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THE ROLE OF THE FIGHTING VEHICLE ON THE AIRLAND BATTLEFIELD

A thesis presented to the faculty of the U. S. Army Command and
General Staff College in partial fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE

by

WILLIAM G. GESSNER, JR, CPT, USA
B. A., University of Rhode Island, 1975

Fort Leavenworth, Kansas
1990

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MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U. S. Army Command and General Staff College or any other government agency. References to this study should include the foregoing statement.

ABSTRACT

THE ROLE OF THE FIGHTING VEHICLE ON THE AIRLAND BATTLEFIELD,
by Captain William G. Gessner, Jr, USA, 127 pages.

This thesis examines the role of the fighting vehicle on the Airland battlefield. Specifically, this researcher's objective was to determine how the fighting vehicle evolved; the roles of fighting vehicles of other countries; the possible roles of future fighting vehicles; and what changes are required in organization, design, and/or doctrine to support the role of the fighting vehicle.

The ability of the U. S. Army to operate at a higher tempo than an enemy is fundamental to its war-fighting doctrine. One aspect of an increased tempo is the capability of the armored force to execute its mission. In an effort to increase its capability, the United States Army is under going a modernization of its armored forces. In the last decade, the Abrams tank has replaced the M60, the Bradley Fighting Vehicle has replaced the M113, and numerous supporting systems have been introduced or upgraded within the heavy divisions.

Unfortunately, the rapid modernization has out-paced the doctrine. We still understand the end result: Defeat the enemy. Lamentably, the ways and means to accomplish this task are not so clear. The role of the Abrams tank on the battlefield is unchanged from the M60. Defeat the enemy's tank. The role of the fighting vehicle on the battlefield is where the issue is unclear. Does the fighting vehicle carry the infantryman to the battle, but not participate in it? Does the fighting vehicle destroy the enemy's fighting vehicle? Does the fighting vehicle support the infantryman in his dismounted missions with direct fire? Must the fighting vehicle accomplish all of these tasks? This thesis examines these questions. ✓

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I want to expressly acknowledge the valuable assistance of my thesis committee. The committee chairman, LTC Houser, provided expertise, common sense, and mentorship. He was a calming and steadying influence during the rigors of this endeavor. LTC Mangrum's editorial capabilities significantly enhanced the professional quality of the final product. MAJ Benedict provided expert advise in locating critical resources and provided continuous moral support.

Finally, I want to thank my wife, Dorothy. She kept my morale high throughout this endeavor with constant encouragement, and she assumed many of the family responsibilities as I pursued this academic goal.

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CHAPTER 1

DEFINING THE PROBLEM

SECTION - 1 - INTRODUCTION

Napoleon said that "the strength of an army, like the momentum in mechanics, is estimated by the weight multiplied by the velocity. A rapid march exerts a beneficial moral influence on the army and increases its means of victory."¹ This concept was as responsible for Napoleon's success in battle as was his ability to concentrate his forces against a divided enemy. Without speed of execution, it is impossible to concentrate faster than your opponent.

In the U. S. Army's current doctrine (Airland Battle), speed of execution contributes directly to the tenet agility, and indirectly to the three other tenets: initiative, depth, and synchronization. Therefore, the ability of the U. S. Army to operate at a higher tempo than an enemy is fundamental to its war-fighting doctrine.

One aspect of an increased tempo is the capability of the armored force to execute its mission. In an effort to increase its capability, the United States Army is undergoing a modernization of its armored forces. A quantitative and qualitative modernization of this magnitude has not been seen since the advent of the Second World War. In the last decade, the Abrams tank has replaced the

M60, the Bradley Fighting Vehicle has replaced the M113, and numerous supporting systems have been introduced or upgraded within the heavy divisions.

Unfortunately, the rapid modernization has out-paced the doctrine. We still understand the end result: Defeat the enemy. Lamentably, the ways and means to accomplish this task are not so clear. The role of the Abrams tank on the battlefield is unchanged from the M60. Defeat the enemy's tank. The role of the fighting vehicle on the battlefield is where the issue is unclear. Does the fighting vehicle carry the infantryman to the battle, but not participate in it? Does the fighting vehicle destroy the enemy's fighting vehicle? Does the fighting vehicle support the infantryman in his dismounted missions with direct fire? Must the fighting vehicle accomplish all of these tasks? This thesis examines the role of the fighting vehicle on the Airland battlefield.

SECTION - 2 - BACKGROUND

The first recorded use of fighting vehicles is found in a discussion of the employment of chariots by Sun Tzu.² The Egyptians organized chariot units that possessed considerable shock effect and mobility, but did not normally dismount the riders to fight. A further refinement was taught to the Romans by the Britons. While the

Romans usually dismounted to fight in their highly disciplined infantry formations, British infantry soldiers were carried to battle and occasionally fought in carts. Both of these initiatives combined the mobility of the cavalry with the staying power of the infantry. The great genius/inventor/painter Leonardo da Vinci wrote that he was "... building secure and covered chariots which are invulnerable when they advance with their weapons into the midst of the foe... and behind them the infantry can follow in safety and without opposition."³ By A. D. 1400, the knight and his horse were protected by armored plates.⁴

The first use of fighting vehicles in the U. S. Army was by Lieutenant Frank Baldwin in the Indian Wars. He put a cannon in a wagon and some infantry in the rest of his trains and charged a Cheyenne encampment.⁵ Perhaps he read Sun Tzu. In any case, this paper will not examine the employment of chariots or other systems that are not self-propelled.

Prior to the Great War, all weapon systems came to the battlefield on foot. Heavy weapons such as artillery were pulled by horses or mules, but even those heavy weapons were employed by men standing on the ground. The extreme lethality of artillery and the machine-gun during the First World War led to the development of the first self-propelled fighting vehicle.

In June 1915, a joint naval and military committee in Great Britain designed the first "landships." Designed as an infantry support

system that could withstand the effects of indirect fire fragments and machine gun fire, the first tanks/infantry fighting vehicles were subsequently successfully employed at Cambrai. Despite the success of the "landships," they were regarded by most of the participants as aberrations of a war that saw evenly matched combatants in a stalemate that was not likely to re-occur.⁶

With the exception of a few visionaries such as J. F. C. Fuller and Liddell Hart, the tank and other fighting vehicles were not seriously evaluated for a decade following the armistice. The U. S. Army, for example, did not even include guidance for infantry working with tanks in a doctrinal publication until 1939. In that year's Tactics and Techniques of Infantry, the role of tanks/fighting vehicles was described as "providing a means for advancing infantry weapons under artificial cover, invulnerable to the ordinary effects of rifle and machine gun fire, shrapnel, and shell splinters. . . Their essential mission is to assist the infantry to advance."⁷

The question of the best way to employ armor during the years preceding the Second World War followed two diverging paths. One path, fostered by the newly created Armored Force at Camp Knox, led to the light tank and armored car. Its primary role would be the new armored cavalry. The other path, charted by the Infantry School, led to the development of the medium tank, the heavy tank, and armored vehicles with other roles. Infantrymen were the primary users of these vehicles, and thus the roles of these fighting vehicles were

reminiscent of the infantry's role in combat. The pace of the attack and defense missions in World War Two were not linked to the speed of the tank. Rather it was limited to the pace of the dismounted infantryman.

SECTION - 3 - PURPOSE OF THE THESIS

The requirements of speed, agility, and depth on the Airland battlefield suggest that the historic roles of infantry and their fighting vehicles are not valid. The pace at which operations are conducted will increase. This research proposes that the role of the fighting vehicle on the Airland battlefield is to support the infantrymen with direct fire in their support of the tank and the mounted battle.

Specifically, this researcher's objective is to determine how the fighting vehicle evolved; the roles of fighting vehicles of other countries; the possible roles of future fighting vehicles; and what changes are required in organization, design, and/or doctrine to support the role of the fighting vehicle.

SECTION - 4 - ASSUMPTIONS

To further focus the direction of this research, certain premises must be established and accepted as given in order for this study to proceed. The primary assumption is that the concept of fighting as

combined arms teams will continue to require a mechanized infantry. Regardless of the level of technological development, General Omar Bradley's assertion that "no victory is assured until the man on the ground takes possession by his physical presence on the enemy's soil," will remain valid.⁸ Without this underlying premise, this research would have no foundation.

Secondly, it is assumed that the mechanized infantry will utilize infantry fighting vehicles. Moreover, the Bradley Fighting Vehicle will be the U. S. Army's infantry fighting vehicle to the year 2000 and beyond. The era of the mechanized infantryman riding around in an armored truck is over.

Thirdly, the fighting vehicle is best employed in open/rolling terrain such as is found in central Europe or southwest Asia. Armored vehicles in general are not well suited to employment in close terrain such as is found in jungles, dense forests, mountains, or urban terrain.

Finally, the fighting vehicle is designed to be employed in concert with tanks. Since the experience of employing fighting vehicles with tanks is limited, this research will examine the roles of fighting vehicles in the Second World War to the present in order to provide as wide a base of information as possible.

SECTION - 5 - DEFINITIONS

The Department of Defense publication that is supposed to be the "be-all - end-all" reference for defining terms in the military has four different definitions for tanks, a definition for the Armored Personnel Carrier (APC), and a definition for motorized infantry. Unfortunately, the authors have not defined 'fighting vehicle,' 'mechanized infantry,' nor 'armored infantry.' Therefore, this author has taken the liberty of providing an interpretation of those definitions as follows:

Armored Infantry - Infantry organized and equipped to fight with Infantry Fighting Vehicles (IFV).

Armored Personnel Carrier (APC) - "A lightly armored, highly mobile, full-tracked vehicle, amphibious and air-droppable, used primarily for transporting personnel and their individual equipment during tactical operations."⁹ It does not have the ability to become part of the direct fire battle except in self-defense.

Infantry Fighting Vehicle (IFV) - An armored, highly mobile, full-tracked vehicle which is used primarily as a tactical combat vehicle. It is capable of moving troops across the battlefield under armored protection, and, in addition, having the capability and function of engaging the enemy in a direct fire battle.

Mechanized Infantry - Infantry organized and equipped to fight with APCs.

Tank, main battle - "A tracked vehicle providing mobile firepower and crew protection for offensive combat."¹⁰

SECTION - 6 - LIMITATIONS

Two significant factors limit the research effort. The most significant limitation is the limited combat history of the fighting vehicle. The second limitation is the available material tends to focus at levels of command that do not clearly delineate the role of the vehicle system.

SECTION - 7 - DELIMITATIONS

There will be no attempt to detail all of the fighting vehicles that history has to offer. Specifically, this research will not study any vehicle that is not self-propelled. Nor will this study attempt to project future infantry fighting vehicles beyond the year 2000. This study will not attempt to examine the role of the fighting vehicle in a low intensity conflict. Lastly, this thesis contains no classified material. Classified sources will be reviewed, however, to insure that no significant information is omitted.

SECTION - 8 - SIGNIFICANCE OF THE STUDY

This study will examine one of the most critical responsibilities on the AirLand battlefield: the role of the infantry fighting vehicle. The forty plus years of peace in Europe are directly related to the presence of forward deployed forces. The majority of these forces are infantry and armored divisions that rely on the close cooperation of the fighting vehicle and the tank to provide a credible deterrence to aggression by the Warsaw Pact. If the conventional force is to have any viability, the armor and infantry communities must realize the full potential of the new combined arms team.

ENDNOTES, CHAPTER ONE.

¹U. S. Department of the Army. Quotes for the Military Writer. Washington: The National Service Publishing Company, 1982, 43.

²Sun Tzu. The Art of War. Translated by Samuel B. Griffith. London: Oxford University Press, 1971, 32.

³U. S. Department of the Army. Tactics and Technique of Infantry - Advanced. Washington: The National Service Publishing Company, 1937, 314.

⁴COL Virgil Ney, PhD, U. S. Army Ret., "The Evolution of the Armored Infantry Rifle Squad," Armor, September - October 1963, 42.

⁵Edwin W. Besch, "Infantry Fighting Vehicles: Their Evolution and Significance," The Marine Corps Gazette, (July 1983), 50-60.

⁶John A. English, On Infantry. New York: Praeger, 1984, 31-32.

⁷Tactics and Techniques of Infantry, (1937), 315.

⁸Quotes for the Military Writer, . 35.

⁹JCS Pub 1.

¹⁰*Ibid*.

CHAPTER 2

REVIEW OF LITERATURE

SECTION - 1 - PURPOSE

The purpose of this chapter is to identify the literature which is both relevant and available concerning the thesis subject. The central focus of the study will be the identification of the roles of fighting vehicles throughout history, and an analysis of the validity of the historical role to the modern battlefield. A comparison of the doctrinal manuals to actual combat will provide historical background.

A study of the development of fighting vehicles must include a variety of references. The principal references used to document the combat experiences were primary sources such as manuals, personal monographs, and other narratives. Many secondary sources were used to confirm or expand the viewpoints of the primary source.

In reviewing the literature concerning the role of the fighting vehicle, one must look at four different areas: the doctrine of employment, how the fighting vehicle was actually employed, the roles of other nations' fighting vehicles, and the roles of future fighting vehicles.

SECTION - 2 - DOCTRINE

One of the primary sources of the research is, and must be, in the official doctrinal base. Today, the United States Army packages its doctrine into field manuals (FM) and field circulars (FC). The field circular represents interim information. This information may be incomplete or transitory in nature. The field manual, on the other hand, indicates that concepts have been staffed, and the ideas embodied in the manual are a consensus of opinion.

The field manual is where doctrine is articulated, and it is usually "experience based" information. Therefore, FMs are a base of historic documents that provide a bedrock of doctrine for the tactical employment of fighting vehicles. An examination of Infantry and Armor FMs will highlight the perceived role of the fighting vehicle at the time the manual was written.

The first self-propelled fighting vehicle was employed at the end of World War One (WW I). Since the fighting vehicle concept was relatively new, there was relatively little doctrine written concerning its role prior to its employment. The vehicle was employed according to whatever seemed reasonable for the commander at the time. It will be necessary to review post war analysis of the fighting vehicle employment to have any understanding of its role in the "Great War."

The earliest American manual discussing the employment of fighting vehicles was The Employment of Tanks in Combat. This 1925

publication was virtually a direct translation of the French equivalent. The U. S. experience in WW I with tanks was extremely limited, and the army relied on the far more experienced French to guide their tactics.

This manual and its follow-on editions provided the foundation for the development of the tank until 1931, when Tactics and Technique of Infantry - Advanced was published. For the first time the U. S. Army had a unique concept of how to employ fighting vehicles. Naturally, there was still a strong reliance on the thoughts of the French. After all, during the late twenties and early thirties, the French Army was considered to be the most powerful land power in the world.

Following the German blitzkrieg in 1939, and again in 1942, there was a revision in Tactics and Technique of Infantry - Advanced. The new doctrinaires attempted to incorporate some of the capabilities demonstrated by the Wehrmacht into the new editions of the manual. Unfortunately, the new manuals still left many questions unanswered. The small unit leader, whether he was a tanker or an infantryman was more or less still required to develop his own tactics as he went along - if he wanted to be successful and survive.

When he returned from duty in North Africa, Major General E. N. Harmon provided a great deal of input concerning lessons learned from combat against the Germans. His reports were incorporated into FM 17-36. Employment of Tanks with Infantry. This was the very

first purely American attempt to document, in a manual, combat lessons learned by U. S. soldiers fighting from and with fighting vehicles. As such, it was an excellent, insightful document that outlined just what needed to be done.

FM 17-36 would be the doctrinal source for employment of fighting vehicles as the U. S. Army went to war in Korea. Apparently, it was not widely read. It was necessary for divisions to publish local standard operating procedures for employment of tanks with infantry. Many of the same lessons learned in blood in WW II had to be relearned - at the same high price - in Korea.

Following the Korean conflict, there was a failure to fund research and development for improved versions of the tank, armored personnel carrier, and other ground fighting vehicles. This was effected by a national command authority decision regarding the relative importance of the army, navy, and air force. This resulted in doctrine writers who seemed to regress in their understanding of the employment of fighting vehicles.

FM 7-20, Armored Infantry Units - Platoon, Company, and Battalion written in 1957, was the manual available for the warriors when they went to Southeast Asia in 1965, to fight again. This manual failed to incorporate any of the lessons learned in WW II or Korea. It is little wonder that for the third consecutive time American soldiers went to war unprepared to fight with their armored fighting vehicles. A 1966 publication for tankers (FM 17-15, Tank Units - Platoon,

Company, and Battalion) seemed to only make matters worse. It apparently forgot about the ongoing conflict in Vietnam and prepared leaders for the feared war in Europe. The infantry manual of the time was even worse; it failed to address fighting with tanks at all. It focused on defeating the Viet Cong from the light infantry perspective.

The current manuals have a similar bend in that the tanker and infantryman are studying how to fight as a heavy force, combined arms team in a European or Southwest Asia scenario. FM 7-71, The Mechanized Infantry Platoon and Squad (Bradley), FM 17-15, Tank Platoon, FM 71-1, Tank and Mechanized Infantry Company Team, and FM 71-2, The Tank and Mechanized Infantry Battalion all published since 1986, are the sources of information for all employment of fighting vehicles, and they totally disregard fighting in other scenarios.

The field manuals written for the regular, airborne, and air assault infantryman (FM 7-10 and FM 7-20) are virtual rewrites of the 1957 manuals, but at least they discuss how to fight with tanks. The light infantry manuals, on the other hand, are very limited in discussing how to employ tanks. FM 7-71, The Light Infantry Company, fails to discuss the tank at all. Furthermore, there is no mention of the employment of any other type of fighting vehicle (such as the Bradley Fighting Vehicle). The battalion level manual, FM 7-72, only discusses, in very generic terms, the employment of tank companies operating separately from the light infantry battalion - as if they were alone.

These manuals are significant to this thesis because they are the sources from which the combat leaders prepared themselves before going to war. One of the author's goals is to demonstrate the relevance of doctrinal material to actual employment in combat.

SECTION - 3 - EMPLOYMENT IN COMBAT

There is a significant monograph library that will permit the study of the validity of the tactics outlined in the manuals. It will be possible to review first the doctrine, then compare the doctrine to the actual employment based on the monographs.

Following World War Two, these monographs, based on recent (at the time they were written) combat experience, served to present an accurate picture of how the fighting vehicles were actually employed. By comparing the doctrine to the combat experience this paper will confirm or deny the validity of the early armored force doctrine.

Much the same is true of the Korean conflict. There is a relatively large collection of monographs that illustrate exactly how the fighting vehicles of the period were employed. This makes comparison of the doctrine to the execution relatively easy.

The Vietnam war is somewhat different. For a variety of reasons, monographs of this period tended to be less informative than those of earlier conflicts. Various histories and books are better able

to indicate how the doctrine supported or failed to support the actual employment of fighting vehicles. Although the employment of fighting vehicles was limited in both Korea and Vietnam, there is ample source material to study the employment of the fighting vehicle as a system.

SECTION - 4 - OTHER NATIONS

To preclude a strictly U. S. perspective, the role of fighting vehicles of other nations will be studied by examining a variety of sources. The doctrinal employment of fighting vehicles in their field manual equivalent sources is obviously the ideal place to begin. However, the availability of those references is limited. Secondary sources will be the primary location of information regarding other nations doctrine.

One of the most prolific authors on the subject of armored warfare is Brigadier General Richard E. Simpkin. This retired British officer has secured a reputation as a valuable subject matter expert regarding the theories of tank and infantry fighting vehicle employment. He has summarized the doctrine of the various armies in a number of his works.

Lieutenant Colonel John English, of the Canadian Army, in his book On Infantry, discusses the various nations' doctrine of armored

infantry. He is succinct in his descriptions of the force structure employed at different times throughout modern warfare.

An examination of the actual combat employment of other nations fighting vehicles is also difficult. To best accomplish this task, a study of translated documents, U. S. monographs, and the writings of eye witnesses will contribute to the evaluation of historical accounts of other nations IFV employment. The examination of historical events will validate or invalidate the doctrinal sources.

SECTION - 5 - THE FUTURE

This thesis will also examine the role of future fighting vehicles. The study will focus on the lessons learned to date, and then compare those lessons to the stated requirements documents and the new doctrinal sources such as "AirLand Battle 2000." The primary literature used in this study will be the "Armored Systems Modernization Operational and Organizational Plan" for the future fighting vehicle, and the "Airland Battle - Future (Heavy)" document. This study will attempt to show what these documents portend for the future of fighting vehicles.

SECTION - 6 - SUMMARY

The literature reviewed during the research of this study was extensive and varied. To categorize the information into more manageable portions, it was necessary to divide it into several main subject areas. Each of these subject areas had complete sources and not so complete sources. The author has attempted to reap the greatest possible information from a source without the resulting problem of over-reliance on any particular reference.

In addition to the primary sources identified in the foregoing sections, the author has reviewed a large number of secondary sources to achieve a greater breadth of knowledge. The books that have assisted the most in achieving a greater understanding are the classics in the subject area.

LTC John A. English's books, On Infantry and The Mechanized Battlefield provided the author with tremendous insight regarding the development of the concept of infantry fighting with tanks. Certainly the same can be said about Richard E. Simpkin's book Mechanized Infantry. Although this paper could have been completed without reading these books, to do so would have been negligent.

CHAPTER 3

RESEARCH METHODOLOGY

SECTION - 1 - PURPOSE

The purpose of this chapter is to clarify the methodology used to study the literature outlined in the previous chapter. By understanding the author's concept of operation for the research, the reader will gain a more complete picture of how the conclusions have been reached. The central focus of the study is the identification of the roles of fighting vehicles throughout history, and an analysis of the validity of the historical role to the modern battlefield.

SECTION - 2 - METHODOLOGY

The primary method of collection will be the review of published material. Due to the rapid rate this doctrine is evolving, interviews with government sources may be required to ensure the most current data is obtained.

The literature reviewed for this study is both extensive and varied. To categorize the information, it was necessary to divide it into more manageable portions. Consequently, this writer has developed the following sections to manage the research.

SECTION - 3 - RESEARCH CATEGORIES

1. Historic Development of Fighting Vehicles.

- a. The introduction of the armored vehicle to the WW I battlefield (Chapter One).**
- b. The diverging roles of the tank and other armored vehicles during World War Two (Chapter Four).**
- c. The employment of fighting vehicles in Korea (Chapter Five).**
 - 1. The employment of tanks.**
 - 2. The employment of other fighting vehicles.**
- d. The employment of fighting vehicles in Vietnam (Chapter Five).**
 - 1. The employment of tanks.**
 - 2. The employment of other fighting vehicles.**
- e. The employment of fighting vehicles in the Arab - Israeli wars (Chapter Six).**

2. Roles of Other Nations' Fighting Vehicles.

- a. From the 1920s to the role of the MARDER in the Bundeswehr.**
- b. From the 1920s to the role of the BMP in the Soviet Army.**
- c. From 1914 to the role of the AMX-VC1 in the French Army.**

d. From 1914 to the role of the FV-432 in the British Army.

3. The Role of Current and Future Fighting Vehicles (Chapter Six).

a. The role of the Bradley Fighting Vehicle.

b. The role of the BFV as employed at the National Training Center (NTC).

c. The role of future fighting vehicles.

4. Conclusions (Chapter Seven).

a. Combined Arms.

b. Firepower.

c. Maneuver.

d. Protection.

SECTION - 4 - SUMMARY

This breakdown into categories, not only facilitates development of an orderly methodology, but it provides an historical perspective on how the fighting vehicle evolved to its current state, and the relation of its history to its future. In addition, the categories provide a perspective on how the role of the fighting vehicle developed within the various nations. Many resources discuss subjects that are relevant to more than one category. These will be

discussed as they occur, or when ever seems most appropriate for clarity.

CHAPTER 4

THE FIGHTING VEHICLE IN WORLD WAR TWO

SECTION - 1 - THE OTHER NATIONS

During the years between World War One and World War Two, several nations studied the possible ways to employ the new armored vehicle on the battlefield. Although every nation ultimately employed its armor in approximately the same way, it is informative to take a brief look at the concepts evolving in Great Britain, the Soviet Union, and Germany before beginning a more detailed evaluation of the United States Army.

The British tested the concept of fighting with mixed tank and infantry battalions, but the idea of the tank fighting alone seemed to be the most satisfactory because it wouldn't be tied to the rate of march of the infantryman.¹ Furthermore, J. F. C. Fuller continued to espouse his 'Plan 1919' as the ideal way to employ armored vehicles. His goal was to defeat the enemy with a 'pistol shot to the brain' of enemy headquarters. Unfortunately, Great Britain lost its lead in the development of fighting vehicles as traditionalism, inter-service jealousies, and fiscal restraints prohibited the maturation of British armor.²

In the mid-twenties, the Soviet Union began to study the future of armored forces, and, in fact, the Russians may have been the first to

consider how to best employ combined infantry and armor forces. The Soviets developed offensive doctrine as a means of spreading the political doctrine. Marshall Mikhail Tukhachevski developed a concept of 'Deep Battle' that employed all arms of the army in concert. The tank would provide direct fire support for the infantry during the creation of a penetration, and then, once the defense was penetrated, the infantry would ride on the tanks as they attacked enemy supplies, headquarters, etc.³ Their progress suffered a serious setback in Stalin's purges of the military during the late thirties. Stalin even executed Marshall Tukhachevski. Of course, the Soviets still managed to develop the T-34 which was recognized as the best mass produced tank of WW II.⁴

While the rest of the world ignored or debated the utility of armored forces, the Germans did something. "Despite the restrictions of the Versailles Treaty, the 1921 German regulation on Command and Combat of the Combined Arms included not only the infantry assault battalion and the carefully planned artillery and preparations of 1918, but also close air support, gas warfare, and tanks in an infantry support role."⁵ General Ludwig Beck, Chief of the German General Staff in 1937, planned to gradually motorize the infantry as materiel became available. The first step was to issue each infantry division its own detachment of fully tracked armored fighting vehicles to provide the infantry with direct fire artillery support.⁶ They were unable to motorize the entire army due to the rapid expansion directed by

Hitler. Therefore, Beck focused the the motorized effort in the Panzer divisions, motorized cavalry, motorized infantry, and special equipment such as heavy artillery.⁷

The German general staff published an article in 1938, that called for the employment of combined arms to prosecute war against fortified zones in depth. The article stated that tanks must be used in mass, and accurately predicted that without the use of infantry the tanks would be lost.⁸

After the invasion of France, the Germans saw that the infantry had difficulty in breaking through enemy positions and pursuing because it had so few vehicles. Thus they concluded that the infantry divisions required better weapons and more motorized vehicles. During the fighting in Russia, the same observations were made. Fortunately for the Allies, the Germans were never able to equip their army in the way they wanted.⁹

SECTION - 2 - THE U. S. ARMY BEFORE THE WAR

In the United States Army, the tank and other fighting vehicles only received a cursory examination during the inter-war years. The National Defense Act of 1920 placed tanks under infantry control, and tanks continued as infantry-support weapons.¹⁰ Although there were proponents of armored warfare, there were as many proponents of horse cavalry. It was not until 1929, that the U. S. Army began to

organize a mechanized force. At that time, General Charles P. Summerall, the Army Chief of Staff, said,

Organize a mechanized force. Give it airplanes and fast reconnaissance vehicles for eyes and ears, mobile artillery support and troops in mobile carriers to consolidate positions and hold the ground the tank has gained through assault, and you have a balanced mechanized force.¹¹

This was the first clear articulation of the requirement for the infantry to ride in an armored vehicle. The 7th Cavalry Brigade was organized along those lines in 1932. Unfortunately, the U. S. did little but talk about any significant mechanization until much later. When armored forces finally came into being, they did so in the same rush as the rest of the American Army which would fight in the Second World War.¹²

General Leslie McNair, commander of the Army Ground Forces, was instrumental in designing the division structures which would fight in WW II. He conceived the idea of armored divisions and the concept of General Headquarters Tank Battalions (to support infantry divisions). McNair believed in the tank as an exploitation device. He also believed the opportunities for exploitation would be limited. Consequently, he planned for fewer armored divisions and more GHQ battalions.¹³

The first armored division was formed from the 7th Cavalry Brigade and the infantry's Motorized Tank Brigade in May of 1940.¹⁴

The second division was formed in July. The two armored divisions were tested in the Louisiana maneuvers in September 1941. These maneuvers, focused on the available doctrine, were not able to demonstrate a need for any change in the employment of the tank or the infantry.

SECTION - 3 - U. S. DOCTRINE

The U. S. Army's experience during the 'Great War' influenced the doctrine of the inter-war years. The concept of infantry advancing to engage and destroy the enemy by "physical encounter" was the accepted way of doing business. The infantry was to be supported by the tank. "The general principle governing the allotment of tanks is that [the tanks] should be attached to the infantry making the main blow. . . . The tanks direct their fire against the hostile elements most dangerous to the riflemen. . . and stop the hostile fire."¹⁵

The next discussion of the role of fighting vehicles, in relation to infantry, was not found until it appeared in the 1942 edition of the Tactics and Techniques of Infantry - Advanced. In this manual, tanks were defined as "... infantry armored and track-laying vehicles designed for actual combat."¹⁶ The role of tanks had previously been defined in 1939, as "... tanks assist the infantry advance by overcoming or neutralizing hostile small arms fire and by crushing barbed wire entanglements."¹⁷ By 1942, this had evolved to:

The original mission of World-War tank units was to assist in the progression of the infantry by overcoming or neutralizing resistance or breaking down obstacles that checked the infantry advance. Today, small-arms fire and wire obstacles are available to the defense in greater volume than ever before. Accordingly, the normal mission for tank units remains unchanged - generally, to overcome the hostile resistance in specified zones in order that infantry elements may pass over or occupy them.¹⁸

The role of the half-track as anything other than as an armored truck was not discussed. The employment of the tank was not discussed until the 1942 manual. There it stated that tanks should be commanded by the infantry unit commanders. The majority of the tanks should be allotted to the unit engaged in the main effort. While tank units operating with assault echelons of infantry units assist in getting the attack underway, there must be fresh tank units, as well as infantry units, available to drive home the attack and to exploit success. Tanks should be committed to action only when their use is essential to the infantry in gaining the decisive objective. Tanks normally attack in two echelons disposed in depth. The lead echelon, which may be composed of medium tanks, advances closely behind the supporting fire of artillery and heavy infantry weapons. These tanks, with the support of the other weapons, have the mission of neutralizing or destroying the hostile anti-tank guns. They move on their objective as soon as the artillery fires lift. They maintain

neutralization by their own fire power and shock action. The second echelon has the accompanying tanks that break into the hostile positions with the infantry.¹⁹

The pre-war doctrine discussed the half-track as the means of protecting and transporting the infantryman as he moved with the tank in the exploitation phase of an attack. It identified the tank as the principal direct fire support weapon of the infantryman as he attacked fortified positions. General McNair's position that exploitation would be a rare event established the tank as the infantry's fighting vehicle in WW II.²⁰

This was the doctrine that was available for the American infantry and tank unit leaders who were preparing to go to war. The rapid expansion of the United States Armed Forces during this period required the citizen soldier to be the executor of mechanized warfare at the company/platoon level. It is reasonable to assume that these novice leaders studied this doctrine and planned to fight in this manner.

SECTION - 4 - OPERATIONS IN NORTH AFRICA

In November of 1942, the 1st Armored Division (AD) participated in "Operation Torch," the invasion of North Africa. After their successful landings near Algiers, the division turned toward Tunis. By January 1943, the logistics situation forced the allies to

assume an essentially defensive posture. Specifically, they were to hold the mountain passes in the Eastern Dorsales and prevent a link-up between the two axis armies (one in Tunis and one coming back from El Alamein).

The 1st AD was assigned piecemeal throughout II Corps area. MG Floyd R. Fredendahl, the II Corps commander, did most of the damage himself. Combat Command (CC) A was the main force left to MG Orlando Ward, the division commander. CC A was defending forward at Sidi Bou Zid and astride the critical Faid Pass. This was one of the focal points of the German counter-offensive.

General Juergen von Arnim's plan was to attack through the Faid Pass and Sidi Bou Zid to Sbeitla and the Kasserine Pass. After defeating the French in Faid Pass, the Americans were next. CC A was poorly deployed. As a result of MG Fredendahl's specific orders, the various units were not mutually supporting, and on the 14th of February, the elements of CC A were rapidly destroyed or bypassed. The 1st Battalion, 6th Armored Infantry Battalion was hard pressed. There were seven enemy tanks on the Company A left flank, and there were an unknown number of tanks on the company's right flank. The enemy infantry infiltrated between platoon positions, and the third platoon was cut off. Repeated counter-attacks by half-tracks (kept in a vehicle park to the rear) temporarily relieved the situation, but, at the end of the battle, only one man returned from third platoon of Company A.²¹

Von Arnim's two divisions procrastinated in Sidi Bou Zid. This afforded II Corps a chance for a counterattack. MG Ward was ordered to "... concentrate on clearing up the situation there and destroying the enemy."²² Ward ordered Colonel Robert Stack to counter-attack with CC C.

This force will move south and by fire and maneuver destroy the enemy armored forces which have threatened our hold on the Sbeitla area. It will so conduct its maneuver as to aid in the withdrawal of our forces in the vicinity of Djebel Kasira [a surrounded battalion near Faid Pass].²³

For this attack CC C "would consist of 2/1st AR, the 3/6th Armored Infantry, G/3/13th AR, and supporting artillery, tank destroyers."²⁴ They faced the 10th Panzer Division and the 21st Panzer Division. This was not the attacker to defender ratio that the Command and General Staff College at Fort Leavenworth would have recommended.

Colonel Stack believed that it was necessary for his command to push through Sidi Bou Zid to reach the encircled forces at Djebel Kasira. Consequently, his plan was to move mounted the thirteen miles from his line of departure to his objective area. He deployed the command by leading with 2nd Battalion, 1st Armored Regiment Battalion Combat Team (BCT), followed by the 68th Armored Field Artillery (AFA), 3rd Battalion, 6th Armored Infantry Regiment BCT

(riding in half-tracks), and G Company, 3rd Battalion, 13th Armored Regiment as the CC reserve. His tank destroyers were positioned on the wings of the lead battalion. He had no supporting artillery (other than his own), and the only air cover he had were five sorties that failed to contribute to the battle. To make a bad situation worse, he positioned his command post (CP) on a hill where he could 'watch' the entire battle, and he placed the tank battalion commander in charge of the attack.²⁵

The attack started late, but it was in parade ground formation. It became a disaster. The Germans' reconnaissance saw the Americans coming. The Luftwaffe's air strikes interdicted CC C as it squeezed through choke points in the wadis. The German commander placed an anti-tank company in a blocking position. When the Americans were within range, German artillery joined the battle. As the harassed attack crossed the last wadi, the lead tanks engaged the blocking force. All of their attention was focused on the identified enemy positions. Then the Germans administered the coup de grace with counter-attacks from the flanks. Combat Command C was defeated and retreated. "It was the most ghastly armored melee that [had] occurred so far in Tunisia."²⁶

The attack had followed current doctrine in that the tanks were leading, seeking out the anti-tank weapons, and the infantry was following. However, the infantry were actually separated from the tanks. The infantry could not come forward fast enough to dismount

and clear the anti-tank positions, and their direct fire weapons were not positioned to contribute to the battle during the movement. The tactics, born of stateside training and pre-war doctrine, were simply not adequate for the African Theater.

SECTION - 5 - EVOLVING DOCTRINE

As the war progressed, lessons were learned about the roles of the fighting vehicle. The tank remained the infantry's principal fighting vehicle. The half-track became merely an armored truck. Major General E. N. Harmon discussed the half-track ambivalently. He suggested added protection on the floor to protect the crew from mines, better protection for the radiator, and the addition of a .30 caliber machine gun for self-defense. He also discussed infantry-tank cooperation in some detail. One interesting observation was that medium tanks should comprise "... the assault punch and attach light tanks to the infantry. . . ."27 This is the first known recommendation for a fighting vehicle for the infantry - other than the main battle tank.

Many of MG Harmon's other recommendations were incorporated into a new Field Manual. FM 17-36 (Tentative). Employment of Tanks with Infantry, was published in February 1944, with the final draft being published a month later. These FMs reflected many of the new ways of integrating fighting vehicles and

infantrymen. The first few pages of the manual articulate the concepts that are clarified within the later text. "Success in battle can be assured only when there is a complete cooperation of all arms. . ."²⁸ The manual stated that anti-tank guns provide the best means of protection against enemy tanks and should closely follow infantry and tanks. It went on to state that the artillery fire did not need to lift until it endangered the infantry. Tanks operating with infantry could best assist the infantry in destroying the enemy, and in gaining ground, by aggressive offensive action. In general, the best advantage would be gained when the infantry and tanks were closely associated; when tanks were used to take out enemy infantry and automatic weapons, while the infantry would eliminate enemy anti-tank guns and clear paths through anti-tank mines. It is not stated, but one would think the author had been at Sidi Bou Zid.

For the first time, the new manuals examined the differing roles of tanks during marches, offensive and defensive actions. During a march, tanks would be placed in the "... column in the order in which they are expected to be committed to action. . . . If combat be considered remote, [infantry rides in trucks and] tanks are moved so as to interfere least with the movement of other troops."²⁹

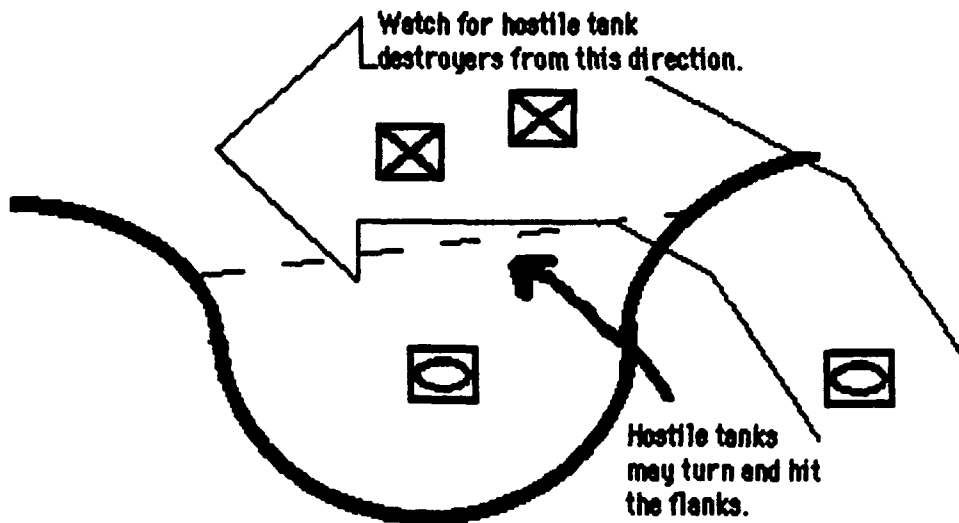
In the chapter about the offense, one is informed that tanks assist infantry by:

- a. Neutralizing or destroying hostile automatic weapons likely to hold up the infantry advance.

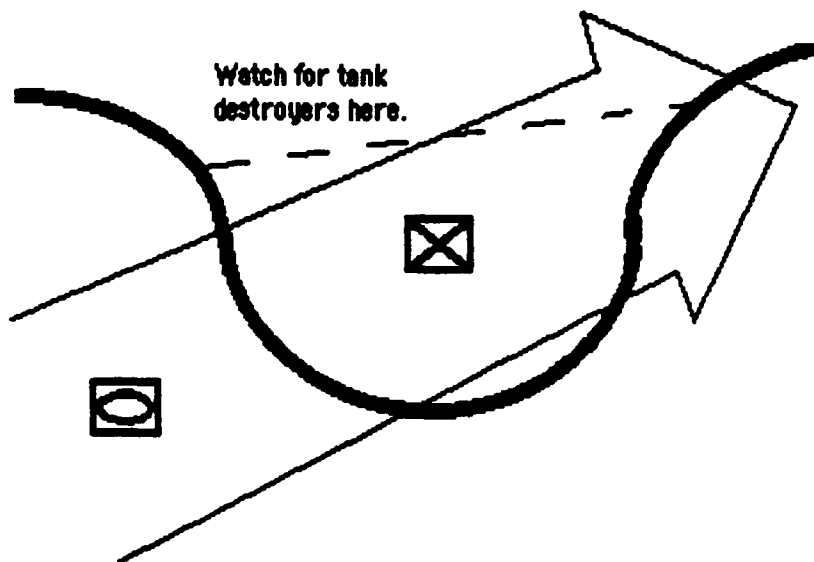
- b. Neutralizing the objective until the arrival of the infantry.
- c. Neutralizing or destroying hostile reserves and artillery.
- d. Destroying or disrupting command, communications, and supply installations.
- e. Breaking up counter-attacks.
- f. Supporting infantry attack by fire.
- g. Making paths through wire and similar obstacles.³⁰

This chapter continues by discussing the situations when tanks would lead the attack and when infantry would lead. In every situation described, the infantry is walking during the assault, and they are supported by the direct fire of the tanks when they are committed to action. All of the "attack plays" suggested that the ideal place for the assault was the enemy's flank.³¹

The role of the tank in the defense "... is to counter-attack in conjunction with other troops."³² The tanks were to be prepared to eject an enemy who had succeeded in penetrating the position or to destroy the enemy while he was forming for an attack. Tanks could be given secondary missions of supporting by direct or indirect fire methods. In infrequent cases tanks could be used in hull down positions to assist infantry in holding a position. The following illustrations clearly indicate the tank mission in the counter-attack was to destroy the enemy infantry and leave the enemy tanks to the infantry.



If hostile tanks attack first, destroy following infantry.



If hostile infantry attacks first, hit front and rear waves at once from a flank.

Do not counter-attack head on against a hostile tank attack. Attack and destroy the following infantry.³³

SECTION - 6 - OFFENSIVE OPERATIONS IN EUROPE

The Army entered Italy fighting with the battlefield lessons learned. The first opportunity for the readers of FM 17-36 to practice what they had studied was in Normandy. Following the 6 June 1944 invasion, the expansion of the beach head went slowly. The combined arms commanders were faced with terrain that was unfavorable for tanks (hedgerows). Doctrine called for infantry to lead the assault with an infantry pure wave to seize the objective and neutralize anti-tank guns. A primarily tank wave (with some infantry) would support the first wave with direct fire. A third wave, equally composed of infantry and tanks, would follow with several contingency missions.³⁴

The hedgerows were ideally suited for defense. The vegetation and earth compartmentalized the terrain. This precluded envelopment. The hedgerows also offered protection from observation, direct fire, and indirect fire. The Germans took full advantage of this terrain to delay the allied breakout from Normandy. Machine guns were the primary weapons of the defense. They covered all of the natural breaks in the hedgerows as well as the open fields between the rows of vegetation.³⁵

The eventual success in the breakout from the Normandy beachhead required a technical solution to breaching the physical obstacle presented by the hedgerows. However, there were tactical

solutions to the hedgerow problem as well. The 29th Infantry Division's solution was an infantry assault with direct fire support by tanks to eliminate the German machine guns. The 83rd Infantry Division employed a tank/infantry assault with tanks in support to deliver direct fire. The tanks were to suppress the enemy machine guns, and the infantry was to provide local security for the tanks. The 3rd AD developed a similar concept. The primary difference was an attempt to bypass some enemy positions and envelop the defenders or force them to withdraw.³⁶

Perhaps the most important new tactical technique employed by Americans in Normandy was "the Russian style" used first by the 2nd Armored Division. The division was assigned a rapid exploitation mission for the breakout that called for three waves. The first echelon consisted solely of tanks, relying on its own mobility and firepower, along with supporting artillery, to eliminate enemy positions. A second wave of tanks and infantry closely followed the lead elements. Eight infantrymen rode on the back deck of each Sherman tank in the second wave. The infantry had two main purposes: provide tanks in the second wave with local security, and whenever the tanks in the first wave encountered stiff resistance, the infantry would dismount and work with the lead tanks to conduct a coordinated combined arms attack. The third echelon also consisted of tanks and infantry, and it had the mission of eliminating positions bypassed or not detected by the leading elements.³⁷

One finds the same doctrine outlined in FM 17-36 when tanks lead, but the Field Manual's implication was that the operation would be conducted at 3 miles per hour (the speed of a walking infantryman). The 2nd AD had modified FM 17-36 by providing the infantry a means to move as fast as their fighting vehicles and simultaneously protect them. This innovation was necessary to get the infantryman where he needed to be when he needed to be there. It would become the modus operandi for armored forces in the European Theater of Operations.

Although this method of carrying infantrymen to battle was widely used, it was not the ideal way to go into battle. Although a company commander from the 4th ID called the use of tanks as personnel carriers "indispensable," he described a variety of problems. Riding on the outside of the tank exposed the infantry to the effects of small arms fire, and the infantrymen were forced to dismount when they were in the middle of a fire fight with no place to hide. Furthermore, there was no good way to communicate with the tankers once they were forced to the ground. Clearly the infantry was in need of a vehicle that could protect them while they were moving with tanks. The half-track was not the answer.³⁸

Despite its limitations, the 4th AD used this technique extensively. During a twenty-eight hour period on the 15th and 16th of August 1944, CC A attacked 225 miles.³⁹ Moreover, during the period 28 July to 31 August 1944, the division attacked 1057 combat

miles.⁴⁰ This was an average of 31 miles a day for more than a month. The infantryman could not keep up without a vehicle to ride on.

Several other fighting vehicle/infantry relationships evolved on the battlefield. When tanks were not available, assault guns and tank destroyers assumed the direct fire support role for the infantry. This was usually found only in the defense and/or when tanks were not available. The tank remained the preferred vehicle due to its ability to withstand indirect and direct fire. Since the preponderance of all types of armored vehicles were in the armored divisions, it was unusual not to have tanks around to support the armored infantry.

Tanks even performed the fire support role in places where they were not supposed to be useful. For example, although FM 17-36 specifically mentions that tanks are not suited for urban environments, combat experience proved that clearing a city with a combined arms team was effective.

On 16 August 1944, the commander of the 10th Armored Infantry Battalion planned to attack the village of Ormes, France, with a squad of engineers accompanying a platoon of infantry and a platoon of tanks. Each combined arms team attacked down opposite sides of the street. The elements on the left side of the street fired into the buildings over the heads of the elements on the right side of the street while the elements on the right side reversed the process."⁴¹

This combination of tanks and infantry was used again by the 4th Armored Division and CC A when they cleared the village of Troyes. In this attack, the task force first had to attack across three and one half miles of open ground to reach the town. The attack began at 1700 on the 24th of August with "... one medium tank company leading and two infantry companies following closely [in half-tracks]. . . " and supported by "... all the artillery of the command."⁴² Once they crossed the open ground and breached a tank ditch, they cleared the city with the same technique as was described above.

The attack was very successful. The CC captured the center of the town and a bridge across the Seine River Canal by 1830. Only one half-track was lost in the assault. Among the division's lessons learned from this attack were security for an armored force was achieved through speed and to attack cities with a balanced force of infantry, armor, and engineers. A final lesson learned that would surprise most tankers was that the primary weapon on the tank was the machine gun. This statement clearly supports the concept of the fighting vehicle's roles of transporting the infantry safely across open terrain and supporting the infantry with direct fire. Unfortunately, it required two vehicles to do it.⁴³

This idea was reinforced by the description of the fighting at Baerendorf, France. After seizing a hill to guard its flank, Task Force East, CC B, 4th AD, attacked the town. Artillery and mortar fire landed

in the town while the tanks "... covered the approaches to the town with a cris[s]-cross of [machine gun] tracers. The infantry preceding the tanks. . . " into the town (the half-tracks followed later).⁴⁴

SECTION - 7 - DEFENSIVE OPERATIONS IN EUROPE

All of these examples of tank - infantry cooperation occur in the offense. There is little to be found regarding the employment of fighting vehicles in the defense. Perhaps the most obvious example is the defense of St. Vith, the turning point in the Battle of the Bulge.

The German plan for the Ardennes counter-offensive was calculated to strike the allied line in a relatively quiet sector and to drive on to Antwerp and Brussels before the allies could react. This would prevent the allies use of the port facilities in those cities and provide time for the development of the jet airplane and other super weapons. On 16 December 1944, the Germans attacked with 17 divisions.⁴⁵

As the offensive developed, it became obvious that the Germans were converging on St. Vith and the road/rail network there. The 7th AD, located near Heerlen in Holland, was ordered to counter-attack to relieve the beleaguered and surrounded 106th Infantry Division defenders. Combat Command B, commanded by Brigadier General Bruce C. Clarke led the way.

After a road march of 60 - 70 miles, CC B arrived too late to relieve the surrounded elements of the 106th ID. Their orders were changed to defend the city. Clarke employed most of his armored infantry and cavalry as the principal defenders, and he kept the 31st Tank Battalion (-) and 23rd Armored Infantry Battalion (-) in reserve to counter-attack where needed. This is exactly what the doctrine in FM 17-36 suggested the solution to be. The defense was actually a piece-mealed affair. Units were thrown into the line as they completed the road march; each arriving unit pushed out until it made contact and dug in there.⁴⁶

The actual fighting saw the counter-attack force employed often to destroy enemy penetrations of the defense. However, the principal targets of the tanks were not enemy tanks. Enemy tanks were usually destroyed by anti-tank weapons such as tank destroyers and bazookas. Tanks principally killed enemy infantrymen. On 19 December 1944, one sees the employment of more than one fighting vehicle in the defense. "Two night attacks were launched against CC B's northern flank with infantry and tanks. . . . Both attacks were repulsed by the combined fires of the tanks of the 31st Tank Battalion and of armored cars and assault guns of the 87th Cavalry Reconnaissance Squadron."⁴⁷

SECTION - 8 - SUMMARY

The infantry assault doctrine of pre-WW II... was not adequate in combat, and it [evolved to] tanks... habitually assigned to all sizable infantry formations.... In any case, the tanks took on centers of resistance while the infantry took on the AT weapons."⁴⁸ Half-tracks or tanks provided the mobility required by armored infantry, and tanks supported the infantry with direct fire. That is how the fighting vehicles were actually employed during the Second World War.

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- ³*Ibid.*, 65.
- ⁴Simpkin, 15.
- ⁵Germany, Ministry of National Defense. Command and Combat of the Combined Arms. (1921-23). Translated by U. S. Army General Service School. Ft Leavenworth, KS, 1925, 23-24.
- ⁶Samuel J. Lewis, Forgotten Legions. New York: Praeger Publishers, 1985, 51.
- ⁷*Ibid.*, 53.
- ⁸*Ibid.*, 55.
- ⁹*Ibid.*, 109-112, 144.
- ¹⁰George Hoffman, "The Demise of the U. S. Tank Corps and the Medium Tank Development Program." Military Affairs. (Feb 1973), 20.
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- ¹⁴*Ibid.*, 464.
- ¹⁵U. S. Army General Service School. The Employment of Tanks in Combat. Ft. Leavenworth, KS: The General Service School Press, 1925, 12-19.
- ¹⁶U. S. Department of the Army. Tactics and Technique of Infantry - Advanced. Washington: The National Service Publishing Company, 1942, 315.
- ¹⁷U. S. Department of the Army. Tactics and Technique of Infantry - Advanced. Washington: The National Service Publishing Company, 1939, 171.
- ¹⁸TTL, 1942, 335.
- ¹⁹*Ibid.*, 334-336.
- ²⁰Weigley, 465-66.
- ²¹Morning Report, 14 FEB 43, 1st Battalion, 6th Armored Infantry Regiment, Combat Command 'A', 1st Armored Division.
- ²²CPT William R. Betson, USA. "Sidi-Bou-Zid - A Case History of Failure." Armor. (November - December 1982), 42.
- ²³BG Paul M. Robinett, USA. "The Axis Offensive in Central Tunisia - February 1943." Armor. (May - June 1954), 11.
- ²⁴Betson, 42.
- ²⁵Robinett, 11. According to LTC Paul Davis, UK exchange officer to the USAIS, the British Army conducts tank/infantry combined arms attacks with the tank

element commander in charge during the movement and the infantry element commander in charge during the assault.

²⁶David Nichols, ed. Ernie's War - The Best of Ernie Pyle's World War II Dispatches. New York: Random House, 1986, 97.

²⁷E. N. Harmon, MG, USA. "Notes on Combat Experience During the Tunisian and African Campaigns." Manuscript of address to the Armor Career Course. Fort Knox, Kentucky in 1944.

²⁸U. S. Department of the Army. FM 17-36, Employment of Tanks with Infantry. Washington: The United States Government Printing Office, 13 MAR 44, 1-2.

²⁹*Ibid.*, 20.

³⁰*Ibid.*, 26.

³¹*Ibid.*, 52-54.

³²*Ibid.*, 66.

³³*Ibid.*, 68.

³⁴*Ibid.*, 59-60.

³⁵Michael D. Doubler, CPT, USA. "Busting the Bocage: American Combined Arms Operations in France, 6 June-31 July 1944." Fort Leavenworth, KS: U. S. Command and General Staff College, 1988, 21-26.

³⁶*Ibid.*, 34, 41, 49-50, 51-53.

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³⁸Lawson W. Magruder, Jr., MAJ, USA. "The Operations of Company G, 22nd Infantry (4th Infantry Division) in the St. Lo Breakthrough 31 July - 1 August 1944. Personal Monograph presented to the Advanced Infantry Officers Course, 1949-1950, 26-27.

³⁹Hal C. Pattison, LTC, USA. "The Operations of Combat Command A, 4th Armored Division From the Normandy Beachhead to the Meuse River, 28 July to 31 August 1944." Fort Leavenworth, KS: U. S. Command and General Staff College, 1947, 22.

⁴⁰*Ibid.*, 43.

⁴¹*Ibid.*, 22.

⁴²*Ibid.*, 30.

⁴³*Ibid.*, 43-45.

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CHAPTER 5

THE FIGHTING VEHICLE FROM WW II THROUGH THE SIXTIES

SECTION - 1 - OTHER NATIONS' DOCTRINE

The employment of fighting vehicles subsequent to World War Two again followed two diverging paths. On one hand were the tank purists who called armor the "combat arm of decision." The tank was known to be the best weapon against other tanks, and virtually every country planned to employ tanks to defeat enemy tanks. However, the other school of thought realized one of the most pressing needs was still an armored fighting vehicle to support the infantry with direct fire. Despite a strong developmental effort, most countries were fiscally restrained from fielding a true infantry fighting vehicle. For the most part, the tank continued to have the infantry support role for the next twenty years.

The French were the victims of the German Army's armored blitzkrieg. From their observations of the Wehrmacht, they identified the need for an infantry fighting vehicle (IFV), and began developing an IFV right after the war. Due to various political and fiscal constraints, however, they did not build an IFV until the mid-fifties.

The AMX-VTT (Vehicule Transport de Troupe) was probably the world's first modern infantry fighting vehicle. It was fully tracked, so it could travel where ever the tank went. For the new

horrors of war, it offered chemical, biological, and nuclear protection for twelve infantrymen and a driver. The three hundred and sixty degrees of 15 to 30mm of armor shielded the men from artillery fragments and small arms fire.

Most significantly, their infantrymen could fight with the vehicle. It had firing ports for the infantry in the sides of the vehicle and in the rear. This enabled the infantry to protect the tank from anti-tank gunners while moving protected on the battlefield. Furthermore, the vehicle had either a turret-mounted 7.5mm machine gun or a .50 caliber machine gun that could be fired from the safety of the vehicle. Appropriately, the French redesignated the vehicle as the AMX-VC1 (Vehicule de Combat d'Infanterie).¹

The Germans were prohibited from having an army following WW II, but their minds were unrestrained. They recognized the main armor deficiency on the Eastern Front was a reliance on too many wheeled vehicles. Wheeled vehicles simply could not move with the tanks on the marshy open terrain in Russia, and being road bound made the armored cars and trucks subject to air attack. The roads were often churned up by the passage of too many vehicles. The Panzers were left to do battle at infantry speed or to do it without their Panzer-grenadiers. They recognized the need for infantry to have full-tracked combat vehicles suited for mounted action. Consequently, the Germans planned to have fully armored units when they finally were permitted to rearm.²

When the West German Bundeswehr began to rebuild, one of its priorities was an infantry fighting vehicle. The Schutzenpanzer 12-3 (Spz 12-3) production was completed in 1962. The Spz 12-3 mounted a 20mm gun and a 7.62mm machine gun in a rotating turret. Its front and side armor protection was similar to the AMX-VCI. The vehicle had several shortcomings. The infantryman had to ride in an open hatch position to fire while moving. The men would be exposed to the full effects of small arms fire and artillery. Worse, they had to climb out through the top to dismount from the vehicle.³

The British recognized the requirements of the nuclear age on the battlefield. They thought that the conventional forces would have to be able to fight in a nuclear environment. Therefore, the soldiers had to be protected. They had a great deal of faith in their armored brigades to operate in this type of environment. The brigade was designed to have armored infantry and tanks, and it was finally equipped with self-propelled artillery and armored anti-tank guns (the Charioteer) to afford those units the required mobility and protection.

The armored brigade's principal fighting vehicle was the Centurian tank (later the Conqueror). It was designed to kill other tanks. The division's cavalry used the relatively useless Saladin armored car. The infantry brigade was increased to four battalions. The British intended to field an infantry vehicle with the same armor as the tank. However, money problems prevailed, and the

infantryman still depended on the truck as his means of moving with the tank. This resulted in the tank still being required to provide the direct fire support for the British infantryman (in addition to its anti-tank role), and the tank was still tied to the pace of the infantryman. Later, the British used the armored car (the Saracen) as a throw away for the mechanized infantryman to ride in.⁴ This is the best illustration of the impact of the tank purist branch on the post-war development of armored fighting vehicles.

The Soviet Union's policy following WW II was to modernize its conventional forces. They had been impressed with the capability of the German Panzer divisions. They had seen how well their own partially armored divisions had fared, and they strived to achieve fully armored divisions to increase that capability.⁵

In late 1945, the Soviets were the first to build a new vehicle for their infantry. They built the BTR-152, their first Armored Personnel Carrier (APC).⁶ It was really just an open-topped armored truck on a six wheeled chassis. It wasn't until the sixties when the Soviets built the BTR60PA and PB that they had a fully enclosed armored vehicle with a turreted machine gun to support the infantry.⁷

The Soviets recognized the requirement for the infantry to keep up with the tank in a protected vehicle. Furthermore, they identified the need for a protected direct fire weapon mounted on the vehicle to support the infantry. Lastly, the Soviets realized the necessity to fight

protected from their infantry fighting vehicle, and their developmental efforts culminated when they built the BMP.

SECTION - 2 - U. S. DOCTRINE IN 1950

The doctrine writers of the late 1940s seemed to be in no hurry to document the lessons learned in World War Two. There were no new manuals written about armored infantry or infantry working with tanks prior to the beginning of the Korean War. The young leader had to make do with the hastily written and published manuals from 1944.

The first Field Manual to directly discuss the role of armored infantry (and the roles of their fighting vehicles) was printed in March of 1951. FM 7-17 The Armored Infantry Company and Battalion was an excellent manual. It clearly articulated the role of the infantryman in relation to the tank in all situations.

- a. Mission. Armored Infantry has the mission of closing with and destroying the enemy by fire and maneuver, repelling hostile assaults in close combat, and providing infantry support for tanks.
- b. Capabilities. Armored Infantry is capable of-
 - 1. Accompanying tanks in offensive action - either in armored personnel carriers, dismounted, or mounted on tanks - to close with and destroy the enemy in close combat.
 - 2. Absorbing reinforcing units to form a team of combined arms, and furnishing armored infantry companies to other units for the same purpose.

3. Reducing and establishing obstacles, supported by tanks and other arms.

4. Organizing and defending ground, supported by other arms.⁸

For the first time, a field manual addressed the doctrinal role of the armored infantryman and his vehicle. It called for armored personnel carriers of the rifle squads to be completely enclosed to protect the soldiers from small arms fire and shell fragments. Significantly, it would not protect them against anti-tank weapons. The manual emphasized using the automatic weapons mounted on armored personnel carriers to provide automatic weapon fire power even though the carrier was under enemy small arms or artillery fire.⁹

Moreover, the manual stated that the "supporting fires are provided primarily by artillery, mortars and carrier machine guns [emphasis added]."¹⁰ For the first time since its inception, the tank was not supposed to be the principal direct fire support weapons platform for the infantryman. For the first time, the infantry's organic means of getting to the battlefield was also supposed to be the primary means of direct fire support.

FM 7-17 discussed the employment of the carriers in the attack. It suggested that the best employment was from hull defilade positions where it could provide overhead machine gun fire. If that

proved to be impossible, it recommended that the carriers follow the platoon by bounds to support.¹¹

In a static defense, the manual recommended dismounting the vehicle's machine gun and locating the vehicle in a covered and concealed assembly area. However, in a mobile defense, it suggested leaving the machine guns on the vehicle and firing from defilade to support the dismounted riflemen. In the reserve, of course, the carrier's weapons were to stay mounted so as to be able to carry out offensive maneuvers such as the counter-attack.¹²

The manual did not preclude the tank from providing direct fire support for the infantryman. In fact it went to some length to describe the best ways for tanks and infantry to operate together in a vast variety of situations. The manual recognized the reality of the equipment situation (ie. no carriers had been built to meet the requirements). Therefore, tank - infantry cooperation was well documented and related very well to the actual experiences of the WW II warriors.

SECTION - 3 - U. S. OPERATIONS IN KOREA

In 1949 and 1950, the North Korean People's Army (NKPA) conducted a series of deployments along the border that would culminate in maneuvers. In June, 1950, the NKPA deployed again, and following a successful deception, at 0600, on the 25th, they finally

attacked. The principal thrust was made by two divisions (each led by a tank regiment) toward Seoul. The NKPA offensive was a complete and total surprise. It fooled everyone. The Republic of Korea (ROK) Army (and its American advisors) were routed.¹³

By 2230 on the 25th, the United Nations Security Council had condemned the invasion, and the United States Army prepared to fight. General Douglas MacArthur's first orders were to the air force, and their contribution to the delay of the NKPA advance cannot be over-emphasized. The 24th Infantry Division (garrisoning occupied Japan) was next into the fray with the now famous Task Force Smith.

Task Force Smith, basically an understrength infantry battalion and an artillery battery, represented only the first of the American soldiers who would have to face the NKPA and their supporting Russian T-34 tanks without fighting vehicles, organic armor, or effective anti-tank weapons. The 2.36 inch rocket launcher was totally ineffective versus the T-34. The NKPA rolled toward a complete victory.

The first U. S. Army armored vehicles to arrive in Korea were the tanks in the 25th Infantry Division's organic tank battalion. The 89th Tank Battalion's M-24 light tanks did yeoman service counter-attacking to stop NKPA penetrations. Tank versus tank action in this period was very limited. Most of the armor was employed in the infantry support role. The light tanks in this battalion (and the three other battalions landed in August) performed very well in their

infantry support role, but they were badly overmatched by the T-34s and the NKPA's anti-tank weapons.¹⁴

On the 2nd of August, MG William Dean, commander of the 24th Infantry Division, ordered a local counter-attack to open a route Northwest of Masan. In the first employment of fighting vehicles in Korea, Company A, 89th Tank Battalion "... led... three platoons of infantry... follow[ing] in trucks. Eight tanks were destroyed by enemy anti-tank gun fire and the truck-borne infantry [many of whom never got out of the trucks] sustained heavy casualties."¹⁵ This was yet another argument for armored protection for infantry fighting with tanks.

The importance of tank-infantry cooperation in the early fighting, like in early WW II, was poorly understood. "After several instances of faulty coordination, an SOP was published... as a guide to the tactical use of attached tanks... the tankers also received instructions in the capabilities and limitations of infantry."¹⁶ Only five years after WW II, the U. S. Army seemed to have forgotten all of the armor-infantry lessons learned in North Africa and Europe.

It was important to re-establish the armor-infantry relationship because "... the primary mission of all tank units in the UN Defensive was in the nature of close-in infantry support... all lines were thinly held and the infantry required every available weapon on the line."¹⁷ The enemy attacks with tanks were more easily repulsed with the

addition of the 3.5 inch rocket launcher and the presence of the M4A3E8 medium tanks in August of 1950.

An example of the inadequacy of half-tracks as infantry fighting vehicles was demonstrated during the fighting around the Pusan Perimeter on the 31st of August. The NKPA attacked across the Naktong River in the zone of the 9th Infantry Regiment. There were two tanks from Company A, 72nd Tank Battalion, an M-19¹⁸ and a half-track from the 82 AAA Battalion supporting the infantry. The attack was preceded by an artillery barrage, and then the NKPA attacked across the river. During the battle, the M-19 withdrew to a second line of defense and one of the tanks had a maintenance failure. The open-topped half-track was quickly over-run, but the lone remaining tank "... proceeded to... cause many casualties... [with]... machine gun and tank gun fire... the tank commander fought off the enemy with hand grenades... his pistol... [and] by rapidly power traversing the turret..."¹⁹ This example illustrates the importance of having enough armor to resist the effects of small arms fire, exploding artillery, and hand grenades. It also argues for armor on the top to prevent the enemy from just jumping inside or tossing a grenade in to kill the crew.

The United Nations Offensive began with the Inchon amphibious assaults on 16 September 1950. The 1st Marine Division and the 7th Infantry Division braved the 33 foot tides at Inchon Harbor and ultimately put 75,000 men deep in the enemy rear. This turning

movement was synchronized with a general offensive from the Pusan Perimeter. Within two weeks, the attack turned first to the exploitation and, later, the pursuit.

The tanks were instrumental in the destruction of enemy soft targets during the exploitation. "Company C, 72nd Tank Battalion [and elements of the 38th Infantry Regiment], on the night of 17 September, ran into the tail of a North Korean battalion of infantry. . . virtually destroying the enemy force with tank machine gun fire."²⁰ There were few tank-on-tank engagements.

The tank-infantry relationship was reminiscent of the heady charge across France. "The 7th Cavalry and Company C, 70th Tank Battalion. . . advance[d] North to. . . Namchomjom. The [attack] was made with. . . infantry mounted on the tanks. This force met with extremely heavy small arms, automatic weapons, and 45mm anti-tank fire. . . heavy casualties were. . . sustained."²¹ The commander stated that "an attack by a company of tanks. . . without infantry. . . would have resulted in fewer casualties."²² It is not clear whether the tanks could have won without infantry, but it is clear that the infantry needed a protected ride into battle.

Things did not get any better as the war progressed. Task Force Crombez attacked on 15 February 1951, to relieve the encircled 23rd Regimental Combat Team (RCT) at Chipyeong-Ni. The task force was comprised of Company D, 6th Medium Tank Battalion, 1st and 4th

Platoons of Company A, 70th Tank Battalion, and Company L, 5th Cavalry (really infantry).²³

"The Chinese occupied the hills on both sides of the road. . . ." ²⁴ Armed with satchel charges on poles, bazookas, and machine guns, the enemy was prepared to fight anyone coming up the road. They were determined to prevent the relief of the 23rd RCT. Unfortunately, the road was the only way the tanks could go. The infantrymen climbed onto the tanks, and at 1500 they attacked. "Almost immediately after moving through the 5th Cavalry lines Task Force Crombez ran into intense machine gun fire. . . ." ²⁵ The infantry was forced to dismount in the middle of a fire swept zone, and only eight men from L Company were not casualties at the end of the day. The tanks continued on up the road. Separated from the infantry, the tanks were an easy mark for the enemy. The following night the enemy withdrew North. ²⁶

One of the most dissatisfying aspects of studying the Korean war is the limited discussion of armored infantry battles available for review. This writer was unable to unearth a single example of armored infantry in battle. Therefore, it is difficult to assess the progress in doctrine or technique from WW II.

SECTION - 4 - U. S. DOCTRINE THROUGH THE SIXTIES

The role of armored infantry continued to be refined as new equipment was fielded and the experience of the Korean War was added to the WW II lessons learned. For the first time the role of armored infantry was documented: "The mission of armored infantry is to assist in the successful advance of tanks through mounted or dismounted action."²⁷

The standard M113 armored personnel carrier was designed to carry the infantryman into combat, protect him from artillery fragments and small arms fire, and provide a weapons platform for supporting fire. For the first time, the armored infantry had a full-tracked vehicle of its own that fit the descriptions found in the doctrinal manuals. Everyone believed that equipment was finally catching up with doctrine.

Unfortunately, doctrine took a step backwards. The manual that superseded the 1951 version of FM 7-17 was published four years after the Korean War. Field Manual 17-20 Armored Infantry Units - Platoon, Company, and Battalion (the manual most likely to be read by small unit commanders) made the role of the armored infantryman clear. However, it made the role of the vehicles of armored infantry units less clear. After all of the years of seeking a fighting vehicle for the infantry, the infantry failed to recognize the role of the armored personnel carrier beyond that of a transporter.

FM 17-20 stated that the employment of the carrier's machine gun was effective against ground targets, but the use of the vehicle weapons "... depends on the need for additional firepower."²⁸ The manual went on to state several reasons why using the machine gun on the APC might not be worth the effort of emplacing it.

While discussing the role of the carrier in the mounted attack, the authors recommended using the .50 caliber machine gun to assist the advance where possible. This researcher considers that advice to be negligent in its vagueness. The manual specified that the carrier's machine gun should augment the fires of the tanks and infantry when they dismount. However, it failed to identify the nature of the targets, and the manual again presented arguments that make this tactic seem to be less than worthwhile. One section stated that using the carriers as the supporting fires in an attack was even undesirable!²⁹

The employment of the carrier in the defense was described as an auxiliary rather than an integral part of the unit's plan. The manual recommended placing vehicles "... in defilade to the rear... with a provision for moving them, as the situation requires, to previously selected firing positions."³⁰ The rationale for this thinking was the high profile of the vehicle and its vulnerability to certain types of enemy fire.

The infantry and tank unit leaders were still studying the 1957 manuals when they went to war again in Asia. The next generation of manuals were not published until 1966. Field Manual 17-1 Armor

Operations was the basic document published that year, and it simply reiterated the ideas articulated in the 1957 manuals.

The 1966 version of Field Manual 17-15 Tank Units - Platoon, Company, and Battalion gave the tank unit commander very specific guidance on the methods and techniques of employing tanks and mechanized infantry. It discussed several variations of three basic offensive operations: tanks and mechanized infantry attack on one axis, tanks and mechanized infantry attack on two converging axes, and tanks support by fire only.³¹

Regardless of the situation discussed, the principal weapons platform used to support the infantry in the attack was the tank. The APC was given casual reference as a fighting vehicle when the manual stated "Whenever possible, the machine guns of the armored personnel carriers are used to support the assault. . . ."³² Later, the manual disparages the APC further:

Such action exposes the armored personnel carrier to fires it was not designed to withstand. Further, infantry mounted in carrier has little power to counter-attack. However, this does not preclude actively supporting the [combined arms] team with carrier-mounted machine gun fire whenever the situation permits.³³

The authors of FM 17-15 apparently did not expect tanks or mechanized infantry to be employed very often in the defense. The manual spent comparatively very little time discussing defensive

operations. In this section, however, the APC was treated somewhat more charitably. The manual called for the integration of the carriers into the overall defense so the commander could take advantage of the additional fire power.³⁴

It is not clear why the role of the armored personnel carrier suffered such a marked setback in the doctrinal literature. One can only assume that the authors perceived the severe limitations of the M113 as a fighting vehicle and wrote accordingly. However, the limitations of the equipment would result in a step backward in the development of doctrine.

SECTION - 5 - U. S. OPERATIONS IN VIETNAM

The first employment of armored forces in Vietnam was by the 3rd Battalion, 3rd Marine Regiment in December 1964, near Da Nang. The M48A3s of the 3rd platoon, Company A, 3rd Tank Battalion and the LVTH-6A1s of 1st Platoon, Company A, 1st Tractor Battalion performed reaction force duty around the Vietnamese Navy PT Boat base at Monkey Mountain for about a week before they were re-deployed to Okinawa. This duty proved to be prophetic. One of the principal uses of armor in Vietnam was to be as a reaction force.³⁵

When President Lyndon Johnson began to employ regular forces in ground combat roles in the Spring of 1965, the 3rd Battalion, 9th Marine Regiment Battalion Landing Team (BLT) began operations in

the I Corps area of operations. The U. S. ambassador to Saigon, Maxwell D. Taylor was angry that tanks were employed. He said, "... [armored vehicles] are not appropriate for counter-insurgency operations."³⁶

Taylor's objections impacted on the Army's decision to send the 1st Infantry Division to Vietnam in 1965. They arrived without their M113 Armored Personnel Carriers (APC) and without their tank battalions. They would fight as dismounted infantry. The same thing happened to other mechanized formations deployed to Vietnam. Taylor's initial observation may have been accurate, but U. S. involvement soon passed the counter-insurgency role of a low intensity conflict and blossomed to a mid-intensity war in which fighting vehicles had a prominent role. Finally, in 1966, the commander of the 25th Infantry Division insisted that his tanks and mechanized infantry be deployed with the division.³⁷

Initially, the tactics of employing fighting vehicles in Vietnam was based on the doctrine found in FM 17-20, FM 17-15, and FM 17-1. The doctrinal sources were based on the combat experiences of the Korean War and World War Two. The WW II influence came primarily from the European Theater of Operations (and North Africa) where combat was in relatively open terrain and against a foe who could be found more or less to the front. The Korean experience was similar. Significantly, the role of fighting vehicles in the Pacific Theater had been denigrated by the doctrinaires. This was a failure of

the doctrine writing system to anticipate a recurrence of fighting in terrain where the enemy would not expect armored vehicles and where the enemy could be found in all directions.³⁸

As an example, early in the war, dismounted infantry would clear the close terrain in front of and to the flanks of the vehicles as they moved through the forests and jungle. This exhausted the infantry and slowed the pace of the armor to the speed of the machete wielding infantry. More significantly, it gave the enemy time to establish ambushes against the infantry, execute them, and get away before the fighting vehicles could get involved in the fight.

The leaders of combined arms operations had to learn on their own how to fight in close terrain. The employment of fighting vehicles in Vietnam would eventually parallel the use of tanks in the fighting against the Japanese. These tactics were not well documented, and the Americans had to relearn them.

Regardless of the techniques used, the role of the fighting vehicle continued to be the support of the infantryman with direct fire. The APC accomplished this with mixed reviews. The firepower of the .50 caliber machine gun was not adequate as a suppressive weapon. "The .50 caliber machine guns on the carriers were not well aimed. . . . The entire area was sprayed."³⁹ Moreover, its rate of fire was too slow, and the gunner was exposed.

One common observation about the M113 was that it had inadequate firepower for its suppression role as a fighting vehicle.

The Army Concept Team in Vietnam recommended the addition of a 40mm automatic grenade launcher to solve this problem. Another recommendation by the ACT-V was the adoption of a ballistic shield for the .50 caliber machine gun and additional armor for the commanders hatch to protect him while firing.⁴⁰

Several ad hoc modifications improved the vehicle's capability. The most common variant involved hatch armor and a gun-shield for the .50 caliber machine gun and the addition of two shielded M-60 machine guns, on pintles, that could be fired from the rear hatch. This variant became the standard configuration of the APC in Vietnam. It was called an Armored Cavalry Assault Vehicle or ACAV. There were a number of other variations of the vehicle designed to improve its firepower and protection.

The U. S. Army also combat tested the addition of firing ports on an M113. This test vehicle was designated the XM734, and it was fielded in limited numbers in Vietnam. The concept was never adequately evaluated because the troops had lost confidence in the ability of the APC to protect them from mines and RPGs. The gasoline powered, aluminum hulled M113s afforded the crews little protection from those weapons. The men preferred to ride on the top exposed to enemy small arms fire than to be trapped inside the vehicle.⁴¹

U. S. Army mechanized formations fought in the three northernmost corps zones. They had success in every type of terrain except true jungle. An interesting point about armored forces fighting

in Vietnam was the units had restrictions put on maneuver to prevent damage to crops and other important civilian property. This was due to the counter-insurgency aspect of the war.⁴²

The three types of missions most often received by armored units were: search and destroy, search and clear, and security. These were typical assignments for any combat unit, but the execution in a mechanized unit was certainly different.⁴³

The nature of security missions varied. An armored unit might have to conduct "Thunder Runs" at night to prevent the enemy from mining the road. Another security mission was reaction force within a fire-base or to rescue downed pilots or a unit in contact. The armored units in Vietnam were better equipped for these types of missions than regular infantry, and they were routinely assigned them. During the communist's 1968 Tet Offensive, the 4th ACR demonstrated several of these security missions.

On the 30th of January, Troop A was ordered to Bien Hoa Air Base to clear a corner of the base that had been occupied since the beginning of Tet. During the night road march, the troop was ambushed twice. They were able to drive through the ambush because of their armor and their capability to shoot while under protection. At Bien Hoa, "The concentrated firepower of our automatic weapons finally told on the Viet Cong and North Vietnamese, and they attempted to withdraw, but the quick moving ACAVs cut them off and killed them as they ran."⁴⁴

At the same time, other armored units in Vietnam were ordered to Saigon. They left what they were doing and road marched 70 to 100 miles. By the 1st of February, the city was ringed with armored forces. This rapid deployment of mechanized infantry, tanks, and armored cavalry encircled the enemy in the metropolitan area and prevented his reinforcement.⁴⁵

Following the Tet offensive, the NVA and the VC became much harder to find. Tactically they had been beaten, and they needed some time to lick their wounds. The U. S. and Republic of Vietnam forces were forced to seek out the enemy if they wanted to fight.

In a battalion sized search and destroy mission, the typical task organization in the 25th Infantry Division was a tank company, two mechanized companies, and a regular infantry company. Sometimes, an Army of Vietnam (ARVN) unit would be attached. The tanks would lead in movement toward a terrain objective with the mechanized infantry following in their APCs. The regular infantry might be in a secure area waiting to be moved by helicopter to the critical spot, or they might be in a blocking position.⁴⁶

When the tanks found signs of the enemy, the mechanized infantrymen dismounted from their carriers to conduct a more detailed search. Once contact was gained, the mobility of the fighting vehicles was used to maintain contact and fix the enemy. The tanks and the ACAVs used their weapons to provide supporting fire to the rear and flanks of the enemy to prevent his withdrawal. Armored

vehicles led the attack with infantry providing close protection from sappers and RPG teams.⁴⁷

A good example of these tactics in a search and destroy mission are the actions of the 3rd Squadron, 4th Armored Cavalry Regiment North of Dong Ha near the artillery outpost, Charlie One. The squadron had been operating in the area for three days when approximately a company of North Vietnamese Army (NVA) regulars were discovered. The dismounted infantry forced the NVA into the blocking positions on the flank. The fire from the ACAVs machine guns forced the NVA to try and bypass the position further along the flank. The squadron commander was able to rapidly and effectively extend the flank with a platoon from another troop. The enemy was destroyed.⁴⁸

In another action, a troop located an NVA battalion. The rest of the squadron deployed more than ten miles within minutes. The enemy was trapped against the South China Sea. Artillery was fired within the cordon, and then one troop assaulted while the others supported from the flanks. The attack across the objective area was repeated twice before dismounted infantrymen followed to clean out the enemy. The squadron recovered 233 bodies, and 44 NVA soldiers surrendered. In this action, the squadron suffered only one killed and nine wounded in action. This was a powerful demonstration of the capabilities of a fighting vehicle equipped unit versus a light infantry unit.⁴⁹

The search and secure operations were similar in nature to the search and destroy missions. The principal difference between the missions was that with a search and secure mission the unit stayed in the area longer and prevented the enemy from returning; otherwise, the tactics were the same.

Many of the tactical techniques valid in Vietnam reflect the original concept of the fighting vehicle in WW I. The fighting vehicle would lead the dismounted infantry into battle crushing the underbrush (barbed wire) and seeking to destroy the enemy's bunker system (machine gun nest) with its main gun while the infantrymen protected their vehicle from anti-armor weapons. It is fair to say that the Vietnam war was a throw-back in time regarding fighting vehicle employment.

SECTION - 6 - SUMMARY

The United States Army, despite the absence of a declared war, had several opportunities to continue testing doctrine on the battlefield. The two major conflicts were in Korea and Vietnam. OPERATION JUST CAUSE (Panama) is too recent to properly evaluate, and there were no armored fighting vehicles employed in the Dominican Republic or Grenada.

In these two undeclared wars, the United States was able to achieve technological superiority in the tank-to-tank battle, and

therefore, the enemy avoided that type of combat. The M113's role in combat was much more significant than simply as a troop carrier.

"The armored personnel carrier is habitually used as a fighting vehicle. . . ,"⁵⁰ as a cavalry/reconnaissance vehicle, and as a means of clearing anti-personnel mines and dense terrain.⁵¹ The tank and the armored personnel carrier were, therefore, both available to be employed as fighting vehicles in support of infantry.

The advent of the armored personnel carrier as a fighting vehicle enabled mechanized infantry units to achieve great versatility and potency with their organic assets. Mechanized infantry was used to support regular infantry in an armor-type role. The vehicle's weapons fixed the enemy while the dismounted infantry maneuvered to destroy him.⁵²

Finally, it was demonstrated that the formation of a combined arms team of tanks and mechanized infantry improved the capability of the organization. The versatility, combined arms capability, and mobile protected firepower of the task forces in Vietnam made them extremely effective for the wide variety of missions they were assigned.

The guiding principles for the employment of fighting vehicles, as proven in combat, have remained constant. The primary role of the fighting vehicle, tank or otherwise, is to support the infantryman with direct fire designed to destroy or suppress the enemy. Whether this

concept is valid or not when both armies have roughly equal tank capabilities is best argued by the results in the Arab- Israeli wars.

ENDNOTES, CHAPTER FIVE.

¹Paul A. Dyster, In the Wake of the Tank: The 20th Century Evolution of the Theory of Armored Warfare. Baltimore: The Johns Hopkins University Press, 1964, 377-378.

²Ibid., 382-385.

³Ibid., 385.

⁴H. C. B. Rogers, COL, UK. Tanks in Battle. London: Seeley Service and Co. Ltd., 1965, 216-219.

⁵Ibid., 216.

⁶BTR is a North Atlantic Treaty Organization designation for the Vishka vronyetransporter (Turreted troop transporter).

⁷Richard E. Simpkin, Mechanized Infantry. Oxford: Brassey's, 1979, 31.

⁸U. S. Department of the Army. FM 7-17 The Armored Infantry Company and Battalion. Washington: The United States Government Printing Office, MAR 1951, 2.

⁹Ibid., 6.

¹⁰Ibid., 8.

¹¹Ibid., 90.

¹²Ibid., 148, 164, 411-412.

¹³T. R. Fehrenbach, This Kind of War. New York: Macmillan, 1963, 54-58.

¹⁴Milton R. Thompson, CPT, USA, and others. Employment of Armor in Korea: The First Year. Fort Knox, KY: The United States Government Printing Office, 1952, 32, 52-53.

¹⁵Ibid., 52.

¹⁶Ibid., 53.

¹⁷Ibid., 56-58.

¹⁸The M-19 is an armored, self-propelled, anti-aircraft gun. Designed during WW II, it had twin 40mm guns mounted on an M-24 tank chassis.

¹⁹Ibid., 61-62.

²⁰Ibid., 105.

²¹Ibid., 89.

²²Ibid., 90.

²³Jack R. Metzdorf, LTC, USA, and others. "Can the Armored Personnel Carrier Be Justified?" Fort Knox, KY: The United States Government Printing Office, 1952, 11-15.

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²⁵Ibid., 14.

²⁶Ibid., 14-15.

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- 36Ibid., 62.
- 37Ibid., 63.
- 38Donald W. Thackeray, LTC, USA, and others. "Use of Armor in the Defense." Fort Knox, KY: The United States Government Printing Office, 1950, i.
- 39U. S. Department of the Army, Army Concept Team in Vietnam. "Mechanized Rifle Troop." Saigon: U. S. Military Assistance Command, Vietnam, 1963, 13.
- 40U. S. Department of the Army, Army Concept Team in Vietnam. "Optimum Mix of Armored Vehicles for Use in Stability Operations." Saigon:U. S. Military Assistance Command, Vietnam, 1971, III-11 & B-25.
- 41Dunstan, 64.
- 42Army Concept Team in Vietnam, II-7.
- 43Dunstan, 71.
- 44Michael D. Mahler. Ringed in Steel. Novato, CA: Presidio Press, 1986,, 100.
- 45Ibid., 101.
- 46Ibid., 70-73.
- 47Ibid., 72-73.
- 48 Ibid., 133-134.
- 49Ibid., 190-191.
- 50Army Concept Team in Vietnam, II-16.
- 51The M113 was driven through the underbrush to knock it down and explode the booby-traps (and other anti-personnel mines) emplaced by the enemy. This technique was not effective later in the war when the enemy began to use anti-tank mines that caused the catastrophic loss of the APC.
- 52Army Concept Team in Vietnam, II-16.

CHAPTER 6

THE CURRENT FIGHTING VEHICLE

SECTION - 1 - THE ARAB - ISRAELI WARS

Since the creation of the state of Israel in 1948, the country has seen conflict based on religious differences. The conflict has been more or less continuous, but it has peaked in four major wars that have, in turn, impacted on the rest of the world. In 1948, 1956, 1967, and 1973, the eyes of the world's military experts were focused on the fighting between the Arabs and the Israelis as they evaluated the various tactics that each side employed. From the very minor contributions of armored forces from both sides in the 1948 war to the significant tank/armored force battles of the 1973 war, most of the world's military theories about armor have been tested.¹

In 1948, the Israeli Defense Force (IDF) had a grand total of 15 light tanks and a few dozen armored cars of dubious heritage. The primary role of these vehicles was the support of infantry with direct fire. Employment was rare, and it did not anticipate the future roles of fighting vehicles in the region.

Economic and political necessity precluded the purchase of significant numbers of armored vehicles until 1955. The French then sold Israel a few tanks and half-tracks. The Egyptians countered and purchased 330 tanks from the Eastern Block. To off-set the Arabs'

advantage, the Israelis bought 100 Sherman tanks, 100 AMX13s, and more half-tracks. The arms race was on just in time for the 1956 war.²

When the war began, the typical employment of tanks by both sides was the same as was first used in World War One. Infantry penetrated enemy positions as tanks supported with direct fire to destroy the enemy's strong-points. In the defense, dug-in tanks functioned as pill boxes. The half-tracks were used primarily to move the infantry forward. The Egyptian Army never learned to fight in any other way.

The Israeli's, however, learned to minimize their losses by avoiding head-on attacks against a prepared enemy. Combined arms task forces of tanks and armored infantry would bypass the Egyptian positions to reach the enemy rear. Once the Egyptian positions were bypassed, their tanks were easily destroyed as they moved to fight in the new direction. The suddenly helpless Egyptian infantry was no match for a combined arms attack.³

The success of the Israeli armor convinced Moshe Dayan, the Israeli Chief of Staff, that armored forces were the best instrument for a war of maneuver, and raised eyebrows around the world. The Soviet Union began to equip the Arab nations with more and modern equipment. The standard Arab tank by 1967, was the T-54 or T-55, and the standard armored personnel carrier was the BTR-152. There were small numbers of Centurians, Charioteers, and BTR-50s. The

Egyptian's were able to field more than 1000 tanks, and the Syrians had about 400 by early 1967.⁴

To counter this array, the Israelis received military assistance from the United States, Great Britain, and France. By 1967, they had about 300 Centurians, 300 M48s, and the armor (AMX13s and Shermans) from 1956. Due to fiscal constraints, their principal armored personnel carrier remained the venerable half-track. They had APCs in adequate numbers to support their armored formations, but the Israelis discounted the importance of infantry in the open terrain of the desert.⁵

The IDF began the 1967 war with a preemptive air strike that virtually eliminated the Arab air forces. A series of set-piece battles involving infantry, paratroopers, artillery, and tanks penetrated the Egyptian defenses. The Israeli tanks, assisted by unmolested close air support, quickly penetrated to the Suez Canal. The shocked Arab world sued for peace.

The lessons learned here were false. The tankers became accustomed to fighting without the support of artillery or infantrymen in their task forces. Neither the 1941 vintage artillery, nor the half-tracks could keep up with the 1961 technology of the tanks. The total dominance of the skies by the Israelis (and good weather) masked the vulnerabilities of close air support. The poor tactical deployments of the Egyptians masked the significance of the missing infantrymen.

The Israelis came to rely on the tank - airplane team instead of the tank - infantry - artillery team.⁶

Where mechanized infantrymen were employed, the half-track displayed its inability to perform to the standards of modern armored warfare. The artillery liaison officer's half-track was hit [and destroyed] by an anti-tank gun. . . . Lieutenant Yossi Algamis. . . hurried toward it, standing upright in the half-track. . . a bullet struck him in the head."⁷ When tanks and infantry were able to fight together, the men riding in the half-tracks suffered many casualties from explosive fragments and small arms fire.

The tactics during the Six Day War were significant because the Israeli employment of tanks without infantry was successful. That they succeeded was more important to the Israelis than the reasons why they were able to do so. In reality, they were lucky.

Between 1967 and 1973, the Israeli armed forces more than doubled its armored forces. Unfortunately, the priority of prestige and training, and, thus, readiness, was afforded to the tankers. Mechanized infantrymen were the lowest order in the Israeli army. Most of the mechanized infantry was in the reserves rather than the active component. This meant the armored forces that began the war in 1973 were almost purely tanks. To make a bad situation worse, the Israelis failed to purchase the M113 as a replacement for the already inadequate half-track. The rationale was that the M113 was not good enough.

In 1973, the Arabs had significantly upgraded their infantry fighting vehicle to the BMP⁸ as the standard equipment in the armor formations. However, the T-55 series remained their main battle tank. The Arab tactics were significantly different from the earlier conflicts. They identified limited objectives and they finally realized the importance of combined arms. The Egyptian integration of anti-tank and air defense systems was the primary reason for their initial tactical successes.

After the successful combined arms crossing of the Suez Canal, the Egyptians established a defensive belt consisting of massed anti-tank weapons manned by dug-in infantry. The infantry was protected by a dense air defense umbrella. The IDF assaulted the Egyptian positions with tanks (unsupported by infantry), and the Israelis sustained losses that stunned their high command. The Egyptian's success lasted until they left the cover of their air defense and attacked.

When the Arabs attacked, the Israelis noted a weakness between the Egyptian 2nd and 3rd Armies, and the IDF counter-attacked. This time, the Israelis used the combined arms concept to the fullest extent possible. They used artillery, air support, tanks, and mechanized infantry in their drive to Suez City. Mechanized infantry was extremely important in suppressing the Egyptian anti-tank weapons.⁹

In the Golan Heights, the Syrians had limited success. The Israeli defenses forced the mechanized infantry to dismount from their

armored personnel carriers. The tanks, moving at the infantryman's pace, were virtually stationary targets for the anti-tank guided missiles (ATGM) and tank fire. When the tanks left the infantry, the Syrians managed a penetration, but they were unable to consolidate their gains because they had no infantry support at the objective.

The Israeli forces experienced difficulties with the half-track in the Golan Heights. Commanders left their half-tracks to command from tanks because the half-tracks could not survive the bombardment. During the attack into Syria, the half-tracks trailed the attack, to avoid enemy fire, and the tank crews had to dismount to mark lanes through minefields themselves. This slowed the attack down and limited the day's advance.¹⁰

The unexpected reverses suffered by the attacking Arabs combined with the Israeli's spectacular drive past the Suez Canal led to another negotiated peace. The entire world's armies benefitted from observing the war.

SECTION - 2 - OTHER NATIONS' DOCTRINE

The conclusions drawn from all of these experiences impacted on every modern army in the world. There were changes in equipment and doctrine based on the lessons learned in the Middle-East. The idea that tanks could operate independently of mechanized infantry had finally died.

The Soviet Union, following the 1973 war in the Middle-East, became convinced that their previous doctrine was inadequate. The Soviet Minister of Defense, A. A. Grechko, stated that there was a renewed emphasis on the importance of combined arms teams.

Combat actions in the Middle-East. . . have put anew the question of the relationship of offense and defense of good troops, and have disclosed a number of characteristic phenomena in the struggle of offensive and defensive means, and in the methods of waging the fire battle.¹¹

The Soviet observers recorded the following: There is a very high attrition of armor on the battlefield; Ammunition and fuel is consumed at a much higher rate than had been predicted; Daily rates of advance are far less than predicted; Tank units, unsupported by infantry, are incapable of defense; Motorized infantry units need better armor protection for mobility under fire; The infantry needs improved fire support capabilities.¹²

From their observations of the fighting (primarily with the Syrians), the Soviets identified several new, or changed, concepts. The offense was no longer the clearly dominant form; success on the battlefield was directly related to the effectiveness of the combined arms team of tanks, infantry, and artillery; moreover, the infantry had a much more significant role in the combined arms team than had been previously thought.¹³

The defense was stronger primarily due to the emergence of long range, portable, and potent ATGM. The increased long range fire destroyed the tanks and left the attacking infantry without direct fire support for the assault. Moreover, it was found that dismounted infantry in a well-prepared strong point could successfully withstand repeated assaults by poorly coordinated attackers.¹⁴

The tanks were ineffective primarily because they were being forced to fight by themselves, or at the pace of the dismounted infantry (slowing the tank's speed increased its vulnerability to the ATGM). The tanks were vulnerable to all sorts of anti-tank weapons if it ran away from its infantry support.¹⁵

The infantry had several problems. The BTR was an inadequate fighting vehicle. Its open top left its soldiers vulnerable to small arms and indirect fires. The inaccurate 12.7mm machine gun on the BTR had limited effectiveness and limited range. The enemy was, therefore, able to separate the tanks from the infantry early - before the infantry could suppress the ATGMs. The BMP was able to protect its soldiers fairly well, but it was not the standard infantry fighting vehicle in the Arab armies. It also had a major deficiency. Due to its slow rate of fire, short range, and a warhead designed to defeat armor, the 73mm gun on the BMP was inadequate as a direct fire support weapon.¹⁶

The field artillery employment was good, if it is evaluated by itself. However, artillery can not win battles alone, and its

effectiveness must be judged by how much it helps the maneuver forces. Unfortunately, it could not provide adequate fires to the dismounted infantry in one place and to the tanks in another.¹⁷

The Russian doctrine writers observed that tanks can not accomplish the infantry support role alone. They saw that the tanks and infantry fighting vehicles were vulnerable to ATGMs, and the infantry's ATGMs were vulnerable to field artillery suppressive fires. It seems easy to infer the solution: Use indirect fire support against enemy positions until the tanks and armored infantry can get close enough to suppress the ATGM gunners with direct fire weapons. That is, the Soviets realized they must first complete the combined arms team and, then, improve its effectiveness through better coordination.

Based on those observations, the Soviets knew that improving doctrine alone would not be sufficient to solve the problems identified in the Middle-East. They recognized the need to improve their infantry fighting vehicle, and the BMP2 was developed. The armor protection was improved. The suppressive firepower was also improved. The 73mm gun was replaced by a 30mm cannon. The new cannon's rate of fire is 300-500 rounds per minute, it has a maximum range of 3000 meters, and one of the ammunition choices is high explosive to effect good area suppression. The Soviets seemed to have cured the IFV problems identified in the Arab - Israeli wars.¹⁸

Their new doctrine called for the BMP2 to pursue and exploit with the tank. When the infantry was forced to dismount, the BMP2

and the tank would follow the infantry and provide suppressive fires. Following a successful attack, the infantry would remount the BMP2 and continue the attack.¹⁹

In the defense, the new doctrine requires the sub-unit commander to position the BMP2 in the squad strong-point so that the fighting vehicle can provide protected automatic weapons fire from defiladed positions. Motorized rifle units conduct counter-attacks mounted or, in rare cases, dismount to protect the tanks. In either situation, the BMP2 provides suppressive fire.²⁰

It is clear to this writer that the Soviets have made a concerted effort to reevaluate their equipment and their doctrine following the Arab - Israeli wars. Moreover, the Soviets have acted upon the new information and implemented changes that support the lessons learned in the Middle-East. The Russians were not the only observers learning lessons from the 1973 war.

The Germans were finally permitted to form the Bundeswehr in the fifties. They made immediate strides towards becoming a full military partner in the North Atlantic Treaty Organization (NATO). Although they were only recently rearmed, they soon led the West in the development of doctrine for the employment of mounted infantry with tanks. The veterans of the great panzer battles were determined to apply the lessons they had learned. General Von Thoma (he commanded on the Eastern Front) was emphatic. "Only armored

infantry can come into action quickly enough for the needs of a mobile battle."²¹

The Bundeswehr developed the Marder. This was NATO's first effective armored fighting vehicle. The Marder had a turret-mounted 20mm automatic cannon, an NBC protective system, and firing ports for the seven infantrymen riding inside. The firing ports enabled the squad to suppress a nearby enemy with an anti-tank weapon.

The Marder afforded the infantry an opportunity to move with the tank. Its armor protected the infantrymen from the effects of most of the battlefields weapons. Moreover, the 20mm cannon was an excellent direct fire support weapon for the dismounted infantry.

The Germans understood the lessons learned in the Middle-East, but the German's have a problem of geography. The Inner-German Border (IGB) is where the iron curtain is drawn. The German's are forced to fight forward to preclude the Warsaw Pact from quickly over-running the nation and suing for peace. Fighting a defensive battle such as this is not conducive to the best utilization of armored units.

This strategic problem becomes a tactical one. The Germans, opting for a forward defensive posture, have elected to use the Marder primarily as an anti-armor system. The infantry are deployed in the close terrain and the Marder is employed on high speed avenues of approach. The fighting vehicle therefore has a primary role of anti-tank and not one of infantry support. The other North

Atlantic Treaty Organization (NATO) members do not have the same geographical constraints on doctrine. However, other nations have other problems.

The exigencies of the fiscal limitations have forced the British to continue to fight with the outdated 1950s generation of equipment. Nonetheless, in Great Britain, the students of the Arab-Israeli conflicts came to similar conclusions as the Soviets. Their combat developers have continued to work toward a robust fighting vehicle. In fact, they have categorized the Bradley and the Marder as inadequate.²²

SECTION - 3 - U. S. DOCTRINE

Following the Vietnam conflict, the United States Army entered a period of doctrinal stagnation. The combat experience in Southeast Asia suggested doctrine that seemingly would fail to meet the threat in Europe. Fortunately, the Yom Kippur War provided a much needed impetus to the doctrinaires, and, eventually, they came to similar conclusions about armored warfare as the rest of the world.

The fielding of a new main battle tank, capable of meeting the demands of the long range and violent battlefield, became important. The often side-tracked Mechanized Infantry Fighting Vehicle (MICV) program received renewed interest. Perhaps most important, interest in combined arms doctrine was revitalized.

The regeneration of the U. S. Army's heavy force did not occur overnight. The M-1 Abrams tank began to be fielded in 1979. The MICV program died and was reincarnated as the Bradley Infantry (and Cavalry) Fighting Vehicle (BFV) program before the first battalions were fielded in 1982. The Army's new doctrinal foundation, Airland Battle was first published in FM 100-5, Operations in 1982. Without all of these parts, the theories gleaned from the Middle-East wars could not be implemented.

The Bradley is currently the most capable infantry fighting vehicle in the world. It has armor protection capable of stopping the armor piercing rounds of heavy machine guns. It has mobility equal to the Abrams tank. However, the greatest advance over the M113 is in terms of firepower. The BFV has a stabilized turret. This allows it to fire its 25mm cannon and 7.62 coaxial machine gun while moving. It also has a tube launched, optically tracked, wire guided weapon (TOW) that can be fired when the Bradley is stationary.²³

The fielding of the Bradley was a significant step for the armored infantryman. "No longer is the infantry's vehicle a mere means to drive to battle. For the first time in our history, the infantry has a true fighting vehicle."²⁴

The user's manual for the American armored infantryman is FM 7-71, The Mechanized Infantry Platoon and Squad (Bradley). It is the doctrinal source for learning the techniques necessary for the squad and platoon leaders to employ the weapons system. Unfortunately, it

fails to tell that level of leadership why they are in the BFV in the first place (that is, to support the tank and the mounted attack).

In the second paragraph of the manual, it states, "The fundamentals of tactical doctrine remain unchanged, but they must be modified to capitalize on the BFV's capabilities and its role in combat."²⁵ However, this author could find no mention of just what that "role" might be. If the manual wanted to educate the platoon leader, it should have stated:

Armored infantry orients on the advance and protection of the main battle tank. It keeps up with the fastest tanks, gets through close terrain safely, overwatches and secures tanks during movement, clears mines and obstacles in the path of the tanks, and in static positions provides close-in security and protection for the tanks from dismounted infantry, especially at night.²⁶

Without this clear guidance, the new armored infantry leader becomes even more confused as he reads the manual. In the first chapter, the manual states that "... when infantrymen dismount to perform their traditional [still undefined] tasks, they will have unprecedented supporting firepower from the BFV."²⁷ Later, it notes that the cannon is supposed to be used against lightly armored vehicles and to suppress enemy troops. To come full cycle, in chapter five, the manual states that the primary purpose of the 25mm cannon

is to destroy BMPs. It should have shown the suppression role as primary.

MG John W. Foss was the commandant of the Infantry School when the Bradley was being fielded. He clearly stated the principal purpose of the 25mm cannon was to support the dismounted infantry (with suppressive fires) in two different articles in Infantry magazine. This should have been made clear in the doctrinal manual.²⁸

The movement and offense chapters describe in detail how the BFV should be employed when the infantry is working with tanks. Discussion follows on how the infantry must protect the tank when both are mounted, and how the infantry clears dangerous areas as the tanks and BFVs support by fire. The manual incorporates many of the lessons learned in World War II, and it refines them based on the lessons learned in the Arab - Israeli wars.

For example, the section about conducting a deliberate attack is a compendium of the lessons learned in WW II and in the Middle-East. The manual discusses synchronization and the roles of the various mounted and dismounted elements.

The manual states the tank must suppress the enemy from long over-watch in hull defilade positions, and exploit the breach to overrun enemy positions, and destroy his defenses. It tells the armored infantryman to dismount, and assist in breaching operations (by conducting the breach or providing close over-watch and security for the breaching element). Finally, the manual tells the infantry leader

how to employ his fighting vehicle. The first task is to transport the infantry to the breach site (if a covered and concealed route is available). Then the vehicles suppress the enemy from long over-watch in hull defilade positions, or provide supporting fire for breaching operations from close over-watch positions (if cover is available). The fighting vehicles would exploit with the tanks after the breach was completed. The manual goes on to note that the dismounted infantryman must rejoin to continue the attack.²⁹

FM 7-7J is an excellent source for the techniques of fighting mounted and dismounted. However, the manual fails to discuss how the platoon would defend with tanks. Since the platoon leader is not likely to have tanks under his control, this is understandable. Nevertheless, it is highly probable that an armored infantry platoon leader would be attached to a tank company team, and therefore, the omission is not wise. The manual does a good job of describing how to employ the BFV in relation to the dismounted infantry to achieve mutual support.

The next level manual is FM 71-1, Tank and Mechanized Infantry Company Team. This manual articulates the interaction between the tank and the armored infantryman in a variety of situations. Although it is not so stated, here is where the role of the armored infantryman is delineated. In the description of a team attack, the principal duties of the infantry are to breach anti-tank obstacles, neutralize enemy anti-tank weapons, designate targets for

tanks, protect tanks from enemy infantrymen. Clearly the armored infantryman's responsibility is to foster the mounted advance.³⁰

The manual also discusses the role of the BFV. It states the BFV is not normally an assault weapon. It does note that the Bradley must move far enough behind the tanks to be afforded some protection, but not so far back that it can not provide anti-armor protection. The BFV's principal role in an attack is to support by fire. Unfortunately, when the manual lists the capabilities of the weapons platform, it starts with the anti-tank capability of the TOW and moves to the anti-BMP capability of the 25mm cannon before it discusses the suppression role.³¹

Another good place to examine the doctrinal emphasis placed on the role of the fighting vehicle is the gunnery manual. According to FM 17-12-1. The Tank Combat Tables, the tanks, in order to qualify, are required to destroy enemy armored vehicles - the primary role in combat. The emphasis in FM 23-1. Bradley Fighting Vehicle Gunnery is for the BFV also to destroy enemy armored vehicles. That is not the primary role of an IFV.³²

Field Manual 23-1 requires the armored infantry in the field to fire Table Eight (the qualification table) as a crew. The squad dismounted soldiers play no part. Although the table includes several enemy infantry targets, they represent enemy with hand-held high explosive anti-tank weapons (that is, they threaten the vehicle - not the infantry).³³

In summation, the current tank and armored infantry manuals written by the doctrine writers at Fort Benning and Fort Knox were good at capturing the lessons learned in the Arab - Israeli wars. They also restated many of the lessons learned in the Second World War. Unfortunately, they do leave the reader somewhat confused about the role of the infantry fighting vehicle.

SECTION - 4 - LESSONS LEARNED AT THE COMBINED MANEUVER TRAINING CENTERS (CMTC)

The United States Army built the National Training Center (NTC) at Fort Irwin California on the site of an old WW II training post in the Mojave Desert. The concept was to provide a large maneuver area (able to tolerate repeated abuse by tracked vehicles) available to train brigades and battalion/task forces against a sophisticated opposing force (OPFOR).

Equipped with a sophisticated array of electronic devices such as the Position Location and Reference System (PLARS) and the Multiple Integrated Laser Engagement System (MILES), the observer/controller (OC) was able to definitively demonstrate to the leaders and soldiers the effectiveness of the tactics and techniques they employed. This provided a variety of much needed answers to diverse questions. The concept was an unqualified success.

The Army decided to expand the concept, and it added three other parts to the Combined Maneuver Training Center (CMTC) program. The Joint Readiness Training Center (JRTC) was designed as a light infantry training experience at Fort Chaffee, Arkansas, and the maneuver training area at Hohenfels, Germany was developed for heavy forces in Europe. Training for corps and division staffs is done at Fort Leavenworth and at home station with the Battle Command Training Program (BCTP), a simulation driven exercise.

One of the issues at the National Training Center has been the tendency to over-emphasize the mounted battle. Therefore, the emphasis on using the 25mm cannon on the Bradley Fighting Vehicle as a BMP killer has been magnified. The OPFOR has even made the BFV a priority target (the M113 was virtually ignored). The BFV has proven to be such a significant threat to the OPFOR that the BFV must be engaged and destroyed if the OPFOR is to be successful.³⁴

This information can be interpreted in several ways. Either the 25mm cannon's principal role should be the destruction of lightly armored vehicles, or the infantry battle is not properly stressed at the National Training Center. It may also be that the terrain insures the mounted battle is predominant. It is difficult to clearly discern the lessons to be learned.

However, several key lessons can still be noted. The importance of direct fire support is emphasized in one report when the company - team's armored infantry platoons outrun the tank platoon to a breach-

site and are destroyed when the assault is conducted without direct (or indirect fire) support. Another company - team in the same task force conducted a dismounted night attack without direct fire support from the BFVs. They were destroyed.³⁵

In a representative after action report from the new CMTC at Hohenfels, 1LT Jerome Burns, a Bradley platoon leader in the 3rd Infantry Division, learned never to engage a tank whose crew was looking in his direction. "It will find you and destroy your BIFV long before. . . [you] can acquire and destroy it with a TOW."³⁶ Nor does Burns think the BFV is a good assault vehicle. He says it must move cautiously along good covered and concealed routes because ". . . it is extremely vulnerable to tanks. . . ."³⁷ Clearly the Bradley is at risk when it is fighting a tank. It simply does not have the armor protection to survive, and the TOW missile system has too slow a rate of fire for the BFV to compete head-to-head with a tank.

Burns went on to say that although it is possible to send the dismounted element ahead to clear an area alone, it is not a good idea. He states that "When the BIFV enters a restrictive area, the troops must dismount to clear the area while the vehicles provide close-in support."³⁸ He believes the platoon must direct all of their efforts in one area. Burns' thoughts are collaborated by other data collected at NTC.

The majority of the relevant information about armored forces comes from the NTC. There are a large number of studies done at the

NTC. One study compared the M113 and the BFV. The study polled the observer - controllers and the OPFOR about the perceived capabilities of each vehicle. The BFV was judged superior in all categories except ease of operator maintenance and detection of dismounted enemy during the day.³⁹

The survey indicates the BFV is vastly superior to the M113 in two areas. One of the highest ratings was its ability to survive on the battlefield due to its agility. The highest rating for the Bradley was its lethality against armored vehicles and dismounted enemy.⁴⁰

The lethality against light armor is well documented. The BFV accounts for an increase of target kills (compared to M113 target kills) of eleven percent during movement to contact, thirteen percent during a daylight defense, and seventeen percent during a night defense. Unfortunately, there are no similar statistics regarding the 25mm as a suppression weapon.⁴¹

In yet another study at the NTC, the analysts determined that the most effective way to defeat the OPFOR defense was with a dismounted attack supported by tanks, TOWs, and BFVs in a 'creeping overwatch.' This tactic places the defender in a dilemma. If he stays in his position the infantry will defeat him with man packed anti-armor systems; if he leaves his prepared positions, he is destroyed by the overwatching tanks, improved TOW vehicles (ITV), and BFVs.⁴²

According to the analysis, this was best achieved by moving the infantry as close as possible to the OPFOR positions to maintain the

momentum of the attack and to protect the infantry from the effects of artillery and direct fire. The study went on to state that large numbers of infantry are not required to achieve these goals, but that close coordination between the supporting fighting vehicles and the infantry is essential.⁴³

The long standing practice of publishing the Combined Arms Lessons Learned (CALL) pamphlet based on observation of repeated successful or unsuccessful operations has significantly improved the proficiency of our armored force. Proficiency might be improved more if the examples that led to the lessons learned were more clearly articulated in the CALL publications. The lessons could then be written into doctrinal publications, and the army would have better source material to train its warriors.

SECTION - 5 - THE FUTURE FIGHTING VEHICLE

What does the future hold for the fighting vehicle? It is difficult to say. The current budget situation and the perceived reduction of the threat in Europe suggest that the United States Army may be entering a period of developmental and doctrinal stagnation. It is easier to argue the merits of what is needed than it is to predict what will be forthcoming.

The future U. S. Army doctrine (Airland Battle - Future [Heavy]) is markedly similar to current doctrine. That is, the army should

expect to synchronize the battle and fight with agility and initiative throughout the depth of the battlefield. The doctrine is based on maneuver, and it calls for the massing of combat power against an enemy weakness. To implement this doctrine against an opposing force of approximately equal capabilities, will require a fully modernized heavy force.⁴⁴

More specifically, the future doctrine requires the heavy force battalion to accomplish such disparate tasks as destroy an attacking (future) threat motorized rifle regiment and then displace ten kilometers within ten minutes while in the defense. In the offense, the battalion must move 400 miles in less than 18 hours and then destroy a fully prepared threat company team defense.⁴⁵

The current systems are incapable of meeting these standards, and they would be overmatched on the future battlefield. The U. S. Army is developing a complete array of armored vehicles to accomplish these tasks. There will be an improved infantry fighting vehicle and better main battle tanks.

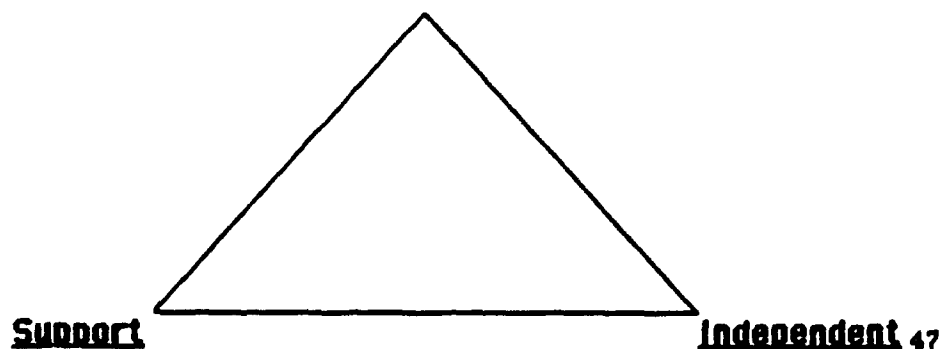
The combat developers have identified the role of the future fighting vehicle (FIFV) as having three parts. First, it must put infantrymen into the battle. Secondly, it must provide integral direct fires in support of the infantry and combined arms team. Finally, the FIFV must provide fires to destroy threat infantry fighting vehicles, light armored vehicles, and tanks.⁴⁶

The FIFV is required to have equal mobility and survivability as the tank. It must move infantry and supporting firepower anywhere on the battlefield. The basic tactics for the FIFV are not significantly different than for the Bradley Fighting Vehicle, but the combat developers are designing it so that it is able to execute its mission in the face of a more sophisticated threat.

SECTION - 6 - SUMMARY

The American, German, and Soviet understanding of the infantry fighting vehicle is different. The difference lies more in the prospective roles for the fighting vehicle than in its capabilities. Brigadier General Richard E. Simpkin, British Army, described these armies as operating at the angles of a marketing triangle.

Conservation



In the marketing triangle, the angle represents 100 percent priority for the the named feature, and the side facing it represents zero percent. Simpkin suggested that the Soviets view the IFV more as a direct fire support vehicle for the infantry, the Germans expect the Marder to fight independently from the infantry, and the Americans primarily want a ride into battle. The experiences of the Middle-East wars were interpreted differently by all three armies.

Although the evidence of the CMTCs is not as conclusive as evidence of actual combat, it is the best that is available to the peacetime army. Moreover, it is the best alternative to combat that has ever been available to any army. It is imperative that the leaders and doctrine writers examine what lessons are learned and modify the doctrine so it is evolving accurately.

One caution this writer would make is to remember the terrain at the NTC is not universal. The open desert makes the mounted battle predominate. Moreover, the electronic systems that make this mock combat so valuable are limited. Tank and fighting vehicle weapons can be more easily replicated than the infantryman's weapons. Therefore, all of the lessons learned in the desert are not universally applicable.

The following illustration summarizes the development of the fighting vehicle by various countries.

FIGHTING VEHICLE DEVELOPMENT

ROLE OF THE FIGHTING VEHICLE	US	GB	GERMANY	USSR
BEFORE WORLD WAR TWO	TANK. FIRE SUPPORT FOR THE INFANTRY	TANK. FIGHTS ALONE (PLAN 1919)	TANK. FIRE SUPPORT FOR THE INFANTRY. TRUCK. MOBILITY	TANK. FIRE SUPPORT FOR THE INFANTRY AND MOBILITY
DURING WORLD WAR TWO	TANK. FIRE SUPPORT AND MOBILITY. HALF-TRACK. MOBILITY AND PROTECTION.	TANK. FIRE SUPPORT. TRUCK. MOBILITY.	TANK. FIRE SUPPORT. HALF-TRACK. MOBILITY AND PROTECTION.	TANK. FIRE SUPPORT AND MOBILITY.
POST WORLD WAR TWO	TANK. FIRE SUPPORT. APC. PROTECTION AND MOBILITY.	TANK. FIRE SUPPORT. APC. PROTECTION AND MOBILITY.	TANK. FIRE SUPPORT. APC. PROTECTION AND MOBILITY.	TANK. FIRE SUPPORT. APC. PROTECTION AND MOBILITY.
CURRENT	IFV. MOBILITY PROTECTION FIRE POWER	TANK. FIRE SUPPORT. APC. PROTECTION AND MOBILITY.	IFV. MOBILITY PROTECTION FIRE SUPPORT.	IFV. MOBILITY PROTECTION FIRE SUPPORT

There is evidence of a developmental concept of fighting vehicle employment. The first fighting vehicles were tanks. Tanks supported the infantry by attacking the enemy's most effective weapon - the machine gun. Tanks evolved into weapons that had to be employed against the enemy's tanks. Tanks had to fulfill a dual role of tank killer and infantry support system. This led to the infantry being forced to fend for itself. This is the crux of the argument for an infantry fighting vehicle to support the infantry.

The fighting vehicle has evolved so that it has virtually reached the potential originally envisioned by the architects of the "landships" of 1914. The infantryman has a protected means of travel on the battlefield, and his vehicle is capable of destroying any enemy it encounters. Now that we have the fighting vehicle; it is incumbent upon the army to learn how to maximize its potential.

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CHAPTER 7
CONCLUSIONS AND RECOMMENDATIONS

SECTION - 1 - COMBINED ARMS

To properly evaluate what the role of the fighting vehicle is and what it should be, one must recall the mission of the armored infantry. Colonel Wass de Czege defined it most succinctly when he said, "Armored infantry orients on the advance and protection of the main battle tank."¹ The mounted armored force is primarily an offensive weapon.

Therefore, the actual acts the armored infantry must perform are mostly related to offensive action. As part of a combined arms team, armored infantry may be required to: conduct a movement to contact to stop an advancing column, conduct a hasty attack of an unprepared enemy, conduct a deliberate attack of a prepared enemy, counter-attack recently successful enemy forces to regain lost terrain before they can be reinforced, conduct defensive operations near the mobile end of the spectrum, and conduct retrograde operations.²

It would be folly to think that these tasks could be accomplished in a South-west Asia or European scenario by tanks alone. Neither could these tasks be accomplished with infantry alone. Furthermore, it would be next to impossible to be accomplished by tanks with infantry, if the infantry were without fighting vehicles.

Thus, the original premise, first articulated in the First World War, was correct - if incomplete. Fighting vehicles must support infantry with direct fire to defeat the enemy's strong points. The results at Cambrai (see Chapter One) further illustrated the requirement for infantrymen to protect the tank. Perceptive leaders observed that neither tanks nor infantry could fight alone.

The twenty years of peace between the wars clouded the issue. Some theorists only saw the infantry support role. There were equal arguments for a tank pure force. The fighting in World War Two would prove the need for a combined arms team (see Chapter Four). Armored forces - be they tank or infantry - required the symbiotic other to be successful.

Therefore, the mission of armored infantry is to assist in the successful advance of the armored forces through mounted or dismounted action. This is a premise that must be accepted if the infantry fighting vehicle (IFV) is working with tanks in combined arms armored formations. It must also be stated that the mission of tanks is to exploit the successes initially achieved by the infantry. Of course infantry are required to hold key terrain at the final objective. Neither can be successful alone.

The concept of armored infantry riding in IFVs and fighting without tanks is within the realm of possibility, but it is clearly foolhardy to do so on the mid to high intensity battlefield one would expect to find in Europe or Southwest Asia. Just as armored infantry

fighting without friendly tanks is foolish, so is the idea of tanks trying to fight enemy combined arms forces without infantry. The success of an entire operation will depend on the judicious application of a combined arms team that is able to apply the inherent strengths of each member of the team against an enemy weakness.

SECTION - 2 - MOBILITY

The concept of mobility is not tied solely to distances travelled. Obviously, the IFV, carrying the armored infantry, must be able to move as far as the tank. The experience of the 4th Armored Division in Europe (see Chapter Four) and the Israeli Armored Brigades in their rush to the canal (see Chapter Six) are obvious examples of the inability of the foot soldier to keep pace with the tank without help.

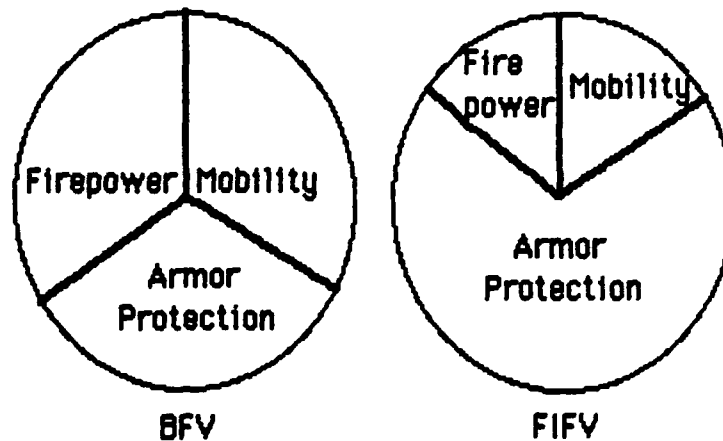
The IFV must also be able to move over the same terrain as the tank. The Russians on the steppes and the Americans on the Western Front were frustrated by the inability of their respective half-tracks to stay with their tanks while moving cross-country. Invariably, the infantrymen had to ride on the outside of the tanks if they were to be in the right place at the right time. In doing that, they were vulnerable to all types of fire (see Chapter Four).

SECTION - 3 - PROTECTION

The question about protection that is raised is one which all modern armies have wrestled with and addressed. Must the IFV have the same armor protection as the tank? The complete answer is complex. However, the bottom line is that the IFV must be able to protect it's infantrymen wherever it takes them. In the past, many arguments have been made about protection.

Protection can be achieved in ways other than by having thick armor. The tactical employment of the IFV can limit the exposure to anti-tank weapons. The speed of the vehicle as it moves across dangerous areas can also protect it. If accurate firepower suppresses the enemy, then the vehicle is protected, too. This writer believes these arguments were made to justify the decreased armor protection afforded the IFV due to costs and other trade-offs. The following illustration compares the Bradley fighting Vehicle's protection to how the Future Fighting Vehicle will achieve protection.

How Protection is Achieved.



Battle wound history shows that when they are unprotected, about ninety-five percent of all casualties suffered by infantrymen are caused by fragments from exploding devices and small arms fire. Therefore, it is clear the IFV must protect the crew and the infantry riding inside the vehicle from the effects of small arms fire, artillery fragments, and anti-personnel mines.³

The future fighting vehicle must provide greater armor protection than is currently offered by the BFV. Studies made of the fighting in the Middle-East and at the National Training Center indicate that half of the IFV kills were caused by tanks. Infantry Fighting Vehicles will operate in close to proximity to tanks; therefore, they must be similarly protected.

Achieving this level of protection will be difficult. It is not possible to protect a vehicle from the effects of all weapons. Weapons are easier to make and faster to field than armored vehicles. Sooner

or later, the weapons technology catches up and the vehicle is over-matched by the weapons system. The minimum that must be done is to protect the crew and infantrymen from the weapons oriented at the infantryman. For the armored infantryman, this should include anti-tank weapons systems, and if the vehicle is protected from anti-tank weapons, it will surely protect the infantry inside from the effects of small arms and fragments.

SECTION - 4 - FIREPOWER

The primary purpose of the infantry fighting vehicle's weapon systems must be to provide the infantryman with direct fire support. This is a concept that seems to be fading from the sight of the users and the doctrine writers. The field manuals for tactics and gunnery emphasize the ability of the BFV to destroy tanks and lightly armored vehicles. They fail to emphasize the capability of the fighting vehicle to support the infantryman.

The secondary purpose of the IFV's weapons should be the destruction of lightly armored vehicles. This is an area that has received a lot of attention by the users and the doctrine writers. The principal reason for this view is the destruction of the enemy's IFV leads to a reduction in the number and capability of enemy infantry who are trying to defeat the armored infantryman. The second reason

for attacking enemy IFVs (and other light armor) is to compliment the capabilities of the tank.

Least important, although relatively so, is the ability to defeat the enemy's tanks. This capability must be judiciously employed. Combat experiences with the tank destroyer in World War Two show the vulnerability of thin skinned vehicles fighting tanks. Experience with MILES at the National Training Center and at the other Combined Maneuver Training Centers indicate that the IFV is quickly destroyed when it goes head-to-head with a tank. If the IFV is to retain this capability, it requires a fire and forget system so that the vehicle is not exposed to the enemy and destroyed.

SECTION - 5 - SUMMARY

The final element of combat power to be discussed is leadership. Most American officers would agree that this is the most important piece of a complex puzzle. The history of the employment of fighting vehicles has shown that the leaders on the ground have done an excellent job of developing the required changes to the doctrine that were necessary to get the job done. Would it not be more productive to begin the next war with the doctrinal issues already solved?

Current doctrinal manuals are generally lacking in their treatment of armored infantry - tank integration and light (or other

dismounted) infantry - tank integration. A lack of common doctrine and an inability to understand each other have created a broad chasm between armor and infantry. Neither the tanker nor the infantryman seem to understand his own role in the combined arms team much less the role of the other fellow.

The most obvious example of today's incomplete doctrine is evidenced at our foremost training facility, the National Training Center. Mechanized infantry squads, platoons, companies, and battalions invariably do poorly in the integration of mounted and dismounted elements. The experts are not experts. The problem is complex, but it can be solved.

Current doctrine writers would do well to review some of the historical field manuals. The most valuable would probably be the ones written by World War Two veterans in the late forties and early fifties (such as the March 1951 edition of FM 7-17). Therein are embodied lessons learned from the United States Army's most diversified and extensive combat involving armored forces.

Another doctrinal problem area is the emphasis in FM 23-1, Bradley Fighting Vehicle Gunnery on shooting at enemy armor. This is the wrong focus (see above and Chapter Six). The gunnery tables should include several suppression targets. The targets should be bunkers or trench-lines, and the standard should be based on coverage from several firing positions within a time constraint (just

shooting from one hull-down position would be too easy, and it would teach bad habits).

In conclusion, the author believes the United States Army, and the infantry in particular, have misdirected their doctrinal efforts in regard to the infantry fighting vehicle. The current doctrine is confusing in the way it details the role of the armored infantry and the role of the fighting vehicle at the execution level. The armored infantry must understand its role on the battlefield if it is expected to succeed.

The success of the armored infantryman is critical to the success of the combined arms team. The tank, protected by armored infantry (from enemy infantry), fulfills its mission. The infantry, protected by the tank (from enemy tanks) and supported by its fighting vehicle, fulfills its mission. The strengths of each member of the team must be orchestrated against the enemies weaknesses. Together they achieve victory.

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