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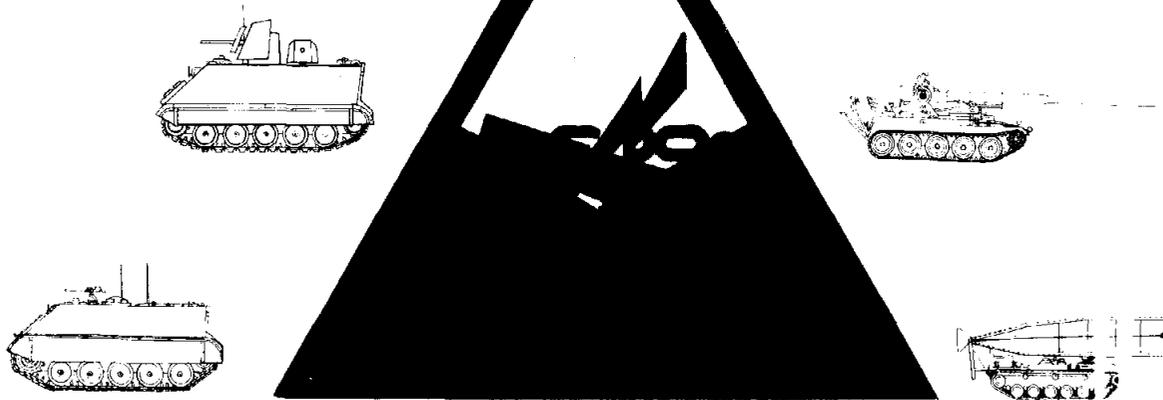
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UNITED STATES ARMY VIETNAM

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MECHANIZED AND ARMOR  
COMBAT OPERATIONS IN VIETNAM

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## FOREWORD

This report summarizes the operations and training aspects of the evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam (MACOV) conducted during the period 6 January to 28 March 1967. I consider it a helpful guide for use by units and individuals fighting in Vietnam or who, at some future time, may join in that fight.

Although oriented on U.S. Army Mechanized Infantry, Tank, and Armored and Air Cavalry, it is of interest to all engaged in the common purpose of defeating the enemy we face in South Vietnam today.

This report supplements previously published training literature dealing with operations in the Republic of Vietnam. The final story of mechanized infantry, tank, and cavalry operations in Vietnam is still being written--lessons are being learned and new techniques developed during every operation. Each of us must continue to display imagination, resourcefulness, and ingenuity in our training and combat operations.

  
W. C. WESTMORELAND  
General, United States Army  
Commanding

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## PREFACE

A detailed evaluation of U.S. Army mechanized infantry, tank, armored cavalry and air cavalry units in the Republic of Vietnam (RVN) was conducted during the period 6 January 1967 to 28 March 1967. This in-country evaluation titled "Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam (MACOV)" was directed by the Department of the Army based on a requirement from the Chief of Staff, U.S. Army, to determine whether a pattern for mechanized infantry and armor operations was emerging in RVN. The Commanding General, U.S. Army Combat Development Command (USACDC) in coordination with the Commander in Chief, U.S. Army Pacific (CINCUSARPAC) and the Commanding General U.S. Army Vietnam (USARV) prepared the study plan which was approved by the Department of the Army in December 1966. The study mission was assigned to CGUSARV and was conducted by the MACOV Study Group, headed by Major General Arthur L. West Jr. One of the tasks which the study was required to address was to evaluate the tactics, techniques, and operations of U.S. Army mechanized infantry, tank, and armored and air cavalry units in the Republic of Vietnam to determine what changes in doctrine and training are required. This report presents the results of that portion of the study relating to this task. This training and information document is designed to be instructive in nature and primarily for the benefit of troops assigned to mechanized

infantry, tank, and armored and air cavalry units and to training centers and service schools charged with their training. It does not replace current doctrine, tactics, and techniques but rather expands on them as applied in the operational environment in the Republic of Vietnam.

Due to the critical role of terrain and ground mobility in any evaluation of armor and mechanized forces, careful attention was given to the examination of military operations in each geographic region within RVN during both of the monsoon seasons. It was recognized that the MACOV evaluation took place in weather conditions favorable to armor and mechanized movement in most of RVN; therefore, considerable effort was devoted to documenting movement capabilities in all seasons.

There was no intent in the MACOV study effort to review and report in detail on the enemy situation or the overall physical geography of Vietnam. However, great attention was given to those characteristics of the enemy, terrain and climate which impacted on the use of armor and mechanized forces. The subject of tactical movement, in particular, was treated in significant depth.

The character of the war in RVN varies significantly from region to region, reflecting the many factors which are peculiar to each of the four CTZ. Although terrain and weather imprint a peculiar and characteristic signature in each tactical zone, other factors are present, and to a considerable degree exert equal or greater influence. In the I CTZ, in the north, the bulk of the

population live along a narrow 15 mile strip of coastal rice growing land. The U.S. Marines, employing Marine Corps doctrine, tactics, and techniques have concentrated in this area and along the Demilitarized Zone (DMZ) to counter the infiltration threat.

In the II CTZ, the broad expanse and extreme variations in terrain, the heavily populated rice growing coastal plains in the east, the rugged central belt of the Annamite Mountains covering 64 percent of the CTZ, and the thickly forested highlands in the west, present a major requirement for force mobility. Strong main force North Vietnamese Army (NVA) units and a primary infiltration route through Laos and Cambodia combine to present a significant enemy threat.

The III CTZ, containing the major population center of Saigon, the political heart of RVN, is flanked by dense mangrove swamps and extensive piedmont jungle growth. The hardcore enemy units, predominantly Viet Cong, have developed a series of long established base areas and a deeply entrenched infrastructure.

In the IV CTZ, primarily an ARVN area of operations, a dense population, flat rice paddy terrain, heavy mangrove swamps and the tactics employed by the enemy, make operations in this area separate and distinct from the other three CTZ.

Forces on the one hand must concentrate on total destruction of the enemy and his infrastructure and provide for complete displacement of the civilian population (e.g. OPERATION CEDAR FALLS in the Iron Triangle.), while in contiguous areas, as throughout

the Mekong Delta, operations may be characterized by numerous small unit actions which have as their combined purpose the defeat of the enemy and the establishment of fertile ground for revolutionary development. In this latter mission, the role of the Regional Forces (RF) and Popular Forces (PF) elements of the Republic of Vietnam Forces (RVNAF) are paramount and must be fully considered in developing a rational basis for U.S. Force employment.

As an adjunct to this training document, a training film, "U.S. Army Mechanized and Armor Combat Operations in Vietnam," is now being completed using combat film footage, and will be issued through normal film distribution channels. A draft field manual on Air Cavalry Operations has also been prepared and informally coordinated with the 1st Cavalry Division (Air Mobile). It will be published by U.S. Army Combat Development Command and will be distributed to air cavalry units and service schools.

## TABLE OF CONTENTS

	<u>PAGE NO.</u>
PREFACE	I
SECTION I - INTRODUCTION	1
1. PURPOSE	1
2. SCOPE	1
3. THE NATURE OF THE ENEMY AND HIS OPERATIONS	2
a. OFFENSIVE TECHNIQUES	3
b. DEFENSIVE TECHNIQUES	6
c. ANTITANK TECHNIQUES	6
4. FRIENDLY FORCES	9
a. FREE WORLD MILITARY ASSISTANCE FORCES	9
b. REPUBLIC OF VIETNAM ARMED FORCES	10
5. ENVIRONMENT	10
a. GENERAL	10
b. CLIMATE AND WEATHER	10
c. TRAFFICABILITY	13
SECTION II - DOCTRINE, TACTICS AND TECHNIQUES	49
1. GENERAL	49
a. PURPOSE	49
b. SCOPE	49
c. THE NATURE OF AREA WAR	50

d.	DOCTRINE	53
e.	EMERGING TRENDS	55
f.	CAPABILITIES OF ARMOR AND INFANTRY UNITS	57
2.	COMBAT OPERATIONS - GENERAL	57
a.	TYPES OF MISSIONS	57
b.	MOUNTED COMBAT AND M113 ARMORED PERSONNEL CARRIER IN A TANK-LIKE ROLE	60
c.	ORGANIZATION FOR COMBAT	68
d.	COMBAT SUPPORT	70
e.	IMPROVEMENT IN NIGHT COMBAT CAPABILITY	77
f.	FIRE AND MANEUVER - FIRE AND MOVEMENT	82
g.	REVERSAL OF ROLES BETWEEN ARMOR AND INFANTRY	82
h.	COMMAND AND CONTROL	84
3.	COMBAT FORMATIONS - BATTLE DRILL	87
a.	COMBAT EXAMPLE	87
b.	BATTLE DRILL AND COMBAT FORMATIONS	89
4.	ARMOR AND MECHANIZED INFANTRY UNIT EMPLOYMENT TECHNIQUES	96
a.	MOVEMENT EXPEDIENTS	96
b.	TANK AND M113 EMPLOYMENT	102
c.	MINES AND BOOBY TRAPS	109
d.	USE OF ARTILLERY AND ARMY GUNSHIPS FOR FLANK SECURITY	114
e.	ARMORED CAVALRY REGIMENT M113's	114

5.	INTELLIGENCE, RECONNAISSANCE AND SECURITY	115
a.	INTELLIGENCE	115
b.	CONVOY ESCORT AND ROUTE SECURITY	127
c.	POLICE OF THE BATTLEFIELD	130
6.	SEARCH AND DESTROY OPERATIONS	132
a.	GENERAL	132
b.	TECHNIQUES	133
c.	TUNNEL SEARCH OPERATIONS	134
7.	DEFENSIVE OPERATIONS	137
a.	PERIMETER DEFENSE	137
b.	DISPERSION IN THE DEFENSE	137
c.	DEFENSE AGAINST ENEMY INDIRECT FIRE WEAPONS	137
8.	AIR CAVALRY	139
a.	AIR CAVALRY TROOPS	139
b.	CAVALRY TROOP	141
c.	PUBLICATIONS	142
9.	COMBAT SERVICE SUPPORT	142
	SECTION III - ORGANIZATION AND EQUIPMENT	145
1.	PURPOSE	145
2.	SCOPE	145
3.	GENERAL	146
a.	METHODS	146
b.	TOE	147
c.	EQUIPMENT	148

4.	TYPE ORGANIZATIONS	148
a.	GENERAL	148
b.	THE MECHANIZED INFANTRY BATTALION	149
c.	THE TANK BATTALION	154
d.	THE ARMORED CAVALRY SQUADRON, DIVISIONAL	160
e.	THE ARMORED CAVALRY REGIMENT	164
f.	THE AIR CAVALRY SQUADRON, AIRMOBILE DIVISION	168
g.	THE ARMORED CAVALRY TROOP, SEPARATE AIRBORNE/LIGHT INFANTRY BRIGADE	170
5.	EQUIPMENT MODIFICATIONS	171
a.	M48A3 TANK	171
b.	M113 PERSONNEL CARRIER	172
c.	ROME PLOW (CLEARING BLADE)	173
d.	PROTECTIVE SANDBAGS	174
6.	CARE AND MAINTENANCE	176
a.	GENERAL	176
b.	HANDSET H-138/U AND MICROPHONE M-80/U	176
c.	M79 GRENADE LAUNCHER	176
d.	M72 ROCKET (LAW)	176
e.	M16 RIFLE	176
f.	TANK GUN, 90MM	177
	CONCLUSION	178

APPENDIX - GLOSSARY

179

ADDENDUM - COMBAT EXAMPLE (3-5 ARMD CAV)

202



SECTION I  
INTRODUCTION

1. PURPOSE

The purpose of this report is to set forth the results of the evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam (MACOV) that are of training interest. It is oriented on mechanized infantry, tank, armored cavalry, and air cavalry units. It is designed to be instructive and primarily for the benefit of troops assigned to these type units and training centers and service schools charged with their training. It does not replace current doctrine, tactics and techniques but rather expands on them as applied in the environment of the Republic of Vietnam.

2. SCOPE

This report is oriented on mechanized infantry, tank, armored cavalry and air cavalry units in the Republic of Vietnam. The first section covers the nature of the enemy and an evaluation of the terrain in the various parts of the country as it affects the operations of these type units. The next section deals with doctrine, tactics, and techniques with illustrated examples of how they are applied in typical combat situations. The final section deals with organizational structure and equipment and includes a rationalization of deviations from standard TOE and other innovations and modifications.

### 3. THE NATURE OF THE ENEMY AND HIS OPERATIONS

NVA forces are better armed, equipped, supplied and led than other VC units. NVA forces usually wear distinctive khaki uniforms and exhibit a greater tendency to maintain unit integrity particularly when forced to withdraw. Because of these factors and his relative unfamiliarity with South Vietnam he can not blend into the local population as VC units frequently do. These considerations also tend to limit NVA operations to those regions in close proximity to sanctuary or in which he can escape detection during the hours of daylight. Despite the foregoing many similarities in VC methods of operation are apparent. The simple but effective code of the VC is "When the enemy advances, withdraw; when he defends, harass; when he is tired, attack; when he withdraws, pursue." This maxim emphasizes the difficulty with which he can be found, fixed, fought and finished. VC tactics and techniques rely on speed, security, surprise and deception for their success. Operations are planned in great detail and are based on thorough, detailed reconnaissance. Sand tables, terrain models and rehearsals are used whenever possible in preparing troops for tactical missions. This practice tends toward a certain amount of inflexibility, since radio communications are usually limited to one short range portable radio per battalion. They generally prefer to break contact when a large operation fails to be executed according to plan rather than change operations in mid-stream. They appear to be reluctant to attack units strong in armor or mechanized equipment and those units

which have demonstrated skill in employing air and artillery support.

a. OFFENSIVE TECHNIQUES. The ambush is a common VC offensive technique. Detailed planning and meticulous preparation are always in evidence; they have been known to let an opportunity slip by rather than act hastily. Command detonated mines are usually employed to fix the target in place. Then after a short and violent attack, the ambushing forces make a rapid withdrawal. The usual target is people, not supplies. Raids are another common offensive technique. The surprise raid takes as much advantage as possible of lax security. It is usually short and aimed at a larger force. Larger power raids employ overwhelming strength and maximum firepower and are designed to quickly overrun and annihilate the defenders. Maximum use is made of darkness and poor weather conditions to minimize the effects of artillery and air fire support. Harassment is one of the tenets of VC guerilla warfare and is practiced wherever conditions permit. Sniper fire, mines, booby traps, grenades, mortars, recoilless rifles and even spiked traps and poison arrows are employed. The VC are adept at infiltration for the purpose of sabotage, assassination, demoralization and the collection of intelligence. The following explanation of VC offensive techniques was furnished by the Ambush Academy, 25th Infantry Division:

The technique, "One Slow, Four Quick" is used by the Viet Cong in their battle planning for assault against built up defensive positions or for ambush of moving columns of vehicles or dismounted troops.

Studies of these steps reveal that the Viet Cong in the first step, that of "PREPARE SLOWLY," believe in thorough and deliberate planning before undertaking any tactical operation. They do not usually undertake an operation that does not have a very good chance of succeeding. In this step the Tactical Commander formulates his plans, studies the strength and weakness of the enemy, evaluates the terrain, makes a ground and map reconnaissance of the area of tactical operation and plans his routes to and from his objective. Then the Viet Cong leader withdraws to the rear in a relative secure area. Here he organizes his tactical elements and chooses a rehearsal site. This must be as near like his planned objective as possible. Here he rehearses the operation until every leader and individual is familiar with the terrain, his specific job and only then, when the Viet Cong Commander is convinced that the rehearsal is perfect does he decide to execute his planned operation.

THE FOUR QUICK STEPS. This is the execution of the operation and in the first quick step "ADVANCE QUICKLY". The Viet Cong element moves from their relatively secure area and advances quickly without delay to minimize their desired objective. Then they immediately as planned go into the second quick step "ASSAULT QUICKLY". In this, the assault phase, they use to maximum advantage the element of surprise and mass a large volume of automatic rifle fire, recoilless rifle fire or rifle grenade fire on their objective or upon the lead element of a vehicular or dismounted column to halt and disorganize it. They then exploit their success and pursue the enemy killing or capturing him.

At this time the Viet Cong executes the third quick step and "CLEAR THE BATTLEFIELD QUICKLY". In this phase he collects and carries off for future use all of the weapons, ammunition and explosives he can carry and destroys anything of value left behind. He evacuates his wounded and religiously carries off his dead.

He then, with orderly precision, advances into the fourth quick step of "WITHDRAWS QUICKLY". He moves out over planned withdrawal routes ready to use alternate routes if necessary and his tactical elements quickly breakdown into smaller elements and lose themselves over as large an area as possible.

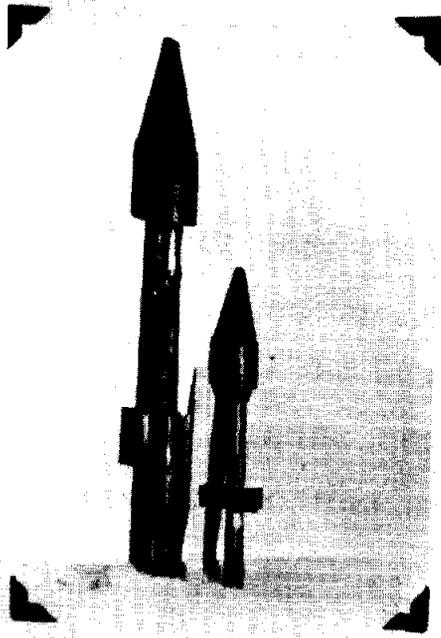


Figure 1. VC Antitank Grenades  
RPG7, Left, RPG2, Right

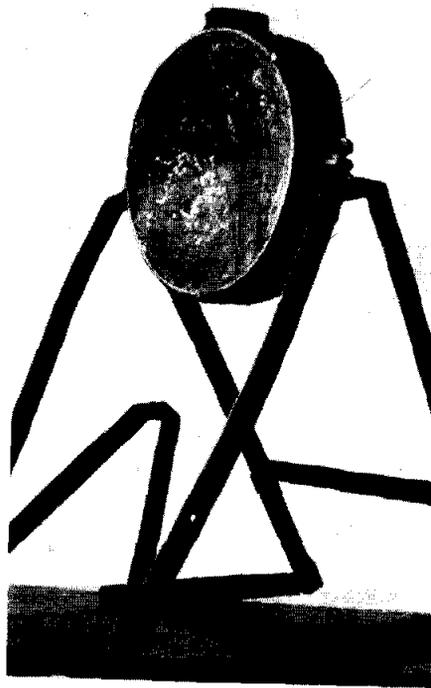


Figure 2. VC Claymore Mine

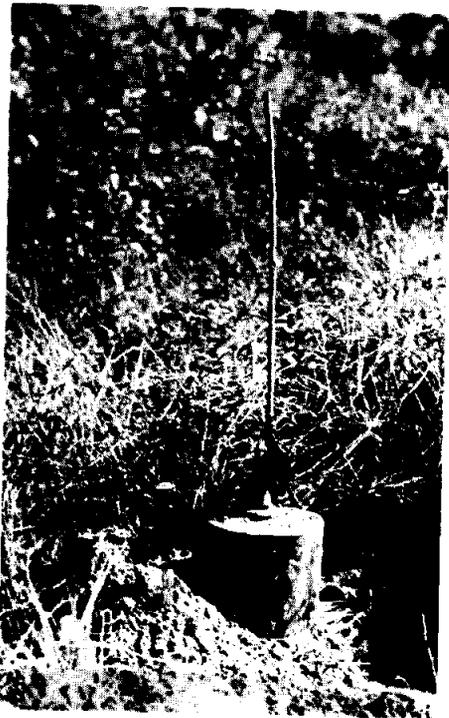


Figure 3. VC Stick Mine



Figure 4. VC Antitank Mine  
Chinese Manufacture

b. DEFENSIVE TECHNIQUES. Defensive techniques are centered around methods of escaping from all forms of attack by stronger forces. In general, the defense is one of delay until a rapid withdrawal from contact can be made. Once contact is broken, the VC either go into hiding or exfiltrate to pre-arranged rallying points. Capture is evaded by blending with the local population, melting into dense jungle areas or by literally going underground into elaborate and well-concealed tunnel systems. The VC prepare extensive defensive systems throughout their areas of operation, and these are characterized by defense in depth, mutual support, overhead cover and maximum use of cover and concealment.

c. ANTITANK TECHNIQUES.

(1) General. Although the VC cannot be said to possess a sophisticated antitank capability, they make effective use of weapons and materials available to them. The primary antitank weapons consist of the 57mm and 75mm recoilless rifles, antitank grenade launchers (RPG2 and RPG7) and at times the 12.7mm machine gun. Antitank mines vary from pressure detonated devices similar to the U.S. antitank mines through various improvised mines which may be as much as 250 lbs in size. They also use recovered artillery and mortar shells and aircraft bombs with pressure or command detonated fuzes. Figures 1 through 4 illustrate typical VC antitank weapons and mines.

(2) Offensive Use. The most frequent offensive use of antitank weapons is in conjunction with ambushes. They are usually

emplaced at each end of the ambush area where they can attack the first and last vehicles in the killing zone and also protect the flanks of the position. They will also be placed at intervals throughout the killing zone. These weapons will have designated alternate positions to which they can be moved to protect the rear of the ambushing force against encirclement by mobile forces. Command detonated mines are also employed at the ends of the killing zone to knock out vehicles and block movement out of the zone. Claymore antipersonnel mines are frequently placed in trees for the purpose of injuring personnel riding on top of vehicles and crewmen who are partially exposed. Enemy personnel will also position themselves in ditches along side the road three to five meters from the passing armored vehicles. They attempt to take advantage of the dead space around APC's and tanks where automatic weapons cannot be sufficiently depressed to engage them. From this distance the enemy attempts to throw hand grenades into the tracks of the vehicle and to throw grenades into the driver and fighting compartment hatches. They will also tie two or three hand grenades together and attempt to lodge them on top of the vehicles in the hope of penetrating the thinner armor. One defense against such tactics is the use of hand grenades dropped over the side of the vehicle. Care must be taken, however, to throw the grenade far enough away from the enemy that he cannot pick it up and throw it back before it explodes. Another solution is mutual support by two or more vehicles in order that one

vehicle can use its automatic weapons to protect the other. Only when conditions are highly favorable will an attack be made against an armor unit unless they can find an isolated platoon or less which they can engage by hit and run tactics. For a short period they will employ all possible means to destroy the armor vehicles including recoilless rifles, antitank grenade launchers, hand grenades and satchel charges. Once they have lost the advantage of surprise and are in danger of being defeated, they withdraw. Nuisance type mining is the most frequent method of offensive antitank warfare. Mines will be emplaced at night in roads that are well traveled during the day. Often large command detonated mines will be emplaced during the hours of darkness. They will also emplace mines on trails which may not have been used for some time. There have been occasions when pressure fused mines did not explode until after several vehicles had passed over them and so were thought to be command detonated. Investigation of other mines found in the vicinity usually indicated that mud had become hardened under the spider of the mine and the vehicle which eventually exploded the mine was one having a higher ground pressure than those that had previously passed over the mine, often a heavily loaded vehicle.

(3) Defensive Employment. Antitank weapons can be expected in any defensive position. They are rapidly moved to that portion of the position being threatened by armored elements. No particular technique has been discerned in their employment except

that they are employed at close ranges, usually less than 50 meters. Mines are also employed in the vicinity of organized defensive positions and base camp complexes. They are not always placed on roads or trails but may be found randomly emplaced in fields and open areas of the jungle.

(4) Logistical Support. The VC relies on the local population for food, clothing and manpower. NVA provides weapons, ammunition and some manpower. Supplies are also received from out-of-country sources in contiguous areas and from Red China.

(5) Strengths and Weaknesses. VC strengths lie in his ideological dedication, his toughness and endurance, a thorough intelligence system and a high degree of foot mobility. His weaknesses stem from his lack of a sophisticated war machine. He is highly vulnerable to air, artillery and armor attack and has none of these capabilities at his own disposal. He lacks communications and has a limited logistical capability for the support of sustained operations.

4. FRIENDLY FORCES. Friendly forces in RVN consist of U.S. Forces, Free World Military Assistance Forces (FWMAF), and the Republic of Vietnam Armed Forces (RVNAF).

a. FREE WORLD MILITARY ASSISTANCE FORCES (FWMAF). FWMAF forces consist of representative units or contingents from Australia, New Zealand, Thailand, Korea, The Republic of China and the Philippines. Tactical FWMAF, at the present time, are limited to the nations of Australia, New Zealand and the Republic of Korea.

b. Republic of Vietnam Armed Forces. The vast majority of RVNAF are in the Army which is deployed in all four CTZ. The Army of Vietnam (ARVN) is divided into regular army forces, regional forces, and popular forces. Regular ARVN units make up the largest single component. Regional Forces (RF) operate as province forces under control of the chief who is usually a major or lieutenant colonel of the regular component. Popular Forces (PF) operate at the hamlet or village level and have the mission of defending the hamlet or village they actually inhabit. RF reinforce PF when hamlets defended by the latter are in danger of being overrun. Republic of Vietnam Navy, Marine and Air Forces account for slightly more than ten percent of the total RVNAF.

#### 5. ENVIRONMENT

a. GENERAL. South Vietnam occupies a crescent-shaped area of about 67,000 square miles on the southeastern edge of the Indochina Peninsula. It is only 45 miles wide at the 17th parallel along the demilitarized zone (DMZ). It has 1,500 miles of seacoast on the South China Sea and the Gulf of Siam. Its western border with Laos and Cambodia measures about 950 miles. Land borders, for the most part, are poorly defined and are drawn through areas difficult of access.

#### b. CLIMATE AND WEATHER

(1) Climate. The climate is hot and humid, subtropical in the north and tropical in the south where the mean monthly temperature is about 80 degrees Fahrenheit. Temperatures

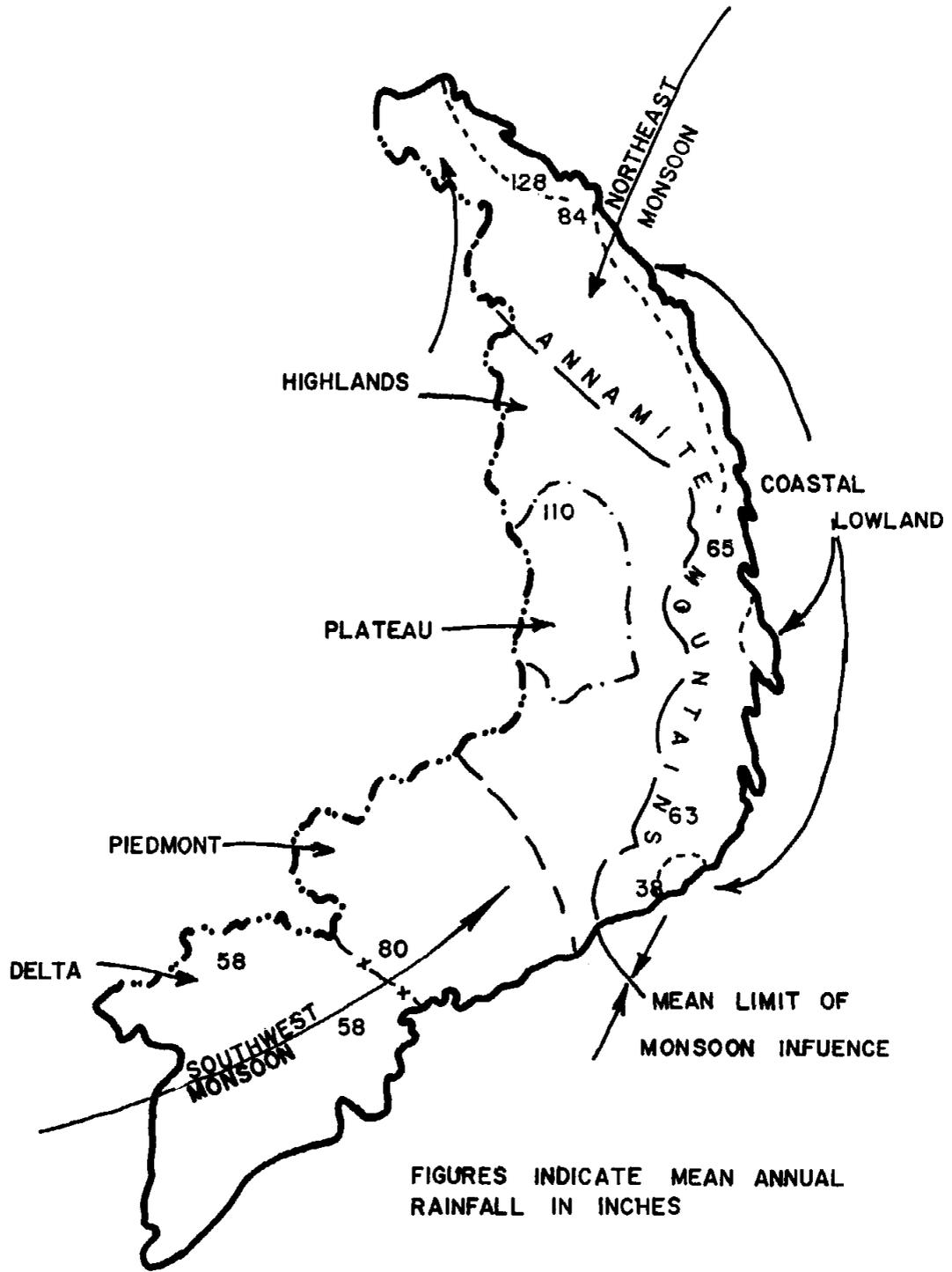


Figure 5. Geomorphic Regions

frequently soar well over the 100 degree mark in parts of the lowlands and delta region. Annual rainfall is heavy in most regions and is profoundly influenced by the monsoon winds throughout the year. Rainfall is heaviest in the north along the coast where the annual average is 128 inches. At Saigon, rainfall averages 80 inches annually.

(2) Weather. There are two distinct seasonal alterations which influence the weather throughout the year. These are the summer, or southwest monsoon and the winter, or northeast monsoon. Monsoon means a periodic wind and are referred to by the direction from which they flow. The dividing line between the influence of the two monsoons is the highlands formed by the Annamite Mountain Range (Figure 5). The southwest monsoon begins in May and lasts through September. Its influence continues to be felt during the transition period which lasts into December. The monsoon brings in warm moist air which is gradually forced upward against the highlands. The cooler temperatures at the higher altitudes cause the moisture to condense and fall as rain. In the area influenced by the southwest monsoon rainfall is heaviest in the north and grows progressively lighter to the south. The northeast monsoon begins during the transition period of the southwest monsoon. It usually begins in September, is firmly established by November and lasts through December. Rains accompanying the northeast monsoons are heaviest in the area north of Da Nang ranging from 80 to 120 inches annually. Rainfall tapers off further south averaging 55 inches at

Nha Trang and less than 40 inches between Phau Thiet and Phan Rang. Rains begin in September and last into February in the northern portion. Farther south rainfall ends in January.

c. TRAFFICABILITY

(1) General. The treatment of the "going" in subsequent paragraphs is, of necessity, general in nature. It is designed to provide a general understanding of the nature of the terrain as it affects all forms of movement. More about the going is being learned every day as mechanized infantry, armor and armored cavalry units penetrate areas of operations in which these type units have not been employed previously. Much more remains to be learned. In some areas it is impractical to expend the engineer effort necessary to move armored units, in other areas armor can move with ease. Between these extremes conditions vary widely in different parts of the country and at different times of the year. Wheeled vehicles are essentially restricted to roads and trails throughout the country. While much of the ground becomes firm enough to support wheeled vehicles during the dry season, the numerous obstacles such as; paddy dikes in the coastal plains, dense vegetation, and steep slopes in the highlands, and dikes, ditches and canals in the delta makes cross-country movement of wheeled vehicles infeasible. The M578 light recovery vehicle, because of its greater weight and lack of a swim capability cannot operate in many areas readily accessible to the M113. The subsequent evaluation of the terrain as it affects tactical movement does not specifically address this type vehicle. The M551

(Sheridan tank) was designed to have the same mobility characteristics as the M113. Tests conducted in CONUS to date indicate the design characteristics have been achieved.

(2) Evaluation of the "Going". Following is a list of "pointers", gathered from many sources in RVN, which have proven helpful in evaluating the going capability of the soils found in the various parts of the country:

(a) Soils composed of red clayey silt, common in the area around Tay Ninh, the plateau region of II Corps Tactical Zone (CTZ), and found locally throughout the country tend to break down when wet. Single tracks may usually be made but repeated passes or sharp turns cause these soils to break down and become untrafficable. Similar conditions often exist in plantation areas where tracking is not advisable during the wet season. One way to test for this type soil is to stick a rod (such as the one found in a box of tank ammunition) into the ground where surface water is standing. If the water drains through the hole, clay is usually present and tracking is not advisable during the wet season.

(b) Watch the water buffalo. He does not go where he can not stand on the bottom. If the bottom supports him it will usually support an APC.



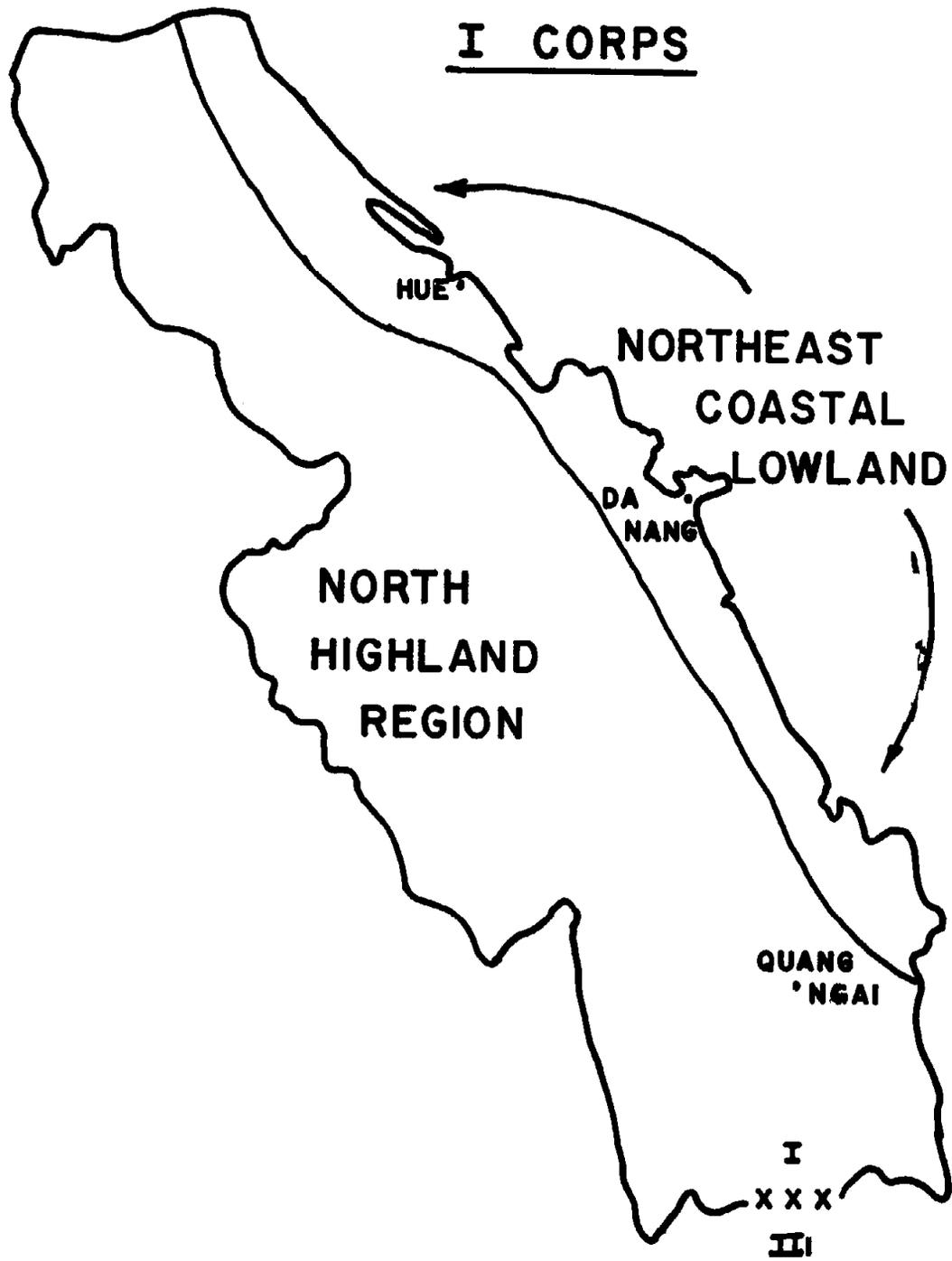


Figure 7. I Corps Geomorphologic Regions

(c) Rice paddies without standing water during the rainy season are too soft to support APC. Those containing clear water and green vegetation are usually trafficable for APC. During the dry season all rice paddies are assumed to be trafficable for APC.

(d) Inundated areas containing yellowish reeds and cloudy water can be expected to have a soft bottom.

(3) Corps Tactical Zones (CTZ). The Republic of Vietnam (RVN) is divided into four Corps Tactical Zones (Figure 6). Conditions of weather, climate and terrain vary between each of these although some common characteristics can be found. For these reasons the terrain and its impact on tactical movement will be treated separately in each of the four zones.

(4) The I Corps Tactical Zone (CTZ) (Figure 7). The I CTZ covers 11,100 square miles or approximately 17 percent of the total land area of RVN. It is divided into five governmental provinces with a total population of approximately two million people or less than 15 percent of the national total. Most of the population inhabit the coastal lowlands. The majority of the land area within the I CTZ consists of the Highland Region which is formed by a chain of rugged mountains, extending the length of the zone from north to south. This area is characterized by steep, rocky slopes; sharp crests and deep narrow valleys. The vegetation in these mountains is the most dense found in RVN and consists of tropical evergreen forests. The remainder

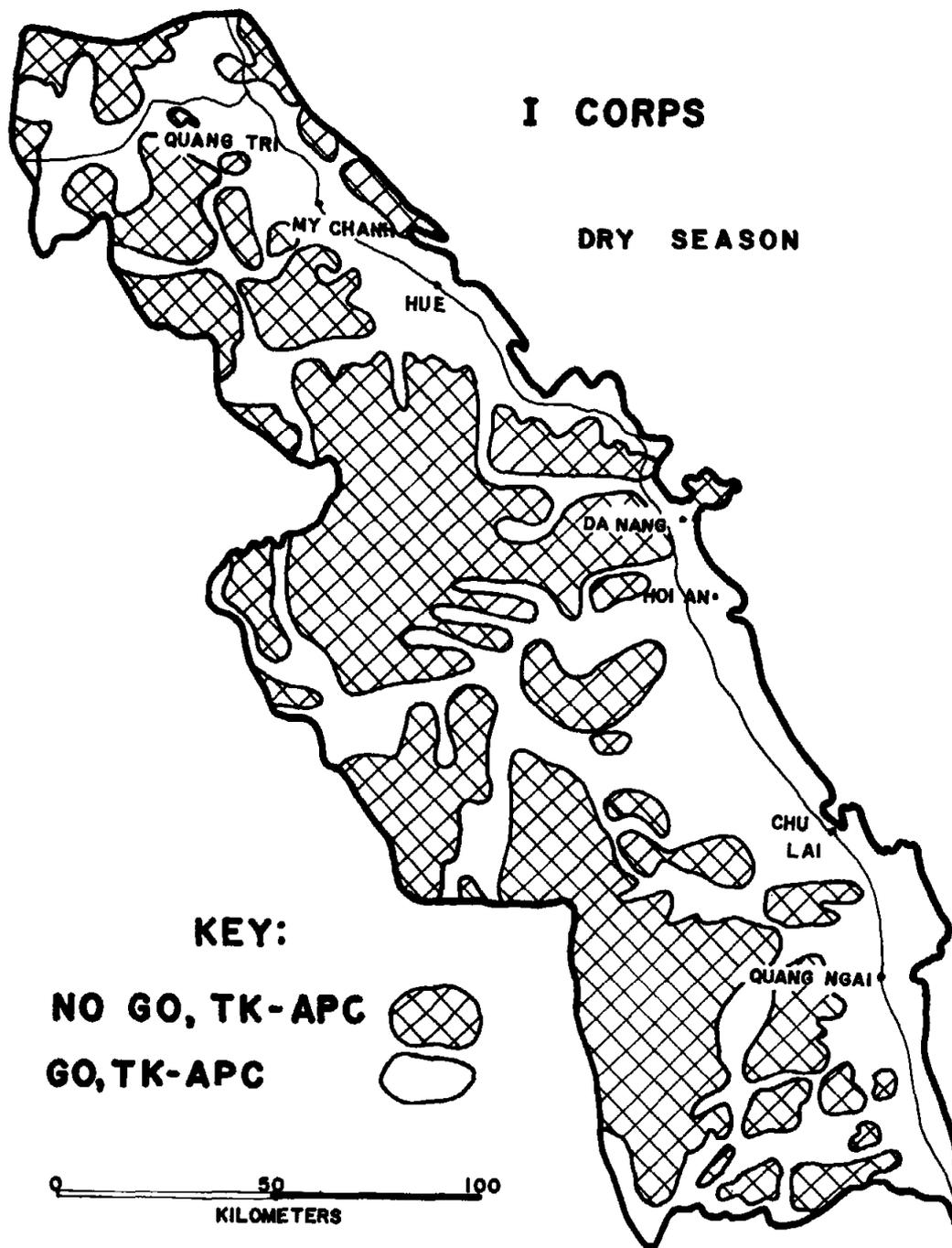


Figure 8. Dry Season Going, I Corps

of the CTZ, the Coastal Lowlands, is a narrow flat plain that extends from the sea to the foothills of the mountains. This area is characterized by sandy beaches and large areas of rice-fields. Rains begin in September and reach a maximum in October and November. Rainfall is heaviest in the Hue area and generally lasts into February. Dry months are from February through August. Due to the porous nature of the soil heavy rains do not affect trafficability after a few sunny days.

(a) Dry Season (Figure 8)

1. Tank Movement. While 44% of the total terrain in the CTZ can be negotiated during the dry season, movement is considered best in the coastal lowlands where over 89% of the terrain is trafficable. During this season, the ground in the coastal lowlands is firm, and supports free tank movement across all but small, isolated marshy areas, and some rice fields adjacent to rivers. Average rate of movement for tanks is 8-10 kilometers per hour. The rivers and numerous streams will, however, reduce the movement rate as their soft soil bottoms generally do not have sufficient bearing strength to support tanks. Class 60 rafts, bridges or armored vehicle launched bridges would be required at crossing sites. The remaining 11% of the terrain in the coastal lowlands consists of isolated peaks and spurs with steep slopes and sharp ridges, covered with dense evergreen forests. The mountains in the highland portion of the CTZ pose the most severe restriction to tank movement and comprise 70% of the terrain in the



Figure 9. Typical Mountain Terrain, I Corps

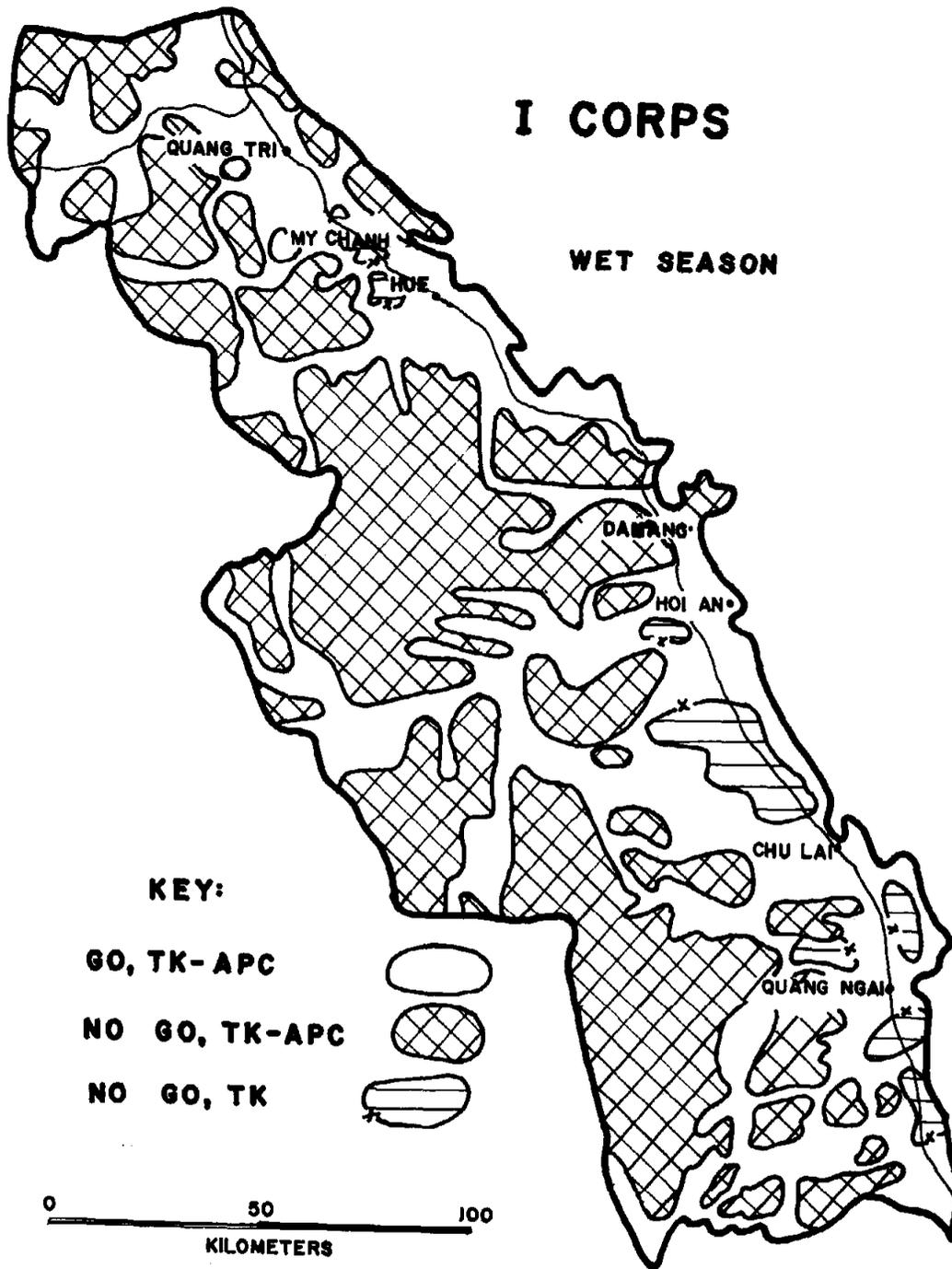


Figure 10. Wet Season Going, I Corps

CTZ. These mountains have slopes from 40 to 60%, and some cliffs. The combination of steep slopes and dense vegetation limits tank movement through the mountains to roads, trails, or stream valleys, unless engineering support is provided to improve the terrain (Figure 9). The numerous stream valleys and passes comprise 21% of the total terrain in the highland area. Cross-country movement can be made in some mountain areas, but would require extensive engineer assistance. Average rate of movement in the mountains does not exceed one kilometer per hour.

2. M113 and M551 Movement. Movement during the dry season is essentially the same as for tanks. Since these vehicles can swim they will not require bridging assistance in river crossings, but will have to use normal field expedients in exiting the steep, soft-soil banks. Average rate of movement is 10 to 12 kilometers per hour in the coastal lowlands and about the same as for tanks in the mountain regions.

3. Foot Movement. Foot movement in the coastal lowlands is essentially unrestricted during the dry season. The combination of steep, rock-covered slopes, and dense vegetation in the highlands restricts foot movement generally to trails and stream valleys. Average rate of movement varies from .2 to .5 kilometers per hour in the mountains to 2 to 3 kilometers per hour in the coastal lowlands.

(b) Wet Season (Figure 10)

1. Tank Movement. During the wet season,

additional soft-soil areas reduce the amount of negotiable terrain in the CTZ to 36%. The soft-soil and inundated areas generally restrict tank movement in the coastal lowlands to roads, sandy beaches, or higher elevations. Tank movement along the roads will normally require bridging assistance, since bridge classifications are frequently less than 20, and the bypasses currently in use are of the low water type. During this period of restricted movement, it may be advantageous to move tanks along the coast by LST. The wide sandy beaches are fully suitable for amphibious landings permitting tanks to be employed along the entire coast. The average rate of movement is reduced to 4 to 5 kilometers per hour. Tank movement is not feasible in the mountains.

2. M113 and M551 Movement. Movement during the wet season is essentially the same as during the dry season. The low ground pressure of these vehicles and their ability to swim enables them to negotiate 89% of the terrain in the coastal lowlands perennially, but the average rate of movement is slowed to 4 to 5 KM per hour. In the highland area some of the stream valleys become inundated and the river velocities exceed the swimming speed of the M113. Crossing of these rivers may require engineer assistance. M113 and M551 movement is not feasible in the mountain regions.

3. Foot Movement. Foot movement during the wet season becomes difficult in the coastal lowlands due to soft-soil and inundated areas, rate of movement is reduced to

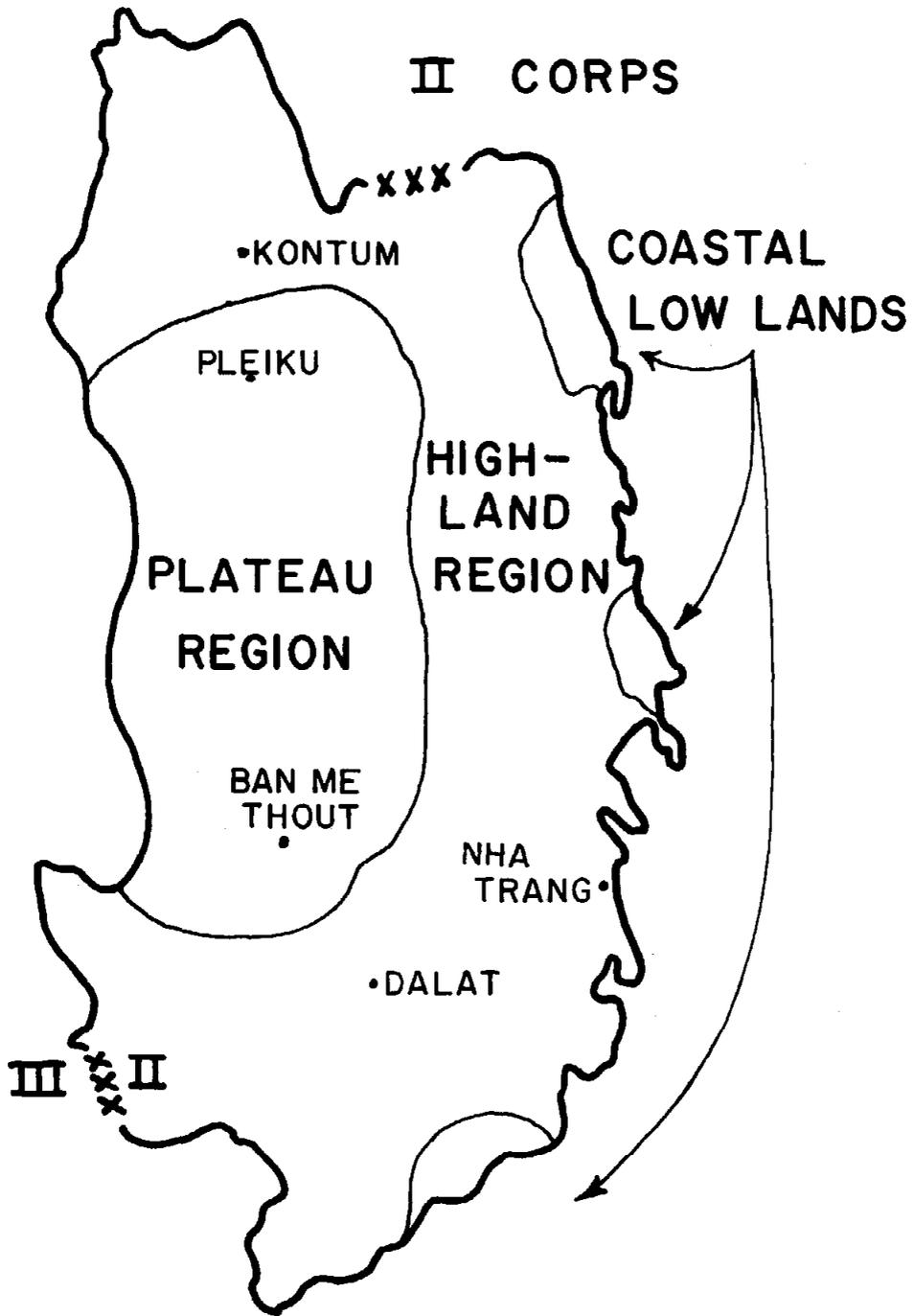


Figure 11. Geomorphic Regions, II Corps

one to two KM per hour. Foot movement may be facilitated by using the swim capability of the M113 in those areas where stream velocities will permit. Rate of movement in the highland mountains is less than .2 KM per hour.

(c) Air Movement. The steep mountainous terrain in most of I CTZ plus the limited road net, makes air movement a necessary element to the conduct of operations. Helicopters thus provide the most effective means of movement in the mountains throughout the year and enjoy their greatest advantage during the wet season when the passes and river valleys become inundated. During the rainy season, helicopter operations are best conducted after the early morning fog and after low cloud cover has dissipated. The coastal lowlands contain many flat areas relatively free of vegetation, thus providing excellent landing sites year-round. Air movement in the coastal lowlands is not as vital as in the mountains because these areas are also best for APC's and tanks.

(5) The II Corps Tactical Zone (Figure 11). The II CTZ covers 29,500 square miles or approximately 45 percent of the total land area of RVN. It is divided into 12 governmental provinces with a total population of approximately 2½ million people. Over two-thirds of this population is located in the coastal provinces. The topography within the II CTZ is divided into three basic regions. The Coastal Lowlands consisting of a series of flat river plains which are bisected locally by spurs

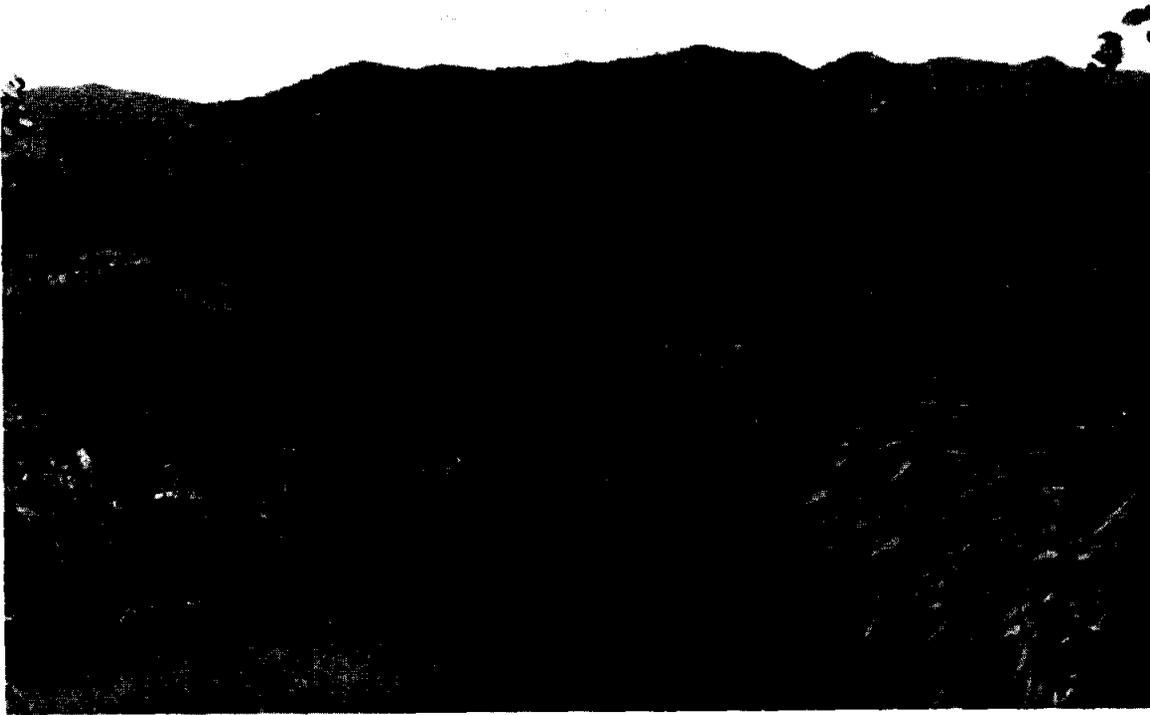
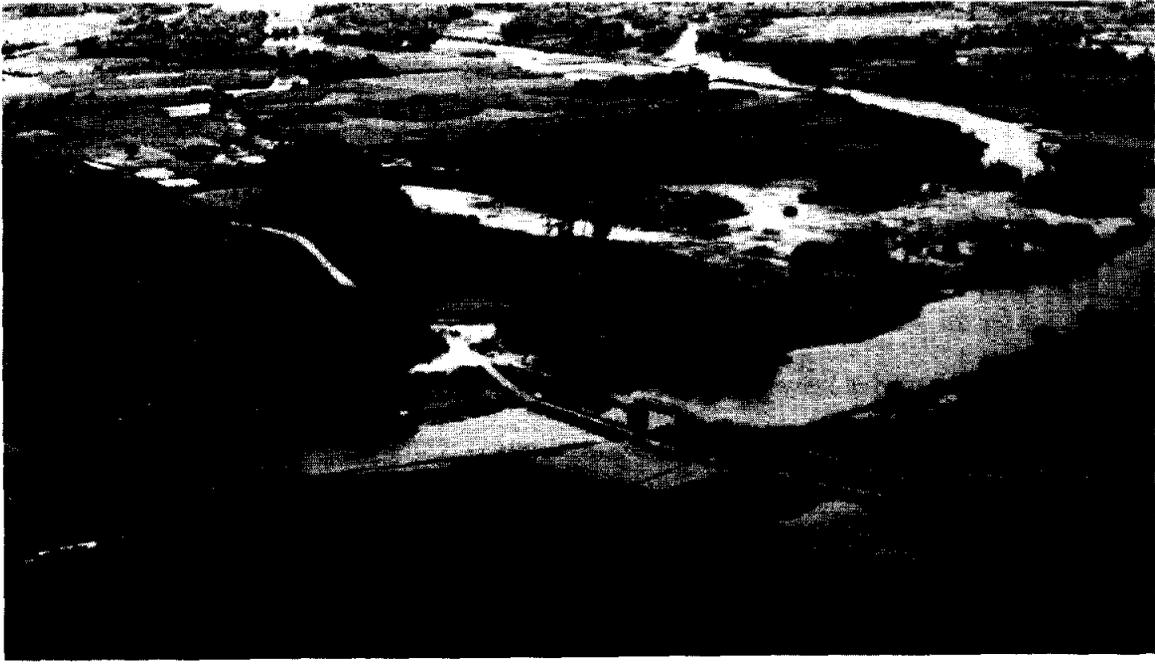


Figure 12. Typical Coastal Lowland (TOP)  
Plateau Region West of Pleiku (BOTTOM)

of the Annamite Mountains that extend to the sea. The area is characterized by sandy and silty beaches, wide flat-floored river valleys, marshes and ricefields (Figure 12). The Highland Region is formed by a chain of mountains and rugged hills which forms a crescent, its ends anchored on Cambodia and Laos, its center backing the coastal lowlands. The area is characterized by steep, boulder-covered slopes; sharp crests; and deep, narrow valleys. Vegetation consists of dense tropical evergreen forest. Scattered patches of smaller trees and clearings can be observed but forming no pattern they are not tactically significant. The Plateau Region is located between the mountains and the Cambodian border. It is characterized by rolling terrain, with hilly areas in the extreme northern and southern sections. Vegetation is generally a mosaic of cultivated fields, grassy areas, bamboo and secondary forests. Dense evergreen forests are found in the hill areas. The II CTZ has two distinct weather regions with the Annamite Mountain range separating the eastern and western climates of the CTZ. The monsoon influence is determined largely by the topographical features of the region. During the southwest monsoon season, rains are released, as winds from the southwest cross the Plateau and the western half of the mountains. As the air descends on the eastern side of the mountains, drying and heating takes place causing fair weather to occur along the coast. During the northeast monsoon season rain predominates on the eastern

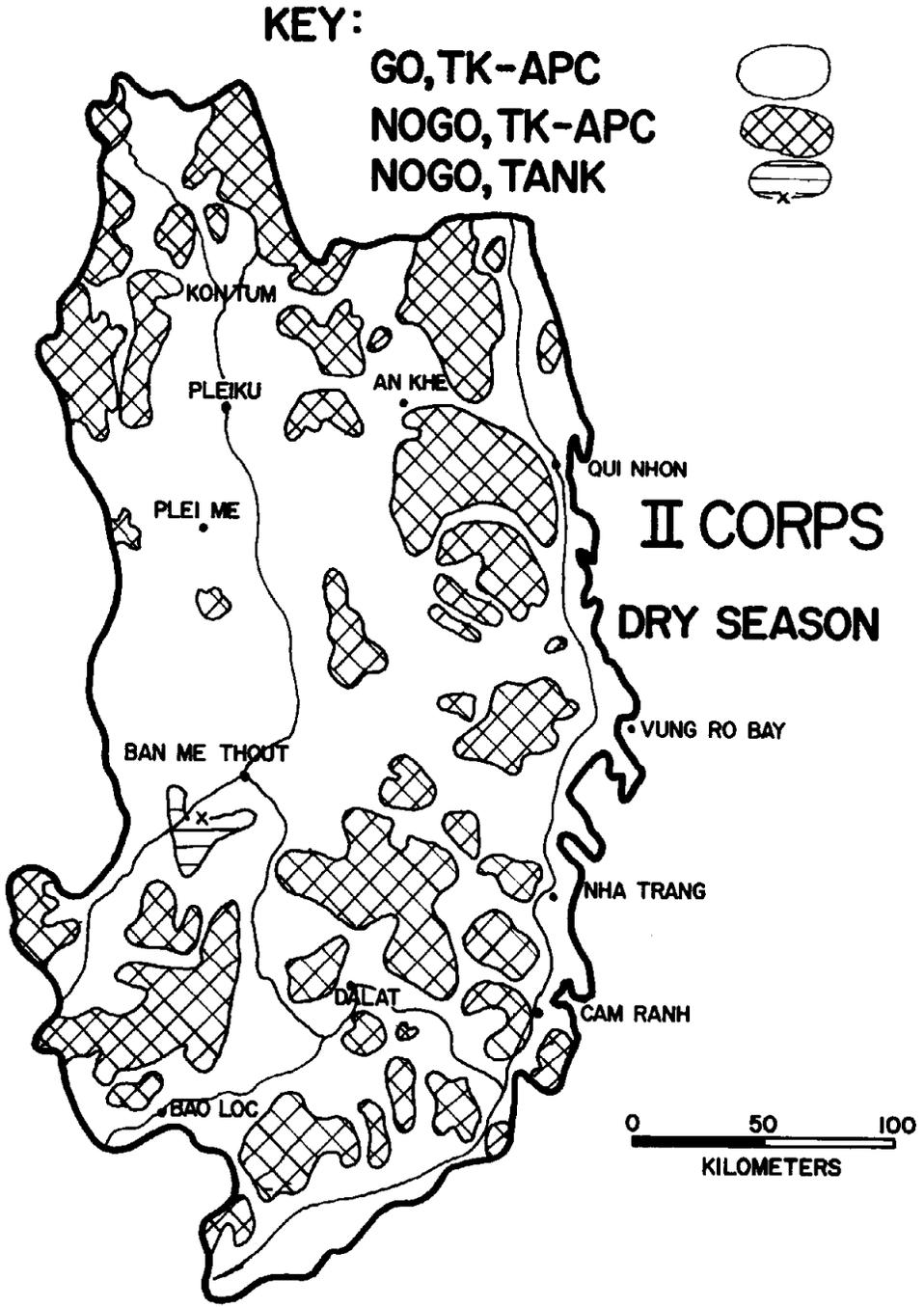


Figure 13. Dry Season Going, II Corps

side of the mountains, while the western half experiences dry weather.

(a) Dry Season (Figure 13)

1. Tank Movement. A shift of forces within the CTZ corresponding to the dry seasons will allow tanks to negotiate 55% of the terrain without assistance. Movement is best in the coastal lowlands from March into September when the ground is firm and the rice paddies are dry. The ground in the western plateau region is firm enough to support tank movement year-around, but many of the streams become too deep to ford during the wet season. Operations are best in the Plateau region starting in November and extending into July. The remaining 45% of the terrain within the CTZ is mostly mountainous and can only be traversed along the limited roads, cart trails and foot paths, which usually follow lines of least resistance. Movement can be made across the mountains but will require extensive engineer assistance. Rates of movement in the mountains and in the coastal lowlands are the same as in I CTZ. The average rate of movement in the Plateau region is 15 to 22 KM per hour.

2. M113 and M551 Movement. The same obstacles that affect tank movement during the dry season also serve to restrict M113 and M551 movement. These vehicles cannot penetrate the same amount of vegetation as the M48A3 tank. It is advisable to use tanks to clear paths for these

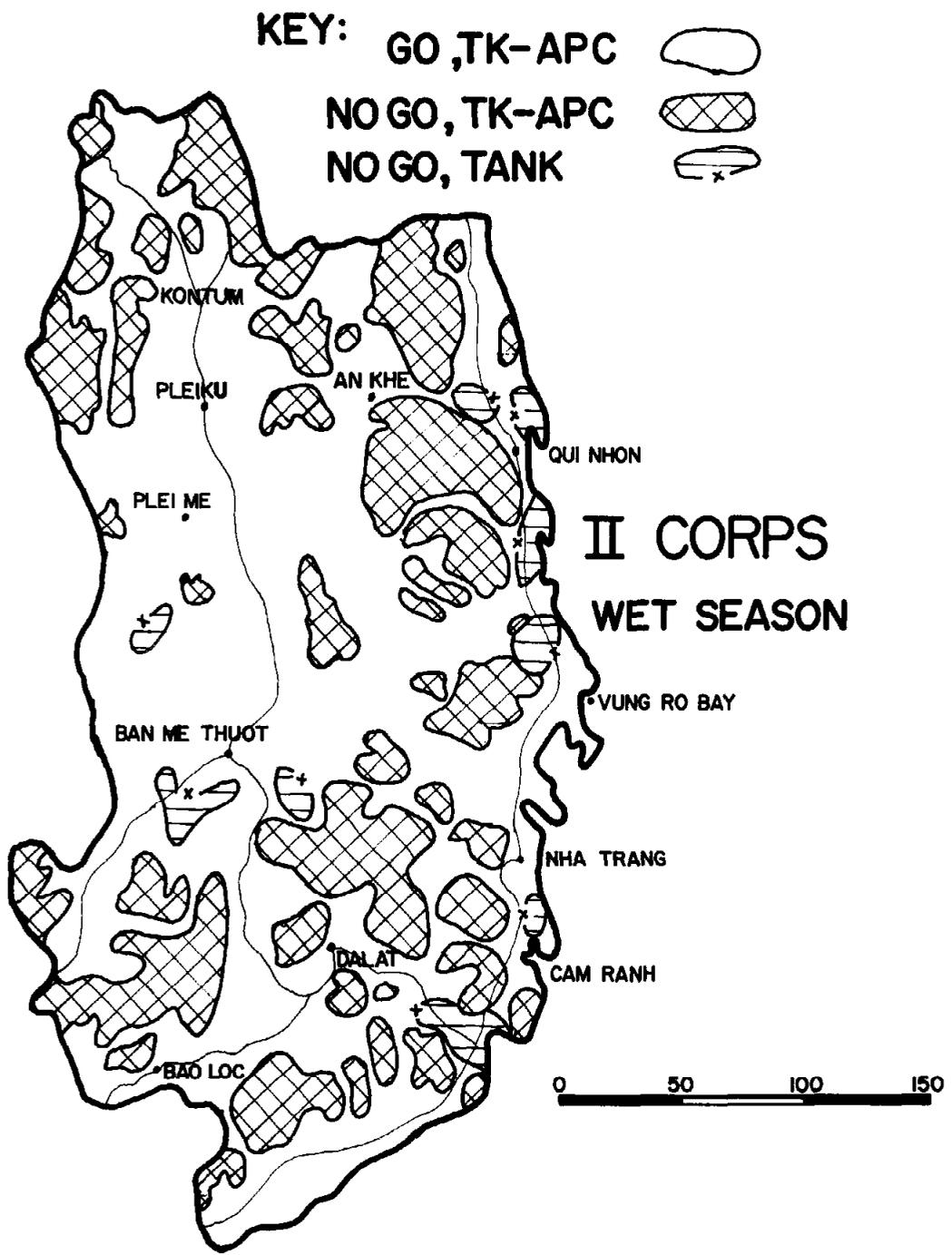


Figure 14. Wet Season Going, II Corps

vehicles through the dense evergreen forests located in the northern and southern hill sections of the Plateau region. Rates of movement in the highland mountains and coastal lowlands are similar to those in I CTZ. The average rate of movement in the Plateau region is 15 to 25 kilometers per hour.

3. Foot Movement. Foot movement in the Coastal lowlands and through the open areas in the Plateau region is essentially unrestricted during the dry seasons, but is considerably slower than the tracked vehicle movement. The dense evergreen forests in sections of the Plateau region and throughout the mountains present a major obstacle to foot troops who must use existing trails, or cut paths through the underbrush. Tracked vehicles can be used to advantage to clear paths for foot troops, and thus increase their speed of movement. Rates of movement in the highland mountains and coastal lowlands are the same as in I CTZ. Foot movement in the Plateau region averages 2 to 3 KM per hour.

(b) Wet Season (Figure 14)

1. Tank Movement. The major restrictions to tank movement during the wet season are the many streams and rivers throughout the entire CTZ. The majority of these streams become too deep to ford, and will require AVLB's and engineer bridging to support waterway crossings during this period. The rice paddies in the coastal lowlands become too soft to support tank movement; however, they are shown to be trafficable because

of the many roads and trails which can be used to traverse them during the wet season. Bridging assistance will be required on these roads due to the limited bridge capacities. Rates of movement in the Plateau region are reduced to 8 to 15 KM per hour. Rates in the coastal lowlands are 4 to 5 KM per hour. Movement in the mountains is not feasible during the wet season.

2. M113 and M551 Movement. The waterways also serve as a restriction to the M113 and M551 movement during the wet season. Water velocities in the Plateau reach highs of 7.5 mph, which far exceed the swim capability of these vehicles. High water velocities adversely affects swimming control of these vehicles, additional engineer support may be required in stream crossings. Rate of movement averages 10 to 15 KM per hour. These vehicles can be used to great advantage in the coastal lowlands during the wet season where they can average 6 to 8 kilometers per hour. Their ability to swim across inundated portions of the land gives them a distinct advantage over non-swimming vehicles and foot troops. Since they are lighter than M48A3 tanks, use of many of the low capacity bridges is possible. Movement in the mountain regions is not feasible during the wet season.

3. Foot Movement. Foot movement during the wet season becomes more difficult in the coastal lowlands due to soft-soil of the inundated rice paddies. Rates of movement are about the same in the plateau region and in the lowlands averaging one to two KM per hour. Foot movement in the mountain

# III CORPS

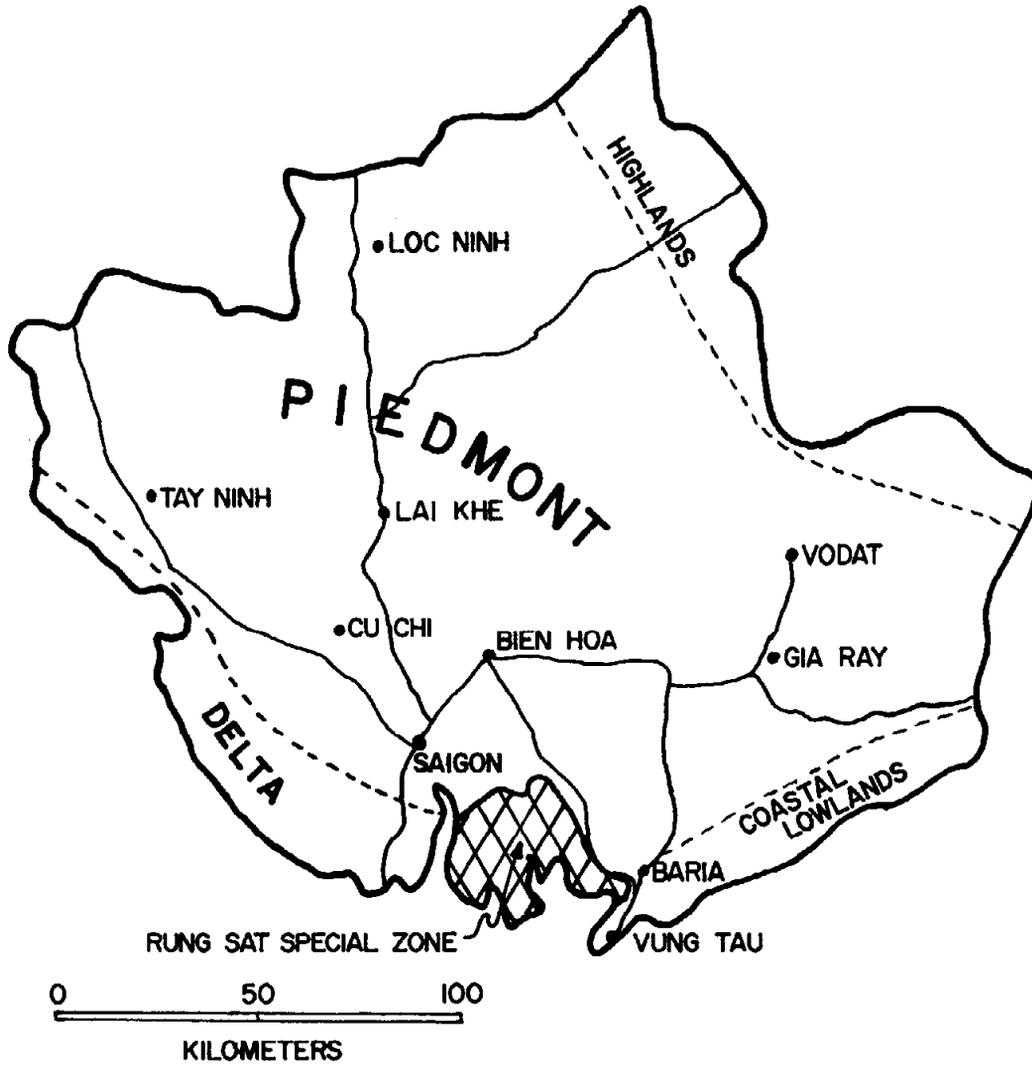


Figure 15. Geomorphic Regions, III Corps

regions is limited to 2 kilometers per hour.

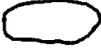
(c) Air Movement. Helicopters provide the most effective means of movement in the mountainous regions of II CTZ throughout the year and enjoy their greatest advantage during the wet season when the river valleys and low passes become inundated. During the rainy season, helicopter operations are best conducted following dissipation of early morning fog and low cloud cover. The plateau and coastal regions both have large, flat areas relatively free of vegetation, thus providing excellent landing sites year-round. These are the same areas where tanks and APC's can operate most effectively year-round.

(6) The III Corps Tactical Zone. (Figure 15)

The III CTZ covers 11,500 square miles, which amounts to about 18 percent of the total land area of RVN. It is divided into 11 provinces which are populated by about 4 million people or just over 25 percent of the total population of RVN. The majority of this population is concentrated in the Saigon area. Most of the land area within the zone consists of the Piedmont (Mekong Terrace) which is characterized by gently rolling hills and plains and dense jungle areas. The Piedmont is bounded on the north by a small section of highlands which is characterized by rugged, forest covered, hills. The eastern section is bounded by the southeast coastal lowlands which are characterized by sandy beaches, wide flat-floored valleys, and rice fields. A small section of the Mekong Delta is located within the southern boundary of III CTZ.

# III CORPS DRY SEASON

KEY:

GO, TK-APC 

NO GO, TK-APC 

NO GO, TANK 



Figure 16. Dry Season Going, III Corps

The predominate types of ground surface in the Delta are marshes and rice paddies. The Rung Sat Special Zone, located southeast of Saigon, is a dense mangrove swamp, interlaced with rivers and streams and is inundated the year-round. Movement within the Rung Sat zone is generally restricted to boats. Some helicopter sites are available and rappelling techniques can be employed. Tidal currents generally restrict APC's to operating around the periphery. The main shipping channel to the Port of Saigon traverses the Rung Sat. Rainfall within III CTZ ranges from 70 to 120 inches. The wet season extends from May through November, but trafficability for tracked vehicles does not begin to deteriorate until late July or early August.

(a) Dry Season. (Figure 16)

1. Tank Movement. During the dry season 92% of the terrain becomes firm enough to support tank movement. The remaining terrain is 4% perennially inundated marshy areas, and 4% mountainous terrain that is covered with dense vegetation. The major obstacles which impede movement are the dense evergreen forests which restrict visibility and speed of movement. Movement can be made through the mountains during the dry season along the roads, trails, and stream valleys; but will require extensive engineer assistance if free movement is to be made across the mountains. Tanks can average 15 to 20 KM per hour in the open area of the Piedmont, the rate of movement is reduced in the jungle regions to 2 to 4 KM per hour.

2. M113 and M551 Movement. During the dry season the M113 and M551 are able to negotiate 93% of the terrain.

# III CORPS WET SEASON

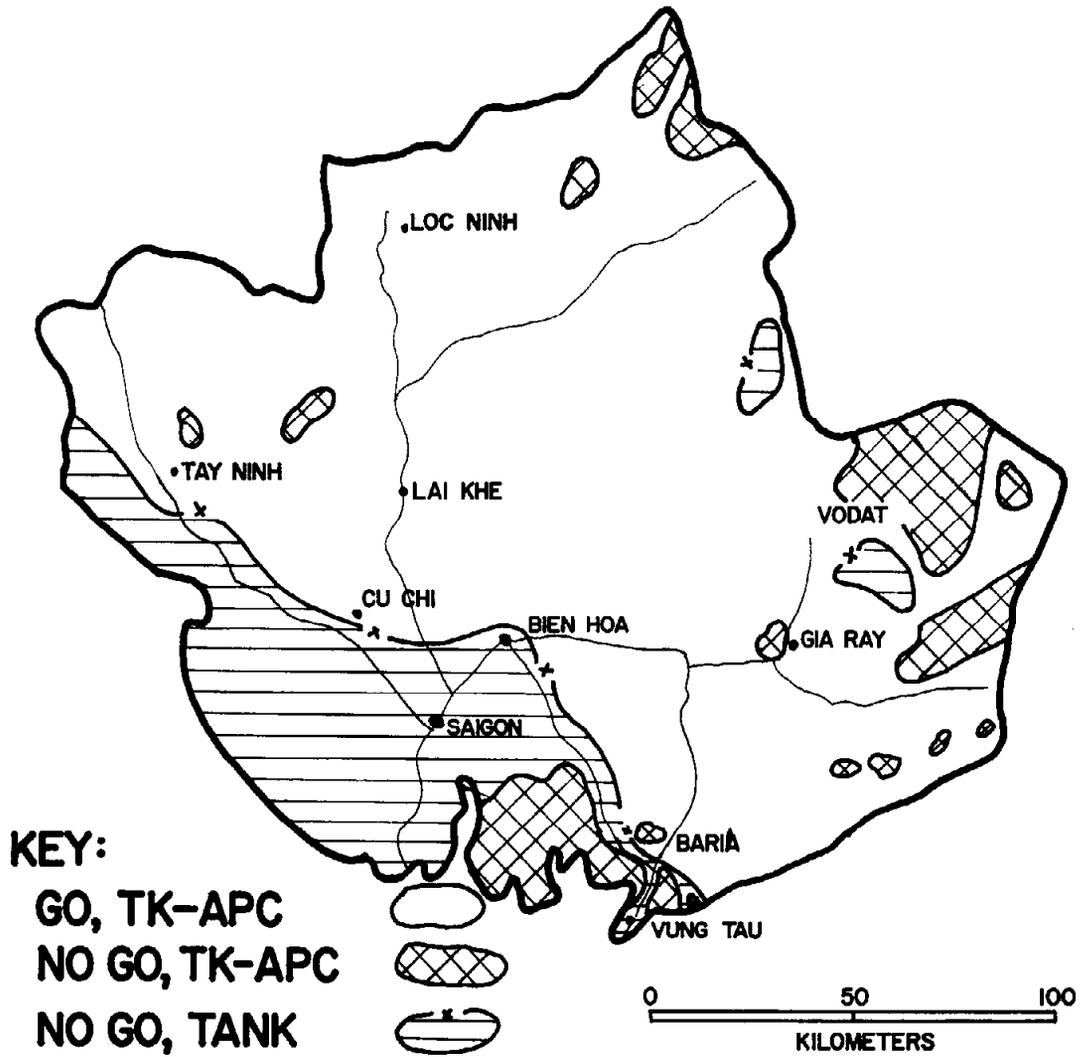


Figure 17. Wet Season Going, III Corps

In the open areas of the Piedmont these vehicles can average between 15 and 25 KM per hour. The restrictions to movement in the ever-green forests are similar to those encountered by tanks, but due to their lighterweights and lower tractive efforts, these vehicles cannot maintain the same speed through vegetation as can the tank; their average rate is 2 to 3 KM per hour. Of the remaining terrain in the CTZ; 3% is mangrove swamps which, because of their soft soil and dense vegetation, can only be penetrated along the waterways; and 4% is mountainous terrain in which movement is restricted to roads, trails and stream valleys.

3. Foot Movement. The dense evergreen forests severely restrict foot movement. Troops must use the existing trails, or cut paths through the dense undergrowth, an extremely slow and laborious process. Rates seldom exceed .5 KM per hour. Tracked vehicles, especially tanks, can be used to good advantage to clear paths for foot movement through many of these areas. Foot movement across the open areas is generally good, but is considerably slower than the tracked vehicle movement; average rates are 2 to 3 KM per hour.

(b) Wet Season. (Figure 17)

1. Tank Movement. During the wet season the southern portion of the CTZ, consisting mainly of rice paddies, becomes too soft to support the medium tank and tank movement can be made only along roads or higher elevations. Movement through the forest and mountains is essentially the same as during the dry

season with the exception that the stream valleys in the mountains flood. Movement in the open areas is reduced to an average rate of 8-15 KM per hour. Jungle rates are generally less than 3 KM per hour.

2. M113 and M551 Movement. Movement of the M113 and M551 is the same during the wet season as during the dry season with the exception that the waterways are frequently easier to cross during the wet season. The higher water level in effect serves to reduce the height of the banks. Rates of movement in the open areas are somewhat degraded by the wet ground but averages run from 10 to 15 KM per hour. Rates of movement in the jungle seldom exceed 2 KM per hour.

3. Foot Movement. Foot movement in the coastal lowlands is generally unrestricted, but becomes difficult during the wet season due to the soft-soil and large inundated areas. During the wet season, APC's can be used to advantage to assist the movement of foot troops. Average rates per hour are 1 to 2 KM in the open areas and .2 to .5 KM in the jungle.

(c) Air Movement. During the wet season, air operations will be hampered by low ceilings and fog in the morning hours. From late December through April weather conditions are ideal. The large number of existing sites make helicopter operations an effective means of movement in the CTZ. Due to the flat terrain in most of the zone, new sites can be constructed as required with relative ease. Many open areas also can be found within

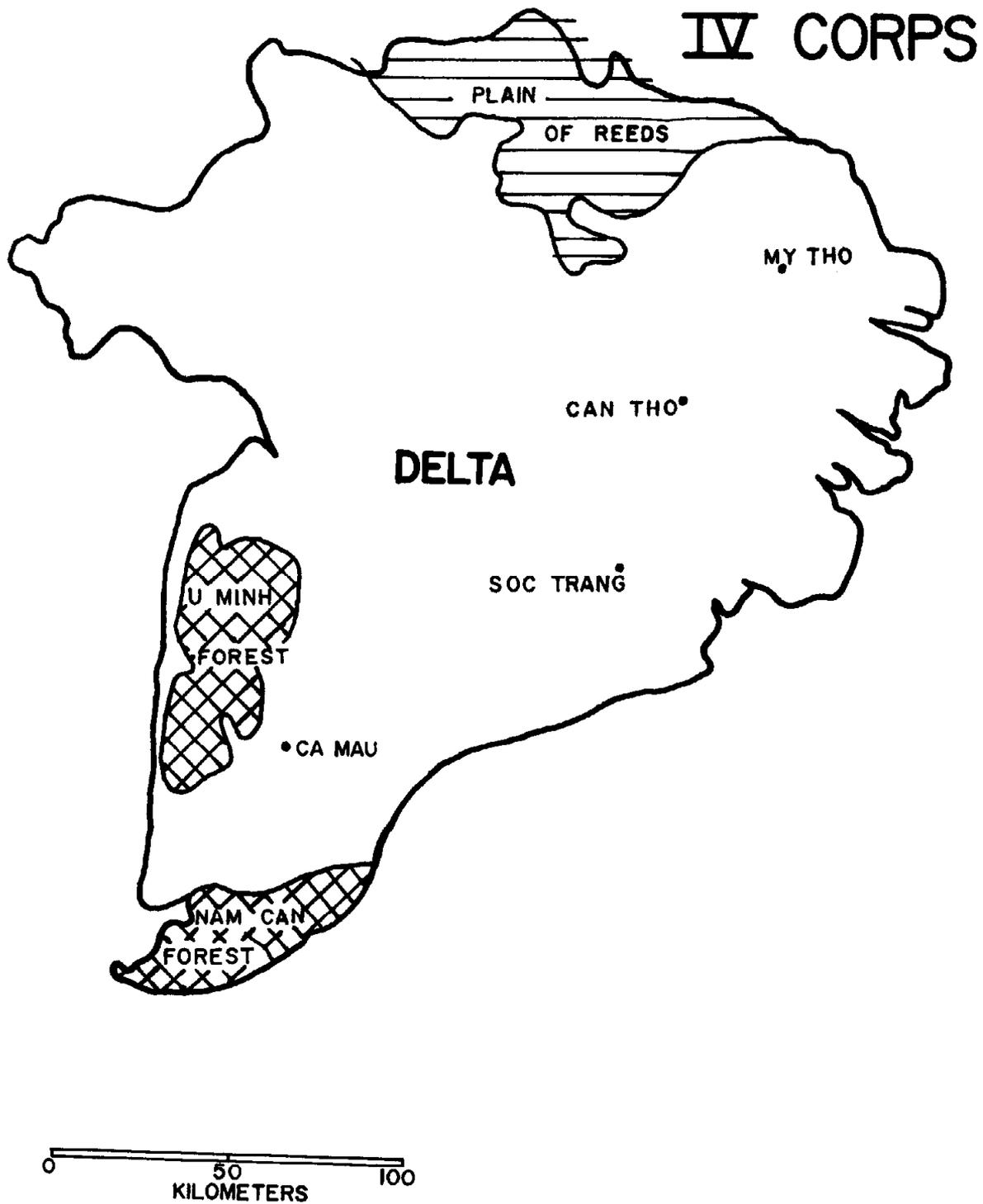


Figure 18. Geomorphic Regions, IV Corps

and between the forested areas in the northern part of the zone. Tanks and APC's are frequently used to secure and clear landing zones for heliborne operations.

(7) The IV Corps Tactical Zone. (Figure 18) The IV CTZ covers 14,000 square miles or about 20 percent of the total land area of South Vietnam. It is divided into 15 provinces which are populated by approximately 5 million people, 1/3 of the total population of RVN. Wholly located within the Mekong Delta, it is characterized by an extensive, flat poorly drained plain that is severely dissected by a network of large and small rivers, streams and canals. Rice paddy is the predominate type of ground surface with marshes and swamps interspersed throughout. Mangrove swamps abound along the coasts and major streams. Rainfall in the Delta is not very heavy and is therefore not the primary cause of wet ground conditions. The state of the ground is affected primarily by flooding, either controlled for rice cultivation, or uncontrolled by the Mekong flood period. Flooding of the Mekong coincides with the Southwest Monsoon and reaches its peak during September-October. The U Minh Forest (Figure 18) is a dense mangrove swamp laced with canals, rivers and streams. Trees, vines, exposed roots and dense undergrowth are marks of mangrove swamps. Swamp depths, depending on tides and floods, vary from one meter of mud to one meter of mud covered by two meters of water. Tides cause river currents to change direction as the tide changes. Salt water is excluded by dams along the coast. Movement is lim-

# IV CORPS

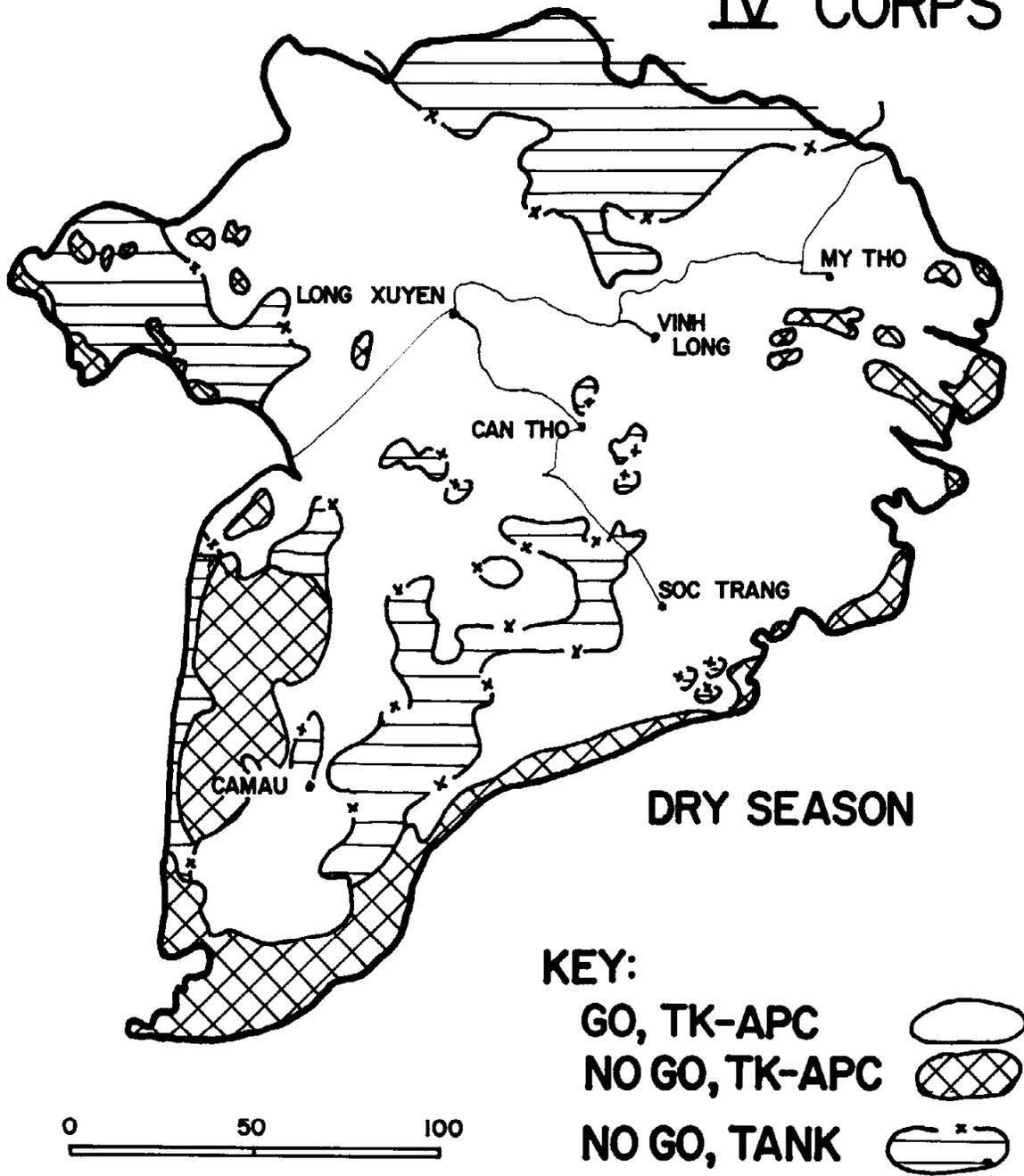


Figure 19. Dry Season Going, IV Corps.

ited to boats which can be stranded at low tide and to vehicles possessing a swim capability. Foot movement is very slow averaging one kilometer per hour and may be only a few hundred meters. APC's can operate around the edges and in some of the waterways. The Nam Can Forest is similar to the U Minh but the water is salty. The Plain of Reeds is a perennially inundated swamp. Depths vary from a few inches to two meters. The area is blanketed by reeds and grass one-half to four and a half meters high. Trees are scattered along the small number of canals and streams in the area. M113 are extremely useful in the area, although frequent stops are necessary to cut the reeds and grass from the suspension system. Foot movement seldom exceeds one kilometer per hour in the wet season and in many places is impossible. In the dry season the average rate of travel is one and a half kilometers per hour. Only two major canals and one road cross the area.

(a) Dry Season (Figure 19).

1. Tank Movement. During the dry season, beginning in December and lasting through April, 60 percent of the terrain becomes firm enough to support tank movement. Movement is slow and difficult because of the numerous streams and canals which severely compartmentalize the rice fields. Average rates of 2 to 4 KM per hour are possible. These waterways are unfordable because of their steep banks and soft-soil bottoms, but can be crossed by the use of armored vehicle launched bridges (AVLB)

or portable bridges. The high frequency of waterway crossings dictate that consideration should be given to a substantial increase in the number of AVLB's if cross-country tank operations are to be conducted in the Delta. The numerous paddy dikes and small irrigation ditches are not considered to be significant obstacles, and only serve to reduce cross-country speed. Throughout the paddy land, cover and concealment are poor. Due to the slightly higher elevation of the roads, fields of fire and observation are excellent, and in many cases extend to the maximum effective range of the tank weapons. The VC uses the vast network of inland waterways as access routes throughout the Delta. Tank fire from the roads could deny him the use of some of these routes. Since the majority of the roads are of earth construction, and have limited capacity bridges, engineer assistance would be needed for road maintenance, and construction of increased capacity bridges and by-passes.

2. M113 APC and M551 Tank Movement. During the dry season, the M113 and M551 are able to negotiate 87 percent of the terrain year-round. The paddy dikes, which are generally 1 to 2 ft high, do not present a problem to movement during the dry season; but can, in conjunction with soft-soil, immobilize these vehicles during the wet season. They are easily overcome by the use of explosives to breach the dikes, by selecting avenues of movement which cross only the lower dikes, or by the use of push bars between vehicles. Speed of movement in the riceland is mainly

restricted by the waterways. While these vehicles have the ability to swim, many of the steep-sided, soft-soiled banks do not provide sufficient traction to enable the vehicles to exit from the water. Exits are usually easier during the high water period when the water level, in effect, serves to reduce the height of the bank. Use of ground anchors, capstans, and other field expedients allows the M113 to exit under its own power. Movement only becomes restricted when dense vegetation in combination with soft-soil presents sufficient resistance to overcome the traction effort of the vehicle. M113 can move across inundated portions of the road networks and thus insure continuous security to otherwise relatively inaccessible areas. Average rate of movement varies from 4 to 6 kilometers per hour.

3. Foot Movement. Dry paddies and reduced water levels in the marsh areas expedite foot movement throughout the entire area, but the troops still experience difficulty in crossing the numerous water courses. Average rates of 1 to 2 kilometers per hour are seldom exceeded. Foot movement in the mangrove swamps is extremely difficult. Troops are able to move only about three kilometers a day, and frequently sink chest deep in the water and soft-soil. The high salt content of the water in the coastal mangrove swamps has an adverse effect on the human body, and foot troops must be relieved after 48 hours of operation in this terrain.

# IV CORPS

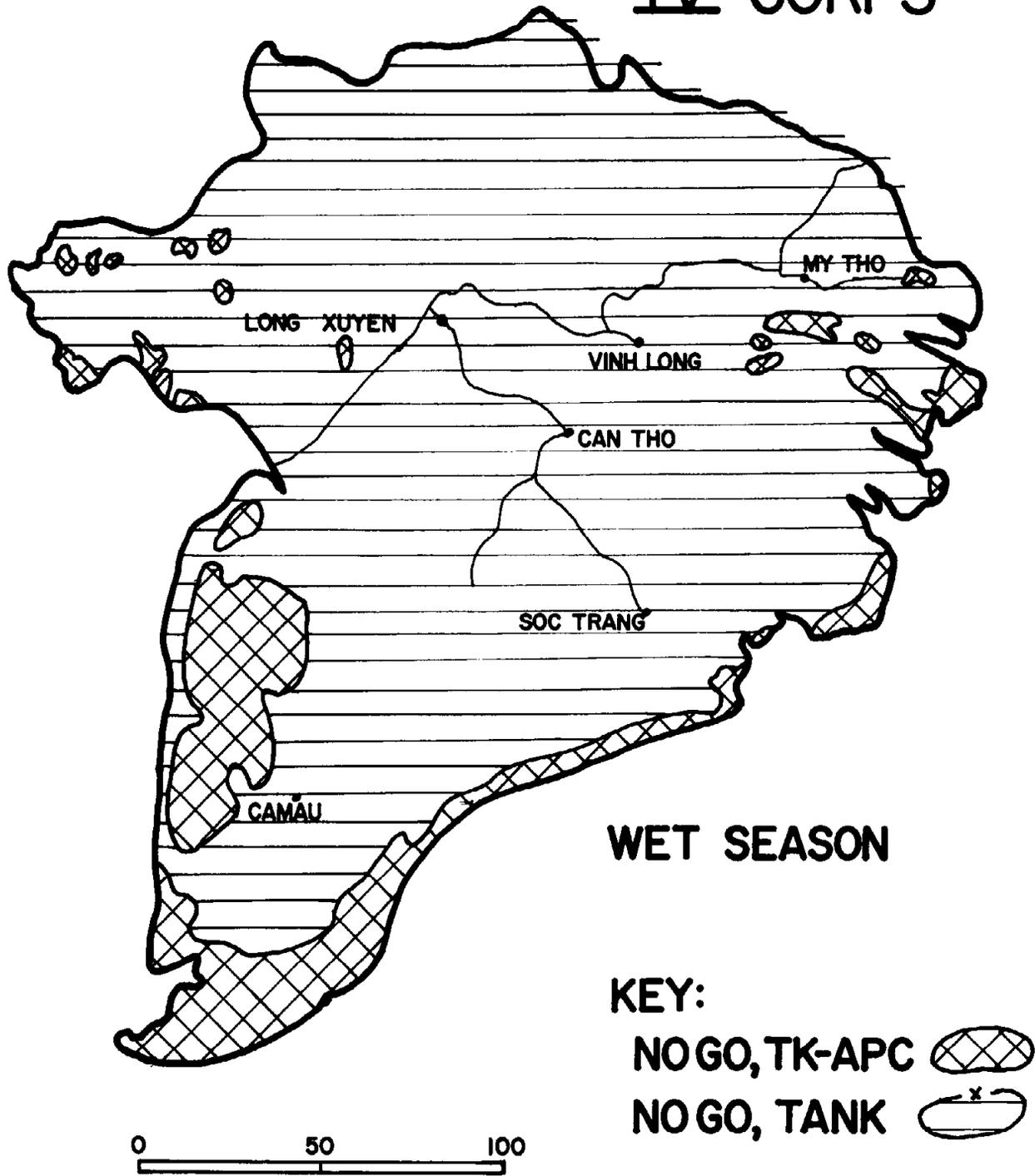


Figure 20. Wet Season Going, IV Corps

(b) Wet Season (Figure 20).

1. Tank Movement. During the wet season the soil in the rice paddies becomes too soft to support tank movement and tanks are restricted to the use of roads during this season. Tanks could fulfill a role in keeping the road net open if desired. The roads are of earth construction, with limited bridge capacities and inundated portions, and would require continuous and extensive engineer support to allow travel.

2. M113 and M551 Movement. Movement of the M113 and M551 is the same during the wet season as during the dry season with the exception that the waterways are easier to cross during the wet season. The higher water level, in effect, serves to reduce the height of the bands. Rates of movement are about the same overall because of reduced traction averaging 4 to 6 KM per hour.

3. Foot Movement. Foot movement during the wet season is reduced to 93% due to water levels above six feet in the plain of the reeds area. Movement through the rest of the CTZ will be more difficult than during the dry season due to the soft-soil rice paddy floors, and the increased water levels in other areas. Rates of movement do not exceed one KM per hour.

(c) Air Movement. Helicopters can be effectively employed in the Delta year-round, day and night. Operations may be hampered during the rainy season by thunderstorms which usually occur between 1500 and 2000 hours. Early morning ground

fogs occur during the dry season but usually clear by 0900 hours. During the dry season the rice fields provide numerous landing sites.

(8) Summary of the Going in RVN. Going characteristics for tanks and APC's throughout the Republic of Vietnam (RVN) are summarized in Figure 21. Overall, tanks can move with organic support in 61 percent of RVN during the dry season and in 46 percent during the wet season. APC's can move in 65 percent of RVN year-round.

### PERCENT GO — TRAFFICABILITY

	DRY		WET	
CORPS	TANKS	APC	TANKS	APC
I	44 %	44 %	36 %	44 %
II	55 %	55 %	54 %	55 %
III	92 %	93 %	73 %	93 %
IV	61 %	87 %	0 %	87 %

Figure 21. Summary of the Going by CTZ.

## SECTION II

### DOCTRINE, TACTICS AND TECHNIQUES

#### 1. GENERAL.

a. PURPOSE. Current U.S. doctrine concerning combat tactics and techniques employed by armor and mechanized infantry units is based principally on experience gained during World War II and the Korean War. Maintenance of effective doctrine demands continuous review of its application by units engaged in combat. The purpose of this section is to describe applications of current doctrine, tactics and techniques and variations in these applications being employed by U.S. Army mechanized infantry, tank, armored cavalry and air cavalry units presently conducting combat operations in RVN.

#### b. SCOPE.

(1) The rapidly accumulating RVN combat experience of several mechanized infantry battalions, tank battalions, and armored and air cavalry squadrons, coupled with observation of combat operations of these units by field data collectors of the Mechanized and Armor Combat Operations in Vietnam (MACOV) Study Group, constitutes the basis for the discussion which follows. The discussion presents variations in application of current doctrine and employment of tactics and techniques in conjunction with applications of current doctrine. A separate detailed discussion of tactics and techniques used in employing air cavalry has been prepared and will be distributed as a U.S. Army Combat Developments Command draft field manual.

(2) A large number of combat actions adequately documented or personally observed by MACOV Study Group members are available for reference. Included in this section are those actions which are most typical and which illustrate particularly those tactics and techniques being discussed.



Figure II-1. M48A3 Tanks and M113 Armor Personnel Carriers Cross a Clearing after Emerging from Jungle North of Saigon

c. THE NATURE OF AREA WARFARE.

(1) The warfare presently being conducted in RVN has been variously described as non-linear, multi-directional, unconventional, or area warfare. Through the remainder of this section it will be termed area warfare. Area warfare results when armed forces seeking to achieve control of the population of a country are unable to or do not desire to conduct military operations in the traditional sense, i.e. by the seizure of a succession of terrain objectives while maintaining a continuous front or line of demarcation between one's

own forces and those of the enemy.

(2) U.S. forces' participation in the area war of RVN is characterized by widespread tactical offensive operations by units varying from platoon to multi-divisional size; the combat operations are logistically supported from semi-permanent unit base camps widely located through most regions of RVN; and the unit base camps, in turn, are further dependent on large-scale logistical installations established in several coastal locations in the vicinity of deep-water ports. U.S. tactical offensive operations have the general goal of locating and destroying the enemy armed forces as opposed to the seizure of terrain objectives; concurrently, U.S. forces must provide security to their own base camps and supporting logistical installations. All offensive and security operations must be undertaken within the broader goal of restoring RVN government control over the population so that nation building can progress throughout the RVN.

(3) The area type warfare, the elusive nature of the enemy, and insufficient friendly intelligence regarding the location and activities of the enemy require that units must expect contact with the enemy at any time and from any direction. Tactical units are constantly ready to deploy in any direction on short notice; supporting fires are provided by units located in relatively secure fire support bases spread to provide complete coverage of the area of operations and to provide immediate fire support in all directions.

Adequate security forces garrison the perimeters of fire support bases, base camps, and logistical installations; while reaction forces are maintained to exploit the opportunity to destroy the enemy wherever found. Because of the multi-directional nature of area warfare in RVN, U.S. forces are also required to secure ground lines of communication connecting logistical installations, base camps and tactical units in the field. At times, due to bad weather, untrafficable terrain, or enemy activity, tactical operations are partially or entirely supported by air lines of communication.

(4) Other characteristics of the area war in RVN are the broad distribution of friendly civilians throughout RVN and the inability on the part of friendly forces to adequately distinguish them from the enemy. Restraints on the employment of combat power are appropriate to avoid casualties among the civilian population. These restrictions are referred to as "rules of engagement."

(5) The character of the war in Vietnam varies significantly from region to region, reflecting the peculiarities of each of the four RVN Corps Tactical Zones (CTZ). In each CTZ, forces must be capable of fighting organized North Vietnamese Army and Viet Cong units, defeating the guerrilla, developing area stability, and securing lines of communications.



Figure II-2. Elements of Armor Task Force Conducting Road March West of PLEIKU.

d. DOCTRINE. Doctrine and tactics contained in appropriate field manuals are generally valid and applicable to mechanized infantry and armor combat operations in Vietnam. However, U.S. doctrine and training are primarily oriented toward a conventional tactical environment. Doctrine related specifically to the area war is incomplete. Examples of additional tactics and techniques which are employed in RVN and which can enrich our present doctrine are enumerated below; they will be discussed in greater detail in appropriate paragraphs of this section.

(1) The M113 armored personnel carrier is being

employed by U.S. armor and mechanized infantry units in a tank-like role; like their ARVN counterparts, U.S. crewmen often remain mounted and employ the M113 as an assault vehicle to close with and destroy the enemy.

(2) With the emergence of the M113 as a fighting vehicle, armor scout and mechanized units are engaging the enemy in mounted combat; current doctrine prescribes this form of combat only for tank units.

(3) A logical result of employing the M113 in a tank-like role is the cross attachment of mechanized infantry units with straight infantry units so that each can benefit from the particular capabilities characterizing the other.

(4) The employment of air cavalry has developed far beyond the limits of current doctrine.

(5) Armored cavalry units, particularly the squadrons of the armored cavalry regiment, are being increasingly employed in those roles previously assigned to armor and infantry combat maneuver battalions rather than being restricted to the traditional reconnaissance, security, and economy of force roles.

(6) The area war in RVN finds a reversal at times in the traditional functions of armor and infantry units; armor unit encounters with the enemy have often times resulted in the armor firepower fixing the enemy force, while infantry units maneuver by helicopter to a location from which they can attack the enemy in his position.

e. **EMERGING TRENDS.** Data and reports available to the MACOV Study Group evaluation staff and observations made by MACOV Study Group field data collectors reveal the following trends in application of existing doctrine:

(1) With some exceptions in the delta region, the enemy has consistently taken advantage of densely vegetated areas to avoid contact with armor and mechanized infantry at long ranges; the typical engagement of the enemy by all types of U.S. forces occurs at pointblank range in dense forest. The proximity of the forces upon contact restricts the effective employment of supporting artillery fires and air strikes directly onto the positions of the enemy in contact. The commander must develop the situation through the employment of fire and maneuver on the part of forces immediately available to him; the resulting attack should employ available supporting artillery fires and air strikes behind the immediate enemy positions to prevent his escape and to prevent his introduction of reinforcements.

(2) Effective night operations currently being conducted in RVN further restrict the freedom of movement of the enemy.

(3) Although large portions of RVN are trafficable for armor and mechanized infantry operations, the terrain generally slows the cross-country movement of armor vehicles; the local commander on the ground must constantly reappraise his plan of operation as it pertains to concepts of maneuver, speed of execution and flexibility.

(4) The widely applied concept of dispersion in the defense does not prevail in RVN; the enemy's ability to infiltrate defensive positions dictates the opposite, and his shortcomings in antitank weapons and heavy artillery make tight consolidation within defensive perimeters an acceptable deviation from doctrine.

(5) The establishment of fire support bases within which to locate supporting artillery and mortar units is usually necessary to provide adequate coverage of an assigned area of operations. In some cases, this requires the assignment of other tactical units to provide security to the fire support bases.

(6) The command and control helicopter provides the ground commander with an additional means of control. Use of the command and control ship is in accordance with the principle that the commander position himself where he can best control the battle.

(7) There is a continuing requirement to develop and employ effective means for the coordination of the support available from Army gunships, tactical air, and artillery; only through extensive and imaginative pre-planning and constant attention to this coordination can a commander derive the maximum benefit of all available fire support.

(8) Rules of engagement necessary to preclude inflicting unwarranted casualties on the civilian population of RVN restrict the employment of both direct and indirect fires; reconnaissance by fire is generally prohibited to those units operating in areas not designated as free fire zones.

(9) Current intelligence doctrine is adequate. The best intelligence results from close liaison and coordination with local indigenous intelligence agencies.

f. CAPABILITIES OF ARMOR AND MECHANIZED INFANTRY UNITS.

The capabilities of armor and mechanized infantry units enumerated in appropriate field manuals remain valid and pertinent to combat operations in RVN.

2. COMBAT OPERATIONS - GENERAL

a. TYPES OF MISSIONS. Missions typical of U.S. combat operations in RVN are search and destroy, clear and secure, and security. These missions entail the conduct of offensive, defensive, reconnaissance, security, or economy of force operations. In RVN, units are frequently assigned missions in various combinations simultaneously, e.g. perform search and destroy operations in assigned area of operations and secure a given route from A to B; or, conduct clear and secure operations in assigned area of operation and provide convoy escort to elements passing along a designated route. These missions may be assigned to infantry, tank, mechanized infantry, and armored or air cavalry units.

(1) Search and Destroy. These operations are designed to locate enemy installations, destroy or evacuate supplies and equipment, and to destroy or capture VC forces. Less importance is attached to seizing and holding critical terrain than to finding and finishing the enemy armed forces and political infrastructure. Search and destroy operations should be planned and conducted so that dismounted

forces physically search zones within an area of operation. The dismounted forces must be given the opportunity to cover the zones thoroughly and the means to destroy or evacuate what they find. Against VC base areas, operations aim at the ultimate domination of the bases. Whenever possible, operations against VC forces are conducted so that the enemy is attacked by a combination of maneuvering and blocking elements, both supported by artillery and air fire support. During a search and destroy operation, armor and mechanized infantry units are initially engaged in area reconnaissance and intelligence missions; when contact with the enemy is made, they undertake offensive operations as in any meeting engagement.

(2) Clear and Secure. These are offensive combat operations aimed at driving VC forces out of a designated area and keeping them out. U.S., RVN Army (ARVN), and Free World Military Assistance Forces (FWMAF) conduct clear and secure operations in selected areas in accordance with theater plans. These operations are generally initiated by search and destroy actions but differ from pure search and destroy in that they are sustained and emphasis is placed on seizing and holding key population and communication centers.

(3) Security. These operations include convoy, route, base, and area security. Convoy security operations can be accomplished by temporarily securing the route to be used or by accompanying the convoy with an appropriate mix of combat units; time involved is limited to that required to complete the movement of the convoy. By their nature, the others are generally longer in

duration and, like clear and secure operations, are normally conducted in conjunction with some search and destroy actions. These security operations are for the purpose of seizing and holding routes, installations and facilities. In the immediate environs of their bases, U.S. units are specifically charged with securing key military installations and routes. Security operations are normally conducted with minimum forces committed: if strongly attacked, security forces are supported by quick reaction reserves. Highly mobile armor and mechanized infantry units are particularly well suited for reaction force missions.

(4) Revolutionary Development (RD). All missions assigned to U.S. units directly contribute to the goal of nation-building, the reestablishment of RVN government control over the RVN population. In general, RD is conducted in phases: U.S., ARVN or FVMAF units conduct military operations within designated areas not presently under RVN government control - typically, search and destroy followed by clear and secure operations; ARVN units then assume responsibility for securing the area and for establishing necessary Regional and Popular Force units from the local population; RVN civil government officials, working in conjunction with national and local police, gradually assume control from the ARVN units; and, finally, the ARVN units are released to conduct operations in other areas. U.S. units conduct civic action operations in conjunction with tactical operations in the form of the Medical Civic Action Program (MEDCAP), needed engineer construction assistance, and distribution of food, soap, clothing, and other supplies. Although

these civic actions contribute to gaining the friendship and support of the population, they are normally of short duration and are characterized by short-range goals. Experience has shown that intelligence information may be gained from the local populace as a result of civic actions. U.S. units closely coordinate civic action efforts with district and province officials through the U.S. military and civilian advisors assigned to the area to avoid interference with long-range RD goals. In RVN I Corps Tactical Zone the U.S. Marines actively participate in the long-range RD efforts of RVN Regional and Popular Forces (RF/PF). In those areas in which RD is being conducted near Marine bases, squads from a U.S. Marine Combined Action Company (CAC) are assigned to live and work with RF/PF units to provide direct U.S. participation in RD operations.

b. MOUNTED COMBAT AND M113 ARMORED PERSONNEL CARRIER IN A TANK-LIKE ROLE. A salient feature of armor and mechanized infantry combat operations in RVN is the emergence of the M113 operating in the role normally attributed to the tank. Modifications made on unit vehicles to better equip them for this role vary from the addition of sandbags to provide the vehicle commander a degree of protection from shell fragments and small arms, to the installation of equipment kits to provide an armored turret for the commander and two added M-60 machineguns complete with armored shields and flexible mounts located to the right and left of the cargo hatch (resulting in the vehicle called the armored cavalry assault vehicle or ACAV). Present doctrine does not cover the use of the M113's as tanks but the following example illustrates their effectiveness in that role.

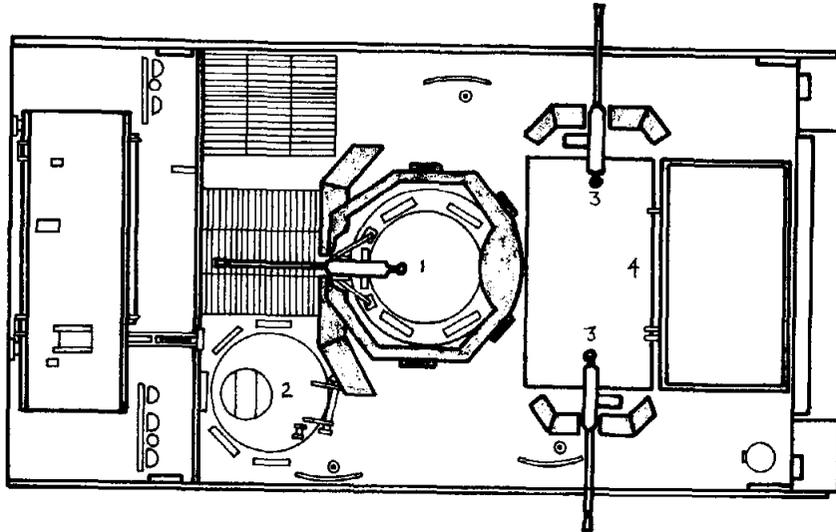


Figure II-3. Armored Cavalry Assault Vehicle (ACAV).  
Typical arrangement of weapons and crew  
members in an armored cavalry assault  
vehicle (ACAV)

1. Vehicle Commander with .50 caliber machine gun.
2. Driver.
3. M60 Machinegunners.
4. M79 Grenadier.

(1) Combat Examples.

(a) On 2 December 1966, a small resupply convoy consisting of two trucks, two tanks and three M113's was ambushed in the vicinity of SUOI CAT (See Figure II-4). The enemy force was estimated as two VC battalions with local guerrilla forces attached. As the VC forces opened fire, the convoy reacted violently in accordance with squadron SOP; the armored vehicles continued to move, escorting the trucks through the ambush position while pouring a heavy volume of accurate fire into the brush on both sides of the road. The tanks and the M113's then returned to the fight and again raked the area with 90mm cannister, caliber .50 and 7.62mm machinegun fire and hand grenades. By this time, elements of three troops of the squadron, including the tank company, were moving to the site. Artillery and tactical aircraft provided support within ten minutes after being called, although the employment of neither had been preplanned. In this operation, the two tanks and three M113's were able to maintain the firefight until the arrival of reinforcements. Ninety-nine VC were killed (body count) and three were captured; American losses were one killed and 22 wounded.

(b) The other example concerns a company of mechanized infantry engaged in OPERATION CEDAR FALLS during January 1967. Two platoons, dismounted from their carriers and moved to destroy a VC basecamp previously uncovered and determined to be unoccupied. The VC had reoccupied the camp meanwhile, and they succeeded in pinning down both of the U.S. platoons with accurate automatic

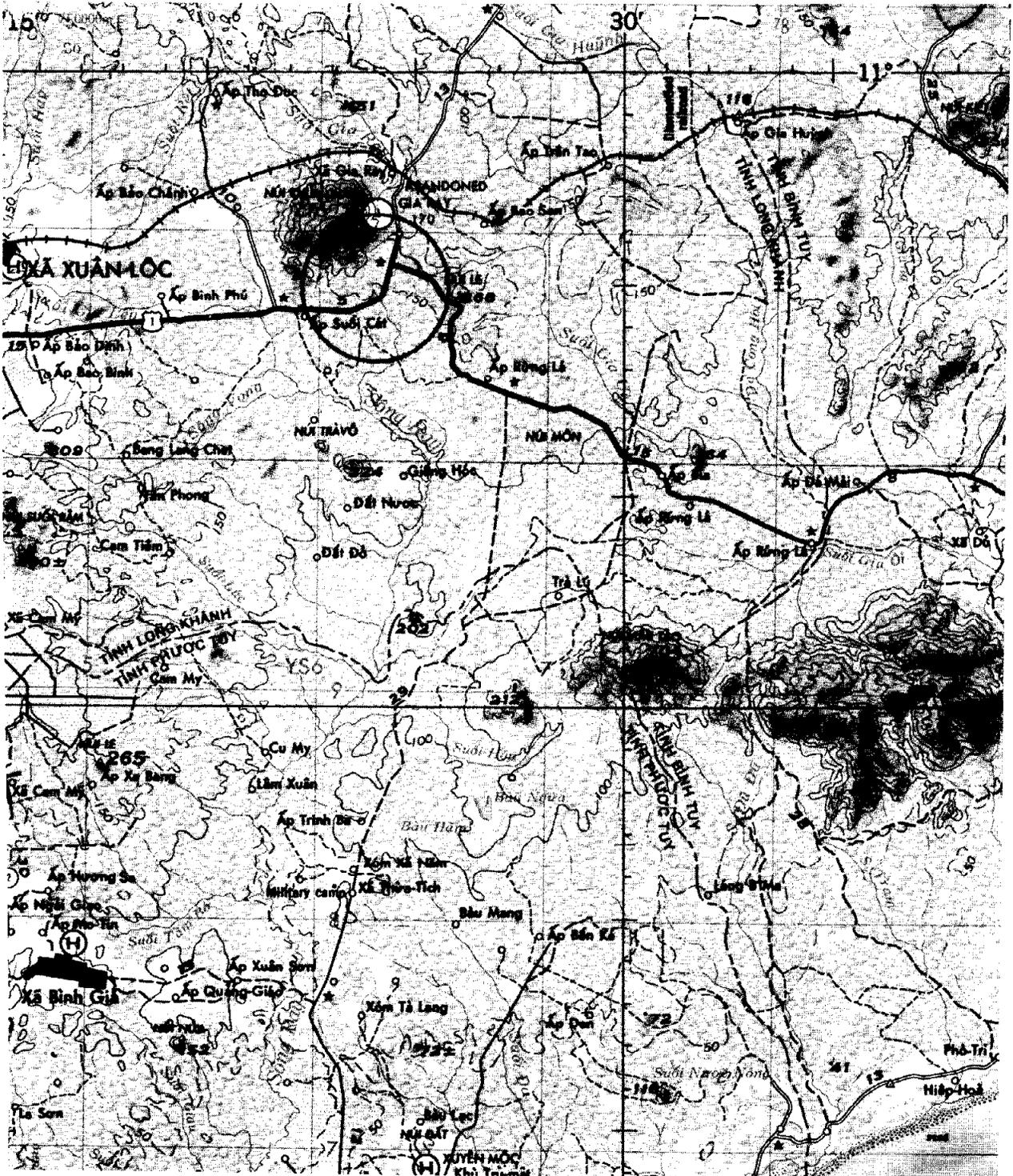


Figure II-4. Map Showing Location of 2 December 1966 ambush. Saigon is 85 KM west of SUOI CAT.

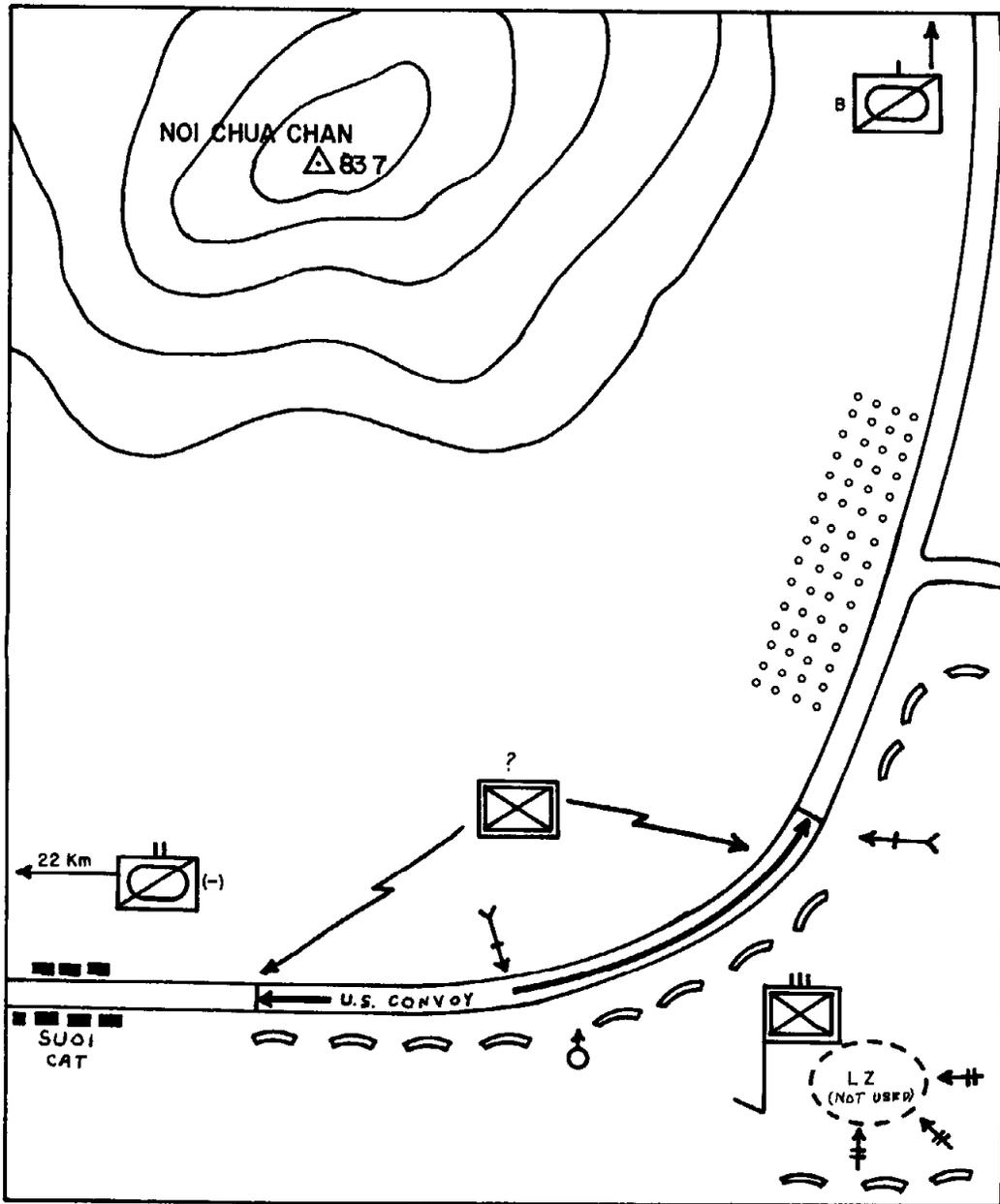


Figure II-5. Enemy and Friendly Dispositions for 2 December 1966 Ambush. Vehicles of U.S. convoy traveling north were arranged in the order: lead M48A3 tank, two M113's (ACAV), two trucks, one M113 (ACAV), and the trail M48A3 tank. Road in this area has elephant grass on both sides for about 60 meters and secondary timber beyond.

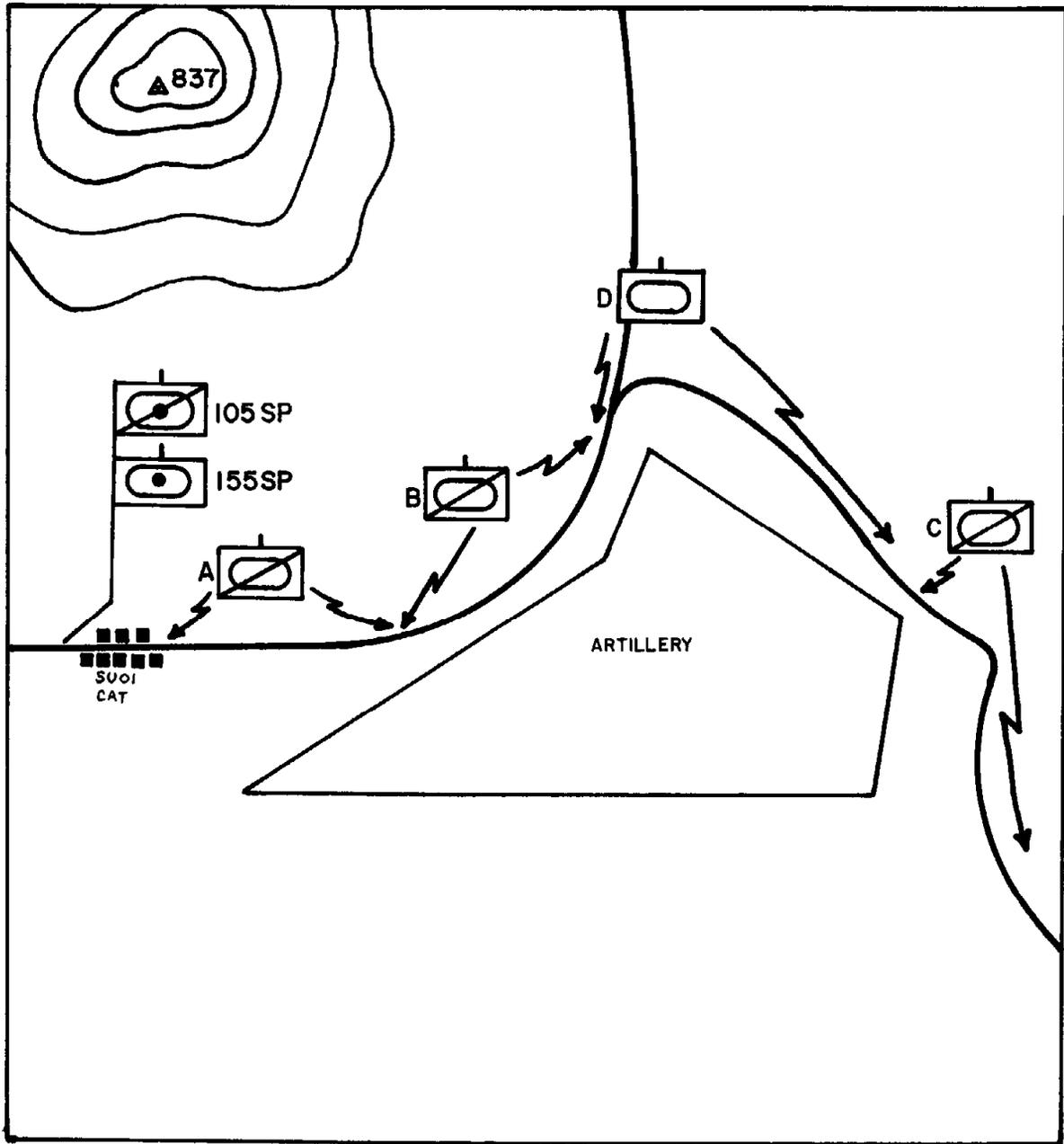


Figure II-6. Friendly Dispositions Following Concentration of Armored Cavalry Squadron to Reduce 2 December 1966 Ambush. Initially, air strikes were conducted in area south of the road, and artillery fires were restricted to area north of the road. Subsequently, upon completion of air strikes, artillery fires were shifted to main enemy positions south of the road.

weapons and rifle fire. Men of the platoons who exposed themselves to return the fire were killed or wounded. The company commander was able to extricate his platoons from this situation only by committing his third platoon and his own command element mounted in armored personnel carriers. Two carriers of this relief force were disabled by enemy recoilless rifle fire, but the high volume of machine gun fire delivered from the armor protection of the moving carriers killed or drove off the VC force, freeing the company to continue on its mission.

(2) Doctrine. Current doctrine treats the armored personnel carrier as a means of transporting troops rather than as a fighting vehicle. Its stated primary function has been to provide infantry and mechanized infantry units the capability to:

(a) Maneuver with a high degree of cross-country mobility with light armor protection and multiple means of communications.

(b) Exploit the effects of mass-destruction weapons.

(c) Complement and enhance the inherent capabilities of tank elements, when employed in infantry-tank task forces.

(d) Provide a highly mobile exploitation force when suitably reinforced with appropriate combat, combat support and combat service support elements.

(e) Traverse inland waterways while mounted.

Employment of mechanized infantry as described in training literature is invariably tempered by the inhibiting assumption of a sophisticated

enemy possessing a significant antitank capability. Doctrinal publications presently place great emphasis on dismounted action as the principal contribution and predominant role of mechanized infantry, the scout sections and rifle squads of the cavalry squadrons, and of straight infantry. Mounted combat is mentioned, but only superficially discussed; no specific mention is made of a mounted unit which remains mounted, i.e. fights from its carriers throughout the greater part of the operation.

(3) RVN Variations. Combat experience in RVN reflects a different situation. Although numerous AT mines and some recoilless weapons are encountered, no significant enemy antitank capability exists. The M113 is used as a fighting vehicle in a tank-like role, i.e. as a vehicle-mounted weapons system with armor protected firepower and excellent cross-country mobility. The crews (squads) dismount only when forced to by untrafficable terrain, the presence of a large number of AT mines or requirements to conduct a detailed search for tunnels and bunkers. Seldom are less than three men left on the M113 when a squad dismounts. M113's are also used to break trails through jungle and knock down trees in much the same manner as tanks. In addition, combat operations in RVN reveal many situations for which mounted combat is appropriate. Here the determinants are trafficability and availability of carriers and not the density of armor-defeating weapons. The armored personnel carrier is habitually used as a fighting vehicle and not just as a means of transportation within the cavalry squadrons and mechanized infantry

battalions. During OPERATION SILVER LAKE, in January 1967, a mechanized infantry battalion successfully conducted purely mounted combat operations.

c. ORGANIZATION FOR COMBAT.

(1) General. To enhance the combat capabilities of assigned units, commanders in RVN cross-attach tank, infantry, mechanized infantry, and armored cavalry units in accordance with current doctrine; flexibility of task organization inherent to the ROAD division concept is fully exploited. The factors of METT (mission, enemy, terrain and weather, and troops available) remain the principal considerations used by commanders in RVN for determining how they will employ armor and mechanized units available to them. Restrictions on employment of firepower resulting from rules of engagement sometimes constitute an additional factor.

(2) Cross-attachment to Improve Mobility. Imaginative attachment of straight infantry units to armor or mechanized infantry units can provide an increased mobility to a dismounted unit. One U.S. tank battalion in RVN habitually uses the M113's of its scout platoon and surveillance section (sixteen M113's total) to mount an attached rifle company. During OPERATION SAM HOUSTON, in January 1967, this battalion initially used these carriers to mechanize an attached U.S. rifle company and later to transport an RVN Civil Irregular Defense Group company operating in coordination with the battalion. On both occasions in this search and destroy operation, company teams

were able to range to more distant portions of the assigned area of operation and traverse larger areas as a result of their rapid movement through tangled undergrowth. Another technique was demonstrated during OPERATION TUCSON in February 1967; while the two lead companies of a mechanized infantry battalion proceeded to their assigned areas to commence the search and destroy mission, the third company was temporarily attached to a straight infantry battalion. By dismounting the attached company (except for drivers and vehicle commanders) at its bivouac area, the straight infantry battalion was able to use the carriers to deliver its companies to their starting points by making three shuttle trips; then the carriers were released to return to pick up their assigned squads and to rejoin their parent mechanized infantry battalion. Excellent preliminary coordination and a very professional execution of the plan accomplished the tactical deployment of both battalions smoothly and rapidly.

(3) Cross-attachment to Provide Armor-protected Firepower. Cross-attachment of straight infantry with mechanized infantry in order to exploit the capabilities of both is the logical extension of employing M113's in a tank-like role. Since the M113 is used as a fighting vehicle, it can be used in conjunction with foot troops as are tanks. There are areas which tanks cannot traverse but which can be negotiated by M113's; tank units may be desired but not available for cross-attachment with straight infantry; in these instances,

attachment of mechanized units constitutes an appropriate alternative.

(4) Armored Cavalry Squadrons as Combat Maneuver Battalions. Armored cavalry squadrons are being increasingly employed in those roles previously assigned to tank and infantry combat maneuver battalions rather than restricted to the traditional reconnaissance, security and economy of force roles. This has evolved primarily due to the nature of the enemy and the concept of area warfare. There are no definitive battlefields in the traditional sense and with the propensity of the enemy to avoid contact by moving in small groups and massing only for short term offensive actions, the emphasis for employment of U.S. forces has shifted to destroying the enemy wherever and whenever he is located. The armored cavalry squadrons have proven to be responsive to this concept of aggressive offensive action in RVN because of their balanced combined arms structure and inherent capability for quick response and extended independent action. The extensive firepower and combat strength of the armored cavalry squadron have dictated its more effective use in the role of a well balanced maneuver battalion rather than in its traditional roles.

d. COMBAT SUPPORT.

(1) Organic Fire Support.

(a) 4.2 inch Mortar Platoons. Tank and mechanized infantry battalions are constantly confronted with two basic problems in employing their organic 4.2 inch mortar platoons: the nature of the war in RVN requires the capability to quickly deliver fires in any direction; and the minimum range of the 4.2 inch mortars (840 meters)

normally precludes their use in firing missions directly in front of the perimeter in which they are positioned. Imaginative employment of these platoons in RVN has partially resolved these problems.

1. Some platoons occupy firing positions in such a way that the tubes are layed in four different directions. This arrangement permits rapid response to requests for fire in any direction. The rate of fire possible with one tube is considered adequate for routine fire missions, and the capability of shifting additional tubes for increased fires is retained.

2. Artillery is habitually available to provide fires in support of mechanized infantry and tank battalion operations. For a battalion to achieve maximum fire volume for close-in defensive fires around unit positions remote from large base camps, it is desirable that 4.2 inch mortar fires as well as available artillery be employed. To achieve this when not positioned within range of an adjacent unit, battalions regularly establish two or more separate perimeters sufficiently far apart so that mortars located in one can fire defensive missions in support of the other; should the commander choose to locate the entire mortar platoon within only one of these perimeters, close defensive concentrations for that perimeter in which the mortars are located can be fired by the artillery.

(b) 4.2 inch Mortars of the Armored Cavalry Squadrons. Problems in employment of 4.2 inch mortars organic to the armored cavalry platoons are generally the same as those described above; in addition, the enemy situation is usually such that positioning of a

single undefended mortar sufficiently remote to provide close continuous support to its platoon is impractical. The platoon mortars are usually grouped at troop or squadron level and employed like those of a mortar platoon. Because of their habitual employment of mortars in battery, armored cavalry units have improvised a mortar fire-direction center. An interesting variation is demonstrated in one squadron's employment of all nine assigned mortars in prepared positions arranged in a triangle (Figure II-7). In addition to providing fires quickly in all directions, this arrangement provides a wide variety of sheafs without computing individual data for each tube; proper selection of tubes to fire a given mission can provide coverage of an area, of a line approximately perpendicular to the line of fire, or of a line approximately parallel to the line of fire.

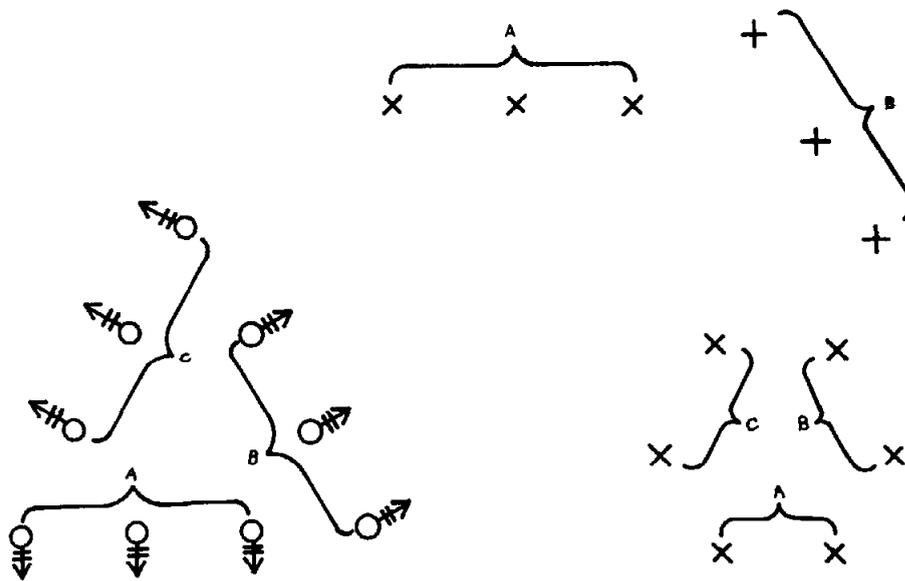


Figure II-7. Nine mortars of an armored cavalry squadron grouped to provide defensive fires for the squadron base camp. Typical sheafs appear on the right.

(c) Antitank Platoon. The antitank platoon, equipped with 106mm recoilless rifles mounted on 1/4-ton trucks, is able to negotiate only roads and improved trails in virtually all areas of operation assigned to mechanized infantry battalions. Because of this lack of cross-country mobility, antitank platoons are not usually employed on missions other than route and base camp security.

(2) Artillery, Army Gunships, and Tactical Air Support.

(a) Artillery.

1. Fire Support Base Concept.

a. Current doctrine prescribes that indirect fire support be positioned so that it is responsive to the maneuver force. To accomplish this task in the area warfare environment of RVN, the supporting artillery must be capable of rapid delivery of fires in every direction. Fire support bases (protected artillery unit firing positions) are normally established within or adjacent to unit areas of operation where they can provide maximum fire support with minimum displacement.

b. Weapons are positioned within the defended perimeter of the fire support base so that they can provide immediate direct or indirect fires in any direction; their direct fires assist security elements in conducting defense of the fire support base from enemy attack. An artillery battalion of the airmobile division advocates that battery positions be arranged in the form of a star. This positioning of guns is recommended because it provides a direct fire capability in all directions, depth to the position

in the event one gun is overrun, and an effective sheaf for area fire when the guns are laid parallel. Infantry elements protecting the position dig in around the perimeter forward of the guns.

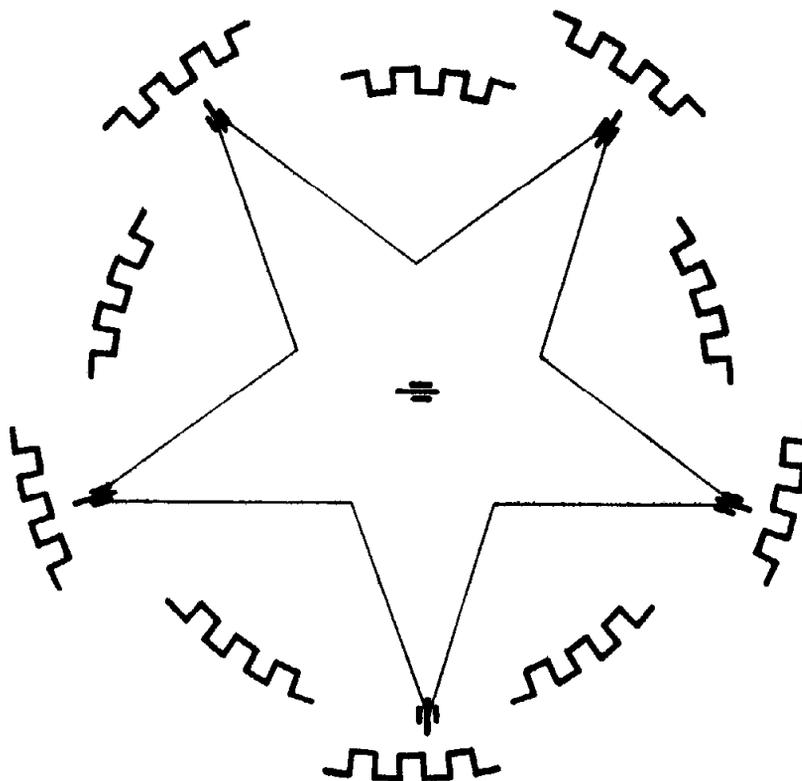


Figure II-8. Battery Fire Base with Guns Positioned in "Star."

2. Security of Fire Support Bases. Fire support base security requirements are the responsibility of the supported force. Most unit SOP's prescribe that a company-sized unit will secure a battery fire support base. Since normal artillery practice in RVN is to assign one battery in direct support of each combat maneuver battalion, the requirement to secure fire bases would theoretically result in a reduction of available maneuver elements by one-third. However, by positioning reaction forces and headquarters elements with the artillery

batteries in the fire support bases, by locating fire support bases within defended U.S. or ARVN base camps, or by grouping two or more batteries in each fire support base, this apparent drain on maneuver resources may be partially alleviated. This security requirement is one of the main reasons why maneuver battalions require a fourth line company.

(b) Army Gunships. When available, Army gunships assigned a mission in support of a battalion or company enter that unit's command net upon arrival in the area; coordination required to identify areas or targets to be attacked and to determine location of friendly units is made on the command net. Normally, Army personnel (Bn CO, Arty Ln O, Co CO, Arty FO, or Plat Ldr) control gunship strikes from their positions on the ground.

(c) Tactical Air Support. Only in isolated instances do the Air Force forward air controllers (FAC) actually exercise their control from ground positions. Dense foliage usually prevents observation of friendly unit dispositions and targets to be attacked, and orientation and position location are difficult to determine from the ground once units leave the roads or operate beyond sight of villages and other precisely located terrain features. Supported units and FAC's prefer that airstrikes be controlled from light observation aircraft above the operation. FAC's operate from airstrips within or near assigned areas of operation; they normally are able to reach the target area prior to the arrival of jets or A1E1 Skyraiders from more remote bases.

1. TAC airstrikes can be requested by any company through command channels or through USAF communications personnel who are habitually attached to battalions for this purpose and who operate on the ground in the battalion CP locations; such USAF personnel bring with them the communications equipment necessary to obtain an airborne FAC and to request TAC aircraft.

2. The FAC has in his aircraft the equipment necessary to communicate directly with the battalion on the command net and with the TAC pilots on the TAC Air Control Net.

3. Commanders agree unanimously that tactical air support procedures in RVN are highly effective and responsive to the needs of their units.

(d) Coordination of Simultaneous Artillery and Tactical Air Support. The abundance of fire support available to maneuver units in RVN or the particular qualities of targets encountered sometimes results in the simultaneous employment of both artillery and tactical air. Since artillery cannot obtain clearance to fire through airspace being employed by aircraft conducting strikes in support of ground forces, the capability to use both depends upon effective coordination by the supported unit. The coordination usually is achieved by the designation of a readily identifiable terrain feature (river, trail, or road) as a fire coordination line (FCL); artillery fires are directed on targets on one side of the FCL (up to the FCL) while airstrikes are directed on those targets located on the other side of the FCL. It is also practical to coordinate consecutive rather than

simultaneous employment by suspending artillery fires during the execution of airstrikes; it is evident, however, that gaps in the supporting fires occur as the artillery ceases fire and the aircraft are directed against targets, and again when the aircraft finish and the artillery is obtaining clearance to resume firing.

e. IMPROVEMENT IN NIGHT COMBAT CAPABILITY. New techniques which enhance armor and mechanized infantry units' capabilities to conduct offensive and defensive combat operations at night are related to new equipment presently available or recommended for issue. Both the infrared and the visible light capabilities of the Xenon searchlights mounted on tanks can be used extensively in the conduct of night operations. The program of installing these lights on all



Figure II-9. Xenon Searchlight Mounted on M48A3 Tank.

tanks in RVN continues and is heartily endorsed by commanders concerned. Image intensification devices are also effectively and enthusiastically used by all units possessing them; similarly trip flares are used and other commercially produced intrusion detectors are being procured for use in RVN. Infantry units include light intensification devices along with Claymore mines and other bulky defensive equipment in SOP "night kits" designed to be helilifted to those elements conducting dismounted operations as they assemble for the night in remote areas; mechanized infantry and armor units normally carry sufficient material on their tracked vehicles to preclude the need for "night kits". Because image intensification devices are comparatively new to the Army's inventory of night vision equipment, and because intrusion detectors are only now being recommended for procurement and issue, further discussion of both is appropriate.

(1) Image Intensification Devices. Image intensification devices are optical-electrical scopes which enable the operator to observe relatively well under conditions of near-darkness; since they emit no energy to illuminate the field of view, they are dependent on the presence of some faint light source such as starlight or weak moonlight. They are effective on all but the darkest night. They are presently available in three models: the small hand held or individual weapon sight (Starlight Scope), the crew-served weapon night vision sight, and the medium range night observation device. The Viet Cong has amply demonstrated his ability to move undetected

under the cover of darkness. Maximum use of image intensification devices should fully exploit our technical advantage over the enemy in this area.

(a) Ambush Operations. Effective use of these scopes enables friendly troops to conduct frequent and persistent night operations. Image intensification devices are particularly useful for ambush operations. They are used to observe and monitor the area surrounding the ambush site and provide early warning of the enemy's approach. The increased night observation range provided by these scopes lengthens the time the ambush party has for making final preparations once the enemy has been detected moving toward the killing zone. These scopes provide the ambush party the capability of selection and discrimination of targets under cover of darkness.

(b) Night Patrols. On night reconnaissance patrols, image intensification devices contribute to the security of the patrol by providing an added surveillance capability during movement. In addition, they are used to assist in maintaining direction and control by enabling personnel with compasses to pick out landmarks at a much greater distance for use as reference points. This reduces the number of halts required for patrols to verify their positions. They are used to check danger areas such as clearings, stream beds and other possible ambush sites. They are also used to assist patrols in passing through friendly forces.

(c) Perimeter Security. The employment of image

intensification devices reduces the number of personnel required for perimeter sentry duty. Use of these scopes enhances the effectiveness of the firepower of the defensive positions. The operator can call for illumination of the target area, fire tracers into the target area, or make reference to range cards. The devices can also be used to select targets for supporting weapons and can aid in the adjustment of these fires.

(2) Intrusion Detectors. The AN/PKS-1 Intrusion Detector Set (a seismometer) has been adopted as standard equipment by the U.S. Army in Vietnam. This set can detect enemy intrusion for a limited distance in all directions from each of four detectors. Employment in dense or saturated soils provides increased range; in fact, best results have been obtained in damp moist ground.

(a) The intrusion detector, used in conjunction with light intensification devices, can remove the doubt as to whether there is an actual enemy probing the perimeter of an area. Detectors wired in parallel and connected to control boxes through a main control cable can provide good surveillance for an area to be defended when employed on the most likely avenues of enemy approach. The control set can be monitored from a remote location by using field wire. Employment of this device reduces the number of troops required to secure either a base camp or tactical unit perimeter.

(b) In addition to providing a warning of enemy presence, intrusion devices can be deployed to pinpoint the direction and location of of the enemy. Accurate placement of the seismometers

will allow the defending unit to illuminate the precise area being intruded.

(c) The intrusion detector is well suited for employment by units performing ambush missions. The detectors are placed along the ambush trail; and, as the enemy comes within detection range, the control set operator alerts the ambush patrol. This intrusion device is best used in conjunction with the Xenon searchlight, crew served weapons night vision sight, or range cards to bring firepower to bear on the enemy.

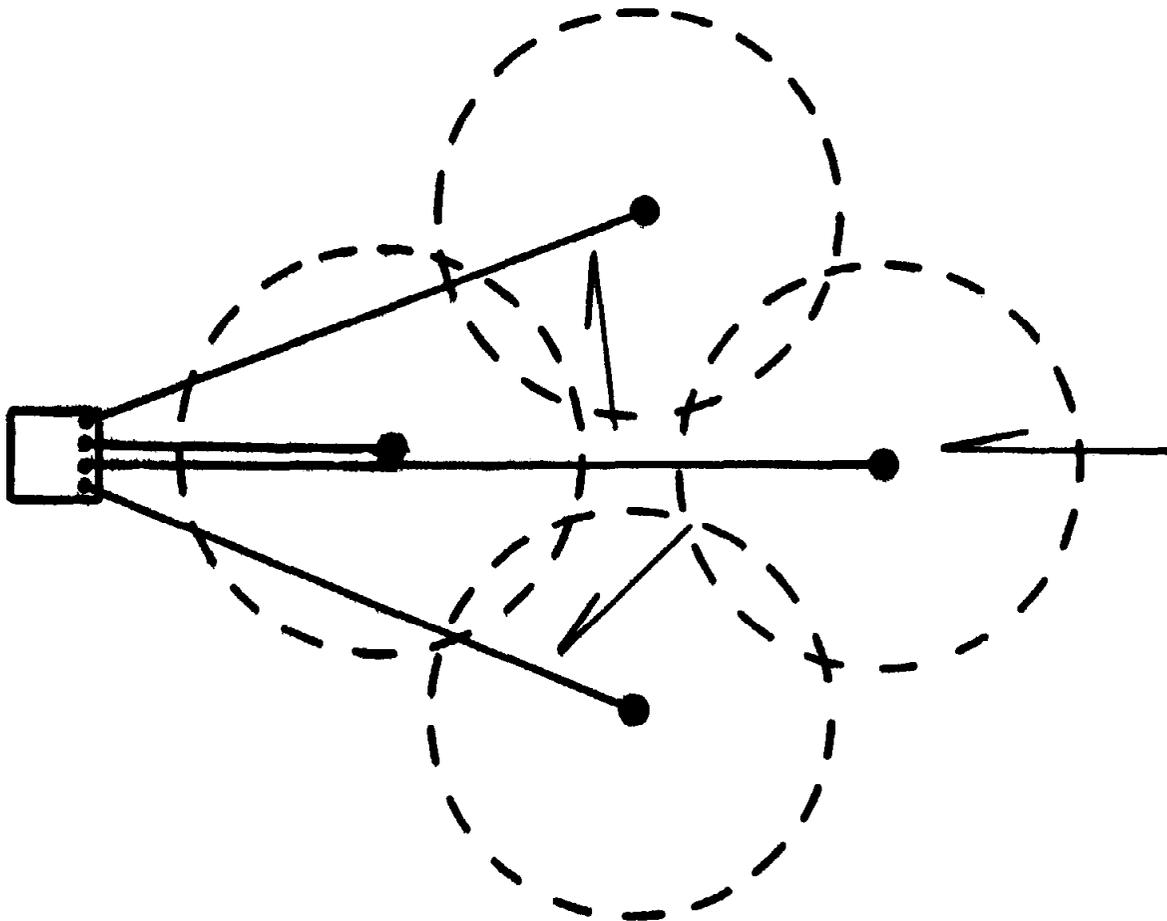


Figure II-10. Schematic Diagram Showing One Arrangement of Intrusion Detectors. Note that four detectors can be monitored from one location and that direction of enemy approach can be determined by the operator.

(3) Radar. Night surveillance techniques dependent on radar equipment have demonstrated only limited success in the RVN environment. The best results have been obtained by employing radar in conjunction with image intensification devices.

f. FIRE AND MANEUVER - FIRE AND MOVEMENT. A fundamental of offensive tactics is to maintain contact, once gained. Only by maintaining contact can a unit develop the situation rapidly and forcefully. In the area war environment of RVN, the enemy's doctrine has taught him to avoid situations in which his position is fixed. This, together with the dense vegetation found in much of RVN, results in numerous meeting engagements at point-blank range. In these meeting engagements, commanders use the forces immediately available to fix the enemy and to maneuver to develop the situation. Because of the proximity of forces, it is seldom possible to employ supporting artillery fires and air strikes on the enemy forces directly in contact unless the unit withdraws; withdrawal, even for a short distance, results in breaking contact thus permitting the enemy to escape. To avoid this, supporting fires are placed on the rear and flanks of the enemy to prevent his withdrawal. Once his location and strength are reasonably clear, the decision to attack or to withdraw to permit supporting fires to be brought in can be taken.

g. REVERSAL OF ROLES BETWEEN ARMOR AND INFANTRY.

(1) Present doctrine states: "In the envelopment the attacking force avoids the enemy's main defensive strength by going around it on the ground or over it by air to seize an objective in

his rear and disrupt his communications and support, cut his escape routes, and subject him to destruction in position. . . . Although favored as the enveloping force, armor units may participate in the envelopment by executing a supporting attack." Because of the difficulty of fixing the enemy in place in area warfare, surprise and speed are essential in the employment of the enveloping force. Air-mobile infantry has been found more effective than armor in this role in RVN. Conversely, armor has been found to be highly capable of executing the supporting attack because of its sustainability under enemy fire and its ability to thrust through jungle and rice paddies at a greater speed than that of infantry in many areas. This trend is all to the good but should be recognized as a reversal of the favored employment of infantry and armor as contained in current doctrine.

(2) Current doctrine also states: "Infantry normally dismount to lead an attack through heavily wooded terrain." Because of the enemy's use of antipersonnel mines and booby traps and his propensity for conducting ambushes in jungle areas, this technique is frequently reversed. Tanks lead attacks through the jungle whenever possible, breaking trails, destroying antipersonnel mines and disrupting enemy defenses. The mechanized infantry follows to complete the destruction of the enemy, and they then make a dismounted sweep of the area to obtain intelligence information and to destroy enemy installations. This again is a noteworthy reversal of roles normally attributed to infantry and armor.

h. COMMAND AND CONTROL.

(1) Land Navigation. Upon leaving established roads and trails in RVN, mounted units often become disoriented. Despite adequate maps and the demonstrated ability of leaders to use them, the absence of identifiable landmarks and the heavy vegetation (conditions encountered often in RVN areas in which U.S. units presently operate) preclude accurate determination of ground locations. Control of unit



Figure II-11. M113 Traversing Secondary Growth Typical of Much of RVN. Note that squad members wear body armor and ride on top of M113.

movement from a helicopter resolves the problem of orientation. In the event helicopters are not available, units have relied on observation of artillery fire, usually smoke, air burst or illuminating rounds, requested on coordinates estimated to be nearby. A limited

number of vehicular compasses mounted on M113's have been effectively employed by some units to maintain direction. Dismounted troops working in conjunction with mounted units can guide the vehicles along designated azimuths by using their compasses and dismounted radio sets as they follow along trails made by the vehicles. In this technique the odometer of the vehicle and the compass of the dismounted element constitute sufficient equipment to employ dead reckoning in reaching prescribed positions. In using this technique, the user must convert miles registered by the odometer to kilometers in order to relate distances traveled to distances on his map. (Odometers which register distance traveled in kilometers have been recommended.) To determine one's location most quickly, however, the helicopter is indispensable.

(2) Position of Commander. The preceding remarks concerning the indispensability of the helicopter for rapid navigation of armor and mechanized infantry units through dense vegetation are not intended to recommend that any commander habitually control his unit from an airborne CP. Aircraft do provide the commander with a capability to move rapidly throughout the area of operations to influence critical actions by his personal presence; but, in many instances, his influence, inspiration and control of his troops requires his physical presence on the ground.

(a) During combat operations in WW II and Korea, the commander usually oriented his attack or defense on key terrain. Because the enemy usually considered the same terrain "key", the decisive point of the battle, both in time and space, was often predictable.

Therefore, the commander could position himself on the ground where he could best influence and inspire his troops. Firefights with the VC are of short duration and violent; the enemy strikes hard in an attack or from ambush and then rapidly withdraws; he tries to avoid sustained combat unless assured of victory. Because the critical point cannot be predetermined, the commander must retain his ability to move about the battlefield both in the air and on the ground; Marine units in RVN have provided tanks to unit commanders to provide them the capability of moving to the decisive point during engagements. Mechanized infantry and armor commanders already possess this capability.

(b) The command and control helicopter in some situations offers the best means to control operations. It sometimes provides the only practical way to personally visit subordinate units operating separately. While operating from a helicopter, however, the commander must recognize his inability to accurately judge terrain conditions and the extent of enemy resistance being encountered by his units.

(c) On those occasions when the commander finds it advantageous to control his forces from a ground position, one of his staff may assist from the airborne command post.

(3) Rules of Engagement. During the conduct of combat operations in RVN, efforts directed toward minimizing noncombatant battle casualties preclude the full application of available firepower

prescribed by existing offensive doctrine; the use of force likely to result in noncombatant battle casualties is forbidden. Aside from obvious humanitarian considerations, experience shows that such indiscriminate use of force embitters the population and turns them towards support of the enemy, thus interfering with the accomplishment of RVN nation-building goals. U.S. Army units in RVN have developed implementing instructions and SOP's concerning rules of engagement based on policy contained in current USMACV directives. Within the policy of these directives, however, rules of engagement vary to accommodate differences in local situations, e.g. assignment of a unit to an area of operations in a VC-dominated war zone may result in removal of restrictions placed on that unit's employment of firepower. Temporary changes to unit SOP on rules of engagement are appropriately announced in commander's conferences, staff briefings, and unit operation orders. The most pertinent restrictions incurred by application of rules of engagement are those which limit use of reconnaissance by fire and those which require units to obtain extensive clearances prior to employing supporting fires of mortars and artillery. By continuous and detailed planning for supporting fires, clearances can be obtained in advance based on the anticipated need for the fires. Without such prior clearances, delays of thirty minutes or more are not uncommon.

### 3. COMBAT FORMATIONS - BATTLE DRILL.

#### a. COMBAT EXAMPLE.

- (1) Elements of the armored cavalry regiment presently

in RVN benefited from a last-minute intelligence warning and the employment of battle drill in an action which occurred on 21 November 1966. A convoy composed of regimental headquarters elements and attachments was moving from the regimental staging area to a new base camp and was ambushed near XA TRANG BOM (Figure II-12). As is customary in this area of RVN, armored vehicles escorted the convoy. The VC had established an ambush as shown in Figure II-13 with a force estimated to have been two battalions of a VC regiment.

(2) As the lead vehicle approached to within 1,000 meters of the ambush site, the convoy commander was informed through intelligence channels that an ambush had been established. This warning permitted the commander to throw the enemy off balance; reconnaissance by fire by the escort vehicles as they entered the ambush site resulted in drawing the VC fire prematurely - small arms, automatic weapons, recoilless rifles, and hand grenades. The suppressive effect of the cavalry escort fires permitted half of the convoy to pass through the ambush safely before a recoilless rifle hit destroyed a truck in such a position that the road was blocked; three following trucks were destroyed practically simultaneously.

(3) Two escorting M113's were hit by recoilless rifle fire. They and the dismounted personnel from the destroyed trucks engaged the enemy by fire. The lead M113's, having cleared the ambush with some of the trucks, reorganized to provide continuing escort to the trucks and to provide two M113's to return to the

assistance of those elements heavily engaged with the ambush force. One of these M113's was subsequently diverted to provide security for a "dust off" helicopter mission to evacuate wounded, while the other proceeded to rejoin the fight to prevent the remainder of the convoy from being overrun by the numerically superior enemy force.

(4) The resulting thirty VC killed (by body count), as compared to U.S. losses of seven killed and eight wounded, can be attributed largely to the warning provided to the convoy prior to its engagement by the ambush force and to the battle drill employed by the escort force during the ensuing action.

b. BATTLE DRILL AND COMBAT FORMATIONS. The squadron SOP for action to be taken in event of ambush described in the combat example above is typical of additional items of battle drill developed and employed by armor and mechanized units in RVN to provide effective firepower quickly. Battle drill is comprised of standard techniques to be learned by all members of the unit and to be used when confronted by recurring or foreseeable situations, e.g. platoons changing formation from column to wedge upon emerging from a woods into a clearing; or vehicles assuming predesignated positions when the platoon leader orders a change in formation.

(1) Ambush. The herringbone formation has been successfully used when forward movement of an armored column has been stopped by an ambush covering a portion of the route from which vehicles cannot deploy (Figure II-14). Its purpose is to rapidly place all

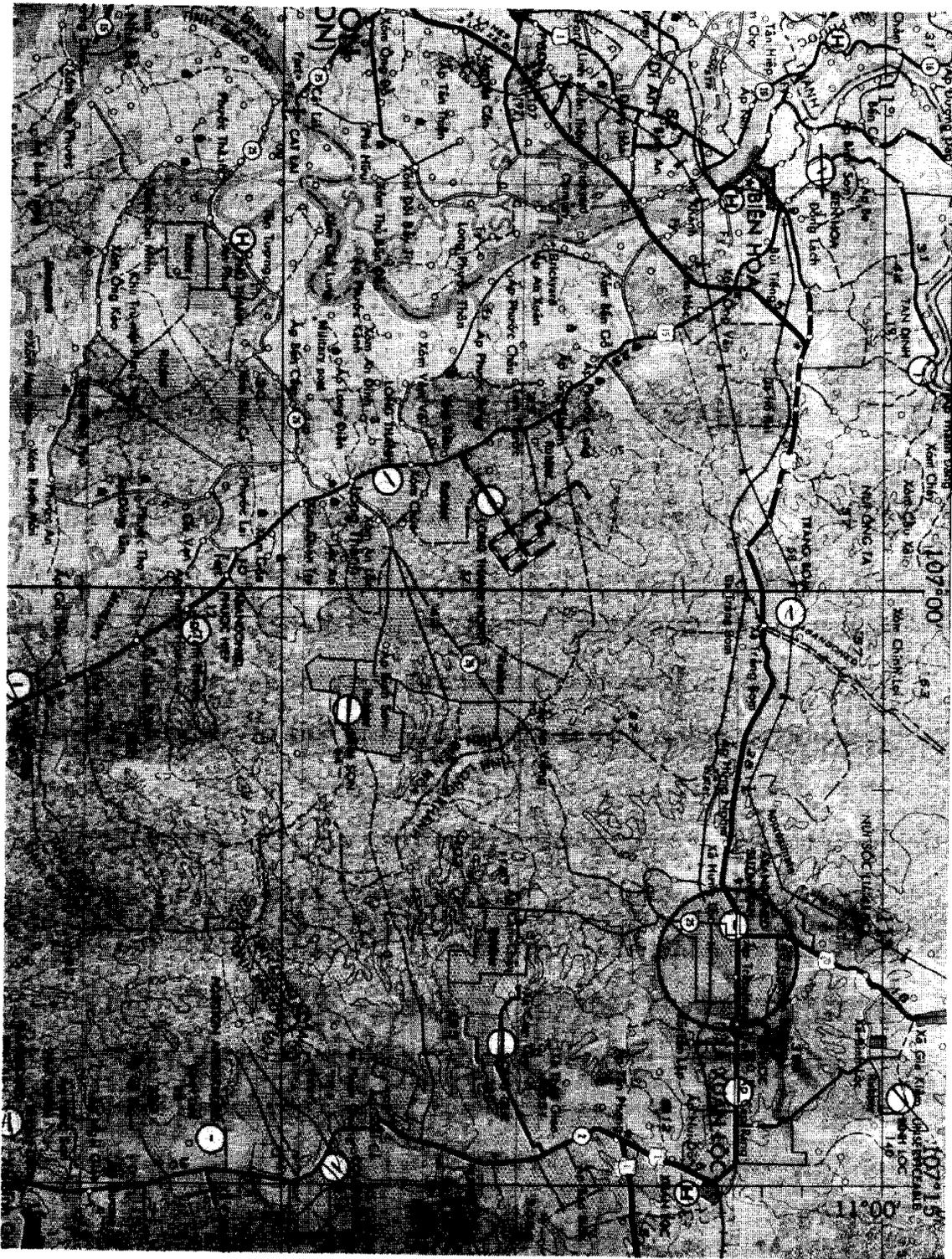


Figure II - 12. Map Showing Location of 21 November 1966 Ambush. Saigon is 50 KM west of XA TRANG BOM.

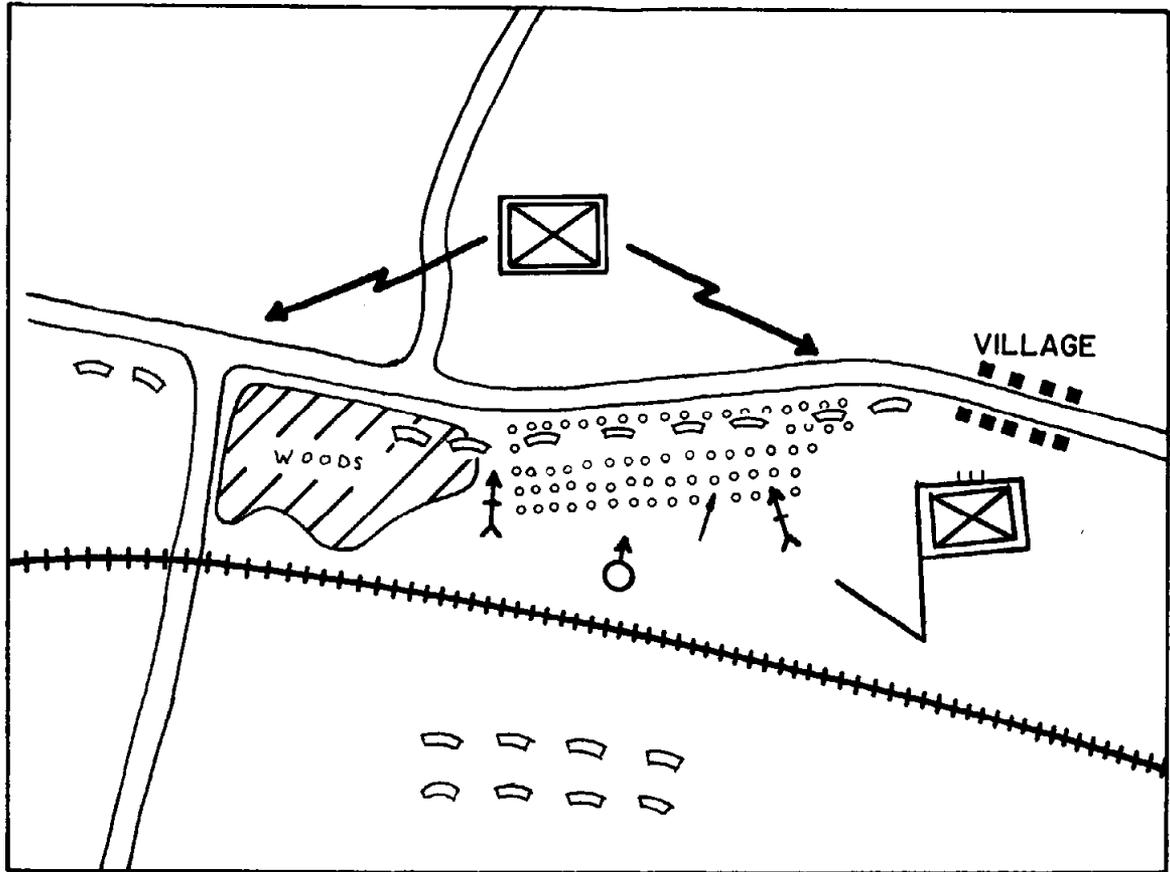


Figure II - 13. Enemy Dispositions for 21 November 1966 Ambush. Vegetation north of Highway 1 in this vicinity is high grass and shrub; south of the highway vegetation varies (from west to east) in sequence: brush, secondary timber, banana trees with grass, and shrub brush with high grass.

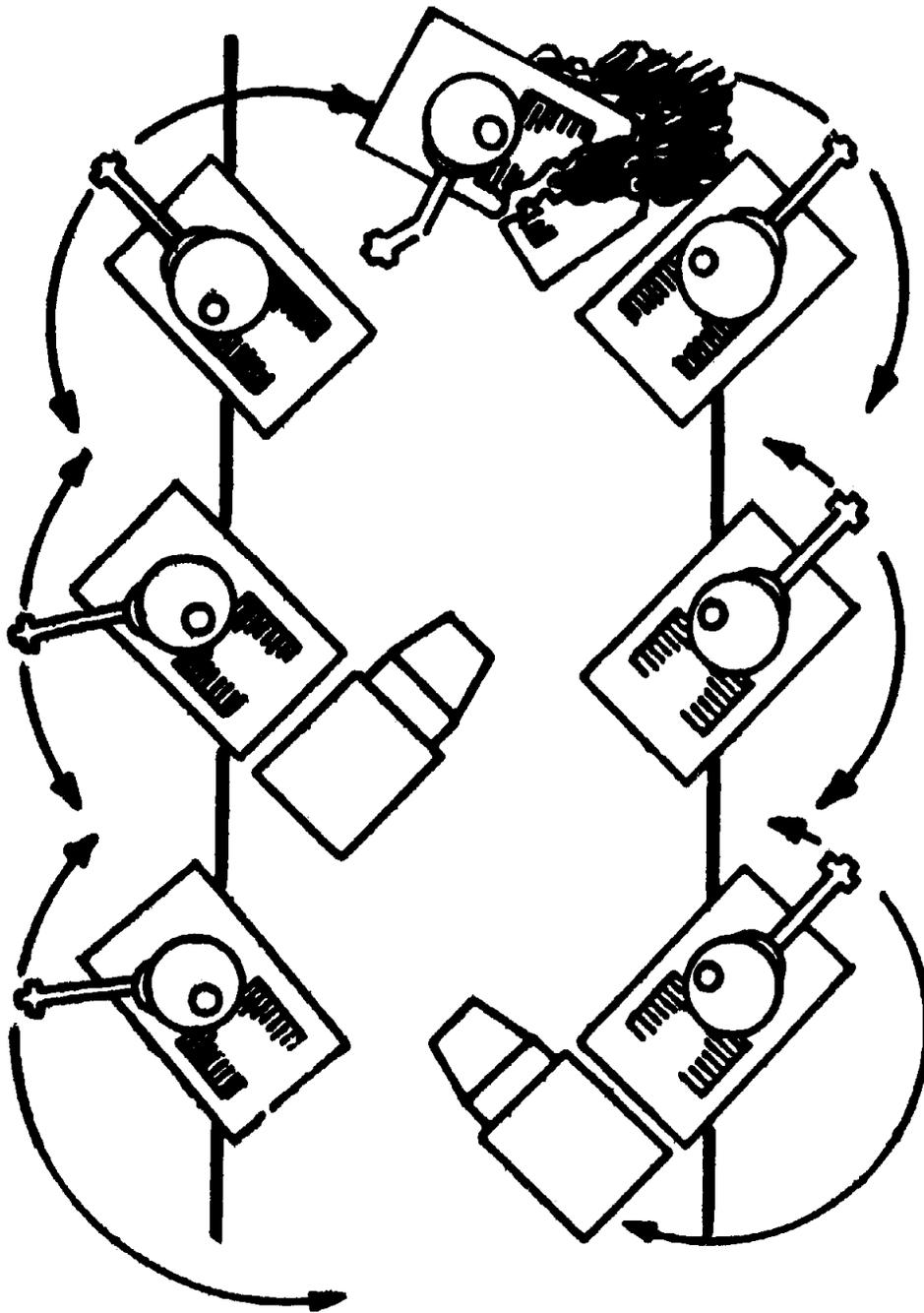


Figure II-14. Herringbone Formation

available fires onto suspected enemy locations at the site of the ambush, so vehicles close rapidly to within a few feet of each other to achieve a high density of firepower. If possible, armored vehicles move directly to close with and destroy the enemy instead of assuming this formation; if unable to deploy, they move as far as the terrain permits so as to leave an open lane on the route to permit evacuation of wounded, resupply, or reenforcement. If wheel vehicles are trapped by the ambush, they position themselves to get maximum cover among the armored vehicles. By SOP, elements which have successfully passed through the ambush, following elements, or reenforcing elements seek to maneuver to kill or route the enemy; only those vehicles halted and engaged assume this posture to destroy or at least to fix the enemy in his position.

(2) Formations in Heavy Undergrowth. Tanks proceeding through dense undergrowth or jungle have a limited capability of traversing their turrets due to interference by tree trunks. Two formations which have successfully been used in RVN to enhance the ability of the tank units to fire in directions other than to the front under these circumstances are the inverted wedge and the inverted echelon (Figures II-15 and II-16). The echelon formation shown is the same as that described in current publications; however, in this case, the formation is called "inverted" because the primary direction of fire is opposite to that of the usual echelon formation. Except for the lead tanks in both formations, all can traverse and fire to at

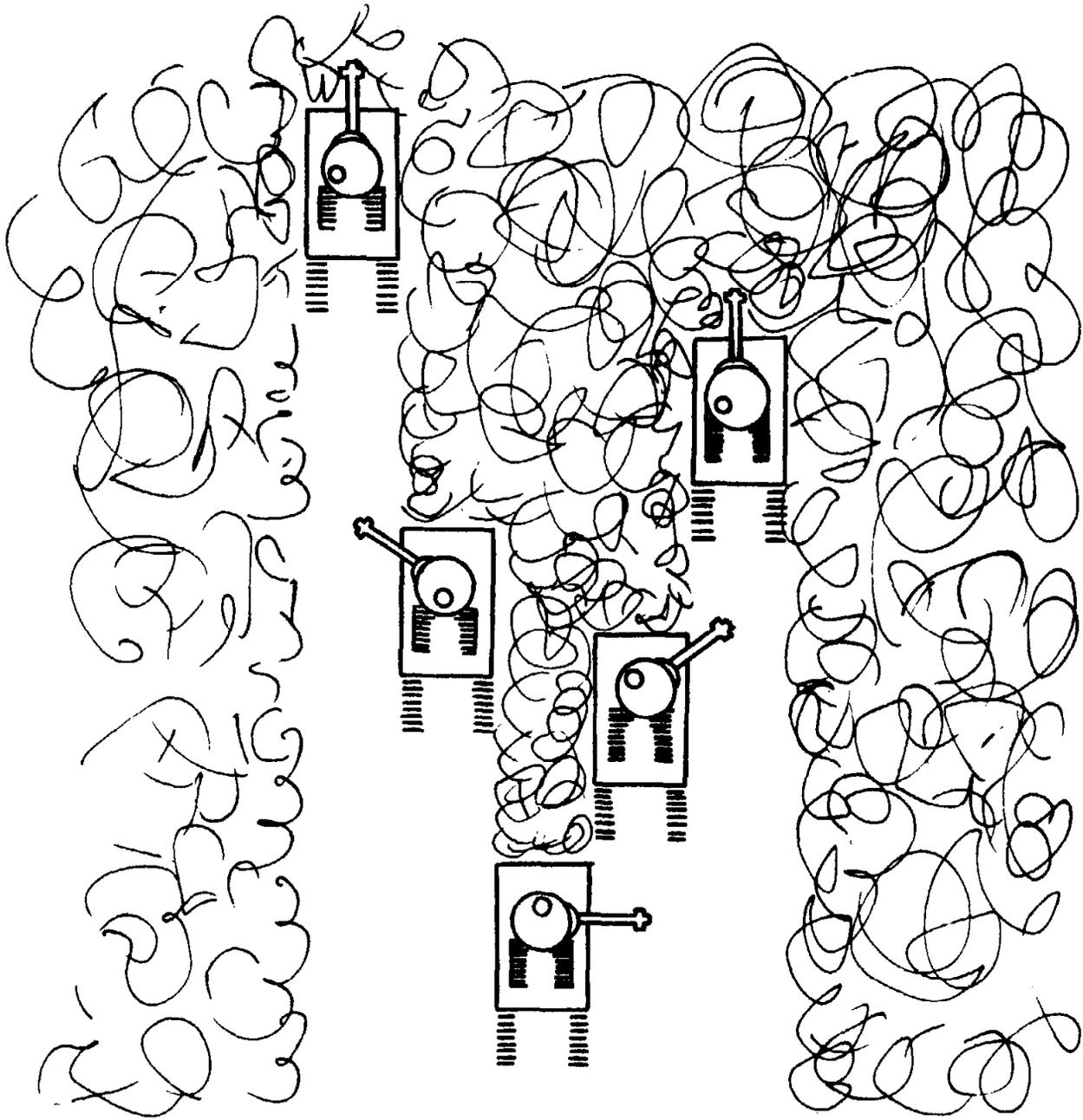


Figure II-15. Tank Platoon in Inverted Wedge Formation.

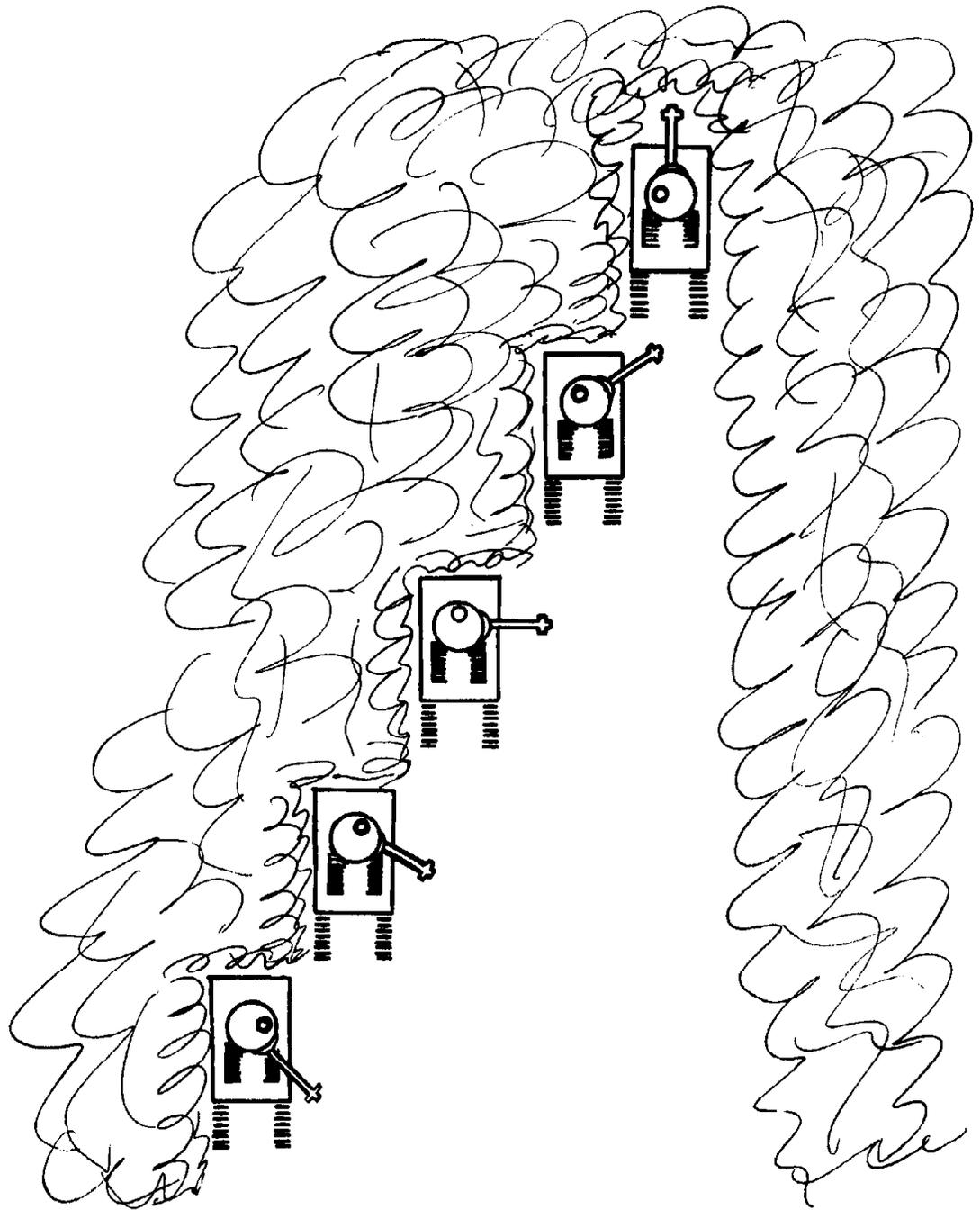


Figure II-16. Tank Platoon in Inverted Echelon Formation (enemy threat from right).

least one flank and to the rear. The inverted wedge formation is also employed for opening mined roads and trails when the terrain permits such employment (as will be discussed in a following paragraph).

(3) Positions of Crew Members. Tanks and M113's usually operate with all hatches open until contact is made with the enemy. Exposed armor vehicle crewmen habitually wear body armor for protection against small arms fire and shell fragments. When moving through dense jungle where claymore mines and booby traps suspended in vines or trees can be expected, squad leaders may require personnel to ride buttoned up inside of their M113; when moving on roads or trails through less dense areas where the major threat is from RPG-2 grenades, recoilless rifles and antitank mines, scout and rifle squad members may travel at least partially outside of the vehicle. Those not manning vehicular weapons ride on top of the M113. Upon establishing enemy contact, all take partial cover within the M113; exterior machineguns continue to be manned; and all personnel who can, occupy firing positions from which they employ their individual weapons against the enemy. The determination of whether the threat is greater from enemy antipersonnel or antitank weapons and the decision on how squads will position themselves within or on the M113 will be made by the squad leader.

#### 4. ARMOR AND MECHANIZED INFANTRY UNIT EMPLOYMENT TECHNIQUES.

##### a. MOVEMENT EXPEDIENTS.

(1) Terrain. A description of the terrain of RVN and techniques employed in estimating trafficability are presented in



Figure II-17. Infantry Squad Members Ride on Top of M113 Personnel Carrier Traversing Open Terrain.

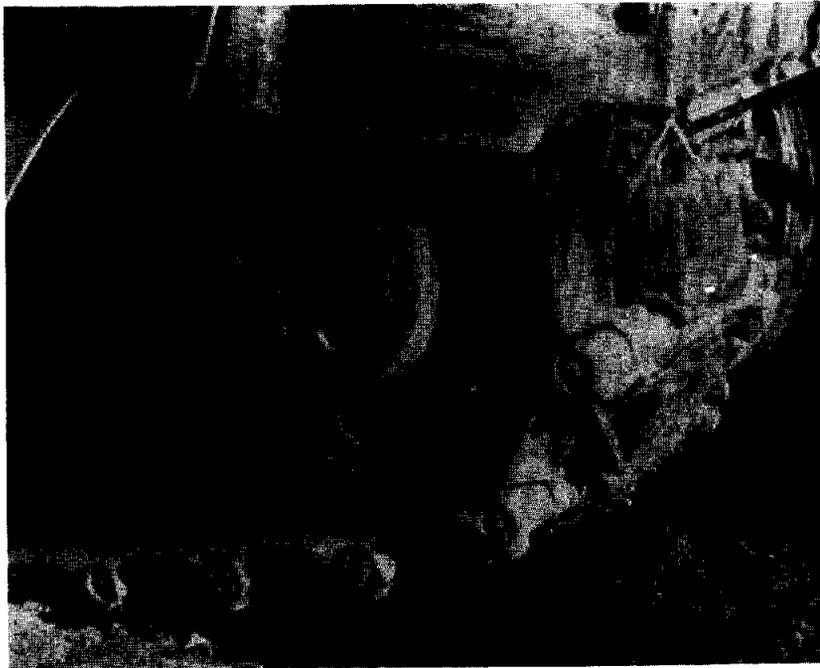


Figure II-18. M113 Sprocket Modified for Attachment of Capstan.

Section I, Introduction.

(2) Expedients. U.S. mechanized infantry units anticipating employment in inundated areas benefit from their ARVN counterparts experience in movement expedients and are presently fabricating equipment needed for employing these expedients. The use of a capstan-and-anchor technique (see Figure II-20) permits an M113 to recover itself once stuck or to traverse a small area known to be an obstacle. ARVN units regularly employ push-bars (see Figure II-23) to pass over areas where sufficient traction cannot be achieved. Extra-long cables carried by some M113's facilitate towing the remaining vehicles through soft spots once the lead vehicle is pushed across. Additional movement expedients are shown in Figures II-21, II-22, and II-24.

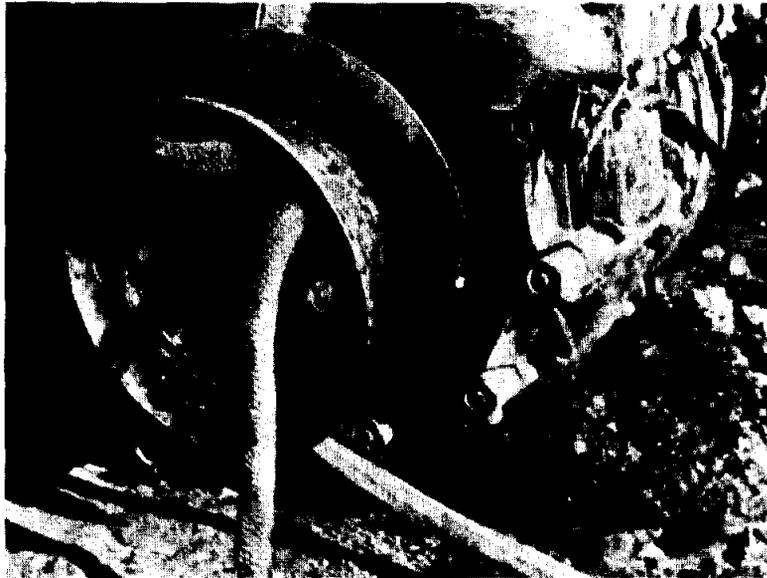


Figure II-19. Capstan Mounted on M113 Sprocket and Capstan in Action.

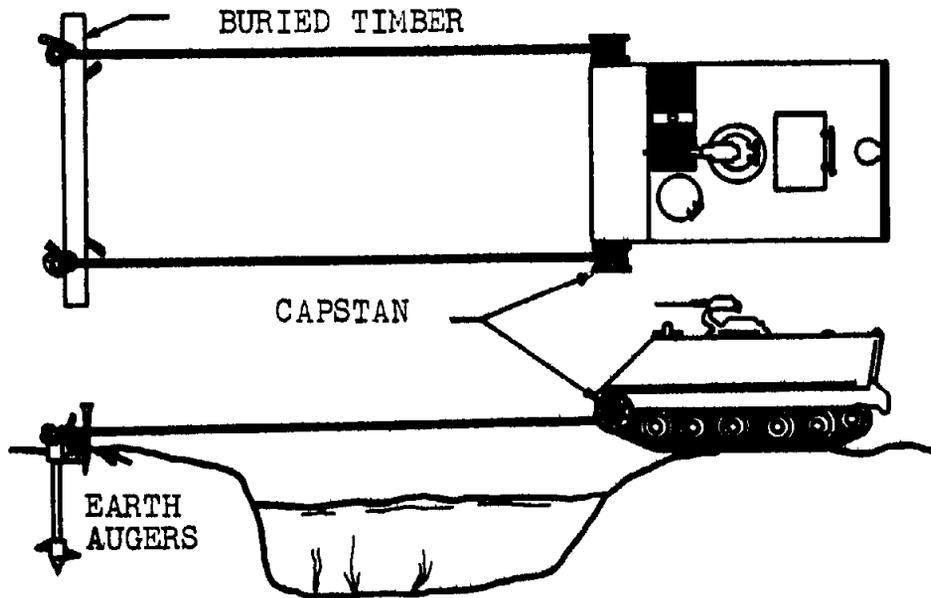


Figure II-20. Use of Capstan Kit. In this instance a "deadman" anchor is employed. Some kits contain marine anchors to use in place of improvised anchor. The capstans can be removed when required to restore original vehicle width.

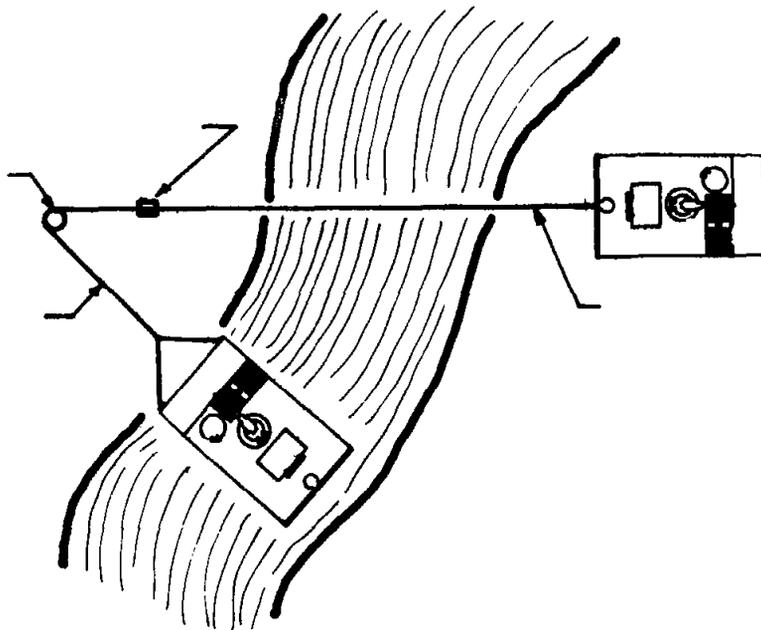


Figure II-21. Block and Tackle. Simple block and tackle rigging is sufficient to move an M113 when the river or canal bank is not too steep.

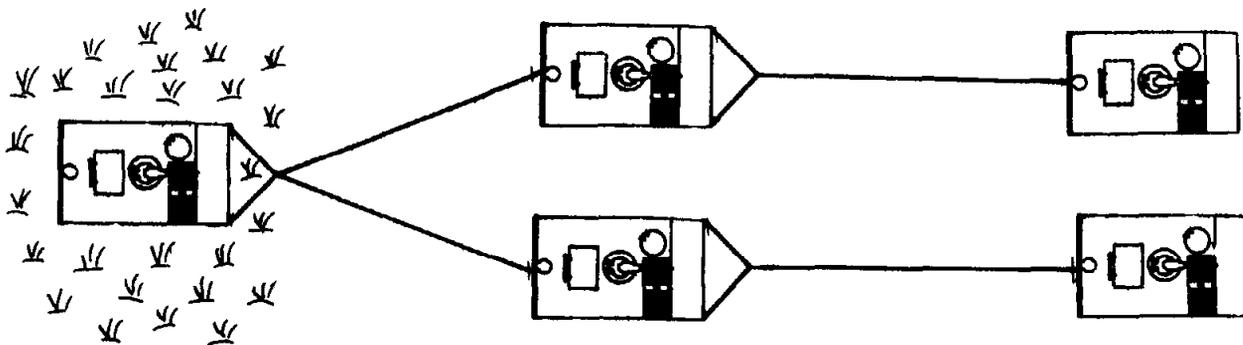


Figure II-22. Tow Cables. The tow cables used to extract an M113 mired in mud are 50 to 100 feet long. The yoke connections at the front of each vehicle are made from the 10 foot tow cables issued with each M113. Poor traction in the vicinity of a mired vehicle may require multiple tows such as the one illustrated.

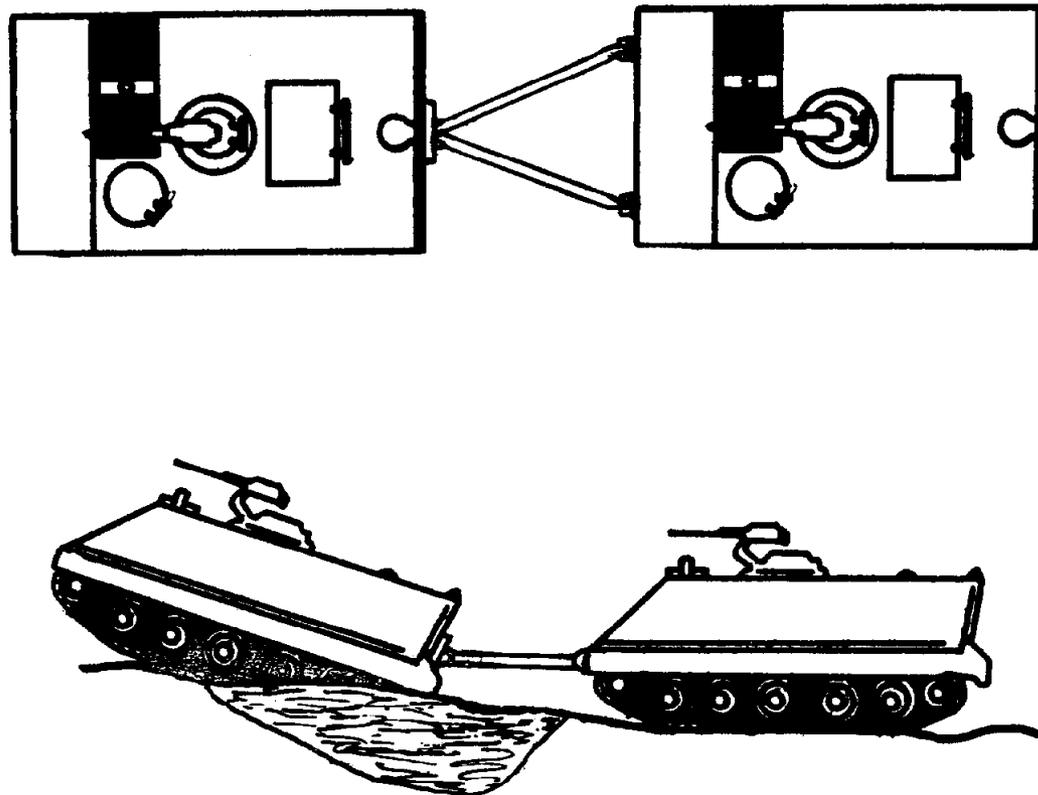


Figure II-23. M113 Employing a Prefabricated Push-bar to Assist a Mired Vehicle. Push-bars improvised from 4 x 4 inch timbers are also employed.

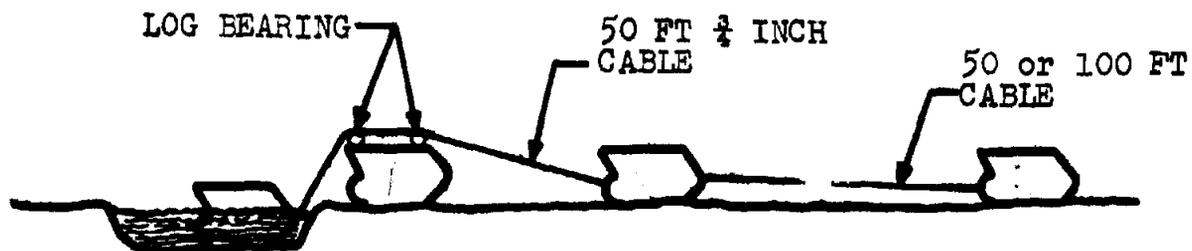


Figure II-24. Extraction of a Vehicle from a Canal with Steep Banks. The cable over vehicle 1 exerts an upward pull on the towed vehicle. Vehicles 2 and 3 exert the forward pull. When the bow of the towed vehicle has been raised sufficiently, vehicle 1 moves forward. The logs on vehicle one serve as bearings.

b. TANK AND M113 EMPLOYMENT.

(1) Combat Example. On OPERATION CEDAR FALLS, in January 1967, a tank battalion task force was assigned the mission of blocking VC escape routes and conducting limited search and destroy operations from

positions on the south bank of the Saigon River (the southwest boundary of the "Iron Triangle") while major units of two divisions and an armored cavalry regiment were committed to search and destroy within the triangle itself. (See Figure II - 25.) During a nineteen day period, this task force killed 54 VC (by actual body count), the highest number killed by any battalion-sized unit committed to the operation.

(2) Canister Ammunition. The most significant feature of this successful armored task force operation was the fact that the preponderance of kills were made through the use of canister ammunition and machine gun fire employed at close range. Only rarely were fields of fire adequate for employment of the tank main armament in its conventional long-range capacity. Canister ammunition was also employed to destroy antipersonnel mines and to knock down foliage and undergrowth concealing enemy location. The relatively short range of canister ammunition permits its employment in situations in which friendly troops or noncombatants might be jeopardized by machine gun or HE firing. That close-in firing is the rule rather than the exception for tanks encountering VC in RVN operations is demonstrated by the typical basic load breakout of 90mm ammunition carried by tanks of two units:

<u>Unit A</u>	<u>Unit B</u>
40 Canister	34 Canister
16 HE	14 HE
4 WP	10 WP
2 HEAT	4 HEAT



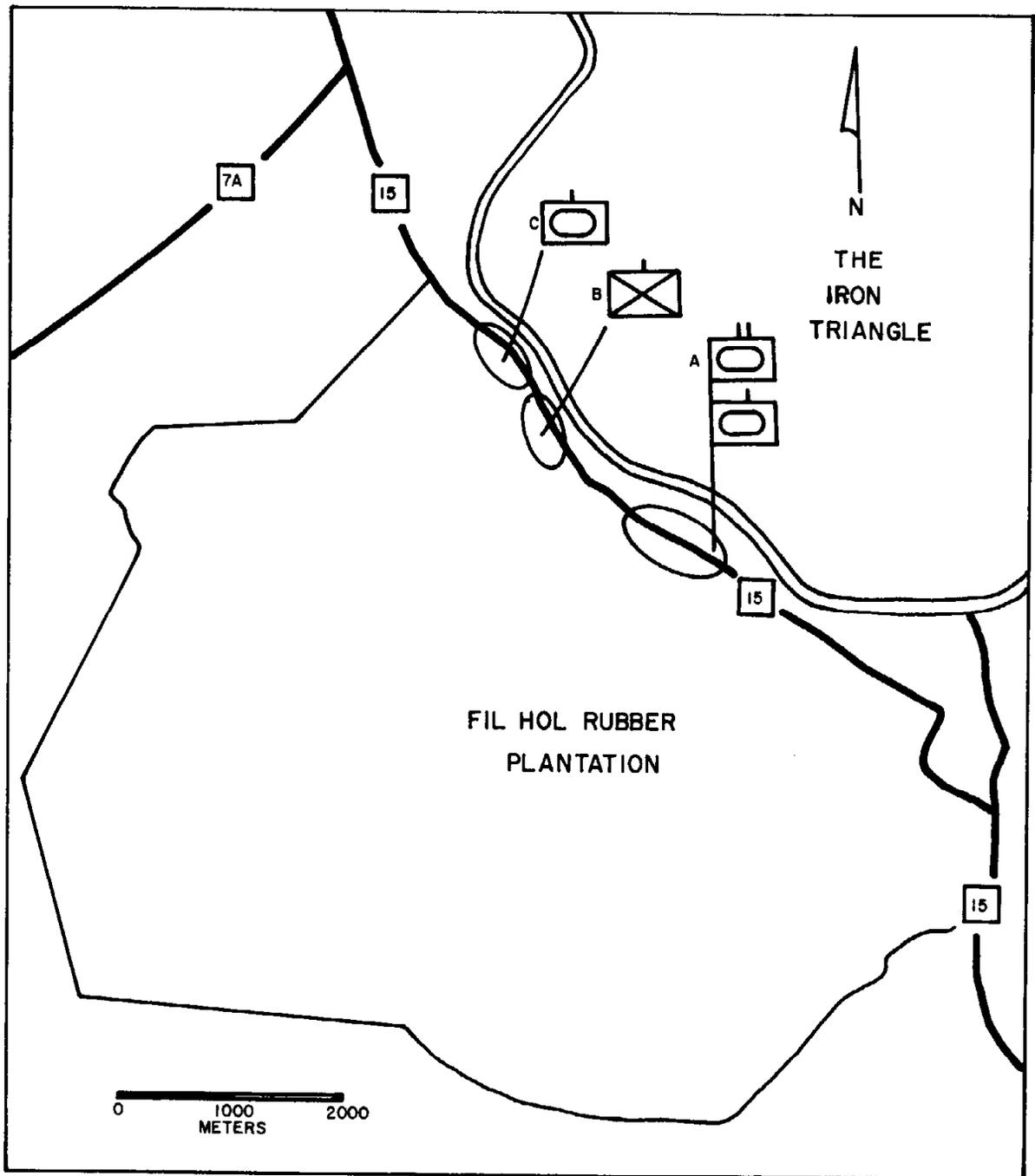


Figure II - 26. Blocking positions assigned to tank battalion task force during OPERATIONS CEDAR FALLS. Task force also executed search and destroy operations in FILHOL PLANTATION.

(3) Uses of M113. In addition to its traditional use as an infantry carrier and its emerging use in a tank-like role, the M113 is demonstrating further versatility in RVN. In those areas in which tanks are unable to operate because of soft terrain, the M113 is used to make trails through light jungle and dense underbrush. This capacity of the M113 to knock down undergrowth is also used to make landing zones for helicopters and fields of fire for defensive perimeters in wooded areas. During search and destroy operations, M113's are used to transport rice and other materiel uncovered in locations inaccessible to other vehicles. The M113 continues to be used as a CP vehicle and as a communication platform for a wide variety of radio equipment.



Figure II - 27. Tanks and M113 Assisting Infantry in Preparing Helicopter Landing Zone in Jungle.



Figure II - 28. M113 at Right is being Loaded with Rice Found in Cache Hidden in Dense Undergrowth.



Figure II - 29. Armor Battalion CP in "Open Area" prior to Crushing Secondary Growth with Tanks.

(4) Flamethrowers (Figure II - 30). The M132 mechanized flamethrower has been successfully employed in offensive and defensive operations in RVN. In search and destroy operations, they are normally employed in pairs against bunkers and densely foliated enemy-defended areas containing antipersonnel mines and booby traps. Flame directed at such areas may not destroy a protected enemy, but heat detonates mines and defoliates the area. In defensive positions, the flamethrower is employed to fill gaps not covered by direct fire weapons and to illuminate the area. During movements, the M132's can provide close-in flank protection to the column.

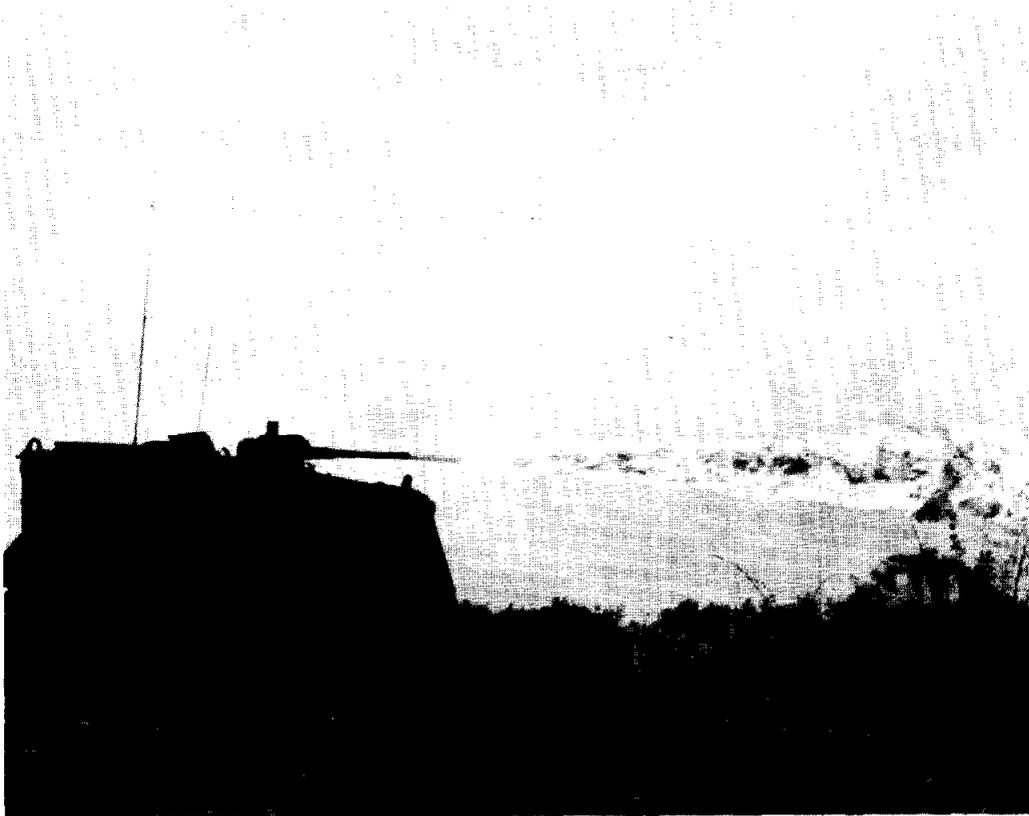


Figure II - 30. Flamethrower M132 Destroying Foliage and Enemy AP Mines.

c. MINES AND BOOBY TRAPS. The VC reaction to the increased introduction of armor and mechanized infantry units to RVN has been to increase his use of antitank mines. He usually incorporates anti-tank mines in his ambushes and organized defenses of base camps and other important installations, and he emplaces a large number to harass and interdict friendly traffic on routes of his choice. Mines employed include those captured during previous operations against the French Army, some imported from Communist China with other war materiel, and many improvised from U.S. dud artillery shells and aircraft bombs. Detonation of VC mines is initiated by the weight of a vehicle driving over an electrical switch or a direct pressure plate, by the tilting of a rod protruding upward from the mine, or by the pulling of a trip wire or closing of an electrical circuit by a concealed enemy observer.

(1) Mine Damage. Most U.S. armor and mechanized infantry units operating in RVN have encountered VC mines. As might be predicted, damage to tanks has been generally moderate to light, although a small number of mined tanks have not been repairable; damage to M113's has been greater, with a correspondingly higher proportion of them total losses. Particular significance is attached to the comparatively high personnel casualty rate among crew members of mined M113's versus crew members of mined tanks.

(2) Protection. The greater vulnerability of M113's to mines recommends employment in conjunction with tanks whenever trafficability permits. Normally some tanks are placed at the head

of any unit moving in column. Of course, dependent on time available and the enemy situation, dismounted troops with mine sweepers are employed to clear at least those sections of the route consid-

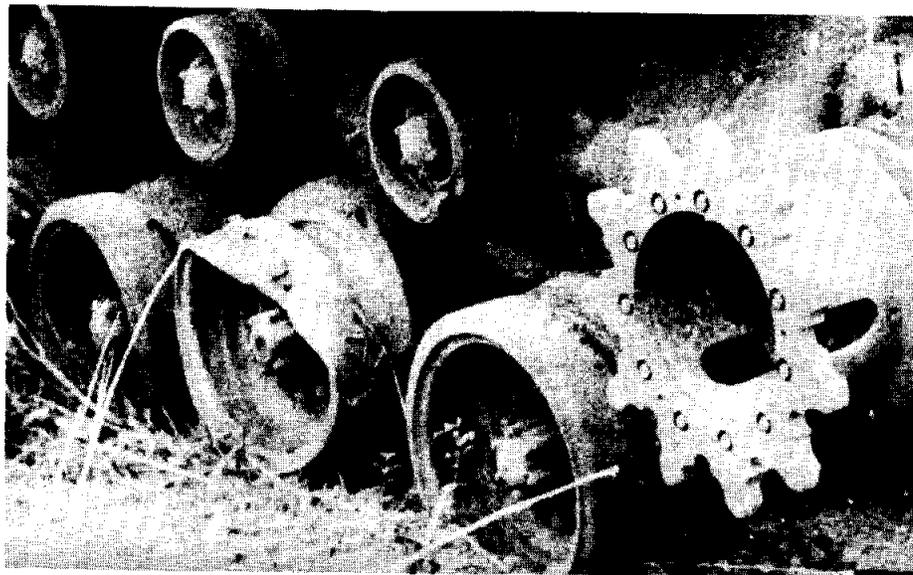


Figure II - 31. Typical Mine Damage.

ered critical. In RVN it is always necessary that such minesweeping parties be provided adequate security; a rifle squad accompanied by two or more armored vehicles is typical. In any event, tanks lead columns in an attempt to detonate mines with minimum injury to crew personnel.

(3) Avoidance. Experience indicates that the enemy emplaces his mines singly or in small groups. The more commonly selected sites are roads, trails, defiles, and breaks in paddy dikes caused by our movement. Where possible, repeated use of these sites is to be avoided. Once we have made a trail, we must assume that the Viet Cong will mine it. Constantly cutting new trails to avoid using old ones will reduce mine incidents. Though not foolproof, following in the tracks of the lead vehicle provides a measure of protection against pressure detonated AT mines.

(4) Clearing. Some emplaced mines have been discovered by identification of markers nearby. Whether these markers are erected by the local inhabitants or by the VC is not known, but any unusual sign should be examined. Rocks or sticks found along or on the side of the roads or trails, and knotted vines or tied tufts of grass found along jungle trails have marked mine locations in the past. The leading of columns by tanks does not preclude destruction of more vulnerable vehicles by those mines which fail to fire because of improper emplacement or insufficient pressure and those which are command-detonated; with the latter the enemy can select his target

from among the elements in the column. Techniques are being developed to deny the enemy this opportunity. One technique employs three tanks, two driving on the shoulders of the road to disrupt wires leading to mines and one following in the center of the road to detonate pressure mines (Figure II - 32). Variations on this technique include the use of additional armor vehicles on the flanks to kill or disperse hidden personnel and the use of tractor-drawn single-tooth rooters to dig up and break electrical wires or trip wires from the road. The resulting formation is usually the inverted wedge. Terrain sometimes limits application of these techniques.

(5) Road-runner Operations. Some of the above techniques are employed daily by armor units conducting route security missions; it is general practice to open routes each day by passing tanks over them prior to permitting other vehicles to use the road. Once opened, roads are secured by the establishment of mobile outposts at critical points and the conduct of mounted patrols between the outposts. These mobile patrol actions are locally called "road-runner" operations. Because the security of routes is not always maintained through the hours of darkness, the enemy is able to emplace additional harassing mines at night. At the end of each day one unit draws a heavy drag or spring-tooth harrow behind the last vehicle traversing a dirt road which they are securing. On the following morning, careful examination of the patterns thus created in the road surface reveal whether or not enemy mining activity has occurred. Despite current efforts, development of countermeasures

to VC antitank mine warfare remains a major challenge; increased use of ground lines of communication leading to saturation of a route with 24-hours a day traffic can preclude the enemy's use of AT mines on that route.

(6) AP Mines. VC employment of large numbers of antipersonnel mines and booby traps limits the employment of dismounted troops in some situations. Armored vehicles, either tanks or M113's, precede the infantry to detonate the mines; in these instances, the hazards of detonating AP or AT mines often dictate that the infantry follow the track vehicles at a considerable distance.

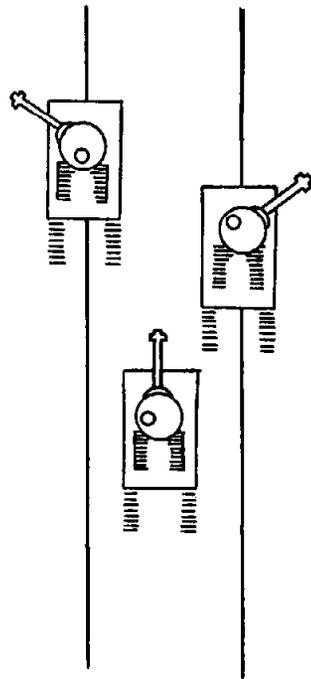


Figure II - 32.  
Tanks Using Inverted Wedge  
Formation to Clear Mines from  
Road and Shoulders.



Figure II - 33.  
4.2 Inch Mortar Dud Rigged  
for Command Detonation.

Against an enemy better armed with antitank weapons, this formation for the attack might not prove effective. As in the past, grappling hooks thrown forward along trails and then retrieved will detonate mines or booby traps set with trip wires. Road-runner operations conducted at random intervals during the night are highly successful in restricting VC mining activities and maintaining the use of IOC's.

d. USE OF ARTILLERY AND ARMY GUNSHIPS FOR FLANK SECURITY.

In many areas of RVN, cross-country movement of tracked vehicles is practical only at reduced speed; the limited RVN road net provides no parallel routes. As a result, mounted road marches are frequently conducted without organic elements performing flank security; however, artillery fires or Army gunships are extensively used for this purpose. Clearance for pre-planned fires to the flanks of moving columns is requested in advance of the unit's approach to the sites of the concentrations; in this manner, fires can be provided quickly on call against enemy threats. In areas where rules of engagement permit, these concentrations may be fired at suspected enemy locations. Effective flank security using this technique depends upon prepositioning or displacement of supporting artillery units controlled by an aerial forward observer or continuous gunship coverage.

e. ARMORED CAVALRY REGIMENT M113's. Existing doctrine regarding the employment of the armored cavalry regiment (ACR) is based on an integrated combined arms team of scouts, tanks, indirect fire support, and infantry, all organic at armored cavalry platoon level. The 11th ACR has been reconfigured to eliminate tanks from

the platoons. Substituted are platoons containing eight modified M113 vehicles (ACAV) and one M106 mortar carrier. The tank company of each squadron remains unchanged. Much of the available basic doctrine which pertains to the ACR is still applicable to the 11th ACR. However, the substitution of ACAV's for tanks and scout vehicles changes the platoon leader's method of employing his unit. Some platoons distribute the infantry squad among their M113's to achieve similar vehicles equally manned; others retain the infantry squad as a distinct unit. Both methods have proven to be effective.

5. INTELLIGENCE, RECONNAISSANCE AND SECURITY.

a. INTELLIGENCE.

(1) Combat Intelligence. Accurate and timely intelligence on the location of the elusive enemy continues to be a major problem in the conduct of armor and mechanized infantry combat operations in RVN. Typically, units are committed to combat operations with little specific knowledge of the enemy location or activity; present practice is to locate him through contact and then to destroy him by reacting to his efforts. This technique requires the establishment of adequate reaction forces able to be employed at any point at which contact is established.

(a) Combat Example.

1. A divisional cavalry squadron conducted successful combat operations for intelligence collection purposes in the vicinity of SROK DONG on 30 June 1966. The mission of this squadron was to conduct a reconnaissance in force north along

Highway 13 (Figure II - 34). Three battalions of straight infantry were available to the controlling brigade for consecutive commitment by helicopter. Units available to the squadron were its organic B and C troops and an attached company of a straight infantry battalion. Vietnamese Regional Force units secured Highway 13 for a portion of the route, and a South Vietnamese Army (ARVN) infantry division was later made available in a blocking role to assist the brigade.

2. In this instance, the enemy initiated contact by attempting to ambush the cavalry force conducting the reconnaissance. A VC regiment had established an L-shaped ambush as shown in Figure II - 35. Logs piled at random provided emplacements for recoilless rifles; the road was mined; mortars were pre-registered; and dismounted VC with automatic weapons and small arms were deployed in the adjacent jungle so as to cover approximately 2,000 meters of the road by fire. It is estimated that a force in excess of two VC battalions manned the ambush.

3. Moderate casualties were inflicted on the lead platoon of B troop by the VC springing the trap (Figure II - 36). Although the bulk of this platoon was permitted by the commander to withdraw to evacuate the wounded, the rapid commitment of the other two platoons of B troop, followed by C troop, inflicted heavy casualties on the ambushing force and interfered with its attempted withdrawal. Continuous tactical air strikes on the west side of the road and artillery fire on the east side of the road supported both the armored cavalry units engaged and the infantry reaction force elements subsequently landed by helicopter in adjacent LZ's.



Figure II - 34. Map Showing Location of 30 June 1966 Ambush. Saigon is 147 KM South of SROK DONG.

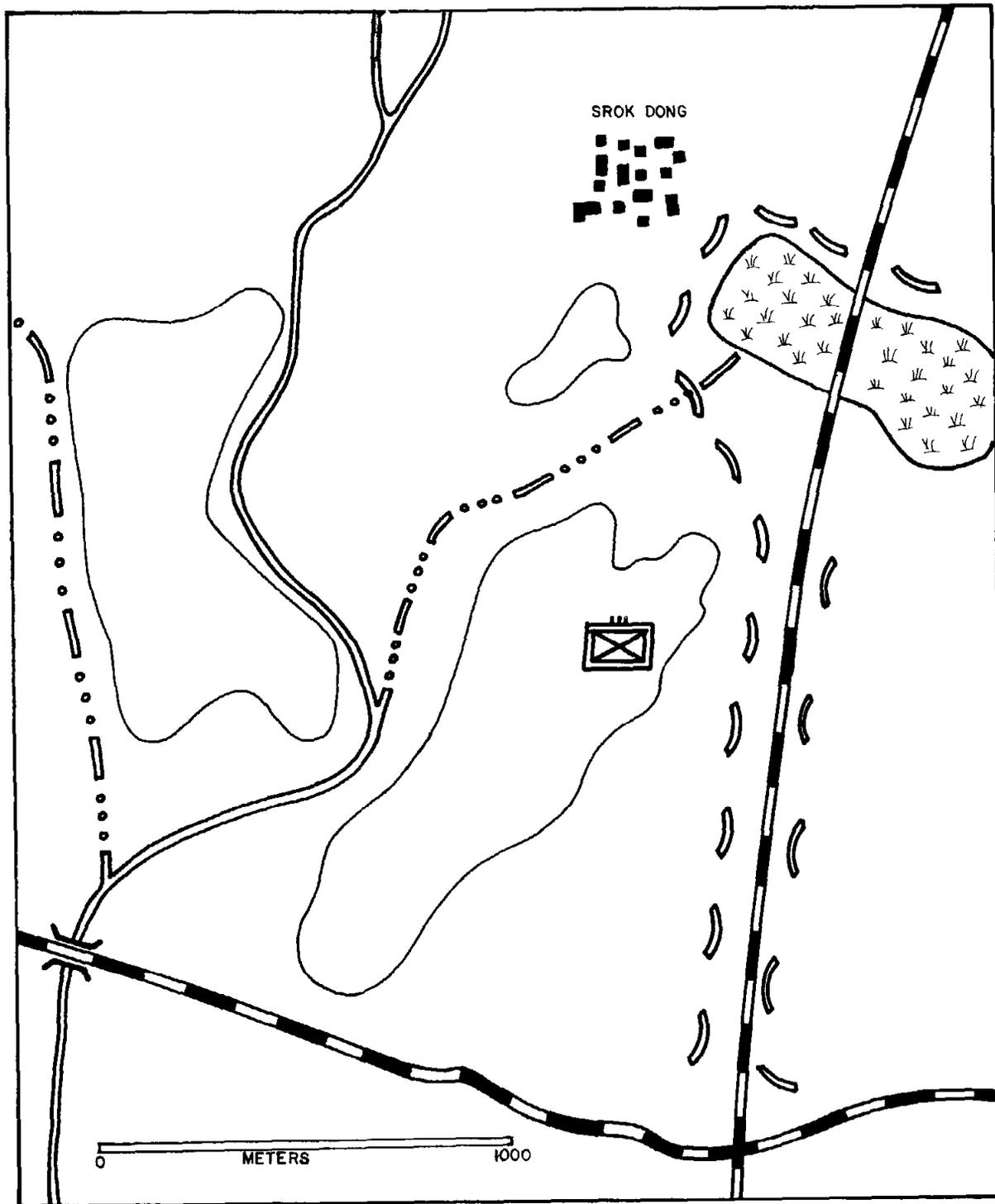


Figure II - 35. Enemy Dispositions for 30 June 1966 Ambush.  
Dense forest covered most of the area.

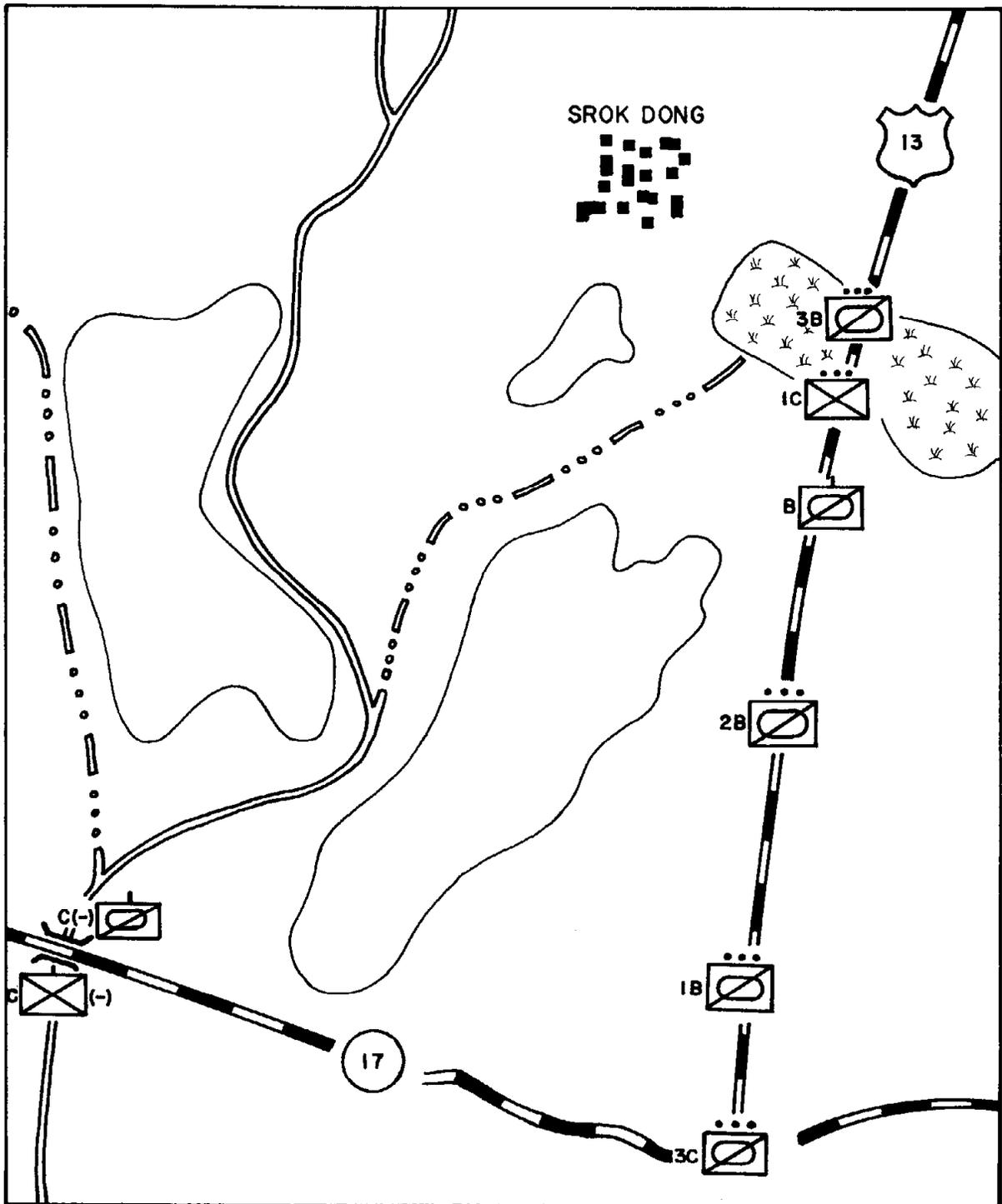


Figure II - 36. Disposition of Lead Elements of Armored Cavalry Squadron Entering 30 June 1966 Ambush.

4. A dismounted sweep of the site by a reaction force infantry battalion supported by the fires of C troop dislodged the enemy (Figure II - 37). An additional two infantry battalions, the remainder of the reaction force, were helilifted to nearby LZ's the following day. Although the VC launched five assaults against the night perimeter occupied by infantry elements on 2 July, and although he directed mortar fire against the perimeter on the morning of 3 July, subsequent dismounted sweeps in diverse areas by elements of the brigade yielded only light contact.

5. The units engaged in this operation captured seven VC and killed two-hundred and seventy (by actual body count) while sustaining losses of twelve killed and fifty-five wounded. It is doubtful that any unit other than the cavalry squadron available to the brigade commander could have withstood the shock of the VC-initiated action, reacted with equal fury, or achieved such gratifying results by reconnaissance in force. This example is typical of combat operations conducted by a cavalry squadron for the purpose of obtaining intelligence information for the brigade to which it was attached.

(b) Patrolling. All units in RVN routinely conduct both day and night reconnaissance patrols to obtain information of the terrain and the enemy. Scout platoons conduct both mounted and dismounted reconnaissance patrols. It must be acknowledged that the ephemeral enemy successfully eludes many of the routine U.S. efforts to locate him and to determine his activities.

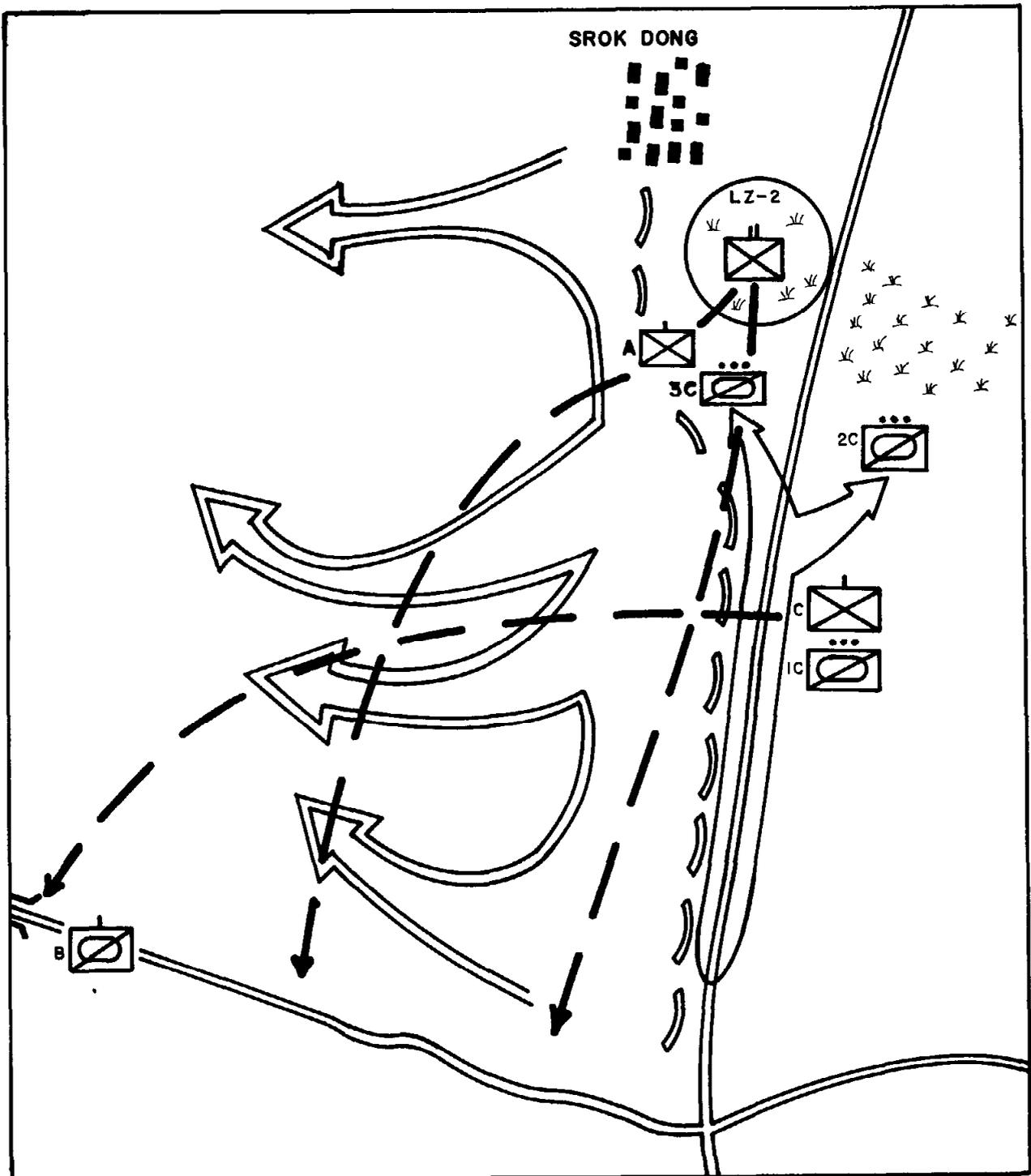


Figure II - 37. Maneuver Following Commitment of Reaction Force Infantry Battalion (-) by Helicopter. C Troop assisted the infantry battalion in dislodging the enemy ambush force.

On the other hand, long range reconnaissance patrols (LRRP) composed of small numbers of men trained in ranger tactics and techniques provide some excellent information on the movement of military formations in VC-dominated areas. LRRP and four techniques are discussed below because of their increasing use in RVN and because of their assessed potential for improving patrol action in RVN.

1. LRRP. LRRP operating in sparsely inhabited border areas assist major commands in the conduct of effective blocking operations with minimum forces. The employment of one LRRP by elements of the airmobile division in Pleiku Province during the initial phase of OPERATION MATADOR I in January 1966 resulted in the capture of three North Vietnamese Army soldiers who admitted that they were members of an antiaircraft battalion which had arrived in the area ten days prior to their capture. This information had a direct impact on the planning and execution of the airmobile operation then pending. The formation and training of LRRP under current TOE's and MACV training directives continues.

2. Saturation Patrols. The technique of saturation patrolling entails each battalion being assigned a specific area of operation for patrolling. Each battalion with its supporting artillery positions itself within its area. Companies may be assigned sub-areas or may operate from the battalion forward base. Large numbers of platoon and squad size patrols move by helicopter or M113 several thousand meters from the base. They are either assigned to reconnoiter specified routes back to their base or to establish

ambush sites. Two to three days provisions are carried by each patrol to prevent disclosure of its location by supply helicopters. Small groups of Viet Cong encountered are destroyed or captured; adjacent patrols converge to counter larger groups contacted. The battalion patrol plans must include night operations to be effective. It is necessary to maintain mobile reaction forces at company and battalion level to overcome Viet Cong forces larger than the patrols can handle.

3. Checkerboard Concept. In this technique the battalion areas of operation are divided into small sub-areas resembling a checkerboard. Each platoon is assigned one area in which it is to conduct search and destroy operations for one or two days. Platoons are then moved to unoccupied areas in accordance with a random pattern established by the battalion. Once contact with the enemy is made, the battalion directs adjacent platoons to converge on the action or to establish blocking positions or ambush sites. The random pattern of movement used permits a limited force to deny a large area to the enemy. It is necessary to hold one mobile company in reserve as a reaction force to be committed when the platoons encounter large forces.

4. Stay Behind Patrols. Experience shows that shortly after we depart from an area, the Viet Cong send in small parties to forage. By leaving a patrol in well camouflaged positions, units can destroy or capture the Viet Cong foragers.

5. Positioning of Patrols by Use of M113.

The M113 is successfully used as a means of positioning patrols. Using M113's for this purpose has the advantage of concealing the location and the actual number of men being positioned. The Viet Cong, or their informers, can count the number of M113's departing and returning to a base of operation; however, they do not know where or how many personnel have been released for patrol operations enroute.

(c) Local Intelligence Agencies. U.S. units in RVN recognize the need for increased exploitation of all local intelligence resources. U.S. and ARVN intelligence agencies operate jointly, and the resulting exchange of intelligence information has improved the intelligence coverage. The continuing development of coordination between U.S. and RVN agencies will improve the intelligence capabilities of both.

(d) Psychological Operations Teams. During the conduct of tactical operations in the Republic of Vietnam, U.S. units experience difficulty in communicating with the local population due to language barriers. In some instances **Americans** are unfamiliar with the area and have little knowledge of enemy activities and location of enemy installations. The concurrent and coordinated employment of psychological operations teams in areas with which they are familiar has been beneficial for units during the conduct of tactical operations. These teams are furnished by the sector or

sub-sector commander from the province in which the area of operations is located. While their size and composition may vary, they normally include interpreters, sector or sub-sector intelligence and psychological warfare personnel, National Police and local government representatives. The teams are commanded by ARVN officers who represent the Province Chief and are accompanied by members of Sector Advisory Teams. The U.S. advisors coordinate team activities with the operations of the units being supported. Team members are from the local area. They assist in identifying local residents, Viet Cong sympathizers, and the Viet Cong infrastructure; and they are helpful in obtaining and providing information of the area and enemy activity.

(e) Attachment of RF/PF Personnel. Another use of local intelligence resources is illustrated by the attachment of three RVN Regional Force/Popular Force (RF/PF) enlisted men to each company of a U.S. mechanized infantry battalion during the conduct of an independent operation southwest of Saigon. Although these men were not intelligence specialists, they knew and were known by the inhabitants of the area in which operations were to be conducted. They provided the companies with the capability of identifying and questioning indigenous suspects; through their assistance, one company captured the highest ranking member of the VC political infrastructure taken by ARVN or U.S. forces to date. The battalion derived particular benefit from these personnel because, being attached down to the company level, they were immediately available when needed.

(f) Chieu Hoi. Many indigenous personnel, particularly Chieu Hoi ralliers (enemy defectors) who willingly cooperate with U.S. Forces, have experienced difficulty in recognizing terrain features from the air or while riding on tracked vehicles. Most of them are also unable to identify locations on maps. They can best guide troops when permitted to travel dismounted on trails which contain landmarks familiar to them.

(2) Counterintelligence.

(a) General. Attachment of RVN personnel can improve the counterintelligence capability as well as the combat intelligence capability of U.S. units. The extensive VC covert agent nets, aided by the requirement that we must tolerate practically unrestricted movement of friendly inhabitants in most RVN areas of operation, foil most efforts to deny the enemy information of our unit strengths and dispositions. Working closely with local Vietnamese military counterintelligence personnel assists in the discovery and disruption of some portion of the VC intelligence effort.

(b) Deception.

1. Care must be exercised by U.S. units to avoid carelessly divulging valuable military information to the enemy. Premature relocation of artillery to provide supporting fires into proposed areas of operations, and excessive aerial reconnaissance of such areas prior to launching operations are practices to be avoided. Any disregard for the enemy intelligence capability is not warranted.

2. The enemy seeks to identify and attack armored vehicles recognized as command vehicles. Installing dummy antennas on other vehicles, changing or obscuring vehicle numbers, and varying the position of command vehicles within formations are techniques employed to deceive the enemy in this respect. However, the recent disproportionate loss of commander's M113's of one mechanized infantry battalion to VC command-detonated mines, despite having taken the precautions described, indicated that the enemy had previously identified the key vehicles, probably by observation of the unit in bivouac. Additional deceptive measures are needed.

b. CONVOY ESCORT AND ROUTE SECURITY.

(1) General. One of the major long-range goals of U.S. and FVMAF forces in RVN is to provide secure ground routes for the flow of military and commercial traffic throughout RVN. At the present stage of the area war, only a small percentage of the available highway network is sufficiently secure to accommodate twenty-four hour per day traffic. This is not to say that the remainder of the highways cannot be used; any highway in RVN can be opened and used provided convoy escort or route security is established. Armor and mechanized infantry units are well suited to perform these tasks; and armored cavalry units are judged to be best suited. In RVN these units spend as much as one-third of their time performing these missions.

(2) Objectives and Forces Employed. The enemy employs three tactics in denying free use of the highways in RVN: small

groups of VC halt commercial vehicles for tax-collection purposes; guerrillas or military units establish ambushes to destroy U.S. or FVMAF forces using the roads. The objective of route security operations is to prevent these acts, and the objective of convoy escort is to render such enemy actions ineffective. Route security requires the continuous commitment of large forces over long periods of time while convoy escort requires smaller forces only for the time required for the passage of the convoy. The forces to be employed in either operation depend on the factors of MERTT, with emphasis on the length of the route, the enemy situation, and troops available.

(3) Route Security. Route security operations require the protection of bridges, defiles, roadway fills, and other critical portions of the route against enemy mining or acts of sabotage; frequent movement of armored forces along the route and inspection of areas adjacent to the route are also required; and reaction forces must be maintained to cope with enemy attacks conducted against troops securing the route. On major routes, the securing of bridges and other critical points is normally a full-time mission for RVN RF/PF units from the local areas; in the absence of such forces, strong points must be of sufficient strength to sustain an enemy attack until reaction forces can arrive; two armored vehicles with a rifle squad would be minimum. Mobile patrols operate on stretches of road between strongpoints established. Avoiding establishing patterns of movement discernable to the enemy, these patrols move on the roads, reconnoiter areas adjacent to the roads, and on occasion

halt to observe; from each halt, movement may be continued in the original direction or back to retrace the patrol route - constant random variation of the patrol actions is essential to keep the enemy off balance and to provide necessary protection to vehicles using the route. A logical distribution of forces would be to have one-third of available troops man strongpoints, one-third conduct patrols, and to distribute one-third among two or more reserve reaction force locations.

(4) Convoy Escort. When forces are insufficient to maintain route security for prolonged periods or when the enemy threat is enough to require additional security, units are assigned to escort convoys. In these circumstances, vehicles are not permitted to travel on the road except in convoy. Convoy escort is performed by assigning tanks to the lead and by distributing tanks or M113's throughout the convoy for control and additional protection. Actions to be taken by convoy escorts in event of ambush have been described in a prior paragraph. Armored vehicles are assigned to escort convoys in the ratio of one armored vehicle per five to ten wheeled vehicles.

(5) Combinations. Units assigned to escort convoys may accomplish the task by securing the route for a limited time. In this technique, only those vehicles needed for control accompany the convoy; and strongpoint and patrol forces are made available for other missions when the tail of the convoy passes their sectors. Even though a route is being secured, it is possible for the enemy

to place individual harassing mines: tanks should lead convoys through doubtful portions of the route, and tanks should be the first vehicles over a route each day. It must be emphasized that the only way to really secure a route against other than coordinated attacks is to use the road daily - and use it for 24 hours each day.

(6) Combat Example.

(a) A route security mission from TAY NINH to TRI TAM was conducted by a tank battalion during December 1966 (Figure II - 38). Small groups of Viet Cong had been successful in mining the road during darkness. The weather was hot and dry; the terrain was flat, and varied from rubber plantations and dense jungle to paddies.

(b) The entire route, with the exception of several friendly hamlets, was a "free-fire" zone at night. During the hours of darkness each night, a tank company or platoon "ran the road" two or three times at irregular intervals. Individual tanks fired canister, caliber .50 and 7.62mm machine guns at likely enemy locations on both sides of the road. After three nights of this activity, mining incidents stopped and the first "Chieu Hoi" rallier in that area surrendered. He attributed his action to his fear of tanks. The armor protection, firepower, mobility and shock effect of tanks make them an effective weapons system for route security missions during both night and daylight hours.

c. POLICE OF THE BATTLEFIELD. The Viet Cong's extended supply line and relatively critical supply situation have forced



him to use all means possible to augment his logistic system. He has demonstrated adeptness and ingenuity in fabricating equipment from the battlefield debris. Waterproof paper, plastic bags, and shell casings have all been used for mine containers. Duds of all sizes have been booby trapped in place, removed and emplaced in other areas, or disassembled for their explosive content. Scraps of metal have been used to fabricate foot traps and to construct firing mechanisms for mines and fragments for booby traps. Accordingly, emphasis must be placed on police of the battlefield. When moving into an area after artillery and air strikes, troops should dispose of duds if possible. Prior to leaving a battle area, an effort should be made to destroy or remove all items that may be of use to the enemy.

#### 6. SEARCH AND DESTROY OPERATIONS.

a. GENERAL. A typical search and destroy mission executed with armor and mechanized infantry is accomplished in three phases; isolation of the area by surrounding it with troops or placing elements in blocking positions across likely avenues of enemy escape; a mounted sweep through the area with tanks leading to disrupt any organized resistance, to detonate mines and booby traps, to locate large installations, and to destroy all possible enemy personnel and emplacements; and finally one or more thorough searches by dismounted personnel accompanied by tanks and carriers to locate any remaining enemy personnel or emplacements and to complete their destruction.

(1) Supporting fires may be employed preceding or concurrently with the isolation phase to fix the enemy in place; or, if surprise is paramount, they may be withheld until used to assist the mounted sweep in the second phase.

(2) Because of the size or nature of the area to be searched or because of insufficient troops, a search and destroy operation may be executed with isolation of the area accomplished only by supporting fires.

(3) In this type operation, tactics employed are more in the nature of a reconnaissance in force, and enemy contact will most often be a matter of his own choosing. Such an operation accomplishes the destruction of enemy emplacements, produces intelligence, and harasses and disrupts the enemy.

b. TECHNIQUES. In search and destroy operations a systematic search must be assured. This may be accomplished by moving through the area in line formation or areas may be assigned to subordinate elements. One solution is the use of what has been named a "cloverleaf" formation. This formation is used to make a rapid mounted search of a large area. This technique will not assure complete coverage of the area but it does move units through the area in a systematic manner that assures the discovery of emplacements or installations of sufficient size to be of importance. It permits use of all troops simultaneously as no reserve is designated. Unengaged units are able to move rapidly to the assistance of other elements. The diagram below depicts the theoretical application of this technique (Figure II - 39).

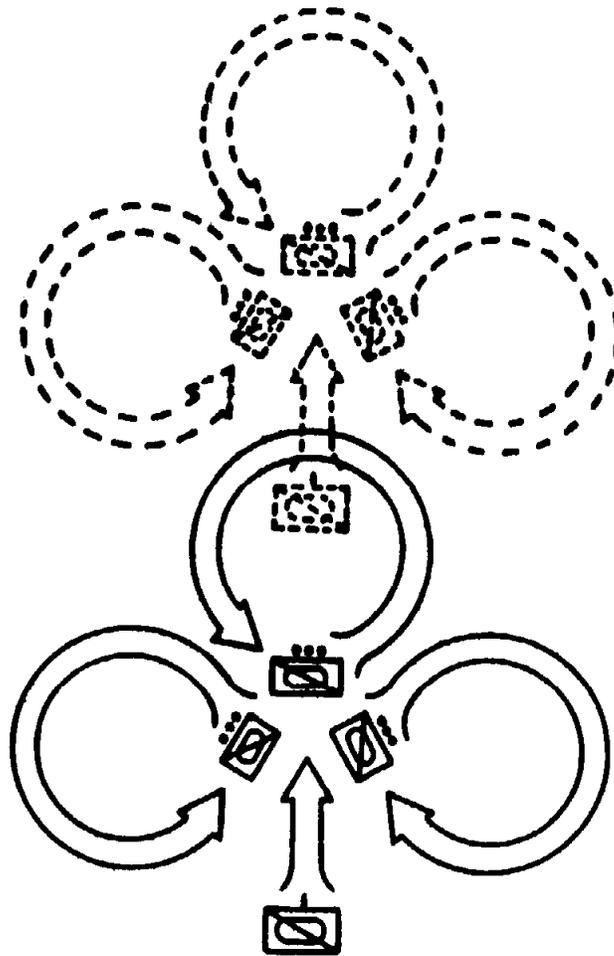


Figure II - 39. Schematic Diagram of Armored Cavalry Troop Conducting Search and Destroy Operation Using Cloverleaf Technique.

c. TUNNEL SEARCH OPERATIONS. A common enemy technique is to build his installations underground to protect them from air strikes and artillery fires. Since these installations normally contain his base of operations, command and control headquarters, and supplies, it is mandatory that they be thoroughly searched and then destroyed. The task of conducting a detailed search of these

underground facilities is tedious and time consuming. While dismounted troops conduct the underground phase of the search, tanks and M113's are helpful in the surface phase of the search.

(1) The surface phase of the operation commences upon the discovery of one or more entrances to caves and tunnels. Tanks and M113's are effectively used to clear these entrances of camouflage, mines and booby traps and to thoroughly search, clear, and secure the surrounding area during the underground phase of the search. The employment of flame weapons to defoliate the area surrounding the entrance to tunnels is another effective means of gaining access to the area.

(2) The underground phase of tunnel search operations is accomplished by special dismounted teams composed of three to five men each. The number of personnel in the team will vary depending on the length and complexity of the tunnel.

(a) The entrance is approached cautiously. To avoid unnecessary casualties from undetected mines and booby traps, only one man should approach the tunnel and probe the area surrounding the entrance. Lowering a light into the entrance to draw enemy fire before the lead man enters the tunnel complex is another logical precaution.

(b) If it is discovered that personnel are in the tunnel, an interpreter should be used to talk them into surrendering. Riot control agents or smoke have been successfully employed to force the enemy out of tunnels when persuasion fails. Smoke may

filter through air vents and other openings to provide information on the size and trace of the tunnel.

(c) The lead man of the tunnel searching team, equipped with a portable telephone, enters the tunnel followed by other members of the tunnel search team. At least one member of the team remains near the tunnel entrance to monitor the telephone and pass instructions to the team. As the lead man proceeds through the tunnel, he reports changes in direction and other information to the operator near the entrance. The lead man is also in voice contact with the man following him. When a junction is encountered, one individual remains at the junction to prevent those ahead of him from being attacked from the rear. Tunnel team members are armed with pistols with silencers for use in the close confines of tunnels.

(d) A field expedient which employs two mine detectors has been successfully used in plotting traces of tunnels up to eight feet below the surface of the ground. One detector is used on the surface and the other is carried by a team member inside the tunnel. With both mine detectors turned on, the tone of the detector on the surface is very clear when directly over the detector in the tunnel.

(e) Once a tunnel has been thoroughly searched, it must be destroyed. Tank dozers and demolitions have been effective in this role. Acetylene or other explosive gases pumped into tunnels and then ignited have been tried in place of demolitions. Whichever method is used, however, requires large quantities of ex-

plosives or gas; to destroy large tunnel complexes may be beyond the logistical capability of the unit conducting the operation. More economical means of destroying tunnels are needed.

#### 7. DEFENSIVE OPERATIONS.

a. PERIMETER SECURITY. The nature of area warfare dictates greater emphasis on all around security in defensive positions. Since the greatest enemy threat in RVN is ground attack, greater security is achieved by selecting open terrain for its better observation and longer fields of fire rather than wooded areas offering cover and concealment. Open terrain further enhances the use of radar, image intensification devices, and all means of illumination. To supplement these technological advantages, perimeters are ringed with concertina wire, claymore mines and trip flares. Listening posts and ambush patrols positioned on likely avenues of approach provide warning and deny enemy access to the area. Defensive perimeters should be moved frequently to reduce VC opportunity for deliberate planning and execution of an attack.

b. DISPERSION IN THE DEFENSE. The enemy lack of any heavy artillery and his shortage of antitank weapons permit U.S. units in RVN to establish defensive perimeters with little dispersion. By concentrating rather than dispersing, units achieve increased control and greater protection against enemy infiltration.

c. DEFENSE AGAINST ENEMY INDIRECT FIRE WEAPONS. Frequent VC mortar attacks on U.S. units and installations dictate that all facilities be sandbagged or dug in, and preferably provided with

overhead cover. Use of engineer dozers or tank dozers to dig positions for CP's, wheel vehicles, sleeping tents, and supply stocks is common in those units so equipped; other units rely more heavily on the use of sandbags. Whether armor or mechanized infantry, when not moving, the unit must dig in.



Figure II-40. M48 Tank with Dozer Blade.

## 8. AIR CAVALRY.

One air cavalry squadron has been employed in RVN since August 1965. It has been continuously committed to active combat operations since its arrival in the theater. It has performed all the traditional cavalry roles of reconnaissance and security operations and has been employed as an economy of force unit in offensive and defensive action.

a. AIR CAVALRY TROOPS. The air cavalry troops of the air cavalry squadron have proven to be versatile combat organizations, particularly in the reconnaissance role. The air cavalry troops have usually been employed in support of a committed airmobile brigade to perform reconnaissance and security missions. The use of the air cavalry troops in support of, rather than attached to, the brigades allows the squadron commander to adjust to changing combat situations and missions. In addition to those of the air cavalry squadron, air cavalry troops of the divisional armored cavalry squadrons and of the armored cavalry regiment are conducting similar combat operations with equal success.

(1) Aero-scouts. The teams of the aero-scout platoon, mounted in observation helicopters and always employed by team, are the eyes of the troop and perform continuous reconnaissance. They usually employ the techniques of area reconnaissance within well defined areas in which they conduct a thorough detailed search. They detect and report information concerning the enemy, the area of operations and the weather. They habitually use nap of the earth

flying techniques to provide for the best low level observation. They search for indicators of enemy presence such as footprints, ashes or smoke from cooking fires, and unusual activity (or the lack of usual activity) in the area. They are able to examine personnel observed and to determine if they are carrying weapons, packs, ammunition, or other combat materiel. When positive enemy contact is made, the scout team undertakes action to develop the situation and reports the contact to the troop operations center. If it is determined that the enemy force is small enough, and the current rules of engagement permit attack, the scout team may engage and defeat the enemy force unassisted. If the force is beyond the capability of the scout team, they call for additional elements of the air cavalry troop. Only one-half of the available aero-scout teams are committed normally; this permits the teams to relieve each other on station to provide continuous reconnaissance.

(2) Aero-weapons. The aero-weapons platoon provides the organic fire support means for the air cavalry troop. Weapons systems mounted on utility helicopters provide the platoon with a point target and area fire capability. Most of the helicopters mount combination weapons systems which permit flexibility in their employment. Like the aero-scouts, this platoon is also employed by team to achieve mutual support. These teams are usually the first elements of the troop to respond to a call for reinforcements from the scouts. The aero-weapons teams work to fix the enemy in position by keeping him pinned down with a heavy volume of aerial firepower.

When not firing a mission, aero-weapons teams augment the reconnaissance effort.

(3) Aero-rifles. The aero-rifle platoon is not just another rifle platoon; it is a highly trained ground reconnaissance force. The primary mission of this platoon is to perform detailed ground reconnaissance in areas which cannot be effectively reconnoitered from the air. The platoon is also the ground fighting force of the troop. It is usually the second element of the troop to respond to an aero-scout's call for reinforcement. The platoon is delivered by helicopter to a landing zone close to the enemy force and, depending on the strength of the enemy force, attacks the enemy either to defeat him or to contain him until a larger unit can be committed.

b. CAVALRY TROOP. The cavalry troop of the air cavalry squadron is equipped with unarmored wheel vehicles to permit its combat elements to be transported by Army helicopters. The troop's ground mobility and combat power are limited. The troop is, however, well suited for the missions which it has normally been assigned in RVN; local convoy escort, local route security, engineer work party security and airmobile reconnaissance operations. The cavalry platoons are frequently used as additional aero-rifle platoons under the operational control of one of the air cavalry troops. These platoons are frequently held in reserve as the squadron reaction force; and they have, on occasion, constituted the reaction force of the division. The troop's automatic weapons, recoilless rifles and mortars are used extensively in the defense of the squadron perimeter.

c. PUBLICATIONS. The MACOV Study Group has prepared a draft field manual covering operations of the air cavalry squadron of the airmobile division. Following informal coordination with the airmobile division in RVN, this draft manual will be published by U.S. Army Combat Developments Command and will be distributed to service schools and units.

9. COMBAT SERVICE SUPPORT.

a. U.S. mechanized and armor units in RVN follow established doctrine for employment of combat and field trains with minor variations. Combat trains are reduced to essential personnel, high demand parts, maintenance equipment, recovery vehicles, and class I, III and V supplies to meet short term requirements. For security, the combat trains are normally collocated with the command post. Vehicles beyond the repair capability of subordinate units or contact team are evacuated to the combat trains or directly to the field trains or base camps.

b. Field trains consist of the remainder of the battalion or squadron service support elements and are positioned in a secure base camp in the vicinity of the area of operations. Although the major portion of the field trains are positioned in the nearest secure installation, a small portion is often left in the unit's base camp to support elements remaining there and to accomplish maintenance which cannot be done in the field. Aircraft are utilized extensively for resupply, evacuation, and transportation of key personnel and critical items.

c. Ground resupply requires secure LOC's; combat elements must clear and secure routes or escort convoys. Climate and terrain seldom permit extensive cross-country movement of wheeled vehicles; therefore, armored personnel carriers are frequently used as cargo carriers on a mission basis to pick up supplies from road terminals and transport them directly to the using unit. Plans and preparations are regularly made for emergency resupply by helicopter in case it is needed; when possible, landing zones are selected and prepared in the immediate vicinity of all unit trains areas. Resupply is normally accomplished on a daily basis. However, mechanized infantry and armor units habitually carry sufficient class I and, depending on expenditure rates, sufficient III and V supplies on their combat vehicles for three days of operations. This independence from daily resupply allows commanders greater leeway in planning and conducting operations in difficult terrain.

d. Medical evacuation helicopters are maintained on ground alert status at airfields throughout Vietnam for "dust-off" or medical evacuation of casualties. These helicopters provide immediate response to unit radio requests for casualty evacuation. Currently evacuation is being accomplished in an average elapsed time of 30 minutes from time of being wounded to arrival at a medical facility. Preparations are continually made for possible air evacuation requirements by selecting or clearing of successive landing zones as tactical operations progress. Commanders can request special equipment on a standby basis for helicopter extraction of casualties through the

jungle canopy while hovering above the trees. This system is necessary for evacuating seriously wounded personnel from areas where landing zones cannot be prepared.

### SECTION III

#### ORGANIZATION AND EQUIPMENT

##### 1. PURPOSE.

The purpose of this section is to, (1) present a general discussion of the current organization of U.S. Army mechanized infantry, tank and armored and air cavalry units in the Republic of Vietnam, (2) stimulate thought and discussion concerning the optimal organization of these units by presenting the various structures examined by the MACOV Study and, (3) point out the unusual care and maintenance requirements of certain items of equipment.

##### 2. SCOPE.

The scope of the MACOV Study consisted of an evaluation of the current organizational structure of U.S. Army mechanized infantry, tank, and armored and air cavalry units, to include authorized, substituted and modified equipment, within the framework of the five functions of land combat: intelligence, movement, firepower, control and service support. A major consideration in developing organizational structures was the premise that the units could be employed in the near future and would be supportable within current U.S. Army resources. The final portion of this section discusses equipment substitutions and modifications, and points out unusual care and maintenance problems encountered with certain items of equipment.

### 3. GENERAL.

a. METHODS. Comments and recommendations from the field were collected and evaluated to provide a base for the various organizational structures under consideration. MACOV team members assigned to selected combat and support elements of IFFV and IIFFV provided the primary source of data. This basic data was collected through the use of questionnaires pertaining to each echelon of command-squad through field force. Additional data was obtained through observation of combat operations and analysis of after action reports, quarterly summaries, reports of lessons learned and various administrative and logistical reports. The evaluation process consists of verifying and recording all data. This is then reduced to each functional area and task section of the evaluation staff. The collected data, plus current organizational charts and equipment lists of units in RVN, are then compared with the Department of the Army approved "G" Series TOE. Deviations from the "G" Series TOE are recorded and analyzed. At the time of this writing evaluation of data is continuing, and, although it may favor one organizational structure over another, the final recommendations have not been determined. The resulting MACOV organizations will be prepared in the form of modifications to the "G" Series TOE and will reflect the findings and conclusions of the study. The organizational structures under consideration have been exercised in a series of combat effectiveness models in

all geomorphic regions to provide a disciplined procedure for evaluating the relative combat effectiveness of men and equipment, by unit, in combat environments.

b. TOE. The organizational structures examined are in the form of modifications to the "G" Series TOE. This TOE was chosen as a point of departure because it provides the latest personnel and equipment authorizations and is the first series to implement the New Army Authorization Document System (NAADS). The principal objective of NAADS, as it applies to the MACOV Study, is the standardization of like TOE units. Other applicable objectives are, (1) the development of common criteria applicable to balanced organizational structures, (2) the generation of a basis for determining the combat requirements of TOE units and, (3) the provision of a means for rapid reorganization caused by changes in available resources. After a unit has been organized under a TOE, an MTOE is the only means of changing portions of the TOE to meet specific combat requirements. Further, the MTOE provides a single document to simplify and facilitate control of organizational changes at all levels of command. Proper application of the established TOE/MTOE procedures will insure that commanders have the most effective organization for combat, consistent with optimum utilization of available resources.

c. EQUIPMENT. Evaluated data and commanders' comments indicated a high degree of equipment suitability for the normal roles and missions of the units in RVN. The individual soldier has confidence in his equipment, and is knowledgeable concerning its proper employment. Successful substitutions, modifications and maintenance pointers are discussed at the end of this section.

#### 4. TYPE ORGANIZATIONS.

a. GENERAL. This paragraph outlines in general terms the current organizational structures of armor, armored cavalry, air cavalry and mechanized infantry units now in RVN, and presents the major changes under consideration for each type unit. In order to avoid unnecessary duplication, the following changes were considered for application to all units at the battalion/squadron level except for the air cavalry squadron:

(1) All organizations should be converted to the "G" Series TOE (paragraph 3b above).

(2) Because of the emphasis placed on civic action and rural development programs, a requirement exists for an S5 section at battalion/squadron level. Units in RVN have implemented the S5 functions by augmentation, by making it an additional duty or by utilizing personnel from other TOE positions.

(3) An assistant S2 is required to augment the battalion/squadron staff. This officer will be integrated into the combined S2/3 tactical operations center to improve the capa-

bility for twenty-four hour operations. Further, analysis of intelligence functions in RVN indicated that the processing of timely intelligence information is most important.

(4) One enlisted S1 clerk has been added to provide additional administrative support.

(5) Supply sections of battalions/squadrons in RVN are involved in direct clothing exchange and ration breakdown functions. This requirement is met by modifying the "G" Series TOE by the addition of two enlisted personnel to carry out these duties. At the present time, units are utilizing other TOE personnel to augment the supply sections.

(6) Two additional crew-men are required in the scout elements where the M113 with the type "A" subsystem has been substituted for the M114. A crew of five provides for three gunners, a driver and a grenadier.

b. THE MECHANIZED INFANTRY BATTALION.

(1) Current Organization. Mechanized infantry battalions which have deployed to RVN in the past were organized under the "E" Series TOE. Additional units converted to mechanized battalions in RVN used the "G" Series. Although there are only minor organizational differences among units, there is a considerable deviation in the armament modifications which have been made to the M113. Consideration should be given to modifying the mechanized infantry battalion by the addition of the type "A"

armament sub-system as described for the divisional armored cavalry squadron (paragraph 2d below).

(2) Organizational Structure. After evaluating the current structure of the mechanized infantry battalions, it appears that an extensive reorganization is required to provide the equipment and flexibility necessary for operations in RVN. Field commanders at all levels expressed a desire for a fourth maneuver element. This was reinforced by the requirements for additional security forces caused by the conduct of an area war. As a result of these factors, the requirement and composition of a fourth maneuver element emerged as a major issue. With this in mind, two different organizations were examined; Battalion "A" consisting of a headquarters and headquarters company and four rifle companies, and Battalion "B" consisting of a headquarters and headquarters company, three rifle companies and an armored cavalry troop. Each organization's performance was examined within the framework of the five functional areas of land combat. A rating system was established to measure each unit against the same set of factors--mission, enemy, terrain and weather and troops available. The missions used were search and destroy, blocking force and line of communications security. The results of the model exercises, the analysis of collected data, and the comments of the field commanders suggest that both organizations offer acceptable solutions.

(a) Battalion "A".

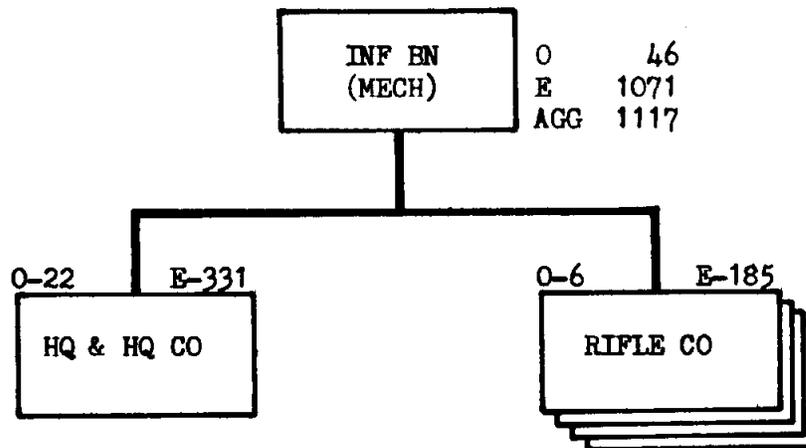


FIG III - 1. ORG CHART INF BN (MECH)(BN "A")

The advantages of this organization are, (1) it is essentially the same organization as the current battalion and would require no changes in the techniques of employment, (2) it increases combat power without a significant increase in command and control personnel, (3) it does not introduce a new item of equipment, (4) excellent cross-country mobility is provided and, (5) organic indirect fire support is provided by the heavy mortar platoon. Disadvantages of this proposal are, (1) attachment of tanks from other units is required for most operations which fragments the limited tank assets of the theater, (2) it lacks organic vehicles capable of penetrating dense brush and jungle and, (3) the unit contains no large caliber,

direct fire weapons except for the 90mm recoilless rifles which are too heavy for dismounted operations and which do not have a suitable antipersonnel round in sufficient quantity.

(b) Battalion "B".

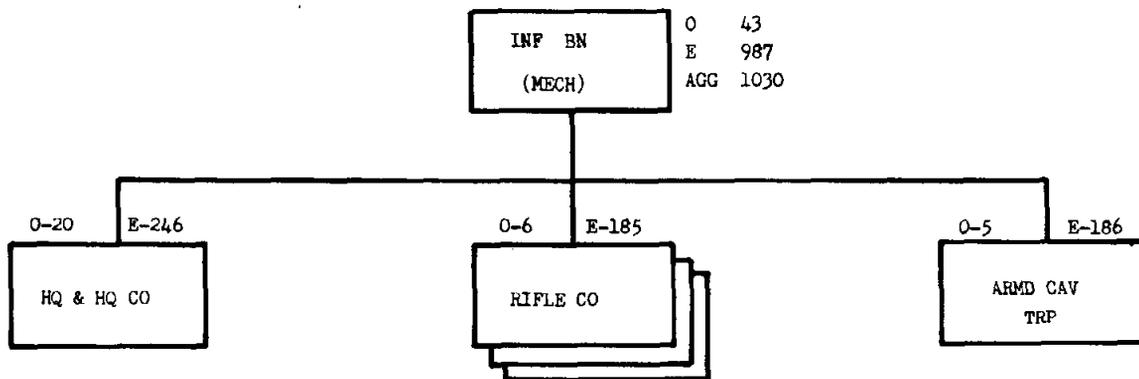


FIG III - 2. ORG CHART INF BN (MECH)(BN "B")

The advantages of this organization are (1) the combination of rifle companies and the armored cavalry troop provides many possible variations when organizing for combat. The troop may be employed "pure", in the "scramble" formation, with platoons attached to rifle companies, or cross-attached with rifle platoons, (2) tanks provide a large caliber, direct fire capability and can penetrate dense brush and jungle, (3) the headquarters and headquarters company commander is freed of the responsibilities of combat support. Because of the firepower of the armored cavalry troop; the scout, mortar and antitank platoons are deleted, (4) there is a very

significant increase in firepower with minimum of additional personnel, (5) additional tanks will seldom be required permitting more flexibility in the employment of the tank battalions and, (6) the armored cavalry troop provides an organic force particularly suited for line of communications security.

(c) General Comments, Battalions "A" and "B".

Since the 106mm recoilless rifle and the ENTAC have proved to be unsatisfactory in RVN because of mobility restrictions and the lack of armor protection, the antitank platoon is considered for deletion. This action is already being accomplished in some units in RVN, and the personnel of the platoon are being utilized as additional scouts or as security guards. A ground surveillance section, organized identically to the one found in the tank battalion, is proposed. It is suggested that the communications platoon be increased by one switchboard operator, one radio mechanic and one radar mechanic to provide necessary support to the battalion. The same substitution of the XM548 tracked cargo carriers as described for the tank battalion has been applied. Personnel in the maintenance platoon, allocated for the maintenance of headquarters vehicles, should be deleted and formed into a headquarters company maintenance section. This will allow the battalion maintenance officer to concentrate on battalion level maintenance without the additional burden of company responsibilities. Four battalion/squadron level units are conducting training in mechanized flame-thrower operations, and the units which are equipped with these

weapons have reported their successful operational employment. The addition of three M132 mechanized flamethrower vehicles and three truck mounted service units is proposed. When available, track mounted service units should replace the three trucks.

(d) Rifle Company. Possible changes to the "G" Series TOE for the rifle company are, (1) the deletion of the 106mm recoilless rifle from the weapons platoon (the 81mm mortars mounted in the M125 carriers have been retained) and, (2) the deletion of the weapons squad and the organization of the platoon into four rifle squads. Because of the weight and the lack of a suitable antipersonnel round in sufficient quantities, the 90mm recoilless rifle is seldom utilized in dismounted operations. This has caused the employment of the weapons squad in a role similar to that of the rifle squad. One 90mm recoilless rifle, less crew, has been added to each rifle platoon to provide a limited direct fire capability.

c. THE TANK BATTALION.

(1) Current Organization. As in the case with the majority of units evaluated, the tank battalions are organized under the "E" Series TOE with a headquarters and headquarters company and three tank companies. Minor modifications by MTOE have been made to compensate for varying mission assignments.

(2) Organizational Structure.

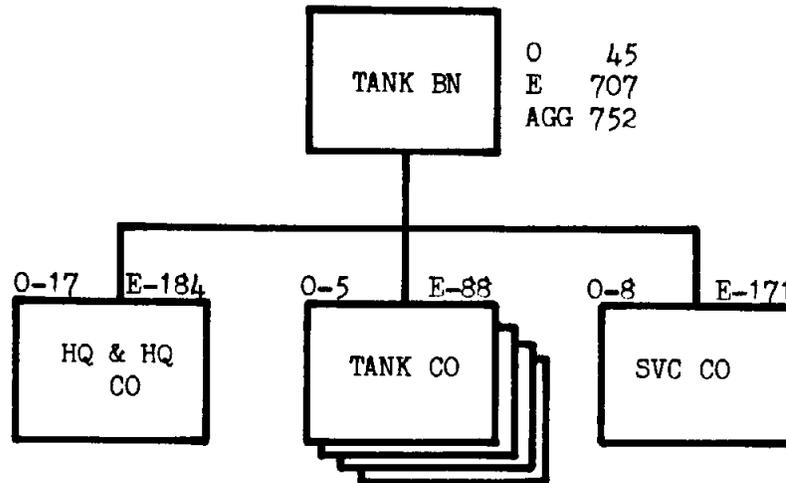


FIG III - 3. ORG CHART TANK BATTALION

(a) General. An analysis of both the current organization and that provided by the "C" Series TOE indicates that major modifications are required to construct an organization specifically for operations in RVN. A possible solution involves two major changes; the reorganization of the headquarters and headquarters company and a service support company, and the addition of a fourth tank company. This additional tank company is required to provide necessary armor support, without unacceptable fragmentation of the battalions, to the infantry units currently in RVN. Since the battalion headquarters, in its current configuration, is capable of controlling four maneuver elements, combat power can be increased substantially without adding additional command and control

personnel. Other alternate organizations which were considered feasible, but less desirable are:

1. A headquarters and headquarters company and four tank companies.

2. A headquarters and headquarters company, a service support company and three tank companies.

(b) Headquarters and Headquarters Company.

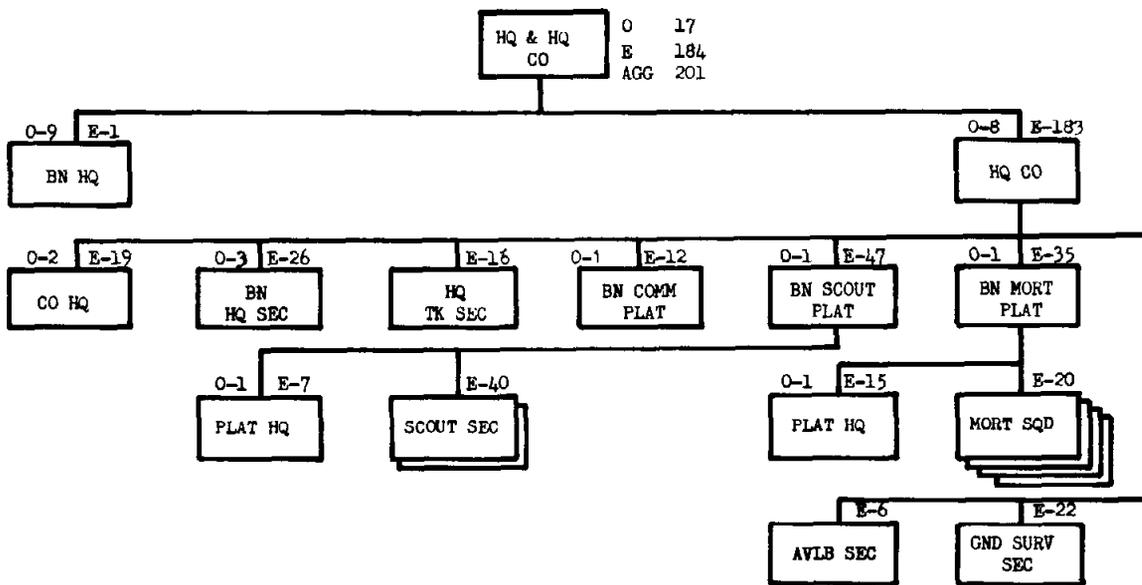


FIG III - 4. ORG CHART HQ & HQ CO TK BN

An analysis of missions assigned to the headquarters and headquarters company disclosed that the command and control and combat support elements deployed to the field. Only a small portion of the combat service support elements, however, habitually deployed in support

of the maneuver elements. Because of the large amount of support required by the tank battalion, and the number and size of these elements in the headquarters and headquarters company, it is considered that a reorganization is desirable. This would separate the functional areas of command and control and combat support from combat service support, and would provide a more flexible and responsive structure. In addition to those changes discussed in paragraph 2a above, the following modifications are considered for the headquarters and headquarters company; (1) because of the realignment of the company, those maintenance personnel associated with the headquarters and the combat support elements should be retained in the unit. The scout platoon has been authorized the type "A" armament sub-system by a Department of the Army basis of issue (BOI). This consists of an open-top turret for the .50 caliber machine gun and two side-firing M60 machine guns with shields (see paragraph 2d below for additional details). An increase in firepower can be achieved by substituting the rapid-fire, high velocity 40mm grenade launcher for the .50 caliber machine gun on one-half of the vehicles, (2) an additional forward observer team would be required for the mortar platoon to provide observed fires for the fourth tank company, (3) the communication platoon would be augmented with an additional switchboard operator to provide twenty-four hour service and, (4) the battalion ground surveillance section would be organized into four company teams of five men each.

Each team would be mounted in two M113's equipped with the AN/PPS-5 radar system. In this regard, an evaluation of the use of the surveillance systems in RVN revealed that both the AN/TPS-33 and the AN/PPS-4 systems are inadequate. The stated operational capabilities of the AN/PPS-5 would correct this situation and provide a system suitable for employment in this environment.

(c) Service Support Company.

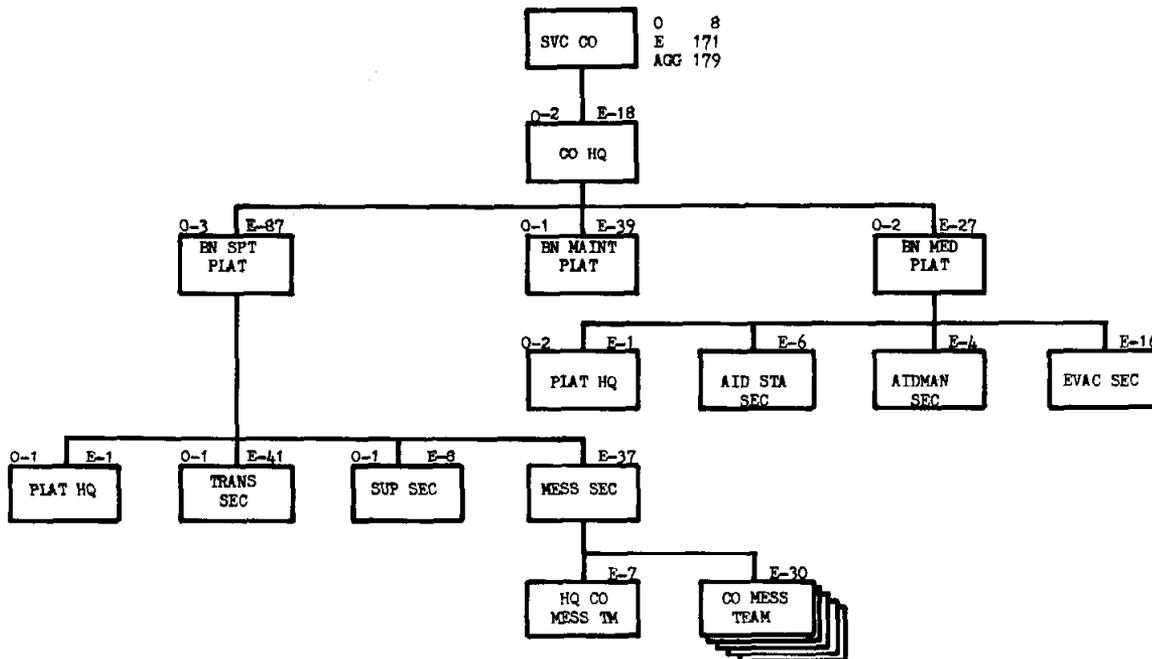


FIG III - 5. ORG CHART SERVICE CO TANK BN

The major elements of this type organization would be a support platoon, a maintenance platoon and a medical platoon. Personnel

and equipment have been increased to provide the required support to the fourth tank company. The evaluation of collected data and the comments of commanders indicated that the 5-ton truck, because of its movement restrictions, is inadequate in a combat resupply role. Because of the difficult terrain to be negotiated, a requirement exists for a tracked cargo carrier with mobility characteristics similar to those of the M113. This requirement could be met by the substitution of nine XM548 tracked cargo carriers for nine 5-ton trucks. Eight of these XM548 would be issued to transport cargo and fuel, while the remaining carrier would be equipped with a welding set to provide a capability for on-site maintenance and repairs. Further, two additional wrecker drivers/operators are required to release mechanics who were assigned this function as an additional duty. One armored ambulance would be provided for each tank company because of the mine incident rate and the difficulty of the terrain encountered. Because of support provided by other services and the lack of an air threat, the air control team and the air defense section could be considered for deletion from the "G" Series organization. Two additional mess teams are required to support the fourth tank company and service company.

(d) Tank Company. The adequacy of the current organization of the tank company has been proved in combat operations. Other than the conversion of the unit to the "G" Series

TOE to obtain the latest equipment changes and personnel skill levels, only minor modifications appear to be warranted. These are, (1) an equipment substitution to provide each platoon with a dozer tank, (2) the addition of one M113 for use as a company command post vehicle, (3) the addition of a turret mechanic and, (4) the substitution of one M79 grenade launcher for one submachine gun caliber .45 on each tank.

d. THE ARMORED CAVALRY SQUADRON, DIVISIONAL.

(1) Current Organization. Analysis of after action reports and reports of lessons learned, in addition to comments from commanders and data collectors, has indicated that the basic organization of the armored cavalry squadrons assigned to the infantry divisions requires no major modification. A standard equipment substitution has been the replacement of the M114 with the M113 which has, in turn, been modified by the addition of two side-firing M60 machine guns with shields. When the M113 has been so modified, it is known locally as the Armored Cavalry Assault Vehicle (ACAV) and is depicted below.

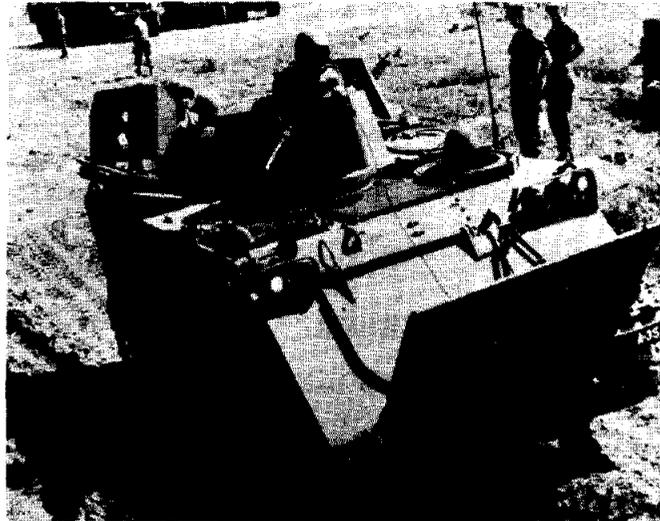


FIG III - 6. Armored Cavalry Assault Vehicle (ACAV)

(2) Organizational Structures.

(a) Headquarters and Headquarters Troop. While the organization of this troop under the "G" Series TOE is considered to be sound basically, certain modifications were considered for RVN oriented units. The requirement to rapidly span antitank ditches, road craters and natural terrain obstacles necessitates the addition of an armored vehicle launched bridge (AVLB) section as authorized currently to the tank battalion. Also, a flamethrower section identical to the one found in the mechanized infantry battalion is required. The size of current flamethrower sections in units in RVN vary from three to six self-propelled flamethrower type vehicles. Responses from the field have verified the requirement for such a weapon at battalion/squadron level for immediate response to support requests. The three-vehicle configuration appears to be adequate to provide the required support. Other possible changes are; (1) the addition of a switchboard operator and a radio operator in the communications platoon, (2) the substitution of nine XM 548 tracked cargo carriers as described in the organization for the tank battalion, (3) the addition of one welder and two wreckers drivers/operators to the maintenance platoon with the welder's equipment mounted on one of the XM548 carriers, (4) the authorization of armored ambulances on the basis of one per troop and, (5) the deletion of the air defense section and the air control team for reasons discussed previously.

(b) Armored Cavalry Troop. An evaluation of the organization and equipment of the armored cavalry troop, together with the comments of commanders and data collectors, indicates that only minor changes to the "G" Series TOE are required. Since the M113 has been substituted for the M114, the strength of the scout section should be increased from three to five men per vehicle in order to man the added armament. An analysis of the employment of the 4.2 inch mortar reveals that the same problems exist for this troop as for the troop of the armored cavalry regiment. Difficulties are encountered in positioning the weapon because of its minimum range of 840 meters. Unless the weapons are centralized at battalion/squadron level, additional security must be provided when the mortars are trailing the maneuver elements. The 81mm mortar, however, has been employed effectively without this added security requirement. Replacement of the 4.2 inch mortar with the 81mm mortar in the armored cavalry troops would alleviate these difficulties. The minimum range of the 81mm, plus the forward firing capability of the M125 carrier, would provide an immediately responsive, indirect fire support capability to the armored cavalry troop.

(c) Air Cavalry Troop. Reorganization of the air cavalry troop under TOE 17-78G (Air Cavalry Troop, Armored Cavalry Squadron, Airborne Division) provides an organization with those characteristics most desired by field commanders. This TOE

provides an air cavalry antitank/rocket platoon rather than the aero-weapons section found in the current organization. It eliminates the light and heavy scout sections and replaces them with four aero-scout squads. Additional door gunners and mechanics, including avionic mechanics, are provided. A further modification appears desirable. The structure in FIG III - 7 below includes the results of the "Aviation Requirements, Combat Structure of the Army (ARCSA)" study which provides additional pilots and mainten-

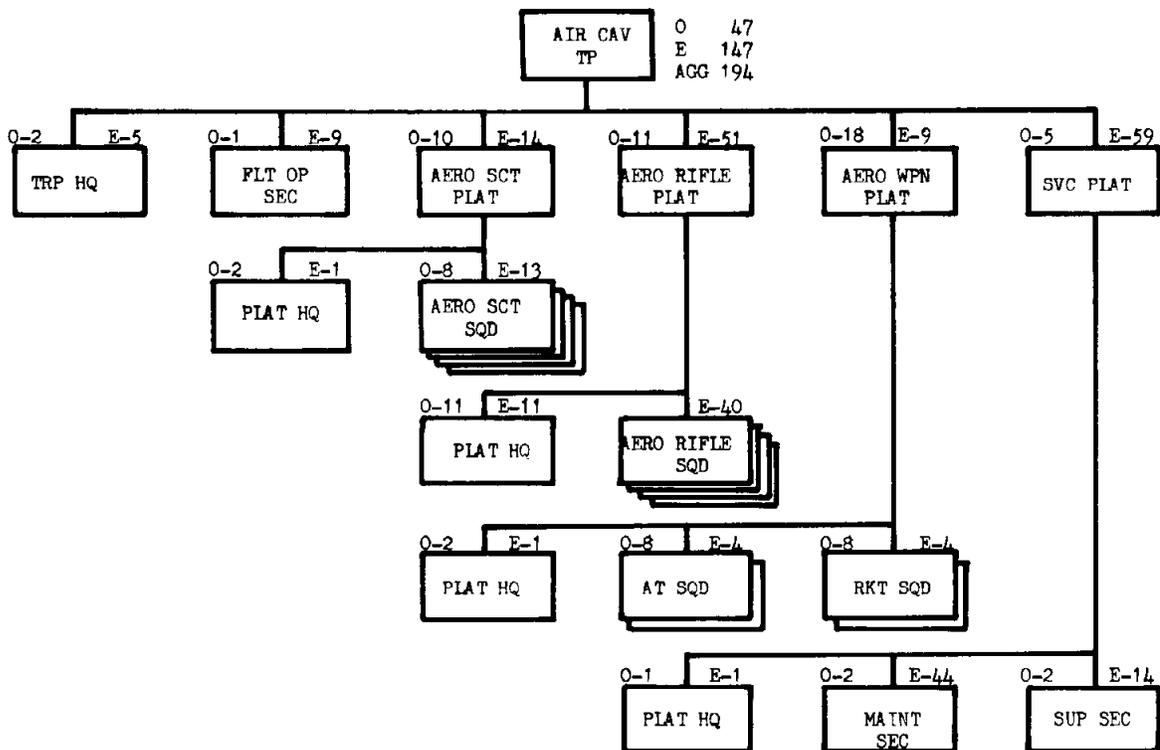


FIG III - 7. ORG CHART AIR CAV TRP ARMD CAV SQDN

ance personnel beyond those authorized by TOE 17-78G. Replacement of the two UH1-B helicopters in the supply and maintenance section by UH1-D aircraft would provide an additional airlift capability.

e. THE ARMORED CAVALRY REGIMENT.

(1) Current Organization. The 11th Armored Cavalry Regiment is organized as shown below. It should be noted that unlike the divisional squadron, the air cavalry troop is authorized by TOE at regimental rather than squadron level.

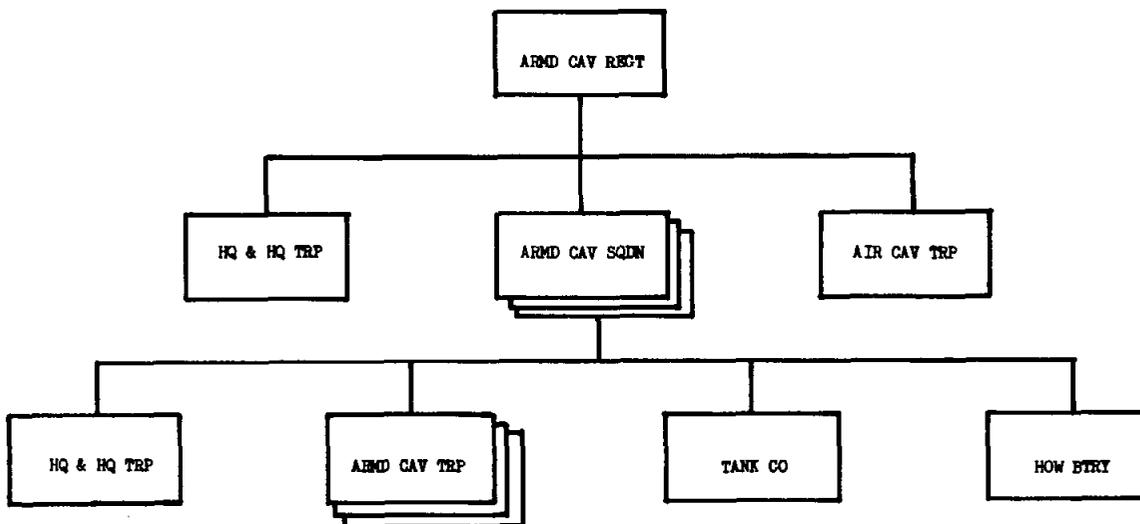


FIG III - 8. ORG CHART, 11th ARMORED CAVALRY REGIMENT

The armored cavalry troop is organized into a troop headquarters and three armored cavalry platoons. Major organizational changes occur at the platoon level as shown below.

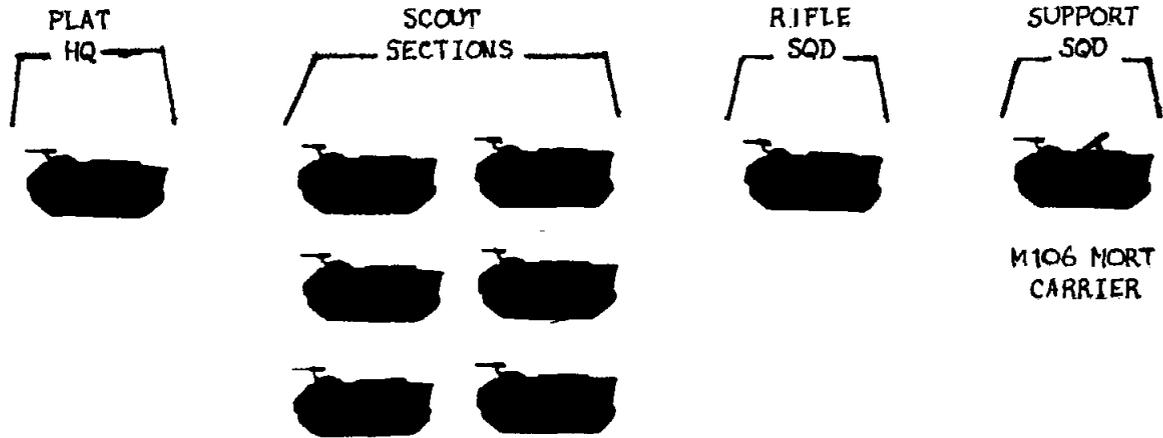


FIG III - 9. ARMORED CAVALRY PLATOON, 11th ARMORED CAVALRY REGIMENT

This current organization depicts the substitution of the M113 for the M114, as was done throughout the regiment. All M113 have been further modified by the addition of the type "A" armament subsystem. The chart also shows the deletion of the tank section and the addition of a third scout squad, equipped with two M113 in lieu of the three tanks normally issued. Because of the range characteristics of the 4.2 inch mortar discussed previously, it is not uncommon to find the support squads centralized at squadron level. This organization has proved to be readily adaptable for combat operations in this environment, and it is considered that no change other than the substitution of the 81mm mortar for the 4.2 inch

mortar is required. The major items of equipment include:

51	M48A3 Tanks
296	M113 Personnel Carriers
18	Howitzer, Self-propelled 155mm
9	Flamethrowers, M132
27	4.2 inch Mortars
476	Caliber .50 Machine gun
727	Caliber 7.62 Machine gun
48	Helicopters

(2) Organizational Structures.

(a) Headquarters and Headquarters Troop, Armored Cavalry Regiment. In order to update authorization documents, it is considered that this troop should be reorganized under the "G" Series TOE. Additionally, an examination of the current MTOE and analysis of field comments indicates that the "G" Series TOE should be modified. These proposed modifications consist of the addition of, (1) an S5 section to supervise and coordinate at the regimental level the civic action programs and to integrate the actions of the squadron S5 into area development programs, (2) an awards and decorations team of two enlisted personnel to assist in the preparation and processing of awards and decorations. Units organic to divisions are provided this support from division resources. The strength of the armored cavalry regiment justifies the inclusion of this support as an organic element and, (3) a casualty reporting team of three

enlisted personnel is essential to provide factual and timely reports to higher headquarters.

(b) Air Cavalry Troop. The operational requirements of this troop are similar to those of the air cavalry troops of the divisional squadrons and the squadron of the airmobile division. Therefore, it is suggested that TOE 17-78G be adopted; however, a minor modification consists of adding a seven-man separate mess team.

(c) Armored Cavalry Squadron. Major changes to this organization, other than conversion to the "G" Series TOE, have not been considered. Combat reports, reports of lessons learned, comments of commanders and data collected from the field have all stated the suitability of the current organization for operations in RVN. Minor adjustments that could be implemented are discussed below.

1. Headquarters and Headquarters Troop.

The flamethrower section as currently authorized by MTOE should be retained. Personnel adjustments (S5 section, assistant S2 and S1 clerk) are the same as those discussed in paragraph 2a above. The substitution of the XM548 cargo carrier for the 5-ton truck is identical to that stated for the tank and mechanized infantry battalions. Two wrecker drivers/operators would replace mechanics who have been assigned this function as an additional duty.

2. Armored Cavalry Troop. The organizational structure under consideration for this unit has already been discussed.

3. Tank Company. No change is considered for the tank company other than its conversion to the "G" Series TOE and the addition of a M113 as a command post vehicle.

4. Field Artillery Battery. As currently organized in RVN, the howitzer batteries of the armored cavalry squadrons are provided the personnel and equipment to perform their assigned mission. A conversion of these units to the "G" Series TOE would provide the latest combat essential equipment authorizations. Based on responses from the field, a M113 is suggested for the use of the battery commander and a recovery vehicle has been added to the maintenance section. It should be noted that a ten-man security section is provided by the new series TOE.

f. THE AIR CAVALRY SQUADRON, AIRMOBILE DIVISION.

(1) General. The United States Army Combat Developments Command will complete the revision of the "T" Series TOE for this squadron to the "G" Series in the near future. This revision is based on the recommendations of the airmobile division in RVN and the comments of U.S. Army, Vietnam (USARV) and U.S. Army, Pacific (USARPAC). The revised "G" Series TOE will reflect the latest personnel and equipment authorizations and implements approved Department of the Army studies.

(2) Organizational Structures.

(a) Air Cavalry Troop. This troop is reorganized to conform to the proposed troop for divisional armored cavalry squadrons and the armored cavalry regiment. The major changes involved are, (1) the addition of a service platoon, (2) the deletion of the maintenance section from the troop headquarters, (3) the organization of an antitank squad and a rocket squad and, (4) the addition of two scout sections to the scout platoon.

(b) Cavalry Troop. Responses from commanders and analysis of collected data indicated that the organization of this troop to conduct ground operations should be examined closely. Of major concern is the question of wheeled versus tracked vehicles. As organized currently, this troop is equipped with 1/4 and 3/4-ton trucks for combat operations. Responses from commanders are divided generally as to the suitability of wheeled vehicles in this role, and approximately one-half of the commanders recommended a conversion to tracked vehicles. An evaluation of the type missions which have been assigned the troop and a comparison of the advantages and disadvantages of both type vehicles, leads to a conclusion that there are three options available in the near time frame. These are, (1) convert to tracked vehicles, (2) retain the wheeled vehicles and, (3) provide armor units to the airmobile division on a mission basis. Considering these options and the difficulties encountered by introducing one-of-a-kind equipment into the division, a compro-

mise appears to be the most attractive solution; retain the wheeled vehicles and reorganize the troop under the "G" Series TOE when published. In the interim, armor units could be made available to the airmobile division on a mission basis to operate in conjunction with the air cavalry squadron.

g. THE ARMORED CAVALRY TROOP, SEPARATE AIRBORNE/LIGHT INFANTRY BRIGADE.

(1) Current Organization. The separate armored cavalry troops in RVN are organized under one of three different TOE with modifications ranging from minor to extensive. All of the troops are equipped with wheeled vehicles, and the employment of each troop varies depending upon the suitability of the vehicles to a particular operation. Currently, one troop is employed as an airmobile force while another is used as an infantry company.

(2) Organizational Structure. The vast majority of data collected from the field indicates that a conversion to tracked vehicles is required. This would provide the cross-country mobility, armor protection and additional firepower afforded by tracked vehicles. It should be noted that the separate airborne or light infantry brigades are not tailored for a specific airmobile role. Thus, an air-lift characteristic for this troop is not a major consideration. Organization of the separate armored cavalry troops to conform to the armored cavalry troop of the 11th Armored Cavalry Regiment, i.e., with the substitution of two M113 for the tank section in each platoon of the cavalry troop would satisfy the requirement.

## 5. EQUIPMENT MODIFICATIONS.

### a. M48A3 TANK.

(1) Cupola. The caliber .50 machine gun, M2, is difficult to load and operate when mounted in the M1 cupola. Since tank commanders seldom close their hatches, most units have removed the .50 caliber from the cupola and mounted it on top of the turret forward of the commander's hatch. The majority of these modifications were accomplished by shortening the legs of a M3 mount and welding it in place. This arrangement corrects the operating difficulties and permits the use of a longer belt of ammunition. For these reasons, consideration should be given to replacing the M1 turret with the M19. In addition, the M19 turret mounts the M35 machine gun with a greater basic load capacity, permits the use of night vision devices and provides increased crew comfort because of its size.

(2) Cutting Bar. Many of the armor units in RVN have modified one or more of the tanks by installing a cutting bar as shown below. This bar consists of a dozer blade tip welded from fender to fender across the front of the tank, and has proved to be an effective tool for clearing brush and small trees. It has been used to clear helicopter landing zones, access routes, and to remove dense jungle growth in areas of operation. The cutting bar increases the effectiveness of the tank, and most commanders feel that all tanks, other than those mounting the dozer blade, should be modified accordingly.

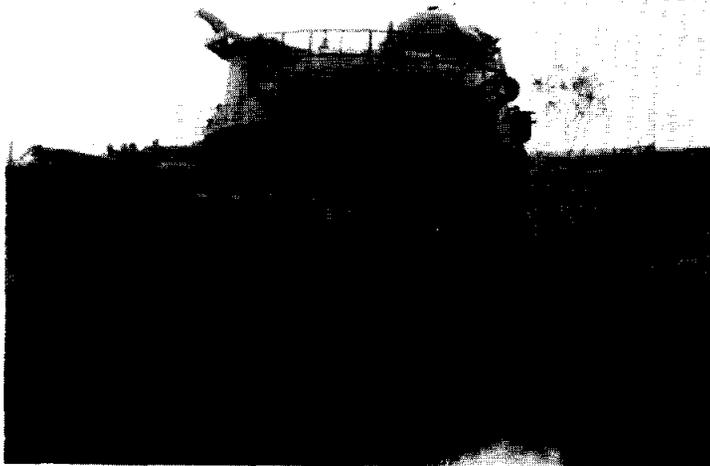


FIG III - 10. Cutting Bar (Dozer Blade Tip) Welded Across the Front of an M48A3 Tank. Note Cutting Edge and Location of Center Weld.

b. M113 PERSONNEL CARRIER.

(1) Lightweight Belly Armor. The lightweight belly armor of the M113 is inadequate to defeat many types of antitank mines encountered in RVN. Most of the units line the floor of the driver and squad compartments with sandbags to reduce mine damage and personnel casualties. To further minimize the antitank mine threat, U.S. Army, Vietnam (USARV) has initiated the installation of titanium armor plate kits beneath the driver and squad compartment.

(2) Boom Hoist. A field expedient for this vehicle which has proved successful is an improvised boom hoisting device. This device is mounted on the front of the M113 and is used for removing and installing major automotive assemblies. The entire

boom can be mounted or dismounted in approximately five minutes and is used when terrain restrictions prohibit employing the M578 recovery vehicle.

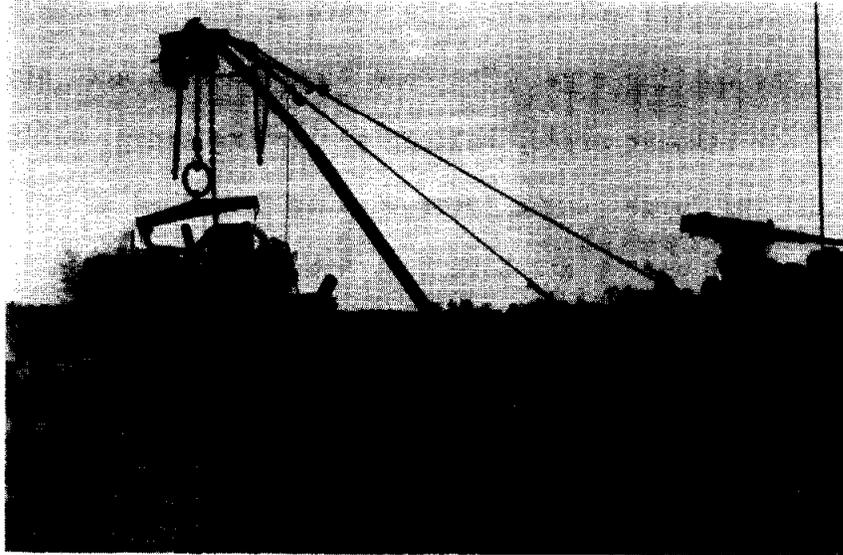


FIG III - 11. Boom Hoisting Device Mounted on the Front of a M113 Personnel Carrier.

c. ROME PLOW (ROME KG CLEARING BLADE). One of the largest single obstacles for our ground forces in RVN is the dense jungle growth and the vast expanses of head-high native grasses. These jungle areas provide a haven for the enemy in which he is able to move and concentrate forces without detection to conduct large scale attacks or small harassing actions. A logical method of overcoming these obstacles and sanctuaries for the enemy is to physically clear the jungle areas. The Rome Plow, a commercial off-the-shelf item consisting of a shearing blade mounted on a caterpillar-

type tractor, is being used effectively. A long, sharp cutting edge extends across the entire length of the blade and will cut through small to medium diameter growth at ground level. When large trees are encountered, a wedge-like projection at the left end of the blade is used to split and weaken the trees so that they can be felled with the cutting edge. The Rome Plow has been used effectively to clear bivouac areas, helicopter landing zones, perimeters of base camps and large jungle areas. It is described as being twice as effective as the standard U.S. Army bulldozer when used to clear brush and trees from an area.

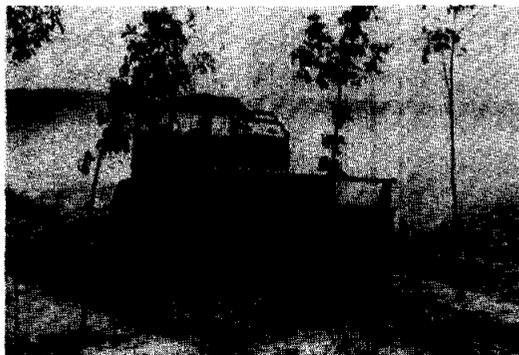


FIG III - 12. Rome Plow (Rome KG Clearing Blade)

d. PROTECTIVE SANDBAGS. Filled sandbags are being utilized on wheel vehicles to provide protection to personnel from enemy munitions. The sandbags are placed usually on the floor of all wheeled vehicles, front and rear. A double row of sandbags is used

in place of the windshield on 1/4-ton and 3/4-ton trucks to provide additional protection from hostile fire. Use of sandbags has caused some degradation in mobility, however, the additional protection provided to personnel more than justifies its loss.

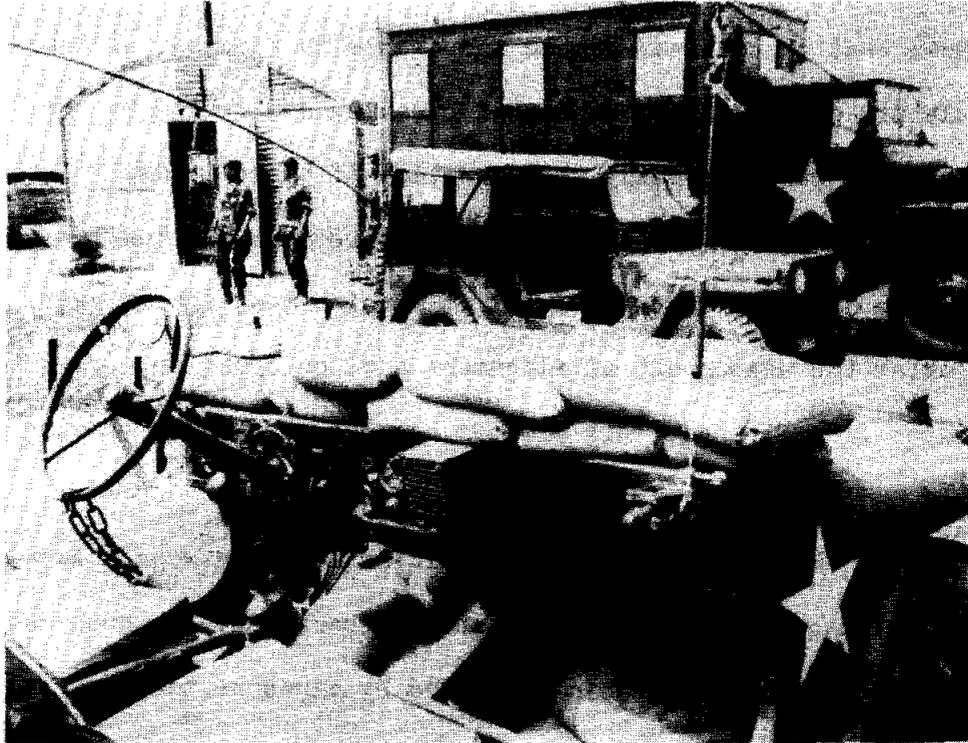


FIG III - 13. Protective Sandbags.

## 6. CARE AND MAINTENANCE.

a. GENERAL. Certain items of equipment used extensively in RVN are failing to function or are functioning improperly. In most instances the malfunction can be traced to environmental conditions peculiar to Vietnam. The items of equipment, contributing causes of malfunctions and corrective actions are discussed below.

b. HANDSET, H-138/U AND MICROPHONE M-30/U. Experience has shown that these items become inoperable as a result of the accumulation of moisture. Continued cleaning and drying by the operator will reduce greatly the down time of these items.

c. M79 GRENADE LAUNCHER. Moisture accumulation has caused the grenade launcher stock to swell at a point near the trigger. This forces the weapon out of alignment and, on occasion, prevents the weapon from firing. This problem has been solved by shaving away the swollen stock surface.

d. M72 ROCKET (LAW). Ammunition for this weapon frequently malfunctions because of moisture absorption. In such cases, the increased care and cleaning demanded by exposure to excessive moisture is most important.

e. M16 RIFLE. This weapon will sometimes fail to extract because of an accumulation of moisture and dust. This causes the expended cartridge case to stick in the chamber to a degree that it can not be extracted. Under such conditions, additional care and cleaning is required.

f. TANK GUN, 90MM. Experience has shown that the canister round for this weapon separates occasionally during handling or when being carried in the gun tube. To insure immediate employment of the main armament, special care must be taken in handling, loading and carrying this round.

## CONCLUSION

The terrain, the enemy and the nature of area war are dominant factors which differentiate combat in Vietnam from the more familiar forms of warfare encountered during World War II and Korea. Doctrine, organizations and equipment which have evolved as a result of those conflicts are basically sound. Tactics and techniques in application of established doctrine have been altered and points of emphasis have been changed to fit the requirements of area warfare. Mechanized infantry, tank and armored and air cavalry equipment is, for the most part, efficient and capable of accomplishing its intended purpose. Many of the modifications, substitutions and new requirements brought out in this report may have evolved, although more slowly, without the impetus of combat operations in Vietnam. Requirements for changes in organization as a result of this examination are neither drastic nor revolutionary. It is important to understand that changes in doctrine, tactics, techniques, organization and equipment which have evolved and which are collected and evaluated here will continue to improve the fighting capability of mechanized and armor units in this area. Mechanized infantry, tank and armored and air cavalry units have been successful in Vietnam. This publication records this fact and seeks to further enhance the efficiency of these formations, not only in the Republic of Vietnam, but also throughout the Free World.

## APPENDIX - GLOSSARY

This glossary is provided as a ready reference for the MACOV report. Most of the terms and abbreviations are not contained in AR 320-5, Dictionary of United States Army Terms, or in AR 320-50, Authorized Abbreviations and Brevity Codes. Some of the terms are explanations as well as definitions and when the reader finds a term or phrase which is not clear in the report, he should consult this glossary. Terms and abbreviations not included here should be adequately defined in appropriate Army Regulations or an English dictionary.

ACAV--See "Armored Cavalry Assault Vehicle."

AO--See "Area of Operations."

AREA OF OPERATIONS (AO)--An area established for a particular operation.

Normally the AO is assigned to the command exercising overall control and is larger than is required to satisfactorily complete the assigned mission. In addition, an AO may be assigned to a subordinate command as a control device. An AO may be within, a part of, or completely separate from a unit TAOR. (See TAOR)

ARMAMENT SUB-SYSTEM--

1. Any vehicle or aircraft armament system which is a sub-system of the vehicle or aircraft of which it is a part.

2. Utilized by DA to signify modification for upgunning the M113. The "A" model or kit is an FMC Corporation armament sub-system, and it consists of hatch armor and gun shield for the commander's caliber .50 machine gun, two M60 machine guns, two elbow pintle mounts with gun shields for mounting the M60's located on both sides of the M113, and a removeable pintle mount on the rear of the M113 in which either of the M60 machine guns with shield may be mounted. The "A" kit is being procured to modify all M113 in RVN not presently so equipped. The "B" model or kit consists of hatch armor and gun shield for the commander's caliber .50 machine gun only and is used on mortar carriers.

ARMORED CAVALRY ASSAULT VEHICLE (ACAV)--An armored vehicle with armament for assaulting enemy positions and carrying soldiers who may either fight from the vehicle or who may dismount and fight on foot. At the present time the ACAV is an M113 modified by the addition of the "A" kit, the FMC Corporation armament sub-system. The term originated with the 11th Armored Cavalry Regiment which equipped its M113 with armament sub-systems before arriving in Vietnam. Some M113 in mechanized infantry units are so modified; and, although they are the same vehicle with the same configuration and although the mechanized infantry assault enemy positions in the M113 as well as fight on foot, the term ACAV is seldom applied to these vehicles.

ARMORED VEHICLE LAUNCHED BRIDGE (AVLB)--Currently there is only one such standard type bridge and launching vehicle in RVN. It is a class 60 folding bridge which is carried on and launched from a modified M48 tank hull. There is also, however, an AVLB under development which is mounted on an M113 and designed for use by M113 to cross short spans.

ARVN--Army of the Republic of Vietnam.

AVLB--See "Armored Vehicle launched Bridge."

BASE AREA--A section of terrain which contains installations, defensive fortifications, or other physical structures used by the enemy for the following purposes: the basic or advanced training of personnel and units; a permanent or temporary location for political, military or logistical headquarters; the storage and distribution of medicine, ordnance, food, POL, and other war material; and as a site used by combat units to rest, regroup, retrain, evade friendly operations, and/or initiate preparatory phases of offensive operations.

BASE CAMP--The location which provides a semi-permanent home for tactical organizations stationed in the Republic of Vietnam (RVN). Depending on their functions, organizations may operate in, in the vicinity of, or totally away from their base camps.

BLACK LIGHT--A source of infrared emission. While this term is a misnomer in the sense that such emissions are invisible and therefore not light and although black light is frequently used to mean ultraviolet emissions in many applications, the term "black light" has gained wide acceptance in the field as meaning infrared emission or a source of infrared emission.

CAPSTAN KIT--A device to help a mired M113 extract itself from places where it has become stuck. It consists of two drums (the capstans) which attach to modified drive sprockets of the M113, two anchors (Danforth anchors designed for naval use), and two 100 foot lengths of 1-inch nylon rope.

CENTRAL OFFICE SOUTH VIETNAM (COSVN)--See "Viet Cong Infrastructure."

CHARLIE--A slang term for Viet Cong or North Vietnamese soldier (s).

CHIEU HOI--The Government of Vietnam open arms program developed to induce the VC/NVA military, political and civilian populace in South Vietnam to return to, or come over to Government of Vietnam controls. The term has gained wide acceptance in the field to mean an individual who responds to the program, but this is not proper usage. Such a person is properly called a "Hoi Chanh." See "Detainee."

CIDG--See "Civilian Irregular Defense Group."

CIVIL DEFENDANT--See "Detainee."

CIVILIAN IRREGULAR DEFENSE GROUP (CIDG)--A paramilitary force locally recruited, clothed, fed, armed, trained, and led by ARVN Special Forces personnel and advised by U.S. Special Forces personnel.

CLEAR AND HOLD--Same as "Clear and Secure" which is the preferred term.

CLEAR AND SECURE--The mission of a military force which is to find and capture or destroy all enemy forces within a specified area and then prevent any enemy force from entering or seriously harassing persons within the area.

COMBAT YOUTH--Youths of military age and below organized within a hamlet or village for security of that hamlet or village. Such forces are no longer authorized under current RVN law; however, in some locations they are still used. No pay or equipment is authorized for them. Local officials arrange funds for them, as well as weapons to a limited degree, from their own resources. Most of the combat youth will be found in IV Corps and parts of III Corps where population is heavy. Their primary mission is early warning. When the current RVN law came into effect, these personnel were supposed to be integrated into the popular force or drafted for regional force or ARVN duty.

CONVOY SECURITY--The mission of a military force which is to accompany a convoy to either discourage enemy attacks or, if attacked, to defend the convoy so as to minimize damage and to get the convoy to its destination.

CORDON AND SEARCH--A military operation in which an area is first sealed by a military force and then searched by another force (or part of the sealing force). It normally implies an operation in and around a village or hamlet.

CORPS TACTICAL ZONE (CTZ)--A major Vietnamese military and political subdivision of the Republic of Vietnam (RVN). There are four CTZ covering the entire area of South Vietnam. The corps commander is the senior Government of Vietnam (GVN) representative in his CTZ.

COSVN--Central Office South Vietnam. See "Viet Cong Infrastructure."

CTZ--See "Corps Tactical Zone."

DESERTER--Any individual absent from his unit with no apparent intention of returning.

DETAINEE--A person who has been detained but whose final status has not yet been determined. The following categories designate final status of a detainee:

Prisoner of War (POW)--A person who qualifies under Article 4 of the Geneva Convention. In addition, the following persons are extended the protection of the Geneva Convention in Vietnam:

Persons who are captured while actually engaging in combat or a belligerent act other than an act of terrorism, sabotage or spying against the Republic of Vietnam, the U.S. or other Free World Military Assistance Forces.

Any captured member of the North Vietnamese Armed Forces or of the Viet Cong, whether captured in combat or not, except a terrorist, saboteur, or spy.

Civil Defendent—A person who is suspected of being a spy, saboteur, terrorist, or criminal and who does not qualify as a prisoner under Article 4 of the Geneva Convention or the paragraphs above.

Returnee—A person who voluntarily returns to Government of Vietnam control under the Chieu Hoi Program after having actively supported the Viet Cong in some form of political or military activities.

Military Hoi Chanh--The military returnee under the Chieu Hoi program.

Political Hoi Chanh--The political returnee under Chieu Hoi program.

Innocent Civilian—A person who does not qualify as a detainee under the provisions above.

DISTRICT--The organizational level of the Government of Vietnam (GVN) structure directly subordinate to the province and comparable to American country. The district chief, usually military, is normally also the sub-sector commander.

DIVISION TACTICAL AREA (DTA)--The same meaning as Tactical Area of Responsibility except that DTA is used by ARVN divisions while U.S. units use TAOR.

DOCTRINE--That which is taught. Usually reflected in field manuals and that which is taught at service schools.

DRAGON SHIP--Same as "Puff the Magic Dragon," an AC-47 armed with miniguns.

DTA--See "Division Tactical Area" and "Tactical Area of Responsibility."

EAGLE FLIGHT--An airmobile, quick reaction force usually of company size or smaller which is capable of searching out and destroying or capturing enemy forces or camps with minimum advance notice. Normally it has the capability to deploy in one lift.

FFORCEV--Field Force Vietnam. The I and II FFORCEV are both approximately a corps in size. I FFORCEV (spoken Eye Force Vee) operates in the II Corps Tactical Zone (CTA) and II FFORCEV (spoken Two Force Vee) operates in the III CTZ.

FIREFLY--A UH-1 modified with banks of C123-type landing lights or a Xenon searchlight. A FIREFLY mission is a mission in

which the specially equipped helicopter attempts to locate enemy movement at night so that accompanying armed helicopters (normally two) can engage the target by fire.

FIRE SUPPORT BASE--A defended perimeter within which supporting artillery and/or mortar units are emplaced to support tactical operations of maneuver units.

FMC CORPORATION--Currently the company that produces M113 and other vehicles using the M113 chassis.

FORWARD SUPPORT AREA--An area selected near the using units in which minimum essential supplies are stocked and issued. Most forward support areas are established temporarily for a particular operation.

FORWARD SUPPORT ELEMENT--An element of a combat service support unit deployed with minimum essential support capability to the vicinity of an operation. It normally is deployed to a forward support area.

FRAGMENTATION--

1. The excessive separation or dissipation of a unit's integrity.
2. Descriptive of an explosive weapon which has a hardened case that fragments when detonated, such as a "fragmentation" grenade.

FREE WORLD MILITARY ASSISTANCE FORCE (FWMAF)--Those free world forces in the Republic of Vietnam (RVN) other than the Republic of Vietnam Armed Forces (RVNAF). They include military assistance from Australia, China, New Zealand, the Philippines, the Republic of Korea, Spain, Thailand, and the United States. The term is frequently used by U.S. forces to include friendly forces other than U.S. forces and RVNAF.

FRONT HEADQUARTERS--A Viet Cong or North Vietnamese military organization designed to perform tactical and administrative functions and to control widely divergent units in a specific area. A front is intentionally unstable, its military force composition changes as operational requirements dictate, and no permanency is attached to its formation (although it may provide the framework for a permanent military unit). A Viet Cong Front or North Vietnamese Army Front in South Vietnam, normally consists of a few small units, a number of regiments exceeding the accepted composition of a division, or several divisions.

FUNCTIONAL AREAS OF LAND WARFARE--An identifiable major component of land warfare, required and always present in varying degree, in all land combat operations. They are intelligence, movement, firepower, control and service support.

FWMAF--See "Free World Military Assistance Force".

GO-GO SHIP--An armed CH-47 "Chinook" helicopter.

GUERRILLAS--Full-time VC forces organized into squads and platoons which do not always stay in their home village or hamlets.

Typical missions for guerrillas are collection of taxes, propaganda, protection of village party committees, and terrorist and sabotage activities. Guerrillas also conduct combat operations against RVN and FVMAF units in RVN.

GUNSHIP--A helicopter armed with air to ground armament other than the door-mounted machine guns that are found on many helicopters.

GUNSWEEP--A flight of armed helicopters whose mission is to attempt to find and attack the enemy at dusk or dawn as he starts or is finishing his operations for the night.

GVN--Government of Vietnam.

HAMMER AND ANVIL--An offensive technique in which an attacking force attempts to cause an enemy force to retreat toward a prepositioned blocking force.

HERRINGBONE FORMATION--A formation used by mechanized and armor units when ambushed or during halts when the unit is moving in column, normally along a road. The armored vehicles turn alternately to the sides of the road or direction of march in such a manner as to place their main armament and heaviest armor obliquely toward the flanks. The center is left clear to provide freedom of movement within the column or a haven for thin-skinned vehicles.

HOI CHANH--See "Detainee."

HOOK--CH-47 cargo helicopter.

IMAGE INTENSIFICATION DEVICES--Passive night vision devices which amplify reflected ambient light to allow visual observation

and aimed fire of weapons at night. The term includes the Starlight Scope, Crew Served Weapon Night Vision Sight and the Night Observation Device, Medium Range.

INFRASTRUCTURE--See "Viet Cong Infrastructure."

INNOCENT CIVILIAN--See "Detainee."

IRREGULARS--Organized VC forces composed of guerillas, self-defense and secret self-defense elements subordinate to village and hamlet level VC organizations. These forces perform a wide variety of missions in support of VC activities and, in fact, provide a training and mobilization base for the VC maneuver and combat support forces.

KHA--Killed in Hostile Action. Since the United States is not engaged in a declared war, the use of the official term, "Killed in Action (KIA)", is not authorized by the Department of Defense for describing U.S. casualties. The term KHA is not an authorized abbreviation, but may be used as a convenience. Similarly, the terms WHA and MHA have come into usage to describe U.S. wounded and missing. Since these terms are not specified for describing enemy casualties, the standard terms KIA and MIA have gained wide usage for describing enemy casualties to differentiate between friendly and enemy losses.

KIA--Killed in Action. See also "KHA."

LIGHT FIRE TEAM--A team of armed helicopters (normally two).

Preferably, one helicopter is armed with machine guns and one with aerial rockets.

LIGHT INFANTRY DIVISIONS--VC and NVA divisional formations tailored specifically for operations in RVN. These divisions are highly foot-mobile and are flexible in force structure, organization and strength. Normally these light infantry divisions are composed of two to four infantry regiments and varying number of technical and fire support elements. They lack wheeled transport and the type artillery normally associated with NVA conventional divisions.

LIGHTNING BUG--A term formerly used to describe specially equipped HU-1B helicopter (see FIREFLY). It should no longer be used because it also is a project code name.

LOC SECURITY--Security of a line of communication which prevents the enemy from seriously interfering with movement along the LOC. It may be established for a specific operation or it may be established on an indefinite basis.

MAF--See "Marine Amphibious Force."

MARINE AMPHIBIOUS FORCE--The III MAF is approximately a corps in size and operates in the I Corps Tactical Zone (CTZ).

MDMAF--Mekong Delta Mobile Assault Force. This term is now obsolete and should no longer be used. See "Mekong Delta Riverine Assault Force."

MDRAF--See "Mekong Delta Riverine Assault Force."

MEDCAP--See "Medical Civic Action Program."

MEDICAL CIVIC ACTION PROGRAM.--The program for providing medical support to a civic action program or mission. In general, MEDCAP is a part of all civic action programs. It may be

continuing as in the case of a unit with a continuing civic action mission or it may be temporary as in the case of a unit on an operation with a civic action component.

MEKONG DELTA RIVERINE ASSAULT FORCE (MDRAF)--A joint Army and Navy force that engages in riverine operations in the Mekong Delta. The Navy component is a River Assault Flotilla or RIVFLOT. The Army component is an infantry brigade.

MHA--Missing in Hostile Action. See "KHA" also.

MINIGUN--A six-barreled 7.62mm machine gun built on the "Gatling" principle.

NATIONAL FRONT FOR THE LIBERATION OF SOUTH VIETNAM--See "Viet Cong Infrastructure."

NEUTRALIZED VC/NVA BASE AREA--One which the enemy no longer can use for its intended purpose. Neutralization can be accomplished by extensive destruction of facilities found within the area, or by the presence in or around the area of friendly forces sufficient to deny the enemy free and unrestricted access to the area for use as a safe haven. Neutralization is not necessarily permanent, and must be re-evaluated periodically.

NIGHT VISION DEVICES--Equipment designed to increase the capability of the soldier to fight, observe, move and work at night. The term covers all the equipments and systems which utilize reflected radiations. The four general categories are battlefield illumination, near infrared devices, image intensification devices and thermal imaging devices.

NORTH VIETNAMESE ARMY (NVA) UNITS--A unit formed, trained, and designated by North Vietnam as an NVA unit, and composed completely or primarily of North Vietnamese.

NVA--North Vietnamese Army.

ORGANIZATIONAL MAINTENANCE--That maintenance which is the responsibility of and performed by a using organization on its assigned equipment.

PAVN--An obsolete term for the North Vietnamese Army. See "North Vietnamese Army."

PF--See "Popular Forces."

POPULAR FORCES (PF)--Vietnamese forces with a primary mission of protecting hamlets and villages. They normally remain in the hamlet or village from which they are recruited. They are lightly armed and not authorized crew served weapons though some have acquired machine guns and 60mm mortars. They are fulltime professional soldiers normally under the command of the district, village, or hamlet chief.

POW--See "Detainee."

PROVINCE--The organizational level of the Government of Vietnam (GVN) subordinate to the Corps Tactical Zone (CTZ), and division tactical area (DTA). Most administration of local government is handled at province level upon instructions direct from Saigon. It is comparable to the state in American government. There are 43 provinces in South Vietnam. The province chief is usually a Vietnamese military officer.

PUFF THE MAGIC DRAGON--An AC-47 armed with miniguns.

PUNJI PIT--A concealed pit lined with punji stakes. The stakes at the bottom point upward and the stakes on the sides point down at an angle. A person stepping in the pit is most likely to attempt to pull his foot out and as he does so, his leg is impaled by the stakes along the sides.

PUNJI STAKES--Barbed stakes made of bamboo normally, but may be made of metal. The tips are normally poisoned, frequently from human excrement. The stakes are used in various ways, but the most frequent are ways which are likely to result in their being stepped on.

RAF--See "River Assault Flotilla." This abbreviation is used but the preferred abbreviation is RIVFLOT.

RAG--See "River Assault Group."

RALLIER--A Hoi Chanh. See "Detainee."

RAS--See "River Assault Squadron."

REACTION FORCE--A force whose mission is to react rapidly to an enemy attack or to attack an enemy force located by a finding force.

REGIONAL FORCES (RF)--Vietnamese forces recruited within a province who normally operate within their province. They are full-time professional soldiers equipped similarly to ARVN and are under control of the province chief. They are often attached to the district for specific missions.

RETURNEE--See "Detainee."

REVOLUTIONARY DEVELOPMENT--The integrated military and civil process to restore, consolidate and expand government control so that nation building can progress throughout the RVN. It consists of those coordinated military and civil actions to liberate the people from Viet Cong control; restore public security; initiate political, economic and social development; extend effective GVN authority; and win the willing support of the people toward these ends.

RF--See "Regional Forces."

RIVER ASSAULT FLOTILLA (RIVFLOT)--The naval component of the MDRAF. It consists of the necessary ships and craft to operate with an infantry brigade. The following types of ships and craft are parts of a RIVFLOT:

APB--A barracks ship capable of housing an infantry battalion.

APL--A large non-self-propelled barracks ship.

ARL--A repair ship for both Army and Navy equipment.

ASPB--Assault Support Patrol Boat. It is the equivalent of a destroyer and minesweeper used in riverine operations.

ATC--Armored Troop Carrier. A riverine troop carrying craft. It can lift an M113 APC.

CCB--Command and Control Boat (a floating battalion command post).

LCM REFUELER--A converted medium-sized landing craft (LCM) used to carry MOGAS for Army use.

LST--Landing Ship, Tank. A ship capable of ramp loading and unloading the equivalent of a tank company.

MONITOR--An LCM converted by the addition of machine guns and mortars. It is an assault craft.

MRV--Mobile Riverine Base. It consists of two or more APB, ARL, or LST (for storing organic equipment).

YFNB--A non-self-propelled repair barge.

RIVER ASSAULT GROUP (RAG)--The Vietnamese Navy equivalent of the U.S. River Assault Squadron.

RIVER ASSAULT SQUADRON (RAS)--A group of river assault craft and troop carriers. It is subordinate to a RIVFLOT.

RIVERINE OPERATIONS--All military activities designed to achieve and/or maintain control of a riverine area by destroying hostile forces and restricting or eliminating hostile activities. Operations are characterized by the extensive use of water transport to move military forces and equipment.

RIVFLOT--See "River Assault Flotilla."

ROAD RUNNER--Normally a small group of vehicles which travels a road for the purpose of keeping the enemy off balance and for making the presence of friendly forces felt among the local populace. The operation is similar to convoy security except that there is no convoy to secure. The operation can be effectively performed at night.

ROME PLOW--The K/G Clearing Blade manufactured by the Rome Plow Company. It is a dozer-like blade designed for cutting

undergrowth and trees at the ground level. It is normally mounted on a Caterpillar tractor. The bottom edge of the blade is angled sharply to the front and must be kept very sharp to be effective. The edge of the blade has a sharp projection on the left of the blade, the "stinger", which is used to split and weaken large trees and stumps so that they can be felled by the cutting edge.

ROUTE SECURITY--The same as LOC security except that it includes security established on a route that is not an LOC and frequently is established on a less permanent basis.

RULES OF ENGAGEMENT--Rules specified by COMUSMACV and subordinate commanders concerning employment of fire and maneuver within the territorial limits the Republic of Vietnam (RVN). Such rules are primarily for the protection of noncombatants and their possessions and are frequently reflected in unit standard operating procedures. From the MACV and national point of view these rules are more aptly described as measures on control of fire and maneuver.

RVN--Republic of Vietnam.

RVNAF--Republic of Vietnam Armed Forces.

SEAL AND SEARCH--Same as "Cordon and Search."

SEARCH AND DESTROY--The mission of a military force which is to search a specified area for enemy forces, materiel and installations and to capture or destroy any such force, materiel or installation that may be found.

SEARCH AND KILL--Same as "search and destroy" which is the preferred term.

SECRET SELF-DEFENSE FORCE--A clandestine VC organization which performs the same general function in GVN-controlled villages and hamlets as do the self-defense force in VC-controlled areas. Its operations involve intelligence collection as well as sabotage and propaganda activities.

SECTOR--The military organizational area equivalent to the province. The sector chief is an RVN military officer charged with the security of the sector. U.S. Military Assistance Command, Vietnam (USMACV) advisors are assigned to sectors.

SELF-DEFENSE FORCE--A VC paramilitary structure responsible for the defense of hamlet and village areas controlled by the VC. These forces do not leave their home area, and they perform their duties on a part-time basis. Duties consist of conducting propaganda operations, constructing fortifications, and defending home areas.

SERVICE SUPPORT--Those activities of an army which are primarily concerned with providing combat service support and administration to assist the combat and combat support elements of the army in carrying out its missions. It includes administration and personnel services; discipline, law and order; supply and distribution of all classes of supplies; maintenance and repair of material and equipment including evacuation of material; medical services including evacuation of personnel

from the rear of units in contact; transportation services including movement of units (excluding tactical maneuver), personnel, and supplies, movement control, and terminal operations; facilities construction and maintenance including supply routes and utilities; CBR decontamination service, area damage control, rear area security, and all aspects of civil affairs.

STABILITY OPERATIONS--Internal security or anti-guerrilla warfare against indigenous insurgents with peace-keeping and national stability as the objective.

SUB-SECTOR--The Vietnamese military area directly subordinate to the sector and comparable to the Government of Vietnam (GVN) district. The sub-sector is the lowest level to which U.S. advisors are assigned.

TACTICAL AREA OF RESPONSIBILITY (TAOR)--That area within which a unit has the following continuing responsibilities to be coordinated as required with local Government of Vietnam (GVN) authorities both military and civil:

- a. Defense of key installations.
- b. Conduct of operations including such reaction operations as are necessary to secure the area against organized military forces.
- c. Support of GVN construction and pacification activities as required.

TACTICS--

1. The employment of units in combat.
2. The ordered arrangement and maneuver of units in relation to each other and/or to the enemy in order to utilize their full potential.

TAOR--See "Tactical Area of Responsibility."

TASK FORCE (BATTALION)--A temporary grouping of unlike companies under a battalion commander, formed for a specific operation or mission.

TEAM (COMPANY)--A tactical grouping of unlike platoons under a company commander, formed for a specific operation or mission.

TECHNIQUES--The detailed methods used by troops or commanders in performing assigned tasks with equipment and/or personnel. The phrase "tactics and techniques" is often used to refer to the general and detailed methods used by commanders and forces in carrying out their assignments (AR 320-5). The term "current techniques" is occasionally used to imply methods of performance that are of more recent origin. Its use should be avoided unless this inference is needed.

TUNNEL KIT--A kit or packet of equipment designed to be used by soldiers searching a tunnel. It consists of cap or head-mounted lamps, small throat or head-mounted microphones and telephones with wire, revolvers with silencers, and earplugs.

VC--See "Viet Cong."

VIET CONG (VC)--The active arm of the communist conspiracy to overthrow the Government of Vietnam (GVN) and set up a communist

government in its place. The term is commonly used to apply to all enemy forces in RVN; but, technically, it should not be applied to the North Vietnamese Army (NVA).

VIET CONG INFRASTRUCTURE--The Viet Cong infrastructure is defined as the political and administrative organization through which the Viet Cong control or seek to control the South Vietnamese people. It embodies the party (Peoples Revolutionary Party) control structure, which includes a command and administrative apparatus (Central Office South Vietnam) at the national level, and the leadership and administration of a parallel front organization (National Front for the Liberation of South Vietnam), both of which extend from the national through the hamlet level.

VIET CONG (VC) LOCAL FORCE (LF)--Those VC military units which are directly subordinate to a provincial or district party committee and normally operate within a specified VC province or district.

VIET CONG (VC) MAIN FORCE (MF)--Those VC military units which are directly subordinate to Central Office South Vietnam (COSVN), a Viet Cong Military Region, or sub-region.

WHA--Wounded in Hostile Action. See "KHA" also.

WIA--Wounded in Action. See "KHA" also.

ADDENDUM - COMBAT EXAMPLE, 3/5 ARMORED CAVALRY SQUADRON

PERIMETER DEFENSE

1. SITUATION

Troop A, 3d Squadron, 5th Cavalry, commanded by Captain Alcalá, was assigned a mission of securing an artillery fire support base vicinity Bau Bang, west of Highway 13, and 7 kilometers north of Lai Khe (XT785462). Defensive positions were occupied at 191150 March 1967. The weather was clear and hot. The position was in an abandoned rubber plantation.

2. EXECUTION

Troop A was employed with two platoons on a perimeter around the fire base and one platoon in an ambush location approximately one mile north, and on the west side of Highway 13. At 192300 March a herd of cows with bells ran across Highway 13 just north of the perimeter. Immediately after the cows cleared the road a caliber .50 machine gun opened fire on the perimeter from the vicinity of the cattle crossing. The machine gun was engaged by tank fire and destroyed. No further action occurred until 200030 March at which time the fire base came under mortar fire from the east and west sides of the perimeter. Simultaneously an enemy ground attack was launched against the southern sector of the perimeter, using recoilless rifles, automatic weapons, and small arms. Organic and supporting fires were placed on the enemy, illumination was used to expose the enemy, and the platoon at the ambush location was ordered back to the perimeter. Armed helicopters quickly responded to the situation and provided close-in aerial fire support. The ambush platoon, en route to the perimeter, encountered an enemy ambush approximately 400 meters northeast of the perimeter, and overran it. On arriving in the battle area at 200100 March, the platoon assumed defense of the southwest quadrant of the perimeter. At 200115 March the 3d platoon of Troop C was placed OPCON to Troop A and moved up Highway 13 from the south. This platoon was brought into the rear of the attacking enemy force and placed heavy direct fires on the enemy force. It was then moved into the perimeter to strengthen the defense. The 1st platoon of Troop B was placed OPCON to Troop A and moved into the battle area along Highway 13 from the north. On arriving at the east side of battle area, the platoon attacked around the southern half of the perimeter, entered the perimeter on the west side, and assumed positions to strengthen the defense. At 200300 March tactical air strikes were employed on concentrated enemy forces south-

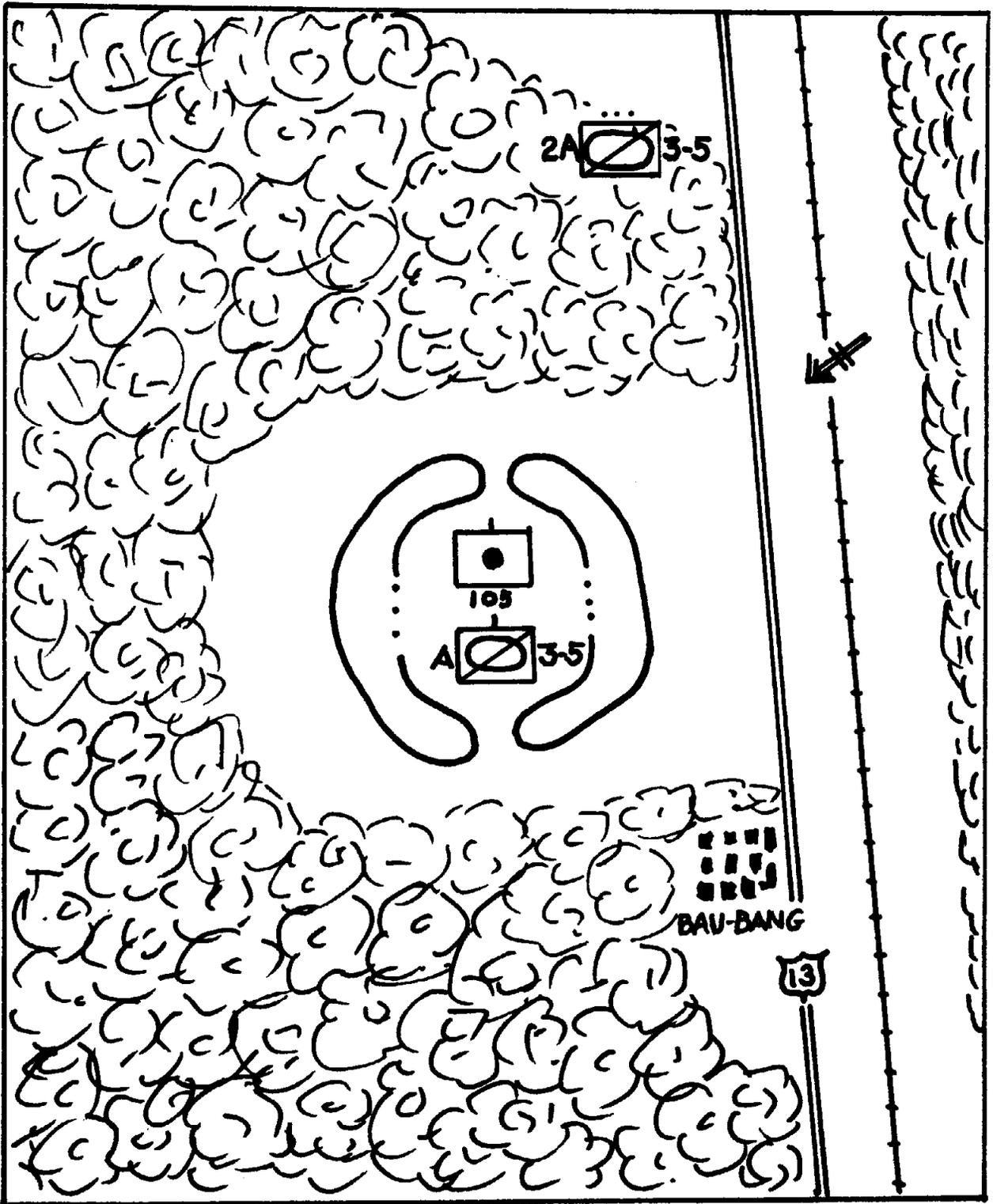
east of the perimeter. At 200345 March the enemy terminated their attack and commenced a police of the battlefield. At 200500 March all action ceased and enemy contact was lost.

### 3. RESULTS

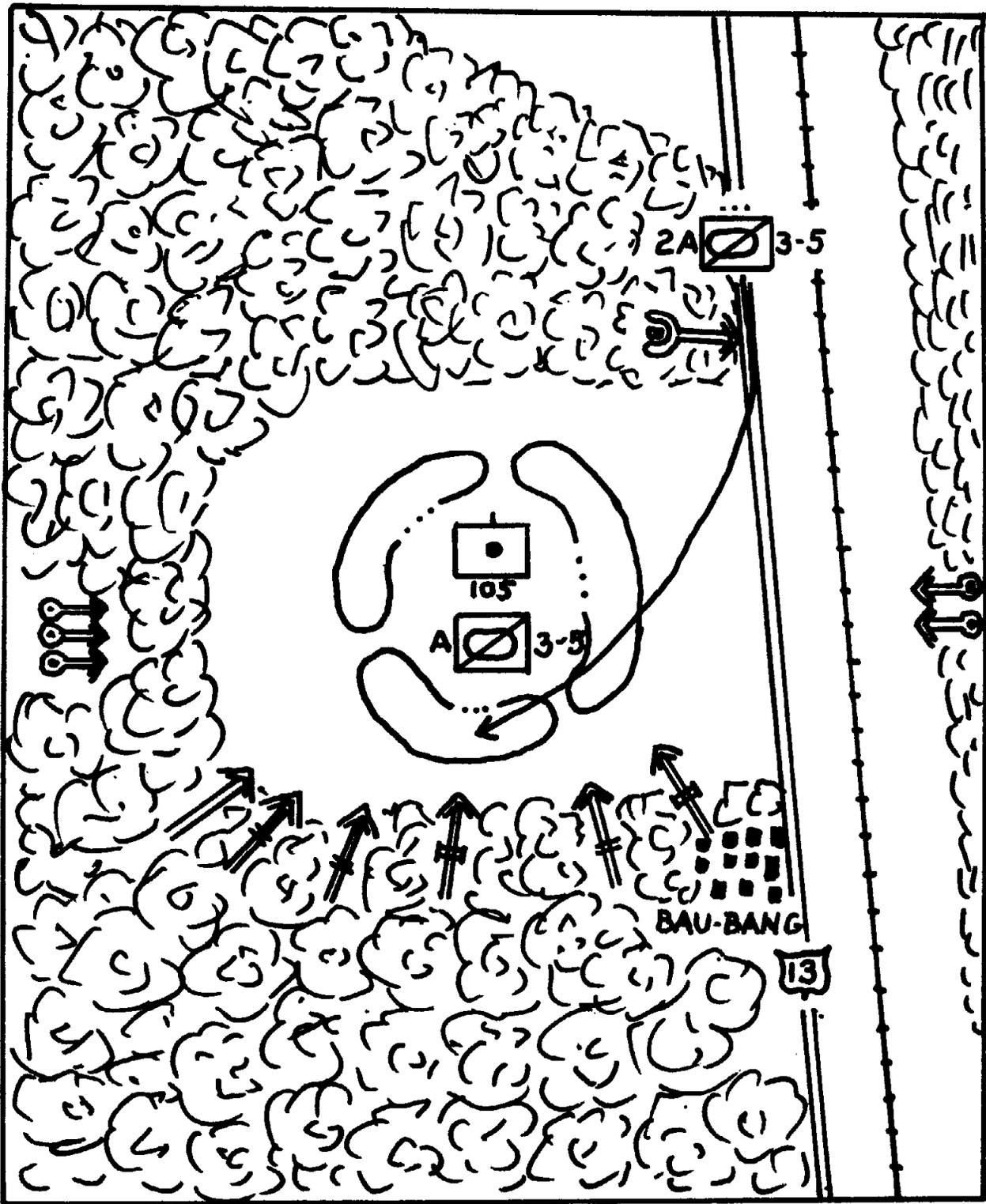
Friendly: 4 KHA, 1 MHA, 38 WHA, 1 M106 destroyed, 1 M113 destroyed, 1 F-100 crashed.

Enemy: 227 KIA (BC), 5 WIA (PW), numerous crew served and individual weapons were captured. Subsequent observations and discoveries of enemy bodies increased the enemy KIA to more than 400, attributed to this action.

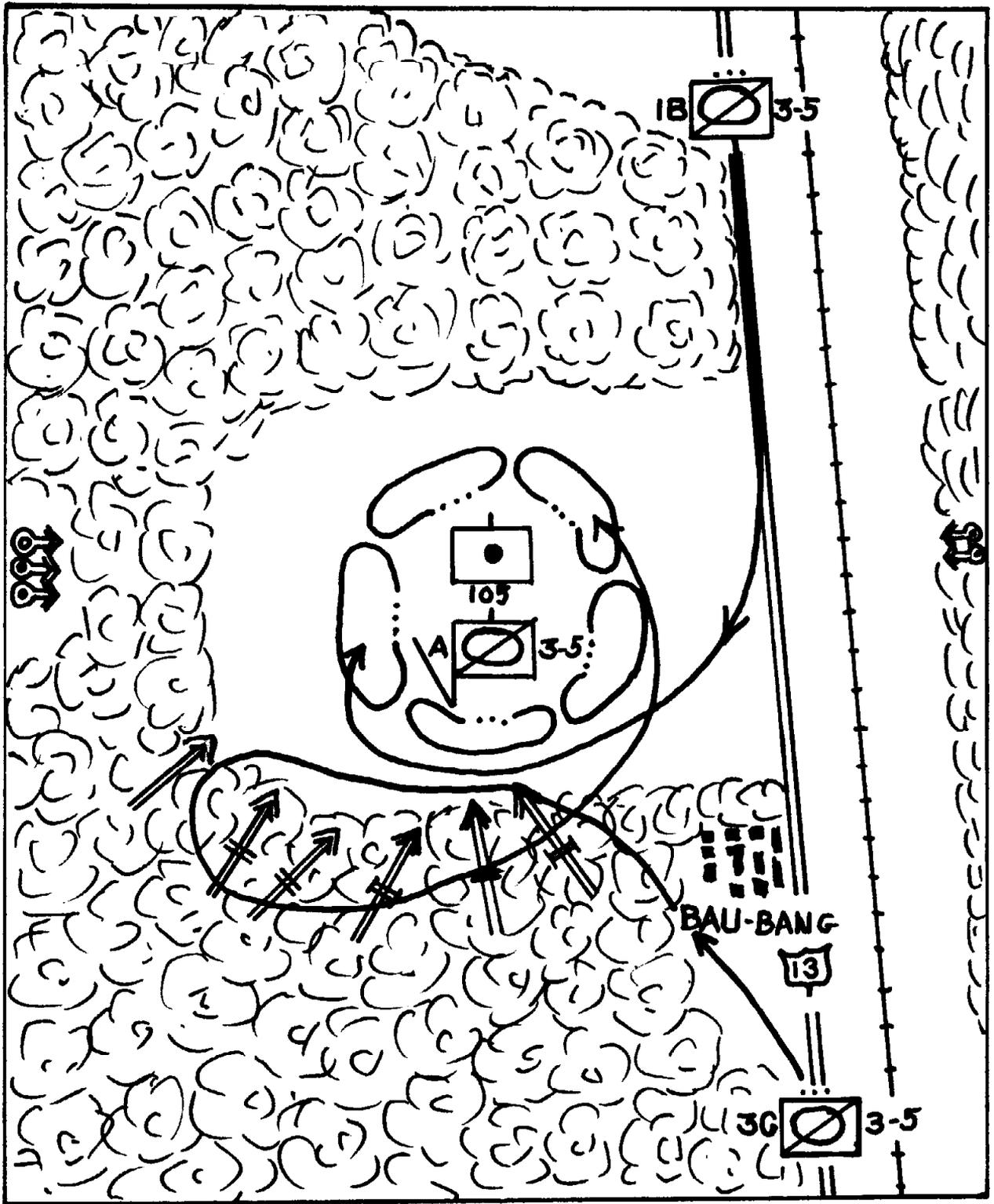




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