OPERATIONAL ANALYSIS

BANG ON TARGET?

INFANTRY MARKSMANSHIP AND COMBAT EFFECTIVENESS IN VIETNAM*

DR BOB HALL AND DR ANDREW ROSS

ABSTRACT

Infantry have long aspired to the ideal of 'one shot, one kill' in marksmanship training, but this article proves that, especially in complex terrain, infantry are better served by employing the 'volume of fire' approach to psychologically dominate the enemy. Only then can the significant challenges of poor visibility and fleeting engagement opportunities be successfully overcome and manoeuvre restored to the light infantryman.

In the matter-of-fact terms of Australian Army doctrine the role of the infantry is to seek out and close with the enemy, to kill or capture him, to seize and hold ground and to repel attack, by day or night, regardless of season, weather or terrain. To perform this role the infantry relies on its capacity to produce effective fire using its own weapons, and where possible, indirect and direct fire support. It is often thought that the individual soldier's marksmanship—the soldier's ability, using his personal weapon, to hit an observed target—is the basis of the infantry's

* This article has been peer reviewed

capacity to produce effective fire. It is well accepted that the infantry (and SAS) of 1st Australian Task Force (1ATF) in Vietnam displayed high tactical skill and dominated fire fights. Yet the standard of marksmanship within the infantry was, and continues to be, called into question.

Many Vietnam Combat Operations After Action Reports drew attention to the perceived poor standard of shooting.[1] Some published personal accounts and unit histories are also critical of shooting standards. For example, Major C F Thomson, a rifle company commander in 7RAR, colourfully expressed the dismay of many infantry officers when he wrote that

> It's a tragic fact, and one that we should not conceal; that on average we couldn't hit the side of a barn at ten metres with a shotgun. The only sure result comes from placing the muzzle against the enemy navel and firing.[2]

The CO of 2RAR/NZ (ANZAC), Lieutenant Colonel John Church, noted in his battalion's tour (May 1970–May 1971) that:

> there had been a high expenditure of small arms' ammunition for a relatively small return of enemy casualties … In the heat of battle many soldiers pointed their weapon in the general direction of the enemy without having identified a specific target, and pulled the trigger, often over and over again.[3]

Criticism of the standard of 1ATF marksmanship has continued to the present. At the 2002 Chief of Army's Military History Conference, two contributors, Major General Mike O'Brien and Brigadier Noel Charlesworth, claimed 1ATF marksmanship had been poor.[4]

Numerous reasons for the 'poor' state of infantry marksmanship were given. They included the lack of suitable ranges near unit barracks leading to insufficient shooting practice, poor fire control by NCOs and junior officers, soldiers deliberately aiming off because training with blank ammunition encouraged them to do so, carriage of excessive amounts of ammunition encouraging profligacy, failure of instructors to instil the desire to shoot to kill, and other reasons. Few of the complainants mentioned the difficulties of acquiring a target in the combat conditions that prevailed in Vietnam.

Few of the complainants mentioned the difficulties of acquiring a target in the combat conditions that prevailed in Vietnam.

The numerous criticisms of infantry marksmanship had one thing in common: despite the critics alluding to the existence of a poor ratio of shots fired to enemy casualties inflicted, none cited any empirical data to support their claims. In this article[5] we are able to revisit the question of infantry combat marksmanship in Vietnam

to assess the truth behind the claims. We can do so using empirical data derived from a database of 4100 1ATF contacts[6] in Vietnam.[7] In the process we are able to provide some insights into the nature of combat shooting that have implications for training and future combat operations in the complex terrain of Australia's region.

But before considering the marksmanship of 1ATF soldiers it is necessary to consider the operational context of combat shooting in Vietnam.

STRATEGIC IMPERATIVES

The Viet Cong and North Vietnamese Army (VC/NVA) enjoyed a major strategic advantage in fighting an insurgency. By adjusting their level of commitment to the war the VC/NVA could wage war virtually indefinitely. For the US and its allies, on the other hand, 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 were under pressure to win the war, but for the VC/NVA it was acceptable to simply avoid losing.

By adjusting their level of commitment to the war the VC/NVA could wage war virtually indefinitely.

These strategic imperatives had an impact on the conduct of operations including on the issue of marksmanship. The VC/NVA generally sought to avoid contact with 1ATF patrols unless under circumstances favourable to themselves. Their main force units withdrew into the jungle where they used wide dispersal, a marked preference to break contact and withdraw if confronted by a 1ATF patrol and the construction of bunker systems providing good protection against indirect fire as their main force protection measures. They would occasionally leave the security of their bases to raid South Vietnamese government forces or civil infrastructure and, less frequently, to conduct deliberate operations against elements of 1ATF. Except for these relatively rare occasions,[8] the burden of manoeuvre to get into contact fell upon 1ATF.

CONTACTS BY TYPE

Table 1 shows the 1ATF contacts by type, as a percentage of total contacts. To bring the enemy to battle, 1ATF conducted an intensive patrolling and ambushing effort and, when enemy camps or bunker systems were located these were attacked. This emphasis on patrolling and ambushing is reflected in the table. Together, patrol encounters and ambushes represented 70 per cent of all 1ATF contacts. Attacks on enemy camps and bunker systems and occasionally against enemy in urban terrain,

amounted to a further 8 per cent of contacts. Those forms of contact initiated by the enemy—attacks or probes on positions and ambushes by the enemy—amounted to less than a quarter of all 1ATF contacts.

Table 1. 1ATF contacts by type as a percentage of all contacts.[9]

Type of contact	1ATF contacts %
Ambush (by enemy)	2
Ambush (of enemy)	34
Attack on enemy position	8
Security contacts	20
'Hot' landing zone	insignificant
Patrol encounter	36

It can be seen that the majority of 1ATF combat shooting was done in patrol encounters and ambushes, in attacks on enemy positions, and in what we have termed 'security contacts'.[10] Most of this shooting took place in thick jungle or other heavy vegetation, or at night.

RANGE OF ENGAGEMENT

Range of engagement is a key factor differentiating combat in a jungle environment from other types of combat. In the Vietnam jungle ranges of engagement tended to be uniformly short.[11] Table 2 shows the ranges of engagement for the forms of contact most frequently encountered by 1ATF.

Table 2. Range of engagement by contact type.

Range of engagement (metres)	Contact type			
	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

The key point is that the close battle in Vietnam was *very* close. Overwhelmingly, ranges of engagement were less than 50 metres across each form of contact. More than half of all ambushes were at ranges of just 15 metres or less. Nearly 80 per cent of all contacts were at ranges of 30 metres or less. There was a sharp decline in the number of contacts at ranges in excess of 30 metres but this was less marked in attacks against bunker systems.

Range of engagement is a key factor differentiating combat in a jungle environment from other types of combat.

The reasons for these short ranges of engagement were twofold. First, the enemy sought to reduce his vulnerability to 1ATF heavy weapons, especially indirect fire support and close air support, by using the concealment provided by dense jungle or night. Range of engagement in the jungle was determined by the range of visibility which was often as short as three to five metres. In more open areas such as paddy fields the range of visibility was much longer but the enemy avoided these areas in daylight. Second, once in contact, VC/NVA troops used the tactic of 'hugging'—getting up, very close to the Australians—so that heavy indirect fire support could not be brought against them without also causing Australian casualties. Both factors resulted in a large percentage of contacts at short range, limited use of heavy indirect fire support and consequently, high reliance on infantry small arms fire for killing effect at the point of contact.

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. Table 3 shows the duration of engagement according to type of contact.

The table shows that the close battle in Vietnam was also very brief. While some battles fought by 1ATF lasted several hours, these tended to be infrequent. Over 75 per cent of all ambushes, patrol encounters and security contacts (forming the bulk of all contacts with the enemy) were completed inside 20 minutes. About half of these contacts lasted five minutes or less. However, bunker system attacks show a marked tendency to last longer with more than 50 per cent lasting more than 30 minutes.

If caught in an ambush or a patrol encounter the enemy usually sought to break contact quickly and escape into the jungle. They were very skilled at doing this and—using high volumes of fire and fragmentation effect from AK47s, RPD light machine-guns and RPGs[12]—often broke contact before the 1ATF patrol could

Table 3. Duration of engagement by contact type.

Duration of engagement (minutes)	Contact type			
	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

organise effective indirect fire support. Artillery responding to an infantry call for fire support usually took about 10 minutes to get effective fire onto a target.[13] Air support could take even longer. But Table 3 shows that in more than 60 per cent of cases, the enemy had already broken contact and escaped in less than 10 minutes.

In bunker system attacks the enemy had chosen the ground and prepared field defences. They enjoyed the benefits of mutual support between bunkers, depth, prepared fire lanes, carefully sited command detonated mines and UXB and other defensive advantages. However, the crucial difference was that the bunkers provided overhead protection against 1ATF heavy indirect fire support. They could therefore loiter in contact. Bunker system attacks also took 1ATF units longer to prepare. These were dangerous operations, often requiring the coordination of several infantry sub-units, armour, helicopter gunships, FGA and artillery and mortar support. Assembling and coordinating these assets took time.

… in more than 60 per cent of cases, the enemy had already broken contact and escaped in less than 10 minutes.

The above shows that 1ATF combat shooting in Vietnam often took place at very short range against a fleeting enemy in dense jungle or when visibility was otherwise limited. More sustained combat tended to take place when the enemy held well-prepared positions with overhead protection. 1ATF infantry patrols relied upon their small arms to defeat the enemy. Indirect fire support could not be applied in the short range engagements or its effects were largely nullified by the enemy's bunkers. Infantrymen were under pressure to shoot quickly and accurately.

OPPOSING ARGUMENTS

It can be seen that the context of infantry combat in Vietnam was not conducive to the calm application of carefully aimed small arms fire that the critics of 1ATF marksmanship seemed to endorse. In fact, two opposing schools of thought developed. The first, as we have seen, was critical of the standards of marksmanship and believed the apotheosis of the marksman's skill was the achievement of 'one shot, one kill'. This group could be characterised as the 'one shot, one kill' school.[14]

Others took the opposite view—that in Vietnam, most targets were engaged under conditions of very poor visibility, either at night or in heavy jungle. Targets were very close and very fleeting, requiring a reflex response—the antithesis of the carefully aimed shot. The enemy produced high volumes of fire and to establish dominance in the fire fight 1ATF patrols should do the same. Soldiers needed to fire at targets if they could see them, but if not, they should vigorously engage those areas where they *thought* the enemy might be. This approach required that they carry large amounts of ammunition. This group could be characterised as the 'volume of fire' school.[15]

> Infantrymen were under pressure to shoot quickly and accurately.

THE REALITIES OF CONTACT IN VIETNAM

The 'one shot, one kill' idea tended to presuppose the existence of a clearly visible target and one that remained visible while the soldier aimed and fired. However, the reality of combat in Vietnam (as during the Malayan Emergency and Confrontation), was that such targets were rare.[16] Thick jungle or night usually obscured the target. If an enemy was seen, it was usually for such a brief moment that the soldier had too little time to react with a carefully aimed shot. In most contacts soldiers did not fire at 'targets' at all; they fired at the noise of enemy movement or at the source of the enemy's shouted orders, at muzzle flashes or RPG back-blasts or at moving vegetation. Many fired at where the enemy had last been seen, where they thought they might be moving, or where they might be taking cover. Much of this shooting was done without using the sights. Both eyes were kept open to keep a wide field of view and to quickly pick up any signs of enemy movement around the flanks.

However, in the first few seconds of some contacts—particularly daytime ambushes (which represented slightly more than half of all ambushes)—the enemy was clearly seen and the initial shots at least, could be aimed with precision. These initial shots may have approached the 'one shot, one kill' ideal. But after this initial burst of fire—perhaps the first one or two rounds—all those near the point of contact

took cover and 'disappeared' from view. In ambushes (by both day and night) it was common to open fire by initiating one or more banks of claymore mines. These produced a heavy volume of shrapnel into the killing ground but also a large cloud of dust and smoke which obscured targets for subsequent engagement by small arms fire. Whether in an ambush or a patrol encounter, targets quickly vanished. Opportunities for carefully aimed fire—even for using the sights—were very fleeting.

Whether in an ambush or a patrol encounter, targets quickly vanished.

Under these circumstances, most small arms fire used the 'volume-of-fire' technique. Its purpose was not necessarily to kill or wound the enemy, although that would be a desirable outcome. Instead it was intended to establish psychological dominance in the fire fight, to pin the enemy and prevent his manoeuvre (especially his withdrawal).

The need to get heavy volumes of fire into the target area quickly led to changes in the contact drill. For example, Lieutenant Colonel F P Scott, CO 3RAR (1971 tour) noted that:

> Platoon commanders who had been in heavy firefights commented that the contact drill laid down in [infantry doctrine] was just not possible particularly in heavy jungle. Personnel got to ground immediately and then crawled to a fire position. The platoon produced the maximum return of fire from the broadest possible base. The platoon commander then fought the battle.[17]

Doctrine also decreed that on contact the machine-gun should be deployed to the high ground or, if the ground was flat, to the right flank. This was also modified. In practice, most rifle sections in contact deployed their machine-guns a very short distance to a pre-determined flank where it was well positioned to bring immediate fire to bear to the front and, if necessary, to support the withdrawal of the forward scout. Again, Scott noted the difficulties of applying doctrine in the terrain of Vietnam. He observed that 'in many cases the thickness of the vegetation absolutely precludes any attempt at "gun to the high ground"'.[18] These modifications to doctrine were aimed at quickly producing a large volume of fire.

Writing of SAS patrol contacts Captain A W Freemantle observed that:

> 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' that occurs momentarily on contact: it's also good for morale.[19]

Freemantle's observations were equally applicable to infantry contacts. He continued:

> 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 area.[20]

A particular problem facing 1ATF patrols (both infantry and SAS) was that seeing an enemy soldier fleetingly at about 15 metres range, through the jungle, told one very little about the enemy's strength, location and intentions. The enemy soldier might be alone and therefore dealt with easily by a rifle section. But he might also be the forward scout of a platoon-strength patrol, a much more dangerous target and beyond the capability of a rifle section. Even worse, he could be a sentry for an occupied company-sized bunker system that is, as yet unseen, 10 metres on the patrol's flank. The enemy was highly skilled at camouflage and concealment and possessed a very high level of fire discipline. For example, in bunker system contacts the enemy soldier often held fire until 1ATF patrols had entered concealed fire lanes. These enemy techniques and skills, usually enhanced by thick, enveloping jungle, produced a high level of uncertainty about enemy strength and location. The effect of this on 1ATF patrols was to cause them to exercise caution and use high volumes of fire and observation of the target area, as Freemantle describes, before attempting to manoeuvre.

The enemy was highly skilled at camouflage and concealment and possessed a very high level of fire discipline.

The lessons Freemantle identified were also supported by others. While some infantry battalion COs criticised the apparent high expenditure of ammunition for a seemingly small number of enemy casualties,[21] many others recognised the value of 'volume of fire'. One early advocate of the 'volume of fire' approach was the CO of 7RAR on its first tour (1967–68), Lieutenant Colonel E H Smith. He wrote:

> In many contacts … the concept of one shot one kill has not been applicable as there has been no visible and identifiable target for the rifleman to fire at. In the majority of contacts it has been noted that area shooting rather than pinpoint shooting has been required. This necessitates a heavy volume of fire preferably from automatic weapons. In night ambushes it is rare for anyone to have a definite target although all members of the ambush must fire into the area of the killing ground. A rule of thumb for night

> ambushes is 200 rounds per MG and 4 mag[azine]s from every other weapon – *regardless of whether a target is identified.*[22]

So convinced of the efficacy of volume fire was the prolific 'lessons' author that he argued for a suite of small arms better able to deliver volume fire. According to McNeill and Ekins, Smith said the infantry

> needed the ability to saturate a small area with a heavy volume of fire from automatic weapons, and they needed to carry such portable firepower on their backs. [He] pointed to the inadequacies of many of the infantry weapons in use. The Australian soldier's standard weapon, the 7.62 mm SLR, needed an automatic-fire capability, a shorter barrel and a 30-round magazine to match the firepower of the enemy's AK47, especially for jungle contacts. The American M16 was lighter and easier to handle but its 5.56 mm round lacked the 'stopping power' of the Australian weapon.[23]

Another advocate of 'volume fire' was the CO of 3RAR (1971 tour), Lieutenant Colonel F P Scott. He wrote a lengthy 'lessons learned' paper covering numerous operational issues including marksmanship. Scott's comments are worth noting at some length:

> Without detracting from the need for better shooting … the concept of 'one shot one kill' and the swift, single, accurate, standing shot by the forward scout drilled into us all at [Jungle Training Centre, Canungra, now the Land Warfare Centre] and by training publications requires comment.
>
> Unfortunately it has little relevance to the reality of the battle field. Economy in the use of small arms ammunition seems a strange concept given the enormous cost in money, sweat, material and effort to gain contact with one enemy, particularly during this [latter] stage of the war. In training on mechanical ranges and the sneaker course we stress snap shooting: on the battle field, particularly in civil access areas the forward scout must run through his list of 'rules of engagement' and positively identify the enemy before firing a shot. It must be accepted that some enemy will escape because of this factor. Once the enemy is identified, the platoon must produce the maximum volume of accurate fire—often it will be at movement, or in the direction of flight. Again, there is a radical difference between a snap shot on a range and the reality of the battle field with the forward scout, three weeks on operation, standing slumped over with fatigue and the weight of his 90 lbs [40.8 kg] pack,

Many soldiers were quick to learn the value of 'volume fire' from the contacts they experienced.

> ammunition and water, bound by the rules of engagement, being confronted with a fleeting moving man at 50 metres. Some of the vigorous comments made in this area must be tempered by the hard reality of operations. Notwithstanding this, the importance of accurate shooting and continuous training in shooting … is hard to over-emphasize but the training must be relevant to the battle field.[24]

Many soldiers were quick to learn the value of 'volume fire' from the contacts they experienced. Some agreed that there was a need for a fully automatic SLR and illegally modified their own.[25] In the SAS conversion of SLRs to fire fully automatic was sanctioned and these weapons were sometimes fitted with forward 'pistol' grips and 30-round magazines as well. Those carrying the modified SLRs carried a larger ammunition load, sufficient to use the 'volume fire' technique.[26]

EVALUATION OF 1ATF SHOOTING PERFORMANCE

An accepted indicator of combat shooting performance is the ratio of shots fired per enemy casualty inflicted. But this ratio varies considerably according to the combat mission being undertaken. Accordingly, Table 4 shows the amount of ammunition fired per enemy casualty for the main combat tasks performed by 1ATF.

Table 4. Average shots fired by 1ATF infantry per enemy casualty by combat type and weapon type.[27]

Weapon	Combat type			
	Patrol encounter	Ambush (of enemy)	Bunker system attack	Security or defence of position
7.62mm GPMG M60	619	495	1310	761
5.56mm M16	232	319	679	307
7.62mm SLR[28]	187	222	517	174

Several points emerge from this table. First, the shots fired per casualty inflicted figures for 1ATF are substantially better than those claimed for some other armies. The most frequently quoted 'shots per casualty' ratio for the Vietnam War is the US Army's figure of 50,000 rounds of small arms ammunition per enemy casualty.[29] We are sceptical of this figure and suspect that it is a gross overestimate and does not reflect individual soldier marksmanship.[30] The 1ATF 'shots per casualty' figures provided in Table 4 are several orders of magnitude less than this US figure but they

are derived from shots fired by infantrymen in contact with the enemy and are an accurate reflection of 1ATF soldier marksmanship.

Another, and possibly the best basis for comparison with 1ATF marksmanship, is the standard of marksmanship achieved by British Commonwealth Forces in North Borneo during Confrontation. The context of these British Commonwealth contacts with Indonesian forces was, in many ways, similar to that of 1ATF in Vietnam. In this environment British Commonwealth security forces achieved a 'shots per casualty' ratio of about 750:1.[31] This had been regarded as far too high with the problem attributed to a range of causes, some of which were similar to those claimed to be causing low shooting standards, later, in Vietnam.[32]

It can be seen that in comparison with the figures for the US Army in Vietnam and Commonwealth Forces in North Borneo, the 1ATF figures shown in Table 4 represent remarkably effective shooting under the difficult combat conditions found in Vietnam.

Table 4 also shows that the three weapons vary considerably in terms of shots fired to achieve an enemy casualty. A generic 'shots per casualty' figure does not tell us the whole story about marksmanship in combat shooting. The role of the GPMG M60 was to lay down dominating fire to suppress the enemy and permit manoeuvre, which is why the table shows it expending large numbers of rounds to produce an enemy casualty. The M16 and the SLR on the other hand were more 'surgical' in the type of fire they produced requiring fewer rounds per enemy casualty. The M16, being capable of fully automatic fire, shows a slightly higher 'shots per casualty' ratio than the semi-automatic 7.62mm SLR. The quality of marksmanship, as measured by 'shots per casualty' ratio, therefore depends heavily on weapon type, capability and function in the fire fight. This also reminds us that when producing fire in contact, the section functions as a team. It is *because* the M60 lays down suppressive fire—at the cost of high ammunition expenditure for low casualties—that the M16 and SLR can achieve more surgical killing effect.

British Commonwealth security forces achieved a 'shots per casualty' ratio of about 750:1.

The third point to note about the table is that marksmanship as measured by 'shots per casualty' varies considerably according to the combat task being performed. It can be seen in Table 4 that while the average number of shots fired by the M60 to inflict a casualty is 495 for an ambush, it jumps dramatically to 1310 for an attack on a bunker system. These changes reflect the tactical advantage or disadvantage deriving from each combat task. The patrol encounter represents a convenient 'neutral' contact: neither side derives an advantage from having selected and prepared the ground. The ambush and security contact reveal the extent to which

the 'shots per casualty' ratio can be improved when the 1ATF patrol has selected and prepared the ground. The bunker system attack shows the disadvantage to 1ATF patrols in terms of the 'shots per casualty' ratio when the enemy selects and prepares the ground. The 'shots per casualty' ratio for bunker system attacks shows that the 1ATF patrol must fire three to four times more ammunition per casualty to overcome the enemy's defensive advantage.

The bunker system attack shows the disadvantage to 1ATF patrols in terms of the 'shots per casualty' ratio …

Marksmanship remains an important skill for a small percentage of contacts where a target is seen for sufficient time to take careful aim. It is also important for the first one or two seconds of a contact before potential targets have taken cover and disappeared from view. But in the complex terrain of Vietnam, combat shooting was mainly a contest of volume of fire. It was not primarily about highly skilled soldiers hitting observed targets with a few well-aimed shots. Instead it was about applying small arms fire to achieve an effect or series of effects. Those effects include establishing psychological dominance in the fire fight, forcing the enemy to reduce their fire output, forcing them to keep heads down while manoeuvre takes place, pinning them and preventing *their* manoeuvre, and preventing them from breaking contact and withdrawing. These effects are much harder to achieve when the enemy has chosen and prepared the ground as in a bunker system. Thus, larger volumes of ammunition must be expended to achieve them. Of course, achieving killing or wounding effect is desirable, but only a small portion of total shots fired should reasonably be expected to achieve this.

The 'shots per casualty' figures for the ambush seem to run counter to this argument since both the M16 and the SLR expend more rounds per casualty in ambush than they do in the 'neutral' patrol encounter. Why so? The answer to this question is twofold. First, many ambushes occurred at night, whereas all patrol encounters and bunker system attacks occurred during the day.[33] As one might expect, poor visibility at night tended to result in a higher 'shots per casualty' ratio. Second, most ambushes by both day and night were initiated by claymore mines.[34] These produced a cloud of dust and smoke that obscured any remaining targets in the killing ground leading, once again, to poor visibility and therefore a higher 'shots per casualty' ratio.

'One shot, one kill' was an ideal that could be approached but never practically achieved …

It is important to note that the statistical data presented in Table 4 shows *average* shots per casualty inflicted. 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 per cent of all 1ATF contacts, thirty shots or less resulted in an enemy casualty.[35] This is a low 'shots per casualty' figure and demonstrates that, under some conditions, 1ATF infantry were often capable of high marksmanship.

CONCLUSIONS

1ATF shooting performance was far better than many critics allowed. Despite very difficult conditions Australian infantry achieved a much lower 'shots per casualty' ratio than the US Army and a significant improvement on the British Commonwealth forces in North Borneo. 'One shot, one kill' was an ideal that could be approached but never practically achieved except in a few isolated cases. Most combat shooting was 'volume of fire' and was conducted by the rifle section as a team.

Though the techniques of 'one shot, one kill' comprised only a small portion of total combat shooting, they remained a critical component and soldiers needed thorough training in their skills. However, an equal, if not larger, training effort needed to be put into the skills of 'volume of fire' techniques—the effective engagement of the enemy when there are no visible targets. This form of shooting was also important and happened to comprise the bulk of all combat shooting yet received almost no attention in training.[36]

This research has established a 'shots per casualty' baseline using Vietnam War data to reveal patterns in the effectiveness of Australian combat shooting. It would be instructive to compare these with similar data drawn from current Australian operations in Afghanistan. Such a comparison might reveal the extent of improvement in soldier lethality and lead to better understanding of the way the combat environment affects soldier lethality. Ongoing monitoring of 'shots per casualty' could also provide Army with a tool to assess the standard of shooting and might help to identify any particular training needed to improve it.

This research also suggests some implications for military technology. It shows that under some circumstances, improving target acquisition systems may result in only a marginal improvement in soldier lethality. Greater benefits may be derived from developing improvements in the volume of fire output, reducing ammunition weight and through providing devices that might aid the coordination of fire within the team.

Finally, in training the infantry for combat shooting it will be important to gather accurate and detailed information about the context in which combat shooting takes place. From the moment troops are deployed into a combat zone they should begin the systematic collection and dissemination of information back to those training

to take their place in subsequent rotations. Perhaps a future family of small arms will assist this process by capturing electronically the date, time, location, number of rounds fired and sight picture every time the trigger is squeezed. Once analysed, this data might inform subsequent training and tactics leading to improved combat performance.

ENDNOTES

1 *Infantry Lessons from Vietnam*, annex A-1 (copy in the author's possession).
2 Major C F Thomson, 'A Company Commander's Impressions', *Australian Infantry*, Vol. xvii, No. 2, May 1971, pp. 29–35.
3 J M Church, DSO, *Second to None: 2RAR as the ANZAC Battalion in Vietnam 1970–71*, Army Doctrine Centre, Sydney, 1995, pp. 87–88. Also see Lieutenant Colonel R F Stuart, 'How to Hit the Barn Door', *Army Journal*, No. 313, June 1975, p. 15.
4 Major General Mike O'Brien (rtd), 'The Training of the Australian Army Units for Active Service in Vietnam: 7th Battalion, The Royal Australian Regiment' and Brigadier Noel Charlesworth (rtd), 'Training for Service in South Vietnam 1966–1967: 2nd Battalion, The Royal Australian Regiment' in Peter Dennis and Jeffrey Grey (eds.), *The Australian Army and the Vietnam War, 1962–1972*, Army History Unit, Department of Defence, Canberra, 2002, pp. 65–66.
5 The Australian Research Council and the Defence Science and Technology Organisation both provided funding to support the research for this article.
6 A 'contact' is defined as the engagement of an enemy force using direct fire weapons, usually small arms.
7 A T Ross built a database called the Vietnam Combat Database. It contains 4100 contacts which we estimate to be over 95 per cent of all 1ATF contacts in Vietnam. For each contact the database contains up to thirty 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, and other details. The data is derived from numerous Combat Operations After Action Reports held by the Australian War Memorial (AWM). The database is a research tool and is regularly upgraded with new information.
8 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).
9 This and all other tabulated data in this paper is derived from a database created by A T Ross called the Vietnam Contact Database (see note 7).
10 'Defence' implies resistance to an assault whereas many of the contacts in this category are minor clashes by sentries or clearing patrols etc., with enemy probes. Hence we use the term 'security contacts' to describe them.

11 By contrast, ranges of engagement in urban operations tend to be very short inside buildings but long outside buildings. See Bing West, *No True Glory: A Frontline Account of the Battle for Fallujah*, Bantam Dell, New York, 2005, pp. 144–46, 174, where West describes small arms fire at ranges of 500 metres or more.

12 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 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.

13 See, for example, AWM95, item 3/5/43, Commander's Diary, 105 Fd Bty RAA. FCC Arty Sig 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 to adjust fire onto the target.

14 Lieutenant Colonels J M Church and R F Stuart could be counted as proponents of this school (see fn. 4), but other examples of this school of thought can be seen at *Infantry Lessons from Vietnam*, p. A-2.

15 Among the proponents of this school was Lieutenant Colonel E H Smith, CO of 7RAR during its first tour in 1967–68.

16 The problems of infantry marksmanship in a jungle environment were raised during both the Malayan Emergency and Confrontation. During Confrontation in particular, a large training effort was made to improve marksmanship through range practices. Soldiers were also exhorted by senior commanders to strive for 'one shot, one kill'. But both campaigns lacked the operational scale and tempo of Vietnam (which tended to emphasise the importance of infantry combat lethality) and the ready availability of helicopter ammunition re-supply in that theatre.

17 AWM115, item 56, Lieutenant Colonel F P Scott, CO 3RAR, 'Lessons Learnt by 3RAR in the 1971 Vietnam Tour', Report dated 29 December 1971 (3RAR Woodside, 569/71/3(A)).

18 Ibid.

19 Captain A W Freemantle, 'Patrol Lessons in Vietnam', *Australian Army Journal: A Periodical Review of Military Literature*, No. 297, February 1974, pp. 48–49.

20 Ibid., p. 49.

21 See for example Directorate of Infantry, *Infantry Lessons from Vietnam*, 1972, pp. A-1–A-2.

22 8RAR R798/1/8, 'Lessons Learnt in South Vietnam', (précis prepared by 7RAR), Enclosure 4: Infantry weapons (in the possession of the authors), 14 August 1969, emphasis added.

23 Lieutenant Colonel E H Smith, CO 7RAR, cited in Ian McNeill and Ashley Ekins, *On the Offensive: The Australian Army in the Vietnam War 1967–1968*, Allen & Unwin, Sydney, 2003, p. 416.

24 AWM115, item 56, Scott, 'Lessons Learnt by 3RAR in the 1971 Vietnam Tour', pp. 17–18.
25 The current infantry rifle, the Steyr, is, of course, capable of fully automatic fire.
26 Freemantle, 'Patrol Lessons', p. 49.
27 This and the following tables in this article refer to averages. However, averages can be misleading. 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.
28 The formal title of this weapon was Rifle Equipment 7.62mm L1A1. It was a semi-automatic or 'self-loading' rifle, hence SLR.
29 This figure is cited in numerous publications including Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society*, Little Brown, New York, 1995 where it is cited several times. However, the most authoritative source appears to be Stockholm International Peace Research Institute, *Anti-Personnel Weapons*, London, 1978, p. 91, which, citing studies by the Office of Operations Research at Johns Hopkins University, states that '10,000–50,000 bullets are fired for every man hit'. This figure was made public shortly after the end of the Vietnam War and we suspect that it helped to promote the impression of poor marksmanship in Vietnam by the US Army and its allies. It should be noted that some US sources put the shots to kills ratio for the US Army as high as 100,000:1. See W Scott Thompson and Donaldson D Frizzell, *The Lessons of Vietnam*, Macdonald and Jane's, London, 1977, p. 174.
30 Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society*, p. 334, n. 2, attributes this high figure to the widespread use of automatic weapons, various tactical techniques favoured by the US Army such as 'reconnaissance by fire' and other factors not connected to infantry marksmanship.
31 Peter Dennis and Jeffrey Grey, *Emergency and Confrontation: Australian Military Operations in Malaya and Borneo 1950–1966*, Allen & Unwin, St Leonards, 1996, pp. 261–62. Grey cites 17th Division training directive No. 8, n.d., held in his possession.
32 Ibid.
33 The Vietnam Combat Database records a total of 980 identified ambushes of which 414 occurred 'at night'.
34 Analysis of the Vietnam Combat Database shows that for the claymore mine, when used in ambushes, the 'detonations' per casualties ratio was 2.9:1. The Vietnam Combat Database also reveals much of interest about the lethality of other fragmentation weapons and their capacity, relative to small arms, to cause casualties, but these insights do not belong in this article.
35 Figures derived from analysis of the Vietnam Combat Database.
36 Infantry Training Vol. 1, Infantry Platoon Weapons, Pamphlet No. 12, *Theory of Small Arms Fire and Training the Battle Shot (All Arms)*, 1967, Army Headquarters, Canberra, 1968. This pamphlet referred only briefly to the conduct of rifle section firing practice. The overwhelming thrust of the training it described was based on the individual attaining various performance objectives. See p. 19.

THE AUTHORS

Dr Bob Hall is a former infantryman and Vietnam veteran. He is the author of *Combat Battalion: The Eighth Battalion in Vietnam*. He is now a Queen Elizabeth II Fellow at UNSW@ADFA.

Dr Andrew Ross is a former Central Studies Establishment (DSTO) analyst and is the author of *Armed and Ready: The Industrial Development and Defence of Australia 1900–1945*. He is currently a Research Associate at UNSW@ADFA.

Both are working on Australian Research Council funded studies of the Australian Army's combat effectiveness in the Vietnam War and the relationship between morale, discipline and combat performance.