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“CRACKERS’ THE HISTORY OF  
THE DETACHMENT 131 DIVISIONAL LOCATING BATTERY RAA  
1N SOUTH VIETNAM 1966 – 1971

## INTRODUCTION

A military formation on operation service included a number of specialist units and elements on its Order of Battle, which are designed to provide some sort of specialist service to the headquarters and units of that formation. These are not the logistics units or such distinct bodies as the light aid detachments and workshops which have roles and specific tasks that allow them to operate as discrete entities within a unit or the formation. Rather it is those units which service other units and elements in small groups that are referred to. By the nature of their duties the, rarely, if ever, congregate together, spending most of their service on any number of separate and specific missions throughout the area of operations, often separated from the rest of their kind.

There is something unique about the way the officers, non-commissioned officers and soldiers of such elements operate – they are not combat soldiers in the sense that they routinely engage in close combat with the enemy, nor are they combat support troops who deal heavy blows to the enemy and must, in return, anticipate that the enemy might strike back at them with counter battery or anti-armour fire. They might be very competent and provide an essential and appreciated service, but they might also, by virtue of the type of operations and the theatre of war, be redundant at times - additional mouths to feed whose Places in the Order of Battle might be better used with additional infantry or gun numbers - and for their pains they will sometimes find themselves looked down upon or even resented, by others who perceive that they lead more dangerous and useful lives. Nor are they ever likely to gain the ultimate rewards of individual decorations and celebrity status, or be part of organizations that are awarded unit citations and freedoms of cities.

Never-the-less these soldiers might still get in the way of a bullet during a vehicle ambush, tread on a mine or be in the killing zone of a stray mortar round, and they are as susceptible to the hazards and diseases of whatever environment they are serving in as the rest of the troops operating there. Yet any glory they receive is merely “reflected glory” they know it, and so do those who create the light and heat of that glory.

Few histories are written about such units and the men who serve in them, for there are usually no great battles or sequences of gripping events around which a 'ripping yarn' can be spun and their story, (if anyone deems it necessary to record it), will devolve to being an adjunct of, (or even just a footnote to), someone else's adventure. One such unit on the Order of Battle of the Australian Army is the 131 Divisional Locating Battery, the Royal Australian Artillery (131 Div Loc Sty RAA), which exists to provide support to field and medium artillery units operating as part of a formation in the field. A detachment of 131 Div Loc Sty served with the 1st` Australian Task Force' (1 ATF) in South Vietnam from April 1966 to July 1971, the only occasion on which any RAA sub unit, apart

from field and air defence batteries. has seen active service overseas in the 45 years between the end of the Second World War and 1990.

The history of that detachment's tour of duty in South Vietnam is related here. Yet it cannot be told out of context and without some sort of technical explanations. The first chapter gives a brief summary of the war and the operations of other units as the affected, and were affected by, the activities of the Det 131 Div Loc Bty. The second chapter describes, in layman's language what the field artillery does and how it does it, then integrates the responsibilities and activities of the div loc bty into that account. Chapter Three deals with the Detachment as a sub-unit, discussing the parameters within which it had to operate against the background of the changed forms and styles of task force operations and the developments of equipments etc. Subsequent chapters describe operations of each section of the detachment, discussing its achievements and failures, and assessing how useful they were perceived to be by those who served in them used their services or merely observed them operating.

Only one of the detachment's soldiers died in combat operations and only (?) others received battle-related injuries. One soldier died as a result of a road accident. None of the (number) of officers and men who served with the detachment received decorations for bravery or service - not even one solitary mentioned-in-dispatches. Some of those who served in the detachment felt frustration at this, for it was really only a quirk of fate that they served in the detachment, and not on the gun line or as a member of forward observer party. Their classmates from Portsea, or friends in the same national service intake experienced the pain and glory of those jobs, for which they were both envied and pitied. For this reason alone, service in the detachment for some was a bitter-sweet experience. Yet those of the detachment who have read other histories of the Vietnam War, or histories of other modern wars, realize that many other ex-servicemen continually ponder the same timeless question. Many of them will harbour doubts about how they might have performed in the sort of such adversity and dangers as their friends and colleagues faced at FSB Coral and elsewhere.

The story of the Det 131 Div Loc Bty is not, therefore, an heroic epic, and it does, indeed, contain many moments of pathos. Yet it remains a story of honourable soldiers who did what they were called upon to do and did it as well as circumstances allowed them. Their story might help non-military readers to appreciate that there is more to land warfare than infantry attacks, tank fights and artillery duels. On reading it some former members of the detachment might come to fully appreciate what they and their comrades were doing, or were supposed to be doing, for the first time - researching it gave the author a more thorough understanding of the war and the locators' involvement in it than he had had before! If this book does at least this then it will have achieved far more than a narrow record of the 'we went' and 'we dun' school of military history and unit memoire.

THE 1ST AUSTRALIAN TASK FORCE

To fully appreciate the activities of the Det, 131 Div Loc Bty during the Vietnam War it is necessary to view them against the background of the war as a whole, the Australian involvement in that war, and the activities of 1ATF and its units. Probably the best general history of the activities of 1ATF is Frank Frost's book Australia's War in Vietnam, (1987), which gives a background to the war itself, and the political events that led up to Australia's involvement in it. Its emphasis is on IATF, not the Australian Army Training Team, Vietnam (AATTV), the Australian Army Assistance Group, Vietnam (AAAGV), or the first tour of duty of the First Battalion The Royal Australian Regiment (1RAR), though they all receive mention. This chapter extracts only as much detail from Frost's book (and some other sources) as are required for the reader to understand the activities of the task force as they affected the Det 131 Div Loc Bty.

Frost calls Australia's involvement in the Vietnam War, the most substantial commitment of Australia's military forces overseas since the 1940s. (Frost 1987, 1) A total of 46,852 troops served there, of whom 17,424 were national servicemen. In all 496 died and 2398 of the total force were wounded and the force's peak strength was about 8300 men and women. The all up monetary cost has been variously estimated as between \$218.4m and \$500m. (Frost 1987, 1) The main body of this commitment was 1ATF, based in Phuoc Tuy province from May 1966 to November 1971, a total period of five and a half years. It must be remembered though that 'Vietnam was not the only matter of defence priority to, the Australian Government in the early and mid-1<sup>9</sup>60s, for Australia was 'continuing to be predominantly concerned at the security implications arising from Indonesia's confrontation with Malaysia. On 10th November 1964 it was announced that conscription for military service would be introduced and an army of 28,000 men was planned for by 1967 (Frost 1987, 18)

The involvement of Australian troops in Vietnam commenced with the arrival of the first members of AATTV in 1962, and their deployment for service with US Army advisory groups throughout the Country. Between August 1965 and October 1967 Australian involvement was increased in four increments. 1RAR was committed to serve with the US Army 173 Airborne Brigade (Separate) in May 1965, and supplementary troops built this up to a battalion group in September 1965. Between April and June 1966 the task force built up to its initial strength of about 4500 men, and 1st Australian Logistics Support Group (1ALSG) at Vung Tau to about 1400 men. After the November 1966 federal election, the size of the force in Vietnam was increased by 900 servicemen, including RAN and RAAF, and by then 40% of the total force were national servicemen. Finally, in October 1967, the task force received a third infantry battalion. (Frost 1987, 21) The wind-down commenced in November 1970 when 8RAR was not replaced on completion of its tour of duty, returning the task force to a two battalion formation. The task force was finally withdrawn from Nui Dat between October and December 1971, and the final 1ALSG elements withdrew on 5 March 1972. The Australian Army Assistance Group Vietnam (AAAGV) was formed at Van Kiep near Baria in Phuoc Tuy on 6 March 1972, and this, Australia's last military unit serving in Vietnam, was withdrawn in December 1972.

The First Australian Task Force was based in Phuoc Tuy Province though it did carry out some major operations elsewhere, especially in the period January 1968 to May 1969. Its experiences were 'profoundly affected by the nature of the province..- and by the organizations and forces with whom it was allied, the South Vietnamese Government and the US Military Assistance Command, and the National Liberation Front, with whom it was in conflict'. (Frost 1987, 29) Phuoc Tuy Province is roughly rectangular in shape, measuring about 30.m north to south and a little over 60km\* west to east, approximately the area covered by the main part of Port Philip Bay, or

greater Sydney between Manly and Penrith and Hornsby and Sutherland. Highway 15, the main land route between Saigon and Vung Tau, runs through the western part of Phuoc Tuy.. The mangrove swamps in the South West, the Rung Sat, and three main groups of hills dominate the topography of Phuoc Tuy. These hills, which all provided significant fortresses and hides for NLF forces, are the Nui May Tao Hills in the North East, the Long Hai Hills to the South of Dat Do and Baria, and the two groups of hills to the North West of Baria, the Nui Thi Vai and Nui Toc Tien Hills, and the Nui Dinh Hills. The large port town of Vung Tau, the province capital Baria and most of the villages and hamlets lie in the southern and western parts of the province, which Frost sums up as follows.

Geographically, the province was very well suited to the support of revolutionary guerilla forces. (It) provided...a combination of potential bases of popular support in the villages and a number of areas in the jungle and in the nearby swamps and mountains where military bases could be established and maintained.

(Frost 1987, 30)

These physical features had been put to good use during the First Indochina War (1945-54) by the Viet Minh who had gained strong popular support against the French. Baria had been occupied briefly by the Japanese in 1945, followed by Indian troops of the British force which intervened to support the French during 1945-6. Towards the end of 1945, in response to this new invasion, the Viet Minh started to develop military units in the Phuoc Tuy – Bien Hoa area. During the First Indochina War the Viet Minh were able to confine the French to Baria, Long Dien, Dat Do and Phuoc Hai, preventing all but large French forces from moving East of Long Dien. (Frost 1987, 35)

It is probable that by 1954 the Viet Minh had control of almost all the villages of the province, outside of ... Baria. Only large, well-armed groups of French could travel in safety.

(Frost 1987, 36)

Phuoc Tuy therefore was an area of strong popular support for the Viet Minh which built up an extensive experience of anti-Colonial guerilla warfare between 1945 and 1954... the legacy of this struggle in the memories of the people of Phuoc Tuy was undoubtedly integral to the NLF's (National Liberation Front] organizational potential and political appeal (later).

(Frost 1987, 37)

The NLF was essentially a continuation and reactivation of the Viet Minh anti-colonial movement; it began organizing in earnest within six years of the end of the war against the French. The Australian Task Force... was thus entering a complex political environment and a difficult geographical environment in which the NLF' had a strong and sophisticated political and military organization.

(Frost 1987, 52)

A further factor worthy of note about the political situation in Phuoc Tuy was the presence of several thousand North Vietnamese refugees, mainly Catholics, who entered the province after the partitioning of Vietnam in 1954 and who settled mainly in Binh Gia, in the mid-north, and the fishing village of Phuoc Tinh, to the west of the Long Hai Hills.

The military and political situation that had developed in Phuoc Tuy by the time of the arrival of 1ATF was the end result of a number of circumstances and events. The NLF had mobilized in July 1964 and, with the formation of regimental sized main force units, the level of military activity throughout South Vietnam increased. In December 1964 the NLF 9th Division attacked the Catholic village of Binh Gia and in a four day battle effectively

destroyed two battalions of the Army of the Republic of Vietnam (RVN) , the first time the NLF had conducted conventional warfare in sustained combat in the open. (Frost 1987, 38)

By early 1966, the NLF could call on 5000 troops of the Fifth Division (274 275 Regts) plus D445 Regiment, five additional local guerilla companies and hundreds of village guerillas, for operations in Phuoc Tuy. Route 15 was cut and the RVN controlled only Baria and its environs and outposts of the district capital. The RVN attempts to contest the NLF presence were minimal and they had little hope of success. By the time the task force arrived in May 1966, the NLF had effectively won the year in Phuoc Tuy.

(Frost 1987, 38)

In 1966 the NLF was relatively free to operate its political organization virtually anywhere it liked in Phuoc Tuy since ... the RVN's situation then was extremely weak. In early 1966 the NLF's Provincial headquarters were located in the fortified villages of Long Phuoc and Long Tan ..

(Frost 1987, 48)

After 1RAR and 173 Airborne Bde had razed Lone Tan and Long Phuoc during Operation HARDIHOOD in May 1966, the NLF moved their headquarters and other facilities to the May Tao Hills.

There were three types of NLF provincial or local units, the lowest level of which were the village guerilla, the military arm of the village political organizations. The next level was that of the district companies, affiliated with the district organizations. The Long Dat Company had its bases in the Long Hai Hills, and the Chau Duc Company, which drew most of its recruits from Hoa Long, often operated out of the Dinh Hi11s, as did the Baria and Vung Tau military organizations. There was also a company based on Xuyen Moc. (Frost 1987 52) In February 1965 the D445 Provincial Mobile Battalion was formed, with four companies. It was locally recruited, especially from Dat Do and had several bases in the jungle to the East and North East of Phuoc Tuy Province. (Frost 1987, 49). The D445 Battalion also operated in Phuoc Tuy between 1967 and 1970. This was made up of elements of the D445 Battalion and North Vietnamese soldiers.

In 1966, the NLF had a division headquarters in the May Tao Mountains which controlled two regiments, 274 and 275. These regiments operated mainly in the area of what was the NLF Military Region 1 and (when they operated 'in Phuoc Tuy] it was mainly in the area of the May Tao Mountains or in the Hat Dich, an area of heavy vegetation on the border of Phuoc' Tuy, Long Khanh and Bien Hoa ....a former area of Viet Minh operations.

In 1967; the 275 Regiment was removed from the vicinity of Phuoc Tuy but another main force unit, the 33<sup>rd</sup> Regiment of the People's Army at Vietnam (PAVN) appeared in 1969 and was to operate in Phuoc Tuy on several occasions. This unit. ..was normally based in Long Khan Province. ...The Mao Tao Mountains were ... used as a supply base for main force units (with) workshops and a large hospital.

(Frost 1987 49)

If Frost's is correct in his assessment of the situation in Phuoc Tuy province at the time of the deployment of 1ATF, then it must be concluded that the NLF were better prepared for it, both militarily and politically, than the Australian 'invaders'. Put simply, the Australian force seems to have been installed in south Vietnam without a clearly defined aim or understanding of what it was expected to do, or how it would fit into the greater scheme of the allies prosecution of the of the war against the NLF.

While the [Australian] army had a relatively well-defined doctrine on counter revolutionary warfare, the pursuit of such concepts in South Vietnam faced some difficult organizational problems. Given the political and military strength of the NLF in Phuoc Tuy in 1966, the task force was obviously entering a difficult and dangerous environment. Its problems were to be compounded by the fact that the Australian government appeared to have assigned the task force to the Phuoc Tuy area without sufficient consideration to the exact operational role which it would fulfil and with sufficient attention to the question of how close and effective a cooperation would be achieved, particularly with the RVN authorities.

(Frost 1987, 54)

Events have shown that the first major activity of the task force was to attempt to secure its assigned area and dominate it. It did this by seeking to locate, engage and weaken the various units of the PAVN and NLF, both inside Phuoc Tuy Province and, from January 1968 to May 1969, in other provinces. (Frost 1987, 59) Frost has identified four phases of this involvement: the task forces military operations against the NLF and the PAVN; its policies and activities towards the political structure of the NLF, (ie its organizations and cadres); the relationships with and policies towards the RVN forces in the local area; and its civic action programme. There were three distinct phases of operations: from May 1966 to December 1967 in Phuoc Tuy; from January 1968 to May 1969, the period of the two Tet Offensives and their aftermaths, when many operations were carried out outside of Phuoc Tuy; and from May 1969 to the end of 1971, when the task force operated mainly in Phuoc Tuy again. (Frost 1987, viii)

#### The First phase: May 1965 to December 1967

The establishment of the 1ATF base at Nui Dot constituted:

the first time since the Second World War that Australian forces had had to position in an area containing large formations of enemy, who could attack from any direction at any time or harrass the supply line from the coast. (Frost 1987, 88)

An estimated 7000 enemy troops faced the task force in the province and this threat made the security of the base the first and absolute priority, which mean that few resources could be allocated to offensive operations. Frost comments on the dangers resulting from limited intelligence during the early period of the build up of the base, which demanded a cautious approach to operations. Apparently the US Army saw the task force as a lucrative target for the NLF. The troops arrived with the onset of the monsoons and the whole area became a sea of mud as the task force set up its defensive, operational and administrative machinery. Particular problems were caused by the lack of sufficient vehicles, machine guns and communications equipment. (Frost 1987, 89) At this time it was felt that two main area of operations had to be carried out, firstly against the NLF local units and their cadres, and secondly against NLF and/or PAVN main force units. For a number of reasons IATF, as constituted in 1966, did not seem adequately equipped to carry out either of these roles without a great deal of difficulty and danger. (Frost 1987, 66) In short:

the task force entered Phuoc Tuy with a complex set of allied relationships and with an operational concept and role which had not been sufficiently delineated and defined.

(Frost 1987, 71)

The most dramatic and memorable single event of the first phase was the Battle of Long Tan, on 18th August 1966. This not only showed the dangers that awaited the task force at that time, but ably demonstrated how the Australian troops would go about dealing with the NLF and the PAVN when they met them in open combat.

The battle [of Long Tan] had illustrated the potential dangers faced by the task force at Nui Dat. A NLF force of at least battalion size had appeared undetected 5000 metres from the task force base and fought an intensive battle despite heavy artillery fire. The battle also illuminated the devastating effects of advanced artillery and mobile weapons platforms against a force with relatively much weaker artillery and relying entirely on mobility by foot. The relatively limited capacities of the Australian force were underlined by the fact that in the subsequent four-day operation an Australian battalion failed to locate the fleeing NLF/PAVN forces.

(Frost 1987, 90-1)

The events of the battle itself, and the critical contribution of the artillery, are well known and need not be related here. (See Lex McAuley's [The Battle of Long Tan](#), for a good general account of the incident). Frost comments on two other NLF attempts to attack defended positions in Phuoc Tuy during the following year. Two fortified positions on the Dat Do - Long Hai minefield, the RVN posts at Hoi My and Lo Com, came under attack in about February 1967. They were fought off with the help of Australian and US forces, at great loss to the enemy, but again no follow up of the fleeing enemy was possible. However these actions were seen as marking the end of the threat to the main population and resources area of Phuoc Tuy. (Frost 1987, 92-3) During 1967 the task force, both by itself and with assistance from US forces, made determined efforts to seek out and deal with NLF bases. Operation PADDINGTON was conducted in the Xuyon Moc area during July 1967, Operation AINSLIE in September in the "Slope 30" area NE of Nui Dat, and Operation SANTA FE in October-November in the May Tao Hills. Such operations as these caused disruptions and losses to the NLF bases, but did not knock them out or stop them from being used again after the allied troops had left those areas. (Frost 1987, 91-2) The large village of Dat Do, the base area for both D445 and 275 regiments, was a focus of operations up to 1970. Attempts were made in this period to reduce the flow of supplies from the Dat Do - Phuoc Hai region to the South East. One unfortunate result of this policy was the creation of the Dat Do - Phuoc Hai minefield, laid in early 1967 and eventually removed by the RAE in May 1970. Frost refers to these operations as the implementation of Australian counter-revolutionary warfare concepts. (Frost 1987, 93)

Despite the dangers and problems of the early days, 1ATF was seen, by the end of 1967, to have fought, 'an appropriate and successful anti-NLF campaign...', with many of the population by then living under government control. (Frost 1987, 85-6) . Summing up the period, Frost says ;

The task force [in 1966-67] did concentrate on operations in Phuoc Tuy [conducting] a large number of operations against NLF main force and local force units and their base areas and also attempted to restrict NLF activity at the village level, particularly by attempting to deny the NLF access to resources by trying to assist the RVN to locate and capture the NLF's cadres. The task force did appear to have considerable success in restricting the activities of some of the NLF's armed units ... [but was] less successful in restricting NLF access to supplies, or in capturing the NLF cadres...

The Second Phase: January :1968 to May 1969

In this phase the task force was involved in a different pattern of operations, many of them conducted outside of Phuoc Tuy Province. They fall into three stages: the 1968 Tet Offensive and subsequent operations between January and March; the NFL's May 1968 offensive; and the 1969 Tet activities.

Operation COBURG, conducted from 24 January to 1 March 1968, saw elements of the task force operating in Bien Hoa, attempting to deny the enemy areas from which they could launch rocket attacks on the US bases at Bien Hoa and Long Binh to the west. Fire Support and Patrol Base (FSPS) ANDERSON, established astride an enemy line of communication, fought off three attempts to remove it during February 1968, the first time an Australian FSB had been subject to ground assault in South Vietnam. (Frost 1987, 108-9) At about the same time, in late January and early February, NLF troops (were?) attacked and briefly occupied Baria and Long Dien. They withdrew after spending six days fighting RVN troops assistance by Australian elements they. (Frost 1987 111)

The second stage of this phase, the NLF May 1968 offensive, was notable for the actions in AO SURFERS in Bien Hoa Province, including the assaults on FSPBs CORAL and BALMORAL in the period May to June 1968. These actions, like the Battle of Long Tan, have been dealt with at length elsewhere and are not discussed further here. (See Lex McAuley, The Battle for Coral, 1988)

During the third stage of the second phase, from January to April 1967, elements of the task force were again out of Phuoc Tuy on operations in Bien Hoa, though this time the FSBs did not come under attack. During the same time frame Operations GOODWOOD and FEDERAL were conducted against NLF bases in the May Tao and Hat Ditch areas.

(Frost 1987, 110)

The Third Phase: May 1969 to November 1971

From May 1969 the task force again concentrated its efforts in Phuoc Tuy Province, directing its operations mainly against the district NLF units and the local province units. Operations for some of the period concentrated on populated areas, in an attempt to restrict the local NLF cadres soldiers and supporters from keeping in touch with the villages and hamlets. (Frost 1987, 1119) This phase can be divided into two distinct stages, the first from May 1969 to November 1970, when the task force operated with three battalions, and from December 1970 to November 1971, when the task force reverted to its original infantry strength of only two battalions. In the first stage the three battalion task force made a special effort to deny the NLF of its support from the villages, but its primary effort was directed towards the provincial NLF forces. During the second stage, when "Vietnamization" of the war was being attempted, and the task force had only two battalions to operate with, efforts concentrated on attempting to contain the increased PAVN and NLF activities.

(Frost 1987, 119)

During the first stage of this phase, May to September 1969, emphasis was given to operations in the

Dat Do area, to restrict NLF access to their support areas. There were also operations against bases in the Dinh Hills and NLF and PAVN forces in the North of the province. In early June a pitched battle took place in Binh Ba between D440 Battalion and 33 Regiment, and 5 RAR and RVN elements. (Frost 1987, 120-2). Between September 1969 and April 1970, positive attempts were made to eliminate D440 and D445 Battalions, with assaults on their bases in the May Toa and Long Hai Hills. NLF gardens were also destroyed in the Xuyon Moc area in September 1969. (Frost 1987, 130-4) Finally, between April and November 1970, the task force redirected its attention from the main force units to the local NLF, attempting to deny them freedom of movement, especially into Hoa Long and Dat Do. This period was also marked by increased cooperation with RVN forces and the formation of the Military Advisory and Training Teams (MAT Teams). (Frost 1987, 130-140)

### The Results Of It All

The situation in Phuoc Tuy was certainly very different [in 1971] to what it had been in 1966, reflecting changes in Vietnam overall. The intensity of the conflict had declined markedly, the NLF mobilized fewer activists and supporters and security for the RVN seemed to have improved substantially. Commerce in the province had expanded considerably, aided by the road construction programme of the task force the villages of the South coast of the province ... (could send their fish to Saigon). However, while the intensity of conflict had subsided the NLF and PAVN main force units now did not operate extensively in Phuoc Tuy, the local NLF still retained some strength and influence ... the NLF was still able to recruit new members ... and the armed units themselves continued to exist in and operate from their base areas.

(Frost 1987, 158)

What had, ultimately, been achieved by IATF? Government control of the area declined in Phuoc Tuy after the departure of the task force. Frost quotes an unnamed Australian officer, who was in the province both in 1966 and 1972 as saying, 'it was for all the world to see as it had been in 1966 at the very beginning ... as if we had never really been there'. (Frost 1987, 162)

In May 1972 Route 15 between Saigon and Vung Tau was cut again, and at about the same time land access to Xuyen Moc and Duc Thanh was denied. On 24th May 1972, Dat Do and Hoa Long were occupied after a nine day battle between the 33 PAVN Regiment and RVN troops supported by US air power. In the final analysis;

the essential structure of the NLF village, district and provincial organizations had in the period 1969-72 survived the presence of the Australian Task Force and had survived the attempts of the RVN to locate and destroy it.

(Frost 1987, 159)

This, then, is the background against which the story of the Royal Australian Artillery in general, and the Det 131 Div Loc Bty in particular, must be told. Subsequent chapters of this book will deal with the activities of the detachment in general, then with each of its sections, describing how its members operated and carried out their duties in their particular specialist fields. The next chapter, though, first deals with the technical and tactical operations of the artillery, in simple, layman's terms.



It is worth spending a little time and space in explaining, briefly and in layman's terms, how the field artillery operated in Vietnam and the technical requirements that were fulfilled by the Det 131 Div Loc Bty in support of the other artillery units. 1 ATF was supported by a field regiment, which had an Australian headquarters and headquarters battery, two Australian field batteries and one New Zealand field battery. The Regimental Headquarters, consisting of the commanding officer (CO) and his staff, was co located with the Task Force commander and his staff, providing them with artillery advice and fire support coordination. The headquarters battery consisted of administration and stores elements, a signals troop and a survey section. Each gun battery consisted of six towed 105mm howitzers, which could fire a 33lb shell out to a range of 11 kms. Each gun battery would normally be placed in 'direct support' of an infantry battalion, which meant that it provided direct liaison and communications between it and the battery's guns. The battery commander (BC) and his staff, who would operate at battalion headquarters, and forward observer (FO) parties operating at company headquarters, provided artillery advice and fire support coordination to their respective levels of infantry commanders. If a battalion needed the fire support of more than one battery, then this would be coordinated by the adjutant in the field regiment command post. A battery could be split into two sections of three guns each for a short period of time. Fire from the field regiment could be applied, therefore, in any number of combinations of guns from three to 18. In addition to the field regiment's 105mm howitzers, a US army medium battery was attached to the task force. This was equipped with six 155mm self propelled howitzers which could fire a \_\_\_lb round up to \_\_\_km. The medium battery provided extra weight and depth of fire and gave the priority of its effort to 1 ATF. There was also a battery of US Army heavy guns at NUI DAT. It had two 8inch self propelled guns and two 175mm self-propelled howitzers, and was part of the resources of II Field Force Vietnam (11FFV). This battery was not at priority call to the task force, but could be made available to it and was integrated into its fire planning for specific operations.

The availability of field, medium and heavy artillery resources to a task force or brigade on independent operations is quite typical. Employed in support of the infantry and armour combat forces of the task force and to helping in the defence of all task force resources, it was subject to two types of control, TACTICAL and TECHNICAL.

### Tactical Control

The three field and one medium batteries 'belonged' to the task force commander, ie he had the ultimate say on how they were to be employed tactically. When exercising this right the task force commander might decide to send a battalion out on an operation and send two field batteries with it, the battalion's own, "direct support" battery, and another one "in support". After the operation that tactical grouping of artillery resources would be changed, to fulfill the new operational requirement. Guns might also be placed on "priority call" for a particular operation or purpose, which meant that if called for by whoever had them at priority call, they stopped what they were doing and redirected their fire in response to that call, and whoever had been using them had to make do without those guns. An example relevant to this history concerns the Task Force Artillery Intelligence Officer (TFAIO), who was responsible for directing fire onto enemy mortars that were firing at friendly troops. He might have been allocated, say, a section (three guns) of the medium battery for this purpose, so that suppression fire could be brought down immediately on any enemy mortars detected firing in the area of operations, without having to spend valuable response time in seeking permission to use them.

TACTICAL control of the artillery in the task force area was affected by the Artillery Tactical Headquarters (ARTY TAC) which was located on one side of the task force tactical headquarters. Arty Tac could make

requests for additional fire support resources, eg, air strikes, naval gunfire, in-range weapons of adjacent formations and higher (divisional and corps) artillery resources. It would then coordinate the tactical application of those additional resources, Co located with Arty Tac and directly supporting its work was the Task Force Artillery intelligence Office (ARTY INT), an element of the Det 131 Div Loc Bty. The duties of this element are very relevant to this history and they will be described in some detail later.

### Technical Control

TECHNICAL control, put very simply, is the orders and calculations necessary to get rounds from the guns onto the targets. To give a simplified sequence of events, a forward observer (FO) identifies a target and decides to fire a battery of guns at it. He radios the battery command post, giving the grid reference of the target and instructions on the type of ammunition required, the number of rounds required and other technical and control requirements. The battery command post staff calculate the range and grid bearing to the target from the battery position and give each gun a range and direction setting. Then guns are then fired on order of the command post when ready, or as ordered by the FO.

The basis of the calculations needed to technically control the fire of the guns is essentially based on plane trigonometry. The grid reference of the battery is known to six figures, (say, GR 381 712) and the FO estimates, from his map, that the target is at GR 395 789. (The last figure of each three figure group is the easting or northing to the nearest one hundred metres). The difference in eastings, therefore, is  $395-341=44$ , ie 4,400 metres. The difference in northings is  $789-732=47$ , ie 4,700 metres. These two distances form the smaller sides of a right angled triangle, the hypotenuse of which is the range to the target. The grid bearing is easily deduced from the calculations of the interior angles of the triangle. If, as is likely, there is a difference in height between the guns and the target, then another right angled triangle calculation will produce the 'slope distance' between the two points. The small angle of this triangle will also give a correction to the vertical angle at which the gun barrels must be elevated to achieve the range to the target. These calculations are not done direct as 'sums' but with a combination of graphs, firing tables, computers and step-by-step entries on specially designed forms. (The lay reader will by now have realized that it helps if the professional artilleryman has a mathematical bent).

After these (and other more sophisticated) calculations have been made, the technical orders are given to each gun by the battery command post and the guns fired. For a number of reasons it is most unlikely that the target will be hit by the first rounds fired. The grid references of both the target and the gun position may be incorrect, and climatic conditions may affect the path followed by the rounds, (eg, a wind from one side will blow the rounds off their designated course during the sixty seconds or more that they could be in the air). In addition, gun barrels might be worn, which affects the speed at which the rounds leaves them (the muzzle velocity), resulting in a lesser range being achieved than that planned for. To overcome these problems it usual for one gun to 'range-in' or 'adjust' fire onto the target, the other guns then tiring on the same data when the first one has hit the target area. This is a cumbersome process that can be reduced (or even done away with altogether under ideal conditions) if: the target can be located as precisely as possible, a point at the centre of the gun position (the battery centre) can be surveyed in accurately, the current weather conditions compensated for, and the muzzle velocity of each gun measured periodically. Each of these factors, and the ways in which they are compensated for, are discussed in turn below.

The degree of accuracy to which an FO (or anyone else) can locate his target will depend on a

number of factors - how accurately the area has been mapped, how close the target is to clearly defined map detail , what sort of view the FO has of the ground, etc. Sometimes a target can be pinpointed to within 10 metres; at other times the observers is guessing to within a thousand metres.

When each gun battery moves to a new gun position it map spots its location and determines orientation by using a type of compass theodolite called a director. To bring each battery into sympathy, so that they are all using a common reference for determining the direction of fire, (ie, common orientation), and are in common spatial relationships (ie, common fixation), the REGIMENTAL SURVEY SECTION links them together with a survey scheme, measuring the angles with theodolites and the distances with steel tapes or man-portable electronic distance measuring equipments. Measurements are made to a low order of accuracy, the scheme progressively computed out, and the results issued as quickly as possible. If two or more field regiments are operating together (ie the divisional artillery is deployed), then further survey schemes have to be carried out to link the regimental survey grids together. This level of survey is the responsibility of the survey troop of the divisional locating battery.

Meteorological conditions are observed by teams of meteorologists. At the time of the Vietnam War, the Australian Army did not have these elements and in Vietnam meteorological data was obtained from US Army sources. Members of the detachment did work with US Army meteorological sections in South Vietnam, to gain experience in the event of this resource being raised in the Australian Army.

The measuring of muzzle velocity (called `calibrating` the guns) was a cumbersome task involving several firings of guns over a precisely surveyed range. During the Vietnam War the Australian Army purchased a piece of mobile electronic equipment called EVA (electronic velocity analyzer), which measured the muzzle velocity of guns as they fired normally. The detachment assumed responsibility for this task in Vietnam.

From the foregoing it can be seen that part of the responsibility of the divisional locating battery was to provide technical assistance and services to enhance the performance and effectiveness of technical gunnery procedures. In addition though, the battery has responsibilities in two other areas of gunnery, target acquisition and artillery intelligence, the culmination of which is the direction of counter mortar/battery fire, ie to suppress enemy crew-served weapons.

### Target Acquisition and Artillery Intelligence

There are several ways of acquiring targets for engagement by the weapons organic or available to the task force. Target acquisition resources organic to the detachment on its arrival in Vietnam were: two mortar locating radars, aural and visual observations by the specially trained personnel of the mortar locating LISTENING POSTS, and artillery intelligence data, (including reports from elements other than those belonging to the detachment), For a period in Vietnam the detachment also deployed a gun locating sound ranging base, and towards the end of the tour the detachment was given responsibility for conducting in-country trials with sensor equipments, (though these were designed more for the collection of general battlefield intelligence, than artillery intelligence).

The artillery intelligence section was directly supervised by the detachment's commander, the Task Force Artillery Intelligence Officer(TFAIO), and operated as part of the Arty Tac HQ. It was responsible for collecting and collating information of enemy mortars, rockets and guns, then planning for and applying retaliatory

fire on them. An artillery intelligence section is generally interested in two types of weapon deployments: those in permanent or semi-permanent positions deployed for a specific operation or purpose, (eg as part of the deployment of forces for a general offensive, or as part of defensive works), and temporary positions occupied briefly in order to fire some harassing rounds, or to provide emergency fire for a patrol etc. Intelligence on both types of positions was gathered by: studying air photographs, reviewing general battlefield intelligence, analyzing shell and mortar craters and examining shell splinters, driving bands and tail fins etc., studying reports of prisoner of war interrogations and the reports from all branches of own troops of firings by enemy weapons, and the results of trackings by mortar locating radars and sound ranging bases. The reports of actual firings and the trackings of those firings by the radars and sound ranging bases were especially important for locating previously unreported weapons. The TFAIO also tried to assess where the fire of various types of weapons might emanate from during a particular Operation, by looking for likely gun or base plate positions off the map, or even during ground or air reconnaissance. Virtually all artillery intelligence activities carried out by the detachment in Vietnam concerned the temporary, often fleeting deployments of guns and mortars.

The mortar locating radar is designed to track a mortar bomb's trajectory in flight, sample it for a few seconds to ascertain its trajectory, then extrapolate back towards the origins of that trajectory, ie the base plate position of the mortars, the grid reference of which it can then calculate. This is then given as a target to whichever guns are tasked for counter mortar fire. The radars used for this purpose in Vietnam could only track mortars and the occasional rocket, but were not designed for tracking the flatter, faster trajectories of most firings from field and medium guns. Another disadvantage that they had was their narrow field of view, which meant that they had to be 'pointed' to a specific search area. Observers in the detachment's LISTENING POSTS, would assess the general area from which a mortar was seen or heard to be firing, then report that back to the radar command post as an area that the radars should search. The Listening Post personnel would also collect and report other artillery and general battlefield intelligence.

Guns could only be located mechanically by the sound ranging base, a series of up to six accurately surveyed microphones set out in a line up to 10,000 metres long facing the direction of the enemy. If a gun fired in front of the base the sound waves of that firing hit each microphone at different times. In the sound ranging command post special equipment recorded the time differences and from this information the position of the gun could be deduced on a plotting board. This target could either have been dealt with straight away, or merely recorded as part of the overall artillery intelligence picture. There was also a need for the sound ranging base to be activated by an operator in an advanced post, it not being feasible, (for a number of technical and operational reasons), to just leave it running all the time.

All troops in the combat area were responsible for making MORTREPS and SHELLREPS, reports of enemy mortar and gun firings. The report forms contained a number of lettered serials covering specific information about the firing. Whatever information was available would be sent through the user's operational radio or telephone net and then passed on by his headquarters to the artillery intelligence net or line, where the information was collated. If two or three observers gave a grid direction from their location to the sound of a gun or mortar firing, then Arty Int would be able to plot the location of that firing from the intersection of the three bearings, (provided that they know where the observers were, of course, but they usually had their locations plotted on the operations maps). Any other information that the observers could report, such as time of firing, how many rounds or bombs were fired, what type of weapon was being fired, (if its specific signature could be recognized), added to the information being collected and helped build up a picture of enemy activity.

The overriding impression that comes out of the study of the activities and performance of the Detachment in South Vietnam between 1966 and 1971, from both official reports and informal memoirs, is how badly the Detachment was equipped, organized, mentally geared and prepared for its job in Vietnam. This is not to say that the overall leadership and administration on the ground were deficient, nor that individual members were technically inefficient. The willingness to work hard, to use initiative and field expedients, to adapt standard techniques and equipment to unforeseen and unusual circumstances, and a common determination to fulfill the Detachment's role, were always

there. Nevertheless, during the first year especially (ie 1966-67) the locators had to try to come to grips with deficiencies not of their own making. These affected their performance and others' perceptions of their usefulness to the task force as a whole.

The major problems were: the haste with which 1ATF was committed to serve in Vietnam; the preceding rapid expansion of the army, including the introduction of a new national service scheme in 1965; the fact that no RAA locating element had been employed on operational service since the Second World War; the organizational philosophy of the div loc bty and the shortcomings of much of the equipment used by the Detachment in Vietnam.

The reasons for the deployment of 1 ATF to Vietnam, the haste with which this was done, and the lack of direction to the Commander about how it was to be employed, have been alluded to in Chapter 1, and explored in greater detail elsewhere. (Specifically in Frost, 1987). The implication of this for the Detachment was that little thought seems to have been given to the need for all, representative elements of the locating battery to go with the task force in the first place, the appropriateness of the organizations of the elements that were sent and the likely cost effectiveness (ie in manpower and resources usage) of their deployment. This statement raises questions that probably cannot be answered without reference to the official files and which may not be answered even when access to those records is available. The eventual employment of both the radar troop and the survey section, and the problems they encountered, illustrate the need for an attempt to be made to look searchingly at this question, and it will be discussed further when those two elements are looked at in detail in later chapters.

The rapid expansion of the army during 1965-66, leading up to the deployment of the task force, meant that trained, experienced personnel, in all branches of the service, were at a premium. A solid core of senior NCOs existed in 131 Div Loc Bty RAA, and there were some good junior NCOs around, but a large proportion of the lance bombardiers and gunners were national servicemen, with less than one year's service in the army. The manning problems of the survey section during 1966-67 exemplify this problem perfectly, and will be dealt with under that heading.

Regardless of how thoroughly and realistically troops have been trained, nothing compensates for the reality of sustained operational service. The RAA gun batteries had had this in Malaya and Borneo in the years leading up to the Vietnam involvement, but the regimental headquarters and the locating units had not. This is not to say that individuals within those elements lacked operational service, but rather that the organizations, procedures and equipments used by them had not been put to sustained testing in an hostile environment. (By 'equipment' more is meant than just the guns, radars and trucks etc; items such as office equipment and machinery, tentage and other 'housekeeping' items, radios and telephones etc., all affected the operational efficiency of the detachment). Consequently both the regimental headquarters and the locating elements had to feel their way, learning by their mistakes and finding out how to get the best out of what were sometimes inadequate and inappropriate stores and

equipments.

If the organization and roles of the various components of the Divisional Locating Battery RAA are compared with those of the Divisional Locating Battery RAA and the Target Acquisition Battalion of the US Army, it is obvious that the RAA battery is based on the model of the other two. They, though, are designed to support large scale, conventional, continental operations, not those of an independent brigade sized formation operating in what was essentially counter revolutionary warfare. All elements of the Detachment laboured in what was essentially an inappropriate organization. Its effects, once again, will be dealt with under the heading of each element of the Detachment.

The Det 131 Div Loc Bty, a technical unit which depended greatly on electrical and communications equipment for the effective execution of its role, (and to justify its presence within the formation) suffered badly from the deficiencies of its major equipments. The mortar locating radars and, to a lesser extent, the tellurometers simply did not stand up to operating in the tropics under operational conditions. The theodolites caused fewer problems, but they were as susceptible to the physical environment as all optical equipments. The radios, the new series '25 sets', which had replaced the '10 set' of the previous generation, did work well and they gave the detachment the essential communications that it needed.

All task force elements arrived at Nui Dat as the monsoons broke and the base facilities, operational plant and defences had to be erected in a sea of mud that made living, moving and work difficult and morale-sapping. The Detachment also had to shake itself out, get into gear and develop a "modus operandi" suitable for the circumstances under which its members found themselves working. If, as has been implied, individual training for members had been deficient and many of them lacked any sort of experience and on the job consolidation for their postings, sub-unit training was even more deficient and inter-branch/corps training virtually non-existent. These factors all added up to the difficulties faced by the locators, in both trying to do their job and prove their worth to their brother gunners and other comrades in arms.

How members of the various sections went about doing this is the subject of the next five chapters.

## **Document 5**     CHAPTER 4 - THE SURVEY SECTION

The swiftness and degree of accuracy to which gun fire can be brought to bear on targets depends to a large degree on two factors. One is the standard of topographical maps of the area of operations; the is the availability of 'theatre survey', that is, a common map control grid upon which all gunnery calculations can be based, and in accordance with which all fire support resources and target acquisition devices can be placed spatially and in orientation. Both of these are dealt with in an article by Captain (later Lt. Col.) R.F. Skitch RASvy, who commanded the 1st Division Topographical Survey Troop (1 Div Topo Svy Tp) with 1ATF during 1966-7. (Reference to the AAJ article).

### Topographical Maps of South Vietnam

By May 1965 the US Army Mapping Service had covered South Vietnam with 1:50 000 topographical maps, which were based on aerial photographs taken in 1958. Revised editions of these maps were produced in September 1966, which showed no significant changes in detail, but did increase the size of the area covered by each sheet by 50%. These maps were not without their faults, which Skitch briefly stated as being:

- Cultural detail in village and town areas was grossly inaccurate.

- Drainage systems were generalized and lacking in detail, with minor creek systems not shown.
- Vegetation classification were generalized, and sometimes inaccurate, while vegetation boundaries were unreliable.
- Contours lacked detail, with smaller seen trams and isolations missing.

(Yet) if absolute points of detail were considered (road junctions, bridges, prominent land marks, water towers, etc the positional accuracy of the series appeared to be very good, At times selected points of detail on the map were included in a ground survey and subsequently coordinated. On each of the eight occasions that this occurred, error of less than 25m was discernable. At 1:50 000 scale, this is certainly within normal scaling tolerance.

(Skitch 1968, pp 31-2)

This attribute of the topographical maps was put to very good use by the Survey Section at a later date.

The 1:25 000 scale Pictomaps, which "proved invaluable for patrol navigation and were readily accepted by the Australian soldiers at all levels of command and experience" (Skitch 1968,p. 32) were of no use whatsoever for determining accurate grid references because of scale distortions in the unadjusted air photographs on which they were directly based.

### The "Artillery Problem"

A number of pages of Skitch`s article are devoted to what he calls the "artillery problem", and how I Div Topo Svy Tp went about helping solve it for I ATF artillery resources. This was a critical requirement because, 'in July 1966 probably less than half of the US artillery units in South Vietnam were on theatre grid in their base locations, let alone when occupying a fire support base away from a base location'. (Skitch 1968, pp.34). Because of the problems of rapid mobility, jungle terrain and the climatic conditions (especially in the wet season), but most of all because of security, the problem of getting orientation and fixation into a fire support base was generally deemed to be insolvable. The conventional wisdom amongst US Army artillery units was that 'artillery was destined to always fire on an independently map-spotted position and an orientation based on magnetic compass observation.' (Skitch 1968, pp.34) For this reason, 'the provision of survey was never given due consideration in any initial operational planning', (Skitch 1968, p. 34) The same attitude was also apparent within the Australian formation and was reflected in the way in which the survey section of the Detachment was regarded. (It was noted in Chapter 2 that the Royal Australian Survey Corps (RASvy) was responsible for carrying survey into the general area of operations, and that the artillery surveyors of the div loc bty then carried it to the gun areas or FSPB. The reader is reminded of this relationship between the two levels of survey operations).

To emphasize its importance to the lay reader, it might be profitable to illustrate the actual problem at this point. Gun battery A is positioned on the ground and can be placed on theatre grid immediately. This implies that it is orientated correctly with grid north so if, say, it is called upon to fire on a bearing of 800 mils, then the guns will actually be firing in that direction. It also implies that there is no error in the grid reference of the battery centre. Gun battery B, whose fire overlaps with that of A, is not on theatre grid and has to be map spotted in for position and gets its orientation from a magnetic compass bearing. Assume that its position is in error by 100 metres for Eastings, and its orientation is in error by 20 mils. Assume that battery A fires onto a target and determines what its grid reference is. This is passed to battery B so that its fire can give added weight of fire onto the target. But because of the error in the fixation of battery B's location, its fire, for this reason alone, will fall 100 metres to the East or West of the target, thus

lessening its value. A further error will be introduced because the guns are not firing on the required bearing, but 20 mils off it, because of the difference in orientation between the two gun batteries. At a range of 5000 metres from the target to battery B, another spatial error of up to 100 meters will be introduced. (In this example, of course, these two errors could possibly compensate, but in the worst case they could accumulate as well, and cause a total error of 200 metres).

During the first three months or so at Nui Dat the "artillery problem" was not particularly serious. Theatre orientation had been provided to the base area by 1 Div Topo Svy Tp from survey control stations on Cap Saint Jacques at Vung Tau, and this had been carried forward direct to all the gun positions by the regimental survey party. This was adequate as long as the field batteries did not fire from outside of the Nui Dat base, though they were destined to do this routinely sooner or later. Another consideration was the arrival of a US Army battery of medium artillery, which was attached to the task force in 1966, and a battery of US Army heavy artillery which arrived in 1966. These guns, with their much greater range than the guns of the field batteries, were capable of accurately ranging onto targets that had already been registered by field batteries at fire support bases away from Nui Dat. Their fire would not be as effective as it might be, though, if the guns which had originally fired on the targets had not been on a theatre grid for both fixation and orientation. The medium and heavy guns were also capable of providing the same sort of support to the five RVN field and medium batteries in the province, provided that they too were on a theatre grid. Between November 1966 and April 1967 1 Div Topo Svy Tp conducted survey schemes to provide theatre survey to the RVN gun positions, and in doing so extended theatre survey throughout the province for possible future use. The operation was sporadic in nature, being largely dependent upon the availability of security... (Skitch 1968, 35)

The key to conducting this sort of survey work was "security". If survey could not be carried by direct line-of-sight to battery positions, then it had to be carried forward by a ground survey party, which required protection by infantry or armoured elements. During the first Year, ie May 1966 to May 1967, consideration was given to the feasibility of extending survey between non-inter visible points where it was not practicable to conduct a ground survey scheme, either because of the terrain, or because of the security problem. The following was suggested. At the base station, which is on a theatre grid, a base line is measured and the grid references of the stations at each end calculated.

A short line is also measured at the fire support base to which survey is to be carried. This line is oriented by a sun or star azimuth observation. The two ends of each line are occupied by observers with theodolites. Between the two bases an elevated reference point is placed - this might be a hovering helicopter or a tethered meteorological balloon. Each observation station tracks the reference point and, when ordered to do so by radio, reads the horizontal angle to the point, ie the observations are made simultaneously. The position of that point in space, at that point of time, is determined and from that data the positions of the two ends of the forward base line can be calculated. This is done a number of times as a check. Ultimately the forward base line location is calculated out from a number of intermediary points in the sky. The first survey section did not use this method, but it had been tested and refined by the time the second section had shaken out and was operating in Vietnam, and they and subsequent survey sections frequently used it. The method was not without its problems, and the commander of the last survey section remarked that while trying to carry theatre survey to Fire Support Base ZIGGIE, because of haze problems, 'some 26 runs (countdowns) [were required] to obtain one synchronized observation where all stations reported "seen".' (Personal Memoirs of Lt. Geoff Evans, dated 28 May 1989)

Simultaneous observations to helicopters or tethered balloons was only one of a number of "theatre expedients" that the surveyors in Vietnam had to resort to.

The story of the locating battery surveyors in Vietnam is best addressed by discussing the experiences and work of the first section, which was nominally formed in early 1966 and served together in Vietnam from about June 1966 to April 1967. The story will then continue by discussing those activities and experiences of subsequent sections where they illustrate later problems and the development of survey techniques.

An account of the first survey section's training and preparation for Vietnam is a sad one: no doubt most of those involved in, or responsible for, those events would be happy to forget all about them. The story is, though, the stuff of which the lessons of history are made and for this reason it demands telling, analyzing and marking well. The survey element of the divisional locating battery is a survey troop, commanded by a captain and consisting of two survey sections. The sections are commanded by a lieutenant, and have a sergeant, three bombardiers and about twelve gunners or lance bombardiers, together with two or three administration staff. The establishment of 131 Div Loc Sty was restricted before 1965 and only one survey section existed then. At the end of 1965 that section had no officer commanding it, though it did have a sergeant, one bombardier and two lance-bombardiers, all regular army and two or three regular army gunners. At the start of 1966 its ranks were fleshed out with gunners from the first two national service intakes, all chosen for this posting because of their education and aptitude for technical work .

The officer appointed as section commander in late 1965 was a former member of the Royal Australian Survey Corps, trained to corporal level as a topographical surveyor, and experienced on long mapping expeditions to Cape York and New Guinea. He had graduated from the Officer Cadet School, Portsea in December 1964 and during 1965 had been on gunnery courses at the School of Artillery and regimental duties with 4th Field Regiment RAA at Wacol in Queensland. He attended an advanced artillery surveyors course with some of his soldiers at the School of Artillery in March and April 1966, but had no formal training and experience in the duties and responsibilities of an artillery survey section commander.

The national servicemen were in two groups, from the first and second national service intakes. Members of the first intake attended a basic artillery surveyors course at the school of Artillery, followed immediately by an advanced artillery surveyors course, (which should normally follow a period of experience and on-the-job consolidation after the basic course). Members of the second national service intake were not able to attend this formal training. Consequently the men from the first intake gained trade pay for the remainder of their time in the army, while those from the second intake did not. They were good, loyal men and none of them made a song and dance about it, but it obviously rankled.

The soldiers of the first national service intake did have some formal training in their trade, (even though they lacked practical experience as individuals, and experience as a group in working as a team in some sort of operational environment, such a on an exercise servicing other artillery units). The bulk of the individual training for the men of the second national service intake was conducted at Tianjara Range during February and March 1966. At the time 1 Field Regiment was conducting its workup exercise before departing for Vietnam and the counter mortar radars were also exercising in the area. The survey section commander was nominally responsible for the training course of the new gunners, but he had to act as safety officer for the mortar detachment that was firing for the radars. The training of these gunner surveyors was left, then, almost entirely in the hands of a junior bombardier, with the section commander being restricted to just checking on what was being done when his travels between mortar base plate portions took him near to the survey training area. There was virtually no time for any training, either individual or sub-unit, after that exercise and "housekeeping" tasks, packing and preparation for the move took up all the time until the Detachment left for Vietnam. Very few, if any, members of the section attended a battle efficiency course at the (then) Jungle Training Centre, Canungra before departure for Vietnam; they were probably amongst very few troops who got away with not going there first.

A few members of the survey section had departed early in the year on HMAS Sydney and acted as part

of the detachment advance party. The rest flew over on three weekly drafts, flying to Saigon via Townsville and Manilla on a QANTAS Boeing 707 (the way to go to war, if one has to). From Saigon the draft flew to Vung Tau on a USAF Fairchild Provider, a sort of two-engined Hercules transport. At Vung Tau the detachment, with other troops, occupied a holding camp on the edge of the airfield. It was here that the survey section paraded complete for the first time, and where the section commander first met some of his soldiers. It was also the first chance for the section to do some section training and get to know how to work with each other. Some miniature traverses and triangulation schemes were carried out on the sand hills of "back beach" at Vung Tau, amongst the logistics units who were setting up the 1st Australian Logistics Support Group (1ALSG) on the site. This training was far from satisfactory, and it probably revealed more problems than it solved, but it was better than no section training at all.

The section still had no experience whatsoever in dealing with the units and elements it was in the theatre to serve. Would it be fanciful to suggest that there is a sort of code of etiquette for dealings between units in the field, which goes beyond Standing Operations Procedures and the like? It involves knowing with whom one can deal direct with in another unit, and who one does not call upon without reference to the second in command, or the company sergeant major, or whoever. It involves understanding which areas of another unit may be visited without permission, without causing ructions. It involves learning who can help in certain circumstances, and what the price for that help is likely to be in the future. Such wisdom is only acquired by experience - often painful and expensive experience - and a formation entering and about to start operations in a war zone is not the best place to acquire it.

The entry into the war zone proper, that is the occupation of the task force base at Nui Dat, was painful, but not without its humour. The bulk of the artillery elements were moved to Nui Dat on the appointed day. The vehicles were taken up in a convoy under escort of the Armoured Personnel Carriers (APCs), while the personnel were heli-lifted from Vung Tau to Nui Dat. Lieutenant Colonel A.M.C. Cubis, the then commander of 1 Fd Regt RAA, related in an article later published in the Army Journal how the vehicles left and arrived in due course at Nui Dat without major incident, while many of the troops were left waiting for some hours on the ground at Vung Tau because the US Army helicopters were called off to another task, and the final troops did not finally move until late in the afternoon. Colonel Cubis commented that it was the only time he had seen a regiment of guns take ten hours to fly between two positions which were linked by 25 miles of secure road, much of which was metalled. The survey section commander recalls jumping off one of the last helicopters late in the afternoon and being met by the TFAIO's batman, with his first orders 'in the operational zone' They were words to the effect of, "Sir, Captain Townley's compliments - your driver hit a noggie kid on the convoy up from Vung Tau. You've got to do a vehicle accident investigation".

More important matters awaited us that first afternoon. As stated earlier the position was vulnerable to attack and some defences had to be set up and dug in. This work continued for some time and the survey section had little actual survey to do during the first few weeks, the bulk of its work being setting up defences and general "housekeeping" tasks. 1 Fd Regt RAA had its own survey section and they were responsible for putting the three batteries of the regiment onto regimental grid. As the infantry did not operate outside of the range of the gun; at Nui Dat for the first few months, neither the regimental survey section nor the locating battery survey section had meaningful survey tasks to perform and personnel were dispersed to other jobs. The locating surveyors did run a traverse from the regimental area to place the two infantry battalion mortar positions onto theatre grid, (1 Div Topo Svy Tp having by then provided theatre survey to the base area), and a couple of alternate gun positions were surveyed in, but little else was achieved.

The survey section did perform one piece of "good works" very early in the deployment, which was in many ways more durable than some of its other achievements. They were positioned near an old rubber drying shed which the task force headquarters had allocated to the padres for a chapel. Chaplain Bennett, the Anglican padre,

asked the survey section commander if his soldiers could find a little time to help him clean the place up a bit and make it suitable for the conduct of church services. Some volunteers from the section spent a few hours cleaning the shed out, then made an altar from a large stores box, a crucifix and altar rails from bound rubber tree branches and kneelers from sandbags. In due course these field expedients were replaced with more respectable fixtures, but the ones put in by the survey section did give the shed the semblance of a place of Christian worship in time for the first Sunday services.

## **Document 6**     CHAPTER 4 - THE SURVEY SECTION (PART B)

The detachment's report to 131 Div Loc Bty at Holsworthy for the period 4 May 66 to 30 Jun 66, states the following about the survey section.

8. Survey section over the Period had done little actual survey work. Initial survey into the regimental area was a regimental grid provided by the survey party of 1 Fd Regt RAA. This was checked by the detachments survey section. There being no higher information available at that stage, no higher grid was instituted.
9. As a result of a request by both infantry battalions, a scheme was done to place both mortar platoons on the same grid as the regiment.
10. Subsequent to this a control point on theatre grid was provided by Det 1 Div Topo Svy Tp. In this they were assisted by members of the survey section. A Change of grid was then computed and passed to guns, radars and mortars.
11. As well as this the section has provided a party of men to each radar to assist with local defence, as well as assisting in the manning of an additional Listening Post.

(Monthly Op. Report No 1 dated 30 June 66)

It was not mentioned in the report, but the survey section commander was spending much of his time as a duty officer in the 1 Fd Regt regimental command post. The Detachment's Operational Report for July 1966 stated that:

Survey section has supported one operation by carrying forward theatre grid to a battery deployed forward. This was relatively simple involving a tellurometer traverse. In addition when not employed in survey work, some members of this section are used to bolster radar detachments for local defence purposes and provide additional listening posts

(Op. Reports for Jul and 'Aug 66, dated 7 Sep 66)

The Operational Report for August 1966 announced that 'the survey section have now embarked on a 4 week training exercise...', with two aims: to give surveyors operational training and to place bearing pickets along the road between VUNG TAU and NUI DAT., which could in the future be used for carrying survey to alternate gun or radar positions. One important motive for this exercise stated:

This will enable us to class this as a basic arty svyrs course. It is proposed to ask the School of Artillery to allow the Det to run a trade test for Class 2 Arty Svyr. but at this stage is only in the early stages of consideration.

(Op. Reports for Jul and Aug 66, dated 7 Sep 66)

This plan, which might have gone some way to overcoming the pay discrepancy between the two groups of national servicemen in the section, did not, alas, come to pass. The Operational Report for September 1966 states:

The survey section has now been absorbed into the LP. All training has ceased and the provision of artillery surveyors in this theatre is the subject of a paper in discussion with the BC 131 Div Loc Bty HOLSWORTHY. The section commander has been placed with 103 Fd Bty to enable his gunnery knowledge to be broadened.

(Op. Report for Sep 1966 dated 9 Oct 66)

The members of the section did, in fact, do more than just man listening posts after the section's operational work was suspended. As stated, the section commander spent three months or so as a section commander on the gun line with 103 Fd Bty, then spent the next two or three months as the assistant adjutant of 1 Fd Regt, and was a standing member of the regimental command post duty officer roster - all of this while not actually posted to that unit. The section sergeant was seconded to manage, (or at least to be on the staff of) the Rest and Convalescent Centre at Vung Tau and one of the Lance Bombardiers went A work for the Civil Affairs team. Some gunners went onto radar detachments, some to work as clerks in arty tac and the regimental command post, while one gunner became the regimental medical officer's (RMOs) records clerk. The frustration felt by members of the section on being disbanded was compounded by the knowledge that they were, at the time, on the verge of conducting a major traverse that would have provided some useful survey control data along the Vung Tau - Nui Dat road. They were also in the middle of conducting some potentially very useful trials work, ascertaining how best to use the distance measuring tellurometers over paddy fields and mangrove swamps.

A semi-technical digression about survey practices is necessary here. The div loc bty surveyors carry out survey work that demands a balance of accuracy and speed which places it between the highly accurate, but relatively slow observations conducted by the topographical surveyors of the RASvy, and the broad tolerances, but very quick observations carried out by the regimental and battery surveyors of the artillery. The distances they routinely measure, and the means of measuring them, differ as well. The regimental and battery surveyors, who are required to carry survey quickly over relatively short distances, normally use a 100(?)metre steel tape, whereas the topographical surveyors use the tellurometer, which is capable of measuring, to geodetic survey standards, single lines of over 150 km, if the stations are sufficiently elevated. The surveyors of the loc bty carry tapes and do make use of them, but they are usually carrying survey further than the regimental surveyors, and need something faster than tapes for measuring the longer traverses. However, their survey schemes are not extensive ones and the surveyors need to keep relatively close together, because of security implications. Loc bty surveyors do not generally climb great, isolated hills in order to measure distances in the tens of kilometers. The tellurometer, although it offered a means of more rapid distance measurement than the steel tape, was not an ideal equipment, for it was 'too good' an instrument for the locating surveyors' purposes. The ideal instruments, small geodimeters and laser distance measuring devices with a working range of between one and five kilometers, came onto the market between five and ten years too late for use by the section in Vietnam, but they are the sort of instrument that would have been very useful then.

The artillery surveyors' main technical challenge became finding ways of operating the tellurometers on a task they were not designed to do and, because of the nature of their characteristics, had difficulty accommodating - measuring lines of as short as one kilometer over paddy fields and mangrove swamps. To this end the survey section started to conduct some tests with the tellurometers, as was recorded in the September 1966 Operation Report.

Some difficulty was experienced in obtaining patterns on tellurometer readings. This was thought to be due to the type of terrain over which the section was operating. Therefore a trial was started to ascertain if this was true. Due to the curtailment of the survey section training there was NOT sufficient time to arrive at any conclusions. However, attached at ANNEX B are some observations which were noted.

(Op. Report for Sep 66, dated 9 Oct 66)

ANNEX B described the actual tests carried out with lines over mangrove and paddy fields about 1300m in length, with the tellurometers placed only one or two meters above the surface, The last paragraph of the report sums up the results and draws conclusions. They indicate that if further tests had been carried out, and surveyors had gained practice in operating the tellurometers in those difficult conditions, then it might have proved possible to use them with confidence in those conditions on operations. The last paragraph reads:

It has been found that lines can be measured successfully across paddy fields. Although the line across the mangrove was NOT successful, further tests may well prove that this can be done. Experiments need to be tried with screening, granter elevations at the terminals, the use of the parabolic reflector and the taking of course readings over a wide range of cavities.

(Op. Report for Sept 66, dated 9 Oct 66, ANNEX 8)

'This was not done and a chance to develop the adoption of techniques and equipment to suit the environment and operational conditions, before the need for artillery survey became great, was lost.

The Detachment's Operation Report for October contains, under the heading "Survey", the interesting note that although no survey work had been carried out in that month, 'Two surveyors have been attached to the Met sect of the (US Army] Target Acquisition Battery', (Op. Report for October 1966. dated 18 Nov66). This marks the beginning of 131 Div Loc Bty's involvement in the provision of meteorological observations to the field artillery. Something that the battery took responsibility for in Australia after the Vietnam War.

The November Operations Report details the detachment's involvement in Operation HAYMAN ISLAND, when 5RAR conducted a search and destroy operation on Long Son Island. Task Force forward HO was deployed for the first time on that operation, together with Arty Tac and the Arty Int Section. 103 Fd Bty provided fire support for the operation from a gun position on the mainland, and one of the mortar locating radars was deployed in the gun position. The report notes that: 'No survey was requested for this operation although it would have been an easy job to provide this. Theatre orientation was provided to both radar and gun position by the simultaneous observation method.' (Op. Report for Nov 66, dated 3 Dec 66)

The same report also mentions OPERATION INGHAM a search and destroy operation conducted by 6RAR to the South East of Nui Dat commencing on 21 Nov 66. It is noted that survey was actually requested, but could, in the end, be provided to only one of the three gun positions occupied, because of lack of warning for the task,

which did not allow a proper reconnaissance to be carried out, and the non availability of protection for the survey parties. Simultaneous observations were carried out to pass theatre orientation to the guns, though. (Op. Report for Nov 66, dated 3 Dec 66)

All of this makes sad reading for anyone who understood the "artillery problem" as outlined in Capt Skitch's article, for it is obvious that commanders who had it in their power to use the surveyors of the Detachment to help overcome this problem, had little conception of how they might be used, or inclination to use them even if they did realize it.

If November 1966 saw the rejection of the work and potential of the survey section, it also saw the genesis of its resurrection and reconstitution. The report for November states that 'There are now some 52 odd surveyors in the trill force area made up as follows...': there then being listed all artillery surveyors with Australian and US artillery units, and the topographical surveyors of the 1 Div Topo Svy Tp (Op. Report for Nov 66, dated 3 Dec 66) Regardless of the implied mental deficiencies or eccentricities of these technical tradesmen it was, at last, realized that there existed within the task force a pool of survey specialists who had the capacity to do something useful for all the Allied Artillery Units spread about the province. The report continues:

To provide some co-ordination it is proposed that Det 131 Div Loc Bty co-ordinate all artillery survey work to be done in the province. To this end survey work has started to tie in all artillery pieces within the TAOR (Tactical Area of Responsibility) and ARVN out posts.

On Weds 16 Nov a small "survey cell" consisting of 9 surveyors (6 from Det 131 Div Loc Bty, 3 from 2/35 US Arty) were detached for field work with 1 TOPO Svy Det. The purpose of this detachment was twofold:

- a) To assist 1 Topo Svy Unit in manpower shortage
- b) To use locating battery surveyors in providing a common grid to ARVN guns as well as US artillery guns.

The Surveyors are to be employed on angular measurement work, tellurometer measurement and taping.

The Svy Sect Comd did the initial recce but was called off this job to assume the duties of the A/adjt for 1 Fd Regt or a period until a replacement arrives. This cell now works under the command of the 1 Topo Survey Unit Sergeant.

(Op Report for Nov 66, dated 3 Dec 66)

It is debatable as to whether the idea for tying in all ARVN batteries onto theatre grid originated with the Det 131 Div Loc Bty or Det 1 Div Topo Svy Tp. Capt Skitch states that 'in November 1966, at the request of HQ 2nd Field Force Vietnam, Det I Topo Svy Tp undertook the task of connecting all the ... ARVN batteries in Phuoc Tuy Province to theatre grid and providing theatre orientation.' (Skitch 1968, 35) Det 131 Div Loc Bty surveyors were most certainly involved in the work, through a fortuitous arrangement that ensured that at least some of the survey section's specialist were geared to carry out survey work and had gained some valuable experience in field work by the time the section was reactivated at very short notice in early 1967.

It will be recalled that the survey section commander was a former member of RASvy and had been involved in geodetic and topographical survey work carried out by that corps in northern Australia and New Guinea. He had trained and worked with many of the members of 1 Topo Svy Tp and knew that Capt Skitch had fewer field surveyors on establishment than he needed, He suggested to the TFAIO that the secondment of some of the artillery surveyors for a period to the Det 1 Div Topo Svy Tp would help overcome their deficiency and gain training and practical experience for his own surveyors, The TFAIO agreed to this and six surveyors, with their own equipment and landrover, worked as a field party under the professional guidance and direction of Sergeant (later Major) Stan Campbell, a contemporary and old friend of the survey section commander. Capt Skitch commented that, 'This arrangement was of benefit to all with the Loc Bty surveyors gaining knowledge and experience, and Det 1 Topo Svy Tp gaining much needed manpower'. (Skitch 1968, 38) These surveyors, with their recent experience and enhanced skills, formed the nucleus of the (by now depleted) section's expertise when the task force started to operate outside of gun range from Nui Dat and it was realized that survey would have to be carried somehow to fire support bases some way from the task force base.

This came about in February 1967, when the survey section started to do the job it was designed for, and had waited so long to get on with. The Operation Report for February 1967 contains a long report on the work of the survey section during that month. It is reproduced extensively below, because it illustrates the sort of tasks the survey section was destined to do for the next five years and indicates how the first survey section set the pattern for later operations.

2.                                      SURVEY

GENERAL: Feb was one of the section's busiest months as regards per survey work and it saw the section working in its proper role in this theatre, probably for the first time. Some difficulties were met in bringing the section together again for the first time in several months and "switching them on" to survey work. Generally the response was good and members of the section worked well and enthusiastically.

## TACTICALLY :

1. On 11 Feb section was given task of positioning 4 calibration points to W of TF. Survey was carried from NUI DAT Trig by line of sight into the four stations. A base line was taped and all angles read on 11 Feb. On 13 Feb a short traverse to the fourth station was carried out and two tellurometer lines measured from Nui Dat. About twelve men worked on the task and three APCs were provided for transport and protection.

2. On 15 Feb twelve men moved on seven APCs to an area S of DAT DO, to position BPs in anticipation of future tactical moves by 1 ATF. A braced quadrilateral with three sides measured and all angles observed, with the apex at NUI DAT, was used to position stns in YS 4657 4758 4859

3. A total of nine men moved out with 103 Fd Bty RAA on 18 Feb, to a gun position in YS 4856. On 19 Feb a traverse from the stn in YS 4657 carried theatre survey to the battery centre. Infantry protection was provided by 5 RAR. Also on 19 Feb a reconnaissance of a new gun area in YS 4854 was carried out.

4. To have carried theatre survey to the new gun portion from the old, on 20 Feb, would have involved a 3500 m traverse, at least 2000 m being through close country. As the battery's fire was not tied in with other guns at that time, it was decided to supply theatre orientation by use of the simultaneous orientation method, the trig station at NUI DAT being the master station. Once an azimuth had been determined in this way, directions were read by theodolite to several prominent features and carefully plotted on a 1:50,000 map as a resection. A short traverse was carried out from a nearby natural feature, the grid reference of which could be easily plotted and the survey mark position checked by this. The BC 103 Fd Bty RAA condoned this technique and later expressed satisfaction with the survey provided.

## TECHNICAL

### 6. EQUIPMENT:

a) Tellurometers: these have continued to give trouble mainly for technical reasons, though lack of user training and depreciation is probably a contributing factor in the failure to gain good, consistent results. Their use over relatively short distances (ie., less than 2000 m) is not recommended unless ideal conditions prevail. They have proved very useful, however, in projecting survey 'out' from NUI DAT into particular areas of operations.

(b)Theodolites: 3 of 7 Wild T2s have had to be written off because they are worn out through fair wear and tear. The fungus problem had been overcome by keeping such optical equipment in an 'oven' heated by electric light globes.

(c)Heliographs: have proved to be of immense value when conditions are not favourable, because of haze or background, for sighting beacons or flags. At least two more are required in the section.

(d) Radios : The ANPRC 25 set is of immense worth. Their reliability enables the sec comd to exercise tight control over a scheme and gives him maximum flexibility in planning.

## SURVEY TECHNIQUES, etc.

7. (a) Carrying forward of Survey. Most recent work has been done by putting in a point in sight of the NUI DAT trig, then later closing back onto this point. In a particular area survey has been taken across country by traversing or triangulation. Trilateration has not been used. In the near future a station is to be established on the feature YS 4962(Horseshoe), thus giving stronger and more extensive basic control to work from in the immediate area of 1 ATF TAOR.

(b) Isolated Areas. The technique described in para 7 has proved most useful in providing survey to independent batteries when it is not possible to carry theatre survey forward. Simultaneous observations for orientation has proved to be a quick and reliable technique on these occasions and theatre orientation can be guaranteed.

## STATION MARKING

8. BPs have been marked by 4' star-iron pickets driven into the ground and set in concrete, Recovery marks are also placed around the stations, blazes on trees, marks on buildings etc., being preferred to other pickets just driven into the ground, though this is at times done. The extra work involved is thought worthwhile. If a Station is occupied, it must be checked for possible movement and even for booby traps.

## RECONNAISSANCE & PLANNING.

9. Rarely has sufficient time been given to either. It is most fortunate that good communications has allowed the Sec Comd maximum flexibility once a task has begun. When other arms protection is supplied it is essential to complete the field work as quickly as possible in order to release the protection for other tasks. Because of this it may be necessary to sacrifice accuracy for speed and the Sec Comd must be in a position to assess this requirement properly.

## PROTECTION.

10. In open country several APCs are ideal for protection and transport, though care must be taken where a traverse may spread people over a long distance; tactful liaison with the APC group Comd of this problem usually supplies an amiable solution. Infantry protection is essential in close country, where a sniper or booby trap threat exists. It is suggested as a rule of thumb, but not as a criteria, that a full platoon of infantry should protect a ten man survey party traversing.

(Op Report for Feb 67, undated)

Some comments on this report of the survey activities during February 1966 might be fruitful. The first was the obvious need for protection, by either infantry or APCs. This had to be provided if the security of the surveyors, (and the completion of the survey scheme) was to be guaranteed. It should be noted that one at the stations positioned in YS 46 57 was only 1500 meters from the steep slope of one to the outcrops of the Long Hai Hills where the NLF had bases, and less than 500 meters from the jungle surrounding those hills. But the bill for this protection could be high in manpower and other resources. The second point is that it had become very obvious that if theatre survey was to be carried to distant fire support bases, then some radical survey techniques had to be

developed or standard techniques adapted to the circumstances. Thirdly, it had to be accepted that observing standards might sometimes have to be lowered and tolerances strained to provide a level of survey that was not going to be perfect, but better than nothing.

Mention of the use of the heliograph in paragraph 6 (c) of the report is an interesting comment. The survey section commander, while a young soldier in RA Svy, had often used these on geodetic surveys and knew the value of them for getting a sighting point through for observations over long distances, even in quite dull conditions. The last survey section commander noted in his memoirs that trip flares were sometimes used to designate the survey station when haze conditions made observations to banderoles difficult. This raises the question as to if the section had lost expertise in the use of heliographs in the intervening years. If so, then it is a sad comment on the way lessons were not handed down as personnel changed over.

In March 1967 survey work continued apace. The operational report for that month shows that the section moved out to the HORSESHOE feature (YS4962) and carried four control points onto it, Between 20 and 26 March the section moved out to HORSESHOE again and put in survey points required during Operation PORTSEA for:

A Bty 11 Armoured Cavalry Regt, US Army (155mm SP); 161 Fd Bty RNZA (105mm towed); A Bty 2nd, 35th Bn US Army (155mm SP); A Bty 1st 83rd Bn US Army (8" and 175mm SP) and 101 Fd Bty RAA (105mm towed). On 26 March survey was provided to a new fire support base in YS 5963. The report continues with a list of equipment problems- but adds that the section was able to carry on its job with what it had. The report on the survey section concluded: 'The section is now working as a section despite the loss of the Svy Sgt and 4 soldiers who returned earlier this month. Sufficient warning is still required for commitments that a thorough recce and preparation can be carried out'. (Op Report for March 1967, dated 5 Apr 67)

In consideration of the last part of that report: had the TFAIO and the survey section commander and his soldiers not realized by then that they were never going to get sufficient time for that elusive "thorough recce and preparation", because of the very nature of the type of warfare they were involved in? Later events were to prove that this was to be the case.

The survey section's work continued at the same tempo in April. On the 7th theatre survey was passed to the ARVN gun company at DAT DO, and on the 10th to the ARVN gun company at Xuyen Moc. On the 14th of April a calibration target was surveyed in north of HORSESHOE feature. That task was pretty well the swan song of the original members of the survey section, and a week or so later they returned to Australia at the end of their year's tour of duty. They left knowing that during the last three months of their tour they had achieved what they were sent to Vietnam to do, and had the satisfaction of knowing that they had provided a firm base for later sections to build on, and given them pointers on how to go about carrying out this job. Their epitaph might well be included in the comment of the TFAIO in that report which reads: 'Extensive use was made of helicopters for transportation of personnel and equipment during the period. Overall the tasks ere carried out in an efficient manner and completed in a minimum of time'

(Op Report for April 1967,dated 4 May 67)

### The Work and Times of The Second and Subsequent Survey Sections

There are two other entries under the heading of 'Survey Section' in the report for April 1967. They are in effect the link to the activities of the second section and forecast changes that were taking place in

the section's activities and technical work. They read:

e. 27-28 Apr 67; Survey passed from NUT DAT to 161 Fd Bty RNZA who were approx 5000 meters WEST of NUI DAT in support of a 7 RAR sweep of the area.

f. 29 Apr 37; Members provided to assist Topo Svy section in an experimental scheme to show the feasibility of a Heli-borne satellite station for long distance survey. Due to faulty equipment, the scheme was not completed.

The paragraphs about the survey section in the Operational Report for May 1967 must make depressing reading for anyone involved in the great spate of useful work carried out by the first section in those gloriously productive months of February, March and April 1967.

Survey.

13. The new Survey Section arrived on 5 May 67. The handover was accomplished through Gnr ENDICOTT, since there was NO overlap of Officers or NCOS.

14. The section has been employed almost entirely in constructing new lines and on local defence. This has now been successfully completed and the emphasis will now be placed on training the surveyors as a section,

15. During the period 15-13 May 67, approx half of the section was employed on a survey project in the 7 RAR area. At the request of the Bn CO, a BP was established in each Coy area to assist in accurate mapping of Coy areas and coordination of weapon pits.

16. On 29 May 67, 3 members were provided to assist TOP- SVY Sec for a task being undertaken in the area where the "fence" being constructed by 7 RAR.

17. A plan to conduct a long traverse training scheme from NUI DAT to VUNG TAU had to be cancelled due to an impending operation in, early June. In lieu a 2 day shakeout scheme was conducted in the I ATF area.

18. A computing centre has been established in the old Regimental Command Post. This has the advantage of allowing night working and, other than some sandbagging and building of more storage facilities, the computing centre is complete.

(Op Report for May 67, dated 5 Jun 67)

In the, period 7-13 June 67 the new survey section went out on its first operational survey task, carrying survey to a FSB in YS 4473, near BINH BA. When the task was completed the members of the survey party were employed on the gun line for the rest of the deployment. On 14 June the section provided survey to the 1/83 heavy battery on HORSESHOE for Operation GERALDTON.

The section's next job saw them breaking new ground. During operation COOPAROO 106 Fd Bty RAA occupied a FSB in YS 5071, which is about 10 000 metres NE of Nui Dat. This FSB lay in a small jungle clearing and survey could not be sighted in direct from either Nui Dat or HORSESHOE. Orientation was provided to the battery by sun azimuth observation

and fixation by the previously untried method of observing to a pair of tethered meteorological balloons. The technique is essentially just a variation on the synchronized helicopter observations described earlier at p. A better-than - expected closure of the scheme was achieved and the computed orientation differed by only 1mil from the orientation observed by sun azimuth. The report states that the survey section commander was claiming a positional accuracy of + or -5 metres. The originator of this idea is not known, but the article• by Capt

Sketch RASvy does suggest this technique, attributing it to W02 D. Christie in 1966/7. (Sketch 1968, 37)

In July 67 the survey section had one particularly busy month, from 9-16 July, when it carried survey during Operation PADDINGTON, one of those operations that Frost described as being a determined effort to seek and deal with NLF bases. It took place about 20 000 metres east to North east of Nui Dat and the four FSBs were positioned between Xuyon Moc and Thua-Tich. Units taking part were 2 RAR, 7 RAR, a squadron of the US Army's 11<sup>th</sup> Armoured Cavalry Regiment(11ARC), and three ARVN marine battalions. The Operation Report for July 67 relates the initial problems of successfully carrying survey to FSPB TON, at YS ,6569 , just north of Xuyen Moc, which contained the two gun batteries of 4 Fd Regt RAA, and two unnamed American batteries. An attempt was then made to carry survey from FSB TOM to FSB BILL at YS 6278 by a single leg traverse , via the hil NUI DAT 3 at YS 6470. High trees and bad weather made this impracticable. The next task attempted was to take survey from FSB TOM to FSB MIKE, in YS 6082, about 1000 m NW of Thua-Tich, at the head of Route 328. The plan was to carry survey from FSB TOM to FSB JOHN in YS 5975, then traverse north up Route 328, a map distance of close on 8km.

At 0900 on 13 July a party consisting of Sect Comd and 6 svyrs left MIKE bound for JOHN with APC and tank protection . The journey took 6 1/2 hours as this road had to be cleared by mine-detectors. At JOHN it took some time to establish a station that could be seen from TOM and vice versa. By this time it was too late to attempt any svy work.

That night (13 Jul), which was spent at MIKE, the FSB was mortared. During the attack one of the Surveyors, Bdr. M.J. POUSTIE, was wounded by two pieces of shrapnel, He was evacuated about 3/4 hour after the attack by DUST OFF. Also during the attack one of the tellurometers was hit by shrapnel.

(Op Report for July 1967 dated 6 Aug 67)

The loss of the tellurometer made it impossible to continue the scheme to MIKE.

A number of problems were highlighted during the survey work for the artillery on Operation PADDINGTON. Only four survey pairs could be put out because of equipment shortages, and of the four tellurometers carried, two had apparently ceased to function. The section's other tellurometers were being repaired at the time. Therefore when one tellurometer became a battle casualty there was nothing to pair with the one good one left. The long term effects of wear and tear on the precision instruments being used in that environment was starting to become very apparent. In an attempt to improve the chances of getting survey into small clearings surrounded by tall trees, experiments were conducted in elevating the tellurometer's antenna and dish, eg by tying them to upper branches of trees. Difficulties in passing survey to the American batteries was experienced because of different techniques and terminologies. In August the survey section commander and two of his NCOs visited a US Army target acquisition battalion at LONG BINH in order to iron out the misunderstanding and compare equipments and methods of using them. The visit was deemed to have achieved its aim.

During August 1967 a few minor survey tasks were carried out, and tests conducted on the tellurometers. These had failed on some operational work and had been suspended. All instruments were then sent back to workshops.

In September 1967 the ,survey section tried its hand at a different sort of survey work. A new hamlet called Ap Suoi Nghe was established at YS 4371, just off Route 2 between Nui Dat and Binh Ba, for refugees being resettled from the "Slope 30" area to the NW of Nui Dat. Six surveyors assisted the Australian Civil Affairs Unit by surveying housing block. From 4 Sept the section provided survey for a regimental FSB at YS 4677 and YS 4577 during Operation AINSLIE. After doing this job the section commander took up a temporary appointment as a section

commander with 108 Fd Bty RAA and his surveyors formed a second Listening Post on the position for the duration of the operation.

Between 28 Sept and 3 Oct the survey section was employed on Operation KENMORE, at the FSB established on the Ho Tram Cape in YS 6758. The Op Report for October notes that: 'it was impossible to provide theatre grid for the guns as there was no control in the area. Regimental grid was established by sunshot for bearing and compass resection for fixation. Later another FSB was surveyed at YS 7662 using the same method. (Op Report for Oct 67, dated 18 Nov 67). This raises an interesting question about survey techniques. Earlier that year, in February, members of the first section has fixed a gun position for 103 Fd Bty RAA in YS 4854, south of Dat Do, by observing a sun azimuth, and then using a theodolite to measure directions to a number of prominent features. These lines, which were then plotted on the 1:50 000 map as a resection, would have given more accurate bearings than those from a prismatic compass. Did members of the survey section in September 1967 know that their predecessors had done this very successfully only seven months earlier? If not, then it demonstrates that there was something very seriously wrong with allowing the section commander and NCOs to leave Vietnam at the end of their tours before their replacements had arrived and worked with them in the physical and operational environment in which they were going to be providing a service to the artillery for the next twelve months. How many other lessons and benefits of experience, one wonders, were lost this way?

The major task force operation in November 1967 was Operation SATNTA FE, which involved 1 ATF, the US 9th Division (-), the US 11 Armoured Cavalry Regiment (-) and a regiment from the 18th ARVN Division. The section's involvement in this operation had actually started on 27 Oct 67 when they provided theatre survey for 4 Fd Regt RAA in FSPB WILTON at YS 5476. There were few problems with this job, but providing survey to another base proved to be very difficult. This was FSPB LION at YS 6181 (the locality FSPB MIKE, which the section was unable to get survey to in July on Operation PADDINGTON -see page 447). It had been proposed to carry survey by traversing for about 7km west along route 327, then another 5Km north along Route 328, using as protection infantry and cavalry elements that were to advance and clear along that route. However their planned rates of advance were too fast for the surveyors and this idea had to be abandoned. It is difficult to see how it could ever have been seriously considered. The infantry/cavalry group presumably had as their prime objective something other than protecting a group of artillery surveyors strung out along the road. The surveyors could easily have been left in the lurch if contact had been made and a pursuit of enemy forces carried out.

That this plan to carry survey down Routes 327 and 328 should receive serious consideration shows that previous experience was again being ignored. During Operation PORTSEA in March/April 1967 the then survey section commander had looked at ways of carrying survey Forward to the Xuyon Moc area for a similar sort of distance along Route 23 from the vicinity of Dat Do. The best reconnaissance he could manage was to hitch a ride on an APC of the 11 ARC squadron operating with 1ATF at the time. The US troops were not inclined to stop every now and then to let lines of sight be checked or banderoles be planted to mark stations. As well as the problems of security on running a scheme like that down a road in a busy area of operations, there was also the consideration of trying to read precision survey equipment while heavy military vehicles are going past all the time, raising dust and shaking the ground - and possibly knocking banderoles aside on the edges of the road.

Eventually the Det I Div Topo Svy Tp brought 3rd order survey control into the area, with some help from the div loc bty survey section, and theatre survey was provided to FSPB LION that way. Later that month the survey section assisted Det 1 Div Topo Svy Tp in laying out a new area for Infantry and armour in the south east of the task force base.

(THE REPORTS FOR DECEMBER 1967 AND JANUARY 1968 ARE MISSING)

The March 1968 Operation Report states that a liaison link had been established between Det 1 Div Topo Svy Tp and the div loc bty svy sect, which would enable BPs to be included in TAOR survey control records. Survey training and minor survey tasks continued during March 1968. A general note in the report commented on their having been a chance during a quiet operational period for the Detachment to conduct some 'In-country training which was badly required'.

(Op Report for March 1968, undated).

(THE REPORTS FOR APRIL AND MAY 1968 ARE MISSING)

By the middle of 1968 it seems to have been the usual practice to send a pair of surveyors out on battery deployments in order to observe orientation by sun azimuth and help fix the location as best they could. This was often initially by map spot, but the surveyor would then be in situ to help bring higher fixation into the position if it could be carried forward.

During July 1968, when Operation THOAN THANG was being conducted, the survey section was attached to

the US Army Target Acquisition Battalion based at LONG BINH and assisted them with survey commitments, assistance that was, apparently, highly commended. The TFAIO concluded his report for July with the commented: 'The survey problem is still difficult and requires continued recce; in some areas survey is not feasible ... under the existing operational conditions and time factors'. (Op Report for July 1968, undated) Obviously, after two years of operations in Vietnam, some things had not changed for the survey section.

An appendix to the July 1968 report discusses the carrying of survey into positions where the line of sight into the position is not possible because of vegetation or crest problems. The use of intersections onto a helicopter hovering over a position had been tried on a number of occasions but only as a last resort. It had a serious weakness, in that there was no absolute guarantee that the helicopter was hovering over the point being fixed when the observations were made. In the system of triangulation with one of the stations being a helicopter, or meteorological balloon, the coordinates of the abstract point in the sky were calculated out and then used to carry survey forward to the point required. During intersection on a helicopter, though, a direct correlation was being made between the abstract point in the air and a point on the ground directly, or supposedly directly, beneath it. It is acknowledged that under the circumstances this still gave a much better fix than a map shot would have done. Unfortunately the technique was given greater credence than it deserved and was used as more than just a last resort.

The Operational Report for August 1968 is particularly instructive on the problems of straining survey techniques beyond elasticity. Survey was required during operation PLATYPUS, which was carried out in the Hat Dich area to the north west of Nui Dat, from 29 July to 6 Aug 68. The report of the way this was done reads.

During OP PLATYPUS, common grid survey was carried to the FSPBs. Because of the nature of terrain, aerial survey was the method used with an accuracy of 50 metres being obtained. A number of factors contributed to this low order of accuracy.

- a. The base established for the aerial intersection had a total length of approximately 5000 metres [actually closer to 4000 metres if measured on the map) and as the furthest FSPB was approximately 15 000 metres distant from the base, ill conditioned triangles resulted.
- b. Screening close to the base forced the helicopter to hover between 1000 - 2500 feet over the different FSPB before it could be observed from all the stations. Additional runs were made to counter the inaccuracy of hovering over a given point from such a height.
- c. Climatic conditions were poor and squalls and visibility hampered observations.

(Op Report for Aug 68, undated)

The report continues by stating that it was virtually impossible to map spot positions in the terrain, and that individual attempts to do so varied by up to 1500 metres. The results were not up to normal artillery standards, but were acceptable to the commanders on the ground. The report also states that long grass on the control stations made it necessary to build platforms of logs to get the observers above the level of the head-high grass. None of this was conducive to good survey.

The same report later describes how a calibration point was surveyed in at YS 411 697. The provision of security was, as usual, a problem and an attempt was made to intersect onto a helicopter hovering above the marker point, but it had to do this in strong winds while flying high enough to avoid possible enemy small arms fire. This failed to work and in due course a protection party had to be found so that the survey could be carried to the station using normal ground survey methods.

Those events are now a long way away in time and distance, but the wisdom of attempting to use the technique of helicopter intersection must be queried. Was it the best technique to use in those cases? Or were the surveyors just trying to apply the 'survey technique of the month'? Why did the survey section of the Det 131 Div Loc Bty mess around with those schemes when alternative, better ways must have been obvious? Perhaps the answer to that question is contained in paragraph 24 of the report;

24. Due to operational requirements the Det Svy Offr has been carrying out full time shift duties in Arty Tac at the request of the CO Fd Regt.

The attempts to survey these two positions during August 1968 exemplify some of the serious problems that the survey section had in doing its job in Vietnam. Firstly, the lack of appreciation by commanders, including some of the artillery ones (who should have known better) of what the survey section could do for them and how advantageous it might have been in some situations to have given them priority of resources. Secondly, the folly of taking a trained technical officer away from duties that any other gunner officer could have handled, to the detriment of the operations of the technical section that that officer was in the theatre to direct. Thirdly, the necessity for officers and NCOs of the survey section to have a thorough understanding of theory and principles - one cannot afford to break rules until they, and the reasons for them, are known thoroughly and the consequences of breaking them properly appreciated, for there is a point where trying to do something that is "better than nothing" is simply counterproductive.

There are two other notes of interest in the August 1968 report. The survey section had been used to calculate meteorological corrections for the calibration of 12 Fd Regt's guns, using the raw meteorological data provided by the US Army meteorological section at Nui Dat. This report also makes reference, for the first time, to the "Survey/Sound Ranging Section". Although the first note under that heading stated that sound ranging equipment had not yet arrived in Vietnam, it does mark a new role for the detachment, and a distraction for the surveyors from their primary responsibilities.

[DRAFT CONCLUDED FOR THE TIME BEING. TO CONTINUE WITH SEP 1968 REPORT)

