Vietnam Combat Database. Cumulative frequency graphs showing the distribution of individual cases around the average were prepared (and can be provided) for any of the average figures shown in this article.
49. The Australian army employed a system of one-year unit rotations for infantry battalions. Thus the records created by 1ATF provide the opportunity to compare sixteen one-year infantry battalion rotations, with each battalion fighting the same enemy in the same AO.
50. The effects of depth of training can be assessed by comparing the highly trained Special Air Service (SAS) with the all-volunteer Royal New Zealand Infantry Regiment (RNZIR) companies and the mixed volunteer and conscript units of the Royal Australian Regiment (RAR). Australian infantry battalions were required by government to be manned to no more than 50% by conscripts.
51. Captain A.W. Freemantle, 'Patrol Lessons in Vietnam', 48–9.
52. AWM275, item 78, [Papers concerning the Vietnam War collected by Lieutenant Colonel R. Breen when researching his book *First to Fight*], Records concerning tactical lessons learned in Vietnam, written by 1RAR officers. Tactical Lessons Learnt in Vietnam by Major J.B. Healy, OC A Coy, 1RAR.
53. Andrew Krepinevich, *The Army and Vietnam*, 188. Similar claims also appear in Guenter Lewy, *America in Vietnam*, 82–3, and James R. Ebert, *A Life in A Year: The American Infantryman in Vietnam 1965–1972*, 186.
54. In each case the data seems to have derived from *The Pentagon Papers*, vol. 4, 461 and refers to combat in the period 1965–66. Elsewhere in *The Pentagon Papers* the assertion is made that 'the VC/NVA started the shooting in over 90% of the company-sized fire fights' (see *The Pentagon Papers*, vol. 4, 465.) but once again, this appears to refer to a relatively brief period in the first few years of ground combat operations and therefore may not accurately represent the US Army combat performance for the war as a whole.
55. In some circumstances infantry patrols could boost the ambient light levels in their location to enable use of the Starlight Scope by requesting artillery or mortar illumination missions on targets several kilometres away.
56. Figures derived from the Vietnam Combat Database.

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