

AD-A262 656



**Increasing The Ground Tactical Mobility
Of U.S. Airborne Forces – Do We
Have the Means Available Now?**

**A Monograph
by**

**Major Stephen M. Sittnick
Infantry**



**Reproduced From
Best Available Copy**

**School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas**

First Term AY 92-93

Approved for Public Release; Distribution is Unlimited

**DTIC
ELECTE
APR 7 1993
S C D**

93 4 06 010

93-07133



20001026242

REPORT DOCUMENTATION PAGEForm Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 17/12/92	3. REPORT TYPE AND DATES COVERED Monograph	
4. TITLE AND SUBTITLE Increasing the ground tactical mobility of U.S. Airborne forces- Do we have the means available now?			5. FUNDING NUMBERS	
6. AUTHOR(S) Maj. Stephen M. Sittnick, USA				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) School of Advanced Military Studies Attn: ATZL-SWV Fort Leavenworth, Kansas 66027-6900 Comm (913) 694-3437 Autovon 552-3437			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT "Approved for public release; distribution is unlimited"			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) See Attached Sheet				
14. SUBJECT TERMS Ground Tactical Mobility Maneuver Protection Airborne Forces Firepower Leadership HMMWV			15. NUMBER OF PAGES 44	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

ABSTRACT

INCREASING THE GROUND TACTICAL MOBILITY OF U.S. AIRBORNE FORCES - DO WE HAVE THE MEANS AVAILABLE NOW? by MAJ. Stephen M. Sittnick, USA, 44 pages.

This monograph examines the current state of ground tactical mobility in U.S. airborne forces. Our national leadership is currently reviewing the assignment of roles and missions of the armed forces. Down-sizing will require the Army to employ its forces more efficiently. We must develop methods to enable smaller forces to apply the same level of combat power. This monograph examines a proposal to increase the ground tactical mobility of airborne forces in order to apply combat power more efficiently.

This monograph traces the historical development of mobility in airborne units to reveal their mobility capability and deficiencies. Past methods used to increase the tactical mobility of airborne units are studied. A conclusion of this monograph is that ground tactical mobility must be increased in U.S. airborne forces to meet current and future mission requirements.

The theoretical and doctrinal implications for increasing ground tactical mobility is considered in light of a new National Military Power Projection Strategy. The HMMWV is proposed as a means to increase ground tactical mobility of airborne units. It is analyzed against the criteria of maneuver, firepower, protection and leadership (the dynamics of combat power as described in FM 100-5 Operations). The HMMWV is found adequate for the mission requirements of U.S. airborne forces.

School of Advanced Military Studies

Monograph Approval

Major Stephen M. Sittnick

Title of Monograph : Increasing The Ground Tactical Mobility Of U.S.

Airborne Forces- Do We Have The Means Available Now?

Approved By:

John W. Brooks Monograph Director
LTC Johnny W. Brooks, M.A.

James R. McDonough Director, School of Advanced Military
COL James R. McDonough, M.S. Studies

Philip J. Brookes Director, Graduate Degree Program
Philip J. Brookes, Ph. D.

Accepted this 4th day of February 1993

Accession For	
NTIS CRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

DISC OF LIT IN

ABSTRACT

INCREASING THE GROUND TACTICAL MOBILITY OF U.S. AIRBORNE FORCES - DO WE HAVE THE MEANS AVAILABLE NOW? by MAJ. Stephen M. Sittnick, USA, 44 pages.

This monograph examines the current state of ground tactical mobility in U.S. airborne forces. Our national leadership is currently reviewing the assignment of roles and missions of the armed forces. Down-sizing will require the Army to employ its forces more efficiently. We must develop methods to enable smaller forces to apply the same level of combat power. This monograph examines a proposal to increase the ground tactical mobility of airborne forces in order to apply combat power more efficiently.

This monograph traces the historical development of mobility in airborne units to reveal their mobility capability and deficiencies. Past methods used to increase the tactical mobility of airborne units are studied. A conclusion of this monograph is that ground tactical mobility must be increased in U.S. airborne forces to meet current and future mission requirements.

The theoretical and doctrinal implications for increasing ground tactical mobility is considered in light of a new National Military Power Projection Strategy. The HMMWV is proposed as a means to increase ground tactical mobility of airborne units. It is analyzed against the criteria of maneuver, firepower, protection and leadership (the dynamics of combat power as described in FM 100-5 Operations). The HMMWV is found adequate for the mission requirements of U.S. airborne forces.

TABLE OF CONTENTS

I. INTRODUCTION	1
II. HISTORY OF GROUND TACTICAL MOBILITY OF AIRBORNE FORCES	5
III. INCREASING THE GROUND TACTICAL MOBILITY OF U.S. AIRBORNE FORCES	15
IV. ANALYSIS OF THE HMMWV AS A MEANS TO INCREASE GROUND TACTICAL MOBILITY OF AIRBORNE FORCES	21
V. CONCLUSIONS	28
APPENDIX: POSSIBLE MOUNTED PACKAGES.....	34
ENDNOTES.....	36
BIBLIOGRAPHY.....	40

I. INTRODUCTION

Jane's Dictionary of Military Terms defines mobility as "a quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfill their primary mission". The desire of military forces to increase their mobility can be traced to antiquity. Ancient warriors harnessed beasts of burden to haul their heavy implements of war. Foot soldiers of the kingdom of Ur were brought directly into battle on large horse drawn carts.¹ In a sense a dichotomy of mobility developed early in time. Mobility could pertain to the transport of combat equipment or movement of integral combat units. Today, as in the past, the first type of mobility often gets more attention by military planners. General Creighton Abrams wrote, "movement of equipment to support a concept of mobility has always been a significant problem. It often overshadows the basic requirement of mobility - "the capacity to move combat power on the battlefield."² This monograph examines the capability of U.S. airborne tactical units to move combat power on the ground, and searches for a method which increases that capability.

DIRECTION OF RESEARCH

The research for this monograph initially focused on the meaning of tactical mobility in the past, present, and future. It encompassed historical, theoretical and doctrinal writings. The focus was then narrowed to define the historical development of ground tactical

mobility of airborne forces. Finally, the adequacy of present and future ground tactical mobility of U.S. airborne forces was examined. The High Mobility, Multi-purpose wheeled Vehicle (HMMWV) was tested as a proposed means to increase the ground tactical mobility of U.S. airborne units. The author's personal experience was included as a source for the final endeavor.

ASSUMPTIONS

1. In this monograph, "U.S. airborne forces" refers to any U.S. unit able to deploy an airborne battalion task force in a contingency operation.
2. This entire battalion task force need not be mounted. METT-T analysis might cause leaders to mount only a section, platoon, or company.
3. This monograph focuses on ground tactical mobility. The helicopter greatly increases the tactical mobility of U.S. airborne units. Use of helicopters, however, is dependent upon weather conditions and enemy air defense coverage.

RESEARCH QUESTIONS

PRIMARY-

Does the U.S. Army have means available today to increase the ground tactical mobility of its airborne forces? The conclusion of this monograph is that the U.S. Army has the material, intellectual, and organizational means to increase the ground tactical mobility of its airborne units.

SECONDARY-

a. What is the historical development of ground tactical mobility in airborne forces? From the first occasion airborne forces were used in WWII combat, a contrast of mobility existed. Airborne forces were highly strategically and operationally mobile due to the airplane. Once on the drop zone, however, the paratrooper was a foot soldier in enemy territory. Efforts in WWII to increase the mobility of airborne forces were devoted to expediting the transport of heavy equipment and weapons. No substantive efforts were taken to increase the mobility of tactical airborne units. This situation continues in current U.S. airborne forces.

b. Is the state of ground tactical mobility in U.S. airborne forces adequate for current and future requirements? The record of Operations Just Cause and Desert Shield/Storm would suggest it is not. In these operations the infantry units of the 82nd Airborne Division had to be augmented with combat wheeled vehicles to move units on the battlefield. The ground tactical mobility of the basic fighting element of the U.S. airborne, the infantry, is still limited to foot mobility. The current national military strategy of power projection demands a force that can quickly deploy with creditable tactical mobility.

c. How do we increase the ground tactical mobility of U.S. airborne forces? The most obvious requirement is to procure an

appropriate cross country vehicle. It involves more than just selecting the right vehicle. We must adapt the entire manner by which airborne forces generate and apply combat power against present and future threats. Airborne soldiers and leaders must be equally proficient in mounted and dismounted combat. Theory, doctrine, techniques, tactics and procedures must be examined and updated. These actions are as important as developing a troop carrier for airborne forces.

d. Is the HMMWV an adequate means to increase the ground tactical mobility of U.S. airborne forces? In recent combat operations, U.S. airborne forces have used the HMMWV as an infantry troop carrier. The HMMWV provided a mobility advantage to traditionally dismounted U.S. tactical units. The HMMWV significantly increased the units' combat power. This monograph analyzes the HMMWV, using the dynamics of combat power (maneuver, firepower, protection and leadership) as criteria.

II. HISTORY OF THE GROUND TACTICAL MOBILITY OF AIRBORNE FORCES

Where is the prince who can afford to cover his country with troops for its defense, as that 10,000 men descending from the clouds, might not, in many places, do an infinite amount of mischief before a force could be brought to repel them?

Benjamin Franklin³

The appeal of airborne forces came primarily from their immense strategic and operational mobility. The possibility of inserting a combat force into the rear of the enemy appealed to WWII planners. They focused on the initial advantage of shock and surprise derived by an airborne operation. The WWII paratrooper, however, was foot-mobile once on the drop zone. Today's U.S. paratrooper has the same limitation. John Weeks wrote, "the paradox of airborne forces is that they get to their battlefield quicker than anyone else, traveling great distances, but once they arrive they are scarcely more mobile than the soldiers of Alexander the Great or Napoleon. They can not conduct a battle of maneuver against their opponents, nor can they easily subdue one objective and move to another unless it is quite close."⁴ This assertion might be contested if, as in Operation Just Cause, helicopters are used. Of course, helicopters are dependent upon weather conditions and are not organic to the main tactical fighting element of the airborne - the infantry. Today a loudspeaker team has more organic mobility than an infantry platoon. While combat multipliers such as the Sheridan (Airborne Armored Reconnaissance Vehicle), TOW HMMWV, and towed

artillery are available, airborne units have no organic infantry troop carrier. The U.S. airborne forces have great strategic mobility, yet minimal ground tactical mobility. The same mobility disparity that plagued the WWII paratrooper exists today in the airborne forces.

WWII

Surprise enables airborne troops lightly armed to achieve initial success. Once enemy defenders have recovered from their surprise a different situation will present itself. The airborne forces need such means of transport as will enable them to move themselves and their equipment.

F.O. Miksche⁵

Prior to WWII, the British assumed that their airborne forces could not seize or hold terrain. The Germans did not feel that paratroopers would have to stay and fight it out so heavy weapons were not initially issued to airborne units.⁶ Both sides felt the initial shock and surprise of the parachute insertion would provide sufficient advantage until follow-on forces arrived. The German airborne invasion of Crete, however, illustrated that paratroopers could find themselves in a significant ground battle.

After the pyrrhic victory of the Germans on Crete, many suggestions were made to strengthen the German airborne forces. "The German Army Command revised the mission of the airborne units to include attack on limited objectives and holding terrain."⁷ German paratroopers requested a tank be added to the force structure. "Experiments with the 'Lilliput panzer' began in 1942 but ceased in the same year due to armament problems."⁸ Heavy weapons and artillery were included in the paratroop unit equipment list. The Herman Goering Airborne Panzer Corps (one panzer and one motorized infantry division) was formed.⁹

This corps never saw action in an airborne operation. Shortly after activation, they were thrown into the conventional ground war. "The German High Command set about determining how all army units could be adapted to be included in airborne operations."¹⁰ The need for providing a creditable amount of combat power and ground mobility to airborne forces was considered critical.

The allies as well recognized the need to increase the mobility and firepower of their airborne forces. After the Normandy drop U.S. paratroopers requested augmentation of some armor.¹¹ The defenders of Bastogne (the 101st Airborne division) were reinforced with tanks, tank destroyers, trucks, and artillery. This was typical of measures taken throughout the war to prepare airborne troops for conventional ground roles. Any permanent measures to increase the combat power for an airborne operation was limited to minor additions of heavy equipment and weapons. Special containers were designed to drop this equipment. "Small wheels were attached to move the containers off the drop zone, but they failed on uneven terrain."¹² The allies failed to take measures to increase the mobility of airborne tactical units.

Bicycles were tested and used by some paratroopers. They were often severely damaged in the drop or unable to handle the rigors of cross-country movement.¹³ The U.S. Army formed the 88th Airborne Infantry Battalion which owned 280 bicycles, 140 motorcycles, and a few jeeps. This unit never left the training ground of Georgia.¹⁴ Ponies, motorcycles, and wheelbarrows were also used to give the airborne units additional mobility.

Jeeps were adapted by allied airborne units to help solve the mobility problem. "The jeep was devoted to moving heavy equipment, not moving forces to secure any positional advantage over the enemy."¹⁵ The jeep seated only three men, had limited payload space, and was a thirsty vehicle with a small gas tank.¹⁶ "The end result was a heavy reliance on follow-on forces and truck augmentation for airborne units to perform missions of regular infantry."¹⁷

DEVELOPMENT OF SOVIET AIRBORNE FORCES

The purges of Stalin in 1937-38 eliminated many of the brilliant Soviet military thinkers. This contributed to the defeat and retreat of the Red Army of 1941. "There was no substantive thought of airborne offensive operations since the murder of General Tukhachevsky."¹⁸ The Red Army attempted an airborne assault in support of the Moscow counteroffensive of 1942-43. Poor planning and insufficient equipment resulted in failure. The rest of the war saw Soviet airborne units mainly involved in regular infantry ground operations. The post-Stalin reforms brought complete doctrinal reformation to the airborne forces. Emphasis was on creating a smaller more mobile force capable of fighting and surviving on the nuclear battlefield. "The tactics which developed rejected the passive defense of limited objectives and adopted maneuver combat."¹⁹

The Soviets, unlike the Americans, set out to increase the ground mobility of airborne units.²⁰ The Soviets considered the airborne assault only the beginning phase of an operation, not the essence of combat operations for an airborne force. Soviet leadership wanted to

give their airborne forces the ability to maneuver after the drop. Secondary mobility, as it was termed, came from mechanized vehicles suitable for airborne operations. In 1973, a mechanized infantry carrier (BMD) was developed as the infantry combat vehicle. It carried an infantry squad and mounted a 73mm canon.²¹ The ASU 57, an armored self propelled 57 mm gun, was also developed. Soviet airborne units had both an infantry fighting vehicle and armored gun.

Initially, Soviet airborne forces were intended to exploit nuclear strikes. In the 1970s, their training and force structure focused on defeating NATO ground forces on a conventional battlefield. "The fielding of the ASU-85, PT-76, AT-3 and AT-4 in airborne units was in reaction to NATO's armored mobile counterattack force."²² Mounting the airborne rifle squad in the BMD gave it greater firepower, armored protection, mobility, and NBC protection.²³ The BMD gave Soviet paratroopers the capability to move combat troops into a fight in an armored fighting vehicle equipped with heavy weapons.²⁴ "While the primary mission of a U.S. airborne unit was to seize and secure an airhead, the Soviet airborne unit was to conduct offensive maneuver with direct firepower."²⁵

U.S. AIRBORNE ADAPTATION

At the close of WWII, the U.S. Army convened a board of officers to study the future of airborne forces. The board delineated the phases of airborne operations which served as the genesis of the current lodgement concept.²⁶ A fire brigade mentality developed. Airborne forces were considered a strategically mobile force able to quickly deploy to demonstrate American resolve. As demonstrated by the

British in the Suez operation, our allies also lacked a focus on tactical mobility. "Paratroopers at Port Said in 1956 found themselves no more mobile once on the ground than their predecessors at Arnhem. They became foot soldiers once more after being delivered to the battle by a vehicle of great strategic mobility -- the transport aircraft. They were dependent upon the early relief by follow-on forces."²⁷

U.S. paratroopers primarily used airmobile tactics during the Vietnam war. Emphasis was on search and destroy operations. There were no improvements in ground tactical mobility of the airborne rifle squad or platoon. The paratrooper in Southeast Asia was foot mobile like other non-mechanized infantry units. As General Giap said, "The American soldier had almost as little foot mobility as their foe had helicopter mobility."²⁸

The 1973 Arab-Israeli War caused the 82nd Airborne to be alerted for deployment. "U.S. paratroopers, equipped with little more than light anti-tank weapons, were unprepared for tank warfare."²⁹ This near deployment generated renewed interest in the airborne forces' role in a central European battlefield. The 82nd Airborne leadership developed the Airborne Anti-Armor Defense (AAAD). It was a defense in depth, built around armor kill zones and infantry protected anti-tank guided missile (ATGM) positions. Success was dependent on wise choice of ground, forcing the enemy into the armor kill zones and separating enemy infantry from their tanks. If the enemy did not attack as planned, there was insufficient mobility to alter the orientation of the defense.

RECENT COMBAT OPERATIONS

Operation Just Cause

In recent combat deployments U.S. airborne forces have had to augment themselves with some form of adhoc mobility packages. In Operation Just Cause, Sheridans, Armored Personnel Carriers (APCs), and Light Armored Vehicles (LAVs) were pre-positioned to counter the Panamanian Defense Forces armored vehicles. Additional Sheridans, artillery and HMMWVs were delivered in the parachute assault. Mobile firepower was needed for direct fire support and convoy security. Other benefits of the vehicles were soon discovered. The HMMWVs and APCs effectively provided mobile roadblocks, patrols and reaction forces. "The M2 .50 caliber machine gun proved itself very effective in urban fighting."³⁰ The HMMWV itself proved to be rugged and battle worthy. One HMMWV caught in an ambush drove through it and to a friendly position despite eighteen bullet holes and two flat tires. The sight of Sheridans and HMMWVs with .50 caliber machine guns helped quell a mob of civilians threatening to riot at the Papal Nuncia. The paratroopers were perceived to be part of a powerful mobile force, not merely a foot bound light infantry unit.

Desert Shield

The 82nd Airborne was deployed to Saudi Arabia to display U.S. resolve and defend Saudi Arabia. Little did the leaders of the division realize the deployment would be a prelude to one of history's grandest examples of maneuver warfare. The initial defensive mission was reminiscent of the AAAD except set in the desert not the central European plains. Overall success in the defense was dependent on the

enemy attacking in the manner and location predicted. The situation demanded a mobile defense. The airborne forces were only able to prepare an area defense.

Desert Storm

Prior to the ground war, the 2nd brigade of the 82nd Airborne Division was attached to the 6th French Light Armored Division. To conduct their mission of leading the attack in the French sector, they had to be augmented with additional Sheridans, HMMWVs, and trucks. The HMMWVs and trucks were utilized as Infantry squad carriers. Units instantly increased their range and speed of movement. Leaders were forced to think in terms of greater mobility. Procedures for mounted battle drill, maintenance, and fueling had to be developed. All the members of the brigade, from rifleman to supply clerk, were mounted when the brigade attacked. The desert war took its place among a list of contingency operations requiring airborne units to be augmented with tactical vehicles.

THE FUTURE AND U.S. AIRBORNE FORCES

This reoccurring need for increased ground tactical mobility must be seen as a permanent requirement. The force structure and training program of airborne units must be altered accordingly. Too often, U.S. airborne units have had to form adhoc mobile force packages to meet mission requirements. In some instances anti-tank sections, mounting .50 caliber machine guns on their HMMWVs, have been sufficient. Other times infantry squads to entire brigade task forces have had to be

mounted. The appropriate mobile packages were organized and subsequently disbanded after mission accomplishment. No doctrine, theory, training plans or force structure was changed. The infantry soldiers still went without an organic troop carrier.

Given lessons of our recent past and future threats, are we not writing doctrine for the airborne that is woefully inadequate? The U.S. public and civilian leadership considers the insertion of the 82nd Airborne the quintessential statement of American resolve. It is time to reveal in plain terms that America's Guard of Honor has the same limited mobility today as it did in WWII. We need more mobility in the airborne infantry, lest some future foe painfully display the depth of our inadequate ground mobility in some pitch battle on foreign soil. The old paradigm has changed. General Ridgway said after WWII, "Airborne troops should not be employed unless they can be supported by other ground or naval forces within three days or unless they can be withdrawn after their mission is accomplished".³¹ The reality of recent combat makes this admonition obsolete. U.S. airborne forces have had to commence decisive combat operations immediately after arrival. The paratrooper must train as he will fight- with the mobility required for his missions.

We are now in the wake of force downsizing and redefining roles and missions. Some say that the Marine Corps prototype Osprey aircraft, or some other suitable over the horizon aircraft, will negate the need for parachute units. This argument misses the basic issue of providing sufficient ground tactical mobility to a rapid deployment contingency force. Whether on a drop zone or landing zone, paratrooper or marine,

an American warrior will once again be foot mobile.

The mobility gap must be eliminated. Airborne forces must routinely plan for and train with combat vehicles that give squads the ground mobility they require for current and future battlefields. Airborne units must not isolate themselves into a community outside the proponents of mobile warfare. Today the cost of doctrinal and operational isolation may well be terminal for airborne forces and U.S. military strategy. The Army must transform its airborne forces into a viable maneuver force with sufficient ground tactical mobility.

SUMMARY

Two prevailing trends emerged from the historical development of the ground tactical mobility of U.S. airborne forces.

1. A gap has persisted between the strategic and tactical mobility of U.S. airborne forces. The Soviet armed forces used modern technology to eliminate this gap in their airborne forces. The United States Army has this same potential, it must decide to exercise it.

2. Efforts to increase the combat power of U.S. airborne units have focused on augmenting them with heavy weapon systems, not increasing the mobility of tactical units. There has been some temporary vehicle augmentation of tactical units for recent combat operations. These measures were not permanently adopted.

These two trends must be broken to meet the requirements of modern combat. The ground tactical mobility of U.S. airborne forces must be increased. This involves more than just equipment augmentation. U.S. airborne forces must adjust their entire method of applying combat power.

III. INCREASING GROUND TACTICAL MOBILITY OF U.S. AIRBORNE FORCES

We must increase the ground tactical mobility of airborne tactical units not merely individuals, weapon systems, or heavy equipment. Units apply the dynamics of combat power to the enemy on the battlefield. Mobility provides movement to combat power. It does no good to have combat power if it can not be delivered to the right place at the right time. Airborne units must have more than just foot mobility available to them. As Liddell Hart admonished military leaders, "While maneuver is the key to victory, it is the maneuver of the units of firepower and not masses of cannon fodder. We must learn to depend for success, not on the physical weight of the infantry attack, but on the skillful offensiveness in combination of all available weapons, based on the principle of maneuver."³² The skill needed to increase the combat power of airborne forces will come from a reexamination of our theory and doctrine. We must also update our force structure to meet the needs of our power projection strategy and make a commitment to bridge the mobility gap.

THE NEED TO STUDY MILITARY THEORY AND HISTORY

Clausewitz will not go out of style, nor will Mao. Murphy's Law will still operate and as, as always, few will prepare for reverses, advances cunningly planned, or retests. The future, despite the best efforts, will have the past as prologue. ³³

Serious study of military history is needed to fight the tendency to

do things the way they have always been done. In a contingency force, such as airborne forces, the daily agenda is crammed with a myriad of administrative, training, and readiness tasks. "In our haste to get on with the practical matters, soldiers learn and teach methods; but they usually fail to learn and teach why those methods are successful."³⁴

The main effort of our peacetime training should remain schooling soldiers and junior leaders in contemporary tactics, techniques and procedures. Time must also be devoted to studying history and theory. The reward is great for those who study the successful methods of past warriors. An opportunity exists to deduce for oneself the immutable principles underlying a historical event of war. These principles serve as a foundation to help us determine the best methods to fight future battles.

Principles can assist us in determining the proper amount of mobility that a force requires to perform its mission. The process is more cerebral than looking into a cookbook of methods and selecting the right one. "Technique alone does not suffice to ensure success and it is the constant task of tacticians to work out the proper combinations of all means, mainly their cooperation in time and space. In the future it will require much skill and intelligence to utilize the engines of war better than the enemy."³⁵ Better and faster is the requirement today. "We must be quicker and more agile than our foe to wrest the initiative from him and economize our own forces."³⁶

The airborne force by its very nature of insertion capitalizes on the shock and surprise to seize the initiative from the enemy. This initiative is perishable when one considers the inherent tempo that

today's potential adversaries possess. A static force confined to the airhead line at foot pace is in a precarious situation. In the past, paratroopers have applied measures that caused an enemy to perceive the insertion of a far larger force. To continue this advantage the airborne force must be able to think and move faster than the enemy. We must seek to control the tempo of the entire battle not just a footprint of enemy territory. The enemy must look upon the airborne force and see fluid activity not a picket line. The facade must resemble the image of a cobra able to strike at will with deadly precision. The airborne force must be able to strike out quickly and powerfully in any direction.

NATIONAL STRATEGY AND AIRBORNE TACTICS

The new U.S. national military strategy of power projection requires airborne forces to increase their mobility and flexibility. FM 100-5 (draft 1992) emphasizes rapid response as the key to carrying out a power projection strategy. "Rapid forces must have the flexibility to contend with situations requiring a larger response. Early entry could lead immediately to direct combat. The force could deploy for humanitarian relief or peace keeping and transition into peacemaking or outright battle."³⁷ An airborne force today does not have the luxury, of waiting three days for a larger force, as did General Ridgway in his time. A smaller, more agile and mobile force must resolve now what a heavier unit might not be able to solve later.

The current U.S. Army concept of power projection provides for the possibility of a phased deployment. The concept calls for initial entry

of a light/airborne battalion or brigade, followed by a heavy brigade at C+7, an airborne/light division by C+12, two heavy divisions by C+30, and a five division corps by C+75. This transition will require an initial light/airborne force that understands the requirements of heavy forces. The heavy brigade will need a support infrastructure and sufficient terrain upon arrival. The Light Division headquarters will need the experience and infrastructure to fight and support a heavy brigade. The division planners and operators must be accustomed to the requisite speed and support required of heavy units. Vehicular mobility cannot be the sole domain of heavy forces.

The initial entry force must be highly mobile to support the phased concept of power projection. It must arrive able to fight at a high tempo in the first days of the operation. "Given the significant numerical superiority of surrogate forces, the Rapid Deployment Force must rely on the classic light-cavalry tactics of military minorities: flank attacks, harassment, mobility, point concentrations of firepower, night and bad weather operations, deception and concealment, mines and booby traps, and concerted psychological warfare."³⁸ An airborne force cannot survive as a static trip wire. It must be a lethal and mobile force.

Enhancing the mobility of airborne forces yields many advantages. The force is able to reach out further and quicker to provide a greater buffer for the initial lodgement. The perception of the size threat to the enemy is inflated as the mobility of the airborne force is increased. To make the moral advantage keener we must routinely and openly display a proficiency with mobile operations. "The aim of a machine attack is to first demoralize and only second to destroy; sustained and

rapid movements are even more important than heavy blows."³⁹

THE COMBINED ARMS MOBILITY GAP

The infantry component of airborne forces feels the consequences of a mobility gap between it and the balance of the airborne forces. Liddell Hart called on the military to, "provide a real tactical mobility on the part of the infantry to demoralize the enemy with effective fire, penetrating weak spots, and menacing his rear."⁴⁰ This kind of effect can only be obtained if the infantry has mobility comparable to the combat multipliers in the airborne division. The armor battalion has the Sheridan and eventually will have the Assault Gun System. The TOW is mounted on a HMMWV and the 105mm howitzer is towed by the same type vehicle. An attached engineer squad, loudspeaker team and even the water purification unit have more organic mobility than the airborne rifle squad or platoon.

The legacy of AirLand Battle and the tenor of contemporary Army operations is suited to a mobile and agile force. Today's paratroopers must be proficient fighting a mounted form of warfare. They must arrive prepared to fight in organic troop carriers. Airborne forces must train and fight mounted as well as dismounted. Paratroopers require this combat multiplier of mobility in order to continue the initial advantage of surprise gained by a parachute or airlanding insertion.

INCREASE GROUND TACTICAL MOBILITY NOW

Airborne forces are not exploiting an existing airdroppable vehicle capable of carrying a rifle squad and its equipment. The HMMWV has the

cross-country mobility and troop carrying space that the WWII paratrooper wished of his jeep. I am not proposing the formation of yet another motorized division, as our Army experimented with in the 30s and 80s. Some day U.S. airborne forces must have its own mechanized carrier available for contingency operations. The Soviets proved that the technology exists now. The HMMWV is not perfect but it is available and combat proven. It gives an Infantry squad the mobility to sustain the initial advantage of shock and surprise.

We must develop a theory, doctrine, and technique for fighting with increased tactical ground mobility. The paratrooper can not remain foot mobile indefinitely. We cannot wait till the perfect armored vehicle is produced. Airborne forces must train on the means available, the means already used in war. "Sometimes we focus on the best /most sophisticated system and a dearth exists in lower technology hardware."⁴¹ There is a dearth of doctrine for fighting a mobile style of war anywhere but Europe or the desert or by any other force than a heavy force. The void must be filled now.

SUMMARY

Today's U.S. airborne forces must be able to do more than arrive in a conflict area quickly. Every component of the airborne force, rifleman to tanker, must have the capability to fight mounted. U.S. airborne forces must be able to strike out and quell a situation on the ground before it escalates, or serve as a mobile spearhead force for a follow-on heavy force. There must be a real sense of intellectual and material connectivity between the airborne forces and armored-heavy forces. This is the only way today's power projection strategy will succeed.

The HMMWV is an available means to help develop that connectivity.

IV. ANALYSIS OF THE HMMWV AS A MEANS TO INCREASE MOBILITY

Leaders must at each level of an organization be given the tools which are easily and effectively managed by men of average capabilities. Too often our approach has been to provide a new capability and expect leaders to be trained up to the demands of their hardware..... this generates a fixation on technology and weapons.

Huba Wass de Czege⁴²

The HMMWV is not the panacea for resolving the mobility gap of airborne forces. It is available and it allows leaders and soldiers to learn and practice the fundamentals of mobile warfare. More than just a vehicle and weapon system are required. Developing doctrine, techniques, and a logistics infrastructure are also needed. As Miksche wrote, "Invention of a tactical system is as important as the invention of the weapon".⁴³ Airborne forces need the capability to mount and fight mobile tactical units not just mobile weapon systems.

The basic tactical unit of the airborne force is the infantry squad. Airborne units need squad mobility. The squad is a cohesive unit with its own inherent maneuver, firepower, protection and leadership. The infantry squad can dismount to patrol, defend, set up a roadblock, or even perform manual labor. A HMMWV mounted squad provides a vehicle and weapon system along with nine spirited and skillfully led paratroopers. They can perform tasks from humanitarian relief to ambush.

The HMMWV is flexible enough to use in multiple roles. Initially a

cargo HMMWV could mount a rifle squad acting as part of a task force reserve on an airfield seizure mission. The squad might then move to establish an anti-armor ambush, retrieve non-combatants, or link-up with SOF teams. The squad might even assist the recovery of equipment containers(CDS). The key point is that a vehicle (a premium asset in an airhead) is controlled by a tactical leader at all times and carries a squad which can attack to destroy the enemy or perform support tasks.

ANALYSIS OF THE HMMWV

The dynamics of combat cited in FM 100-5 serve as an effective model to analyze the capability of the HMMWV as a means to increase the mobility of airborne forces. Combat power is the ability to fight. It is expressed as the combined effects of the dynamics - maneuver, firepower, protection, and leadership - on the enemy. Maneuver is the ability to move in relation to the enemy, firepower is the ability to destroy the enemy, protection is the ability to conserve friendly combat power, and leadership directs the application of combat power.⁴⁴

MANEUVER

The essence of maneuver is positioning forces in critical areas to gain a relative advantage over the enemy. "The effect causes the enemy to be thrown off balance by attacking his weakness, unhinging his plan, and preventing him from countering our action against him."⁴⁵ It implies not only getting the right friendly force at the right place and time but also insuring the right enemy force arrives at the right time and place. Jomini defines maneuver as, "imparting to the troops the greatest possible mobility and activity so as, by their

successive employment upon points where it may be important to act, to bring superior force to bear upon fractions of the hostile army."⁴⁶ One method of hitting fractions of the enemy army is to practice the paratrooper's traditional art of striking at many places at once. T.E. Lawrence referred to such action as, "a creeping paralysis caused by an intangible ubiquity which substituted for the fixed battle."⁴⁷

HMMWV mounted units should not be compared to armored units in terms of maneuverability. Both do take advantage of their vehicles' speed and cross-country mobility to maneuver. HMMWV mounted infantry, however, do not possess the same potential for momentum as an armored forces. "The tanker halts between moves, the infantryman moves between halts."⁴⁸ The infantry squad must be dismounted and positioned to deliver the full effect of its weapons on the enemy. The HMMWV's mobility provides speed, range, and trafficability to assist the infantry unit moving between positions.

HMMWV mounted units must fully exploit the terrain using available cover, concealment, and stealth. They must overwatch the movement of friendly vehicles with direct suppressive fire. The key is to avoid becoming a moving target. Stonewall Jackson said, "One seeks to take the enemy unawares, to mislead, mystify and surprise him, to compel him to deploy his forces while you remain concentrated, to destroy the cohesion of his forces while maintaining that of your own."⁴⁹ One has to always keep the enemy in mind and avoid contact on the move.

The HMMWV allows the mounted paratrooper to arrive at the proper position quickly. The ultimate goal would be to someday mount the airborne infantry squad in a vehicle that would give it the capability to

attack from the line of march.⁵⁰ This would only come from mounting infantry in an armored vehicle - the HMMWV is not an armored vehicle.

FIREPOWER

The firepower of the HMMWV consists of the direct fire weapon mounted on the vehicle, the weapons carried by each soldier on-board, and the effects of fire support assets the mounted unit can request and control. The possible mounted direct fire weapon systems are the M60 and .50 caliber machine guns, MK 19, and TOW. The vehicle radio provides the unit's forward observer with a more powerful, reliable, and durable radio to request and control fire support assets. A platoon mounted in four HMMWVs with two MK 19s and two .50 cal. MGs could be reinforced with two TOW HMMWVs or Sheridans to form a very mobile and potent anti-armor force. This force is also a very creditable battalion task force reserve. The HMMWV can move the combined effects of the unit's direct and indirect weapons about the battlefield with great speed.

PROTECTION

Protection is accomplished by shielding the fighting potential of the friendly force so that it can be applied at the decisive point at the right time and place. As pointed out earlier, the HMMWV itself does not possess sufficient inherent protection. The HMMWV's mobility aids in gaining protection. Merely mounting a unit in the HMMWV is not an effective protective measure against enemy fire.

Partial armoring of the HMMWV is not a viable solution. Partial

armoring a vehicle was appropriate in 1715 B.C., when the first partially armored carts delivered foot soldiers into battle, it is not sufficient enough today.⁵¹ World War II motorized unit leaders actually found expedient partial armoring to be more dangerous in some cases. "Half Armor is really less valuable than no armor at all, for it gives the crew a false sense of security and results in needless casualties."⁵² A fully armored vehicle for the airborne forces must be produced. Until such a vehicle is produced, HMMWV mounted forces will gain protection by skillful positioning and maneuver.

The paratrooper must retain his physical toughness regardless of the means of mobility he uses. Paratroopers rely on their fitness, achieved through demanding training, to keep alive. They must not be reluctant to dismount their vehicles and dig in. Whether attacking or defending, squad members must dismount to use their weapons against the enemy. S.L.A. Marshall observed in the Korean War that the American soldier had an innate tendency to cling to his vehicle.⁵³ He called on the traditional hardiness of the foot soldier to counter this dangerous trait. "The soldier must be willing to prepare a fighting position in order to diminish the target he offers the enemy and gain the cover and concealment of the ground."⁵⁴ HMMWV mounted paratroopers must arrive at the right piece of terrain before the enemy, prepare a fighting position, and use expert marksmanship to destroy the enemy.

LEADERSHIP

"Leadership inspires and motivates soldiers to do difficult things in dangerous and stressful circumstances."⁵⁵ The leader must be

able to not only control his soldiers but also synchronize the proper combination of maneuver, firepower, and protection. The HMMWV's additional mobility requires the leader to think faster than if foot-mobile. In dismounted operations a leader trains his unit to react properly to enemy contact or elude contact till he can strike the enemy at a favorable time and place. In mounted combat the unit must go a step further. The leader must estimate the enemy capability (action) and consider the proper friendly action to counter it (reaction). Then, adhering to the tenet of agility, the leader attempts to apply some friendly activity to prevent the enemy from performing the initial action.

The ability to move quicker on the battlefield assists the leader in exercising agility. Squad and platoon leaders must be given the opportunity to routinely train mounted in order to develop agility. Leaders of mounted forces must develop a whole new way to think about fighting. They must be able to unhinge the enemy plan, striking the enemy before he can strike. This maneuver style of warfare will only develop from routine mounted training.

Troops must be habituated to the method in peace if they are to carry it out safely and successfully in war. To acclimatize the infantry to motors is almost as important, for reasons not of morale, but of mobility. For only by being used to an instrument can it be used to full advantage.

Liddell Hart⁵⁶

SUMMARY

The HMMWV is an adequate means to increase the ground tactical mobility of U.S. airborne forces. It can move paratroopers to the

decisive point faster than if dismounted. A HMMWV mounted unit can deliver a potent blend of direct and indirect firepower. Protection comes from quickly delivering a unit to defensible terrain or rapidly traversing dangerous ground. Mounting airborne units in HMMWVs, allows airborne leaders to exercise greater agility. Units could strike out at the enemy before he recovers from the shock of the initial airborne insertion.

V. CONCLUSIONS

The primary research question of this monograph was, "Is there a means available today to increase the ground tactical mobility of the U.S. airborne force?" The HMMWV series vehicle is available and has even been used in recent combat operations by airborne forces to provide that increased mobility. It continues to be an effective means to help paratroopers accomplish their mission.

THE HMMWV BREAKS THE HISTORICAL TREND

Once on the ground, the airborne force has limited tactical mobility. That mobility depends on the number and type of vehicles and helicopters that can be brought into the objective area.
FM 90-26 Airborne Operations p. 1-6

The above excerpt vividly describes the mobility gap between the strategic and tactical mobility of airborne forces. At times, this mobility gap has been bridged by temporarily mounting paratroopers in HMMWVs. The capability for airborne forces to conduct mounted combat has become a permanent mission requirement. The primary role of airborne forces today is to conduct decisive contingency operations that lead to conflict resolution not merely an initial lodgement. It is doubtful in today's world if an exclusively foot-mobile force alone can render conflict resolution.

Airborne forces can no longer rely on seizing an airhead and waiting in a static perimeter defense for reinforcement from heavier mobile

forces. They must arrive with ground tactical mobility that enables them to assemble, seize the airhead, and swiftly and decisively strike out from the airhead against a stunned foe.

The need for small mobile and potent forces has been accepted worldwide. The tempo of modern combat is not based on plodding a mass of soldiers and weapons but swift decisive maneuver. Nations have adapted this principle to their airborne forces. The Soviets led the way with their BMD mounted airborne forces. The U.S. must give its own airborne forces increased ground tactical mobility that will sustain the paratrooper's initial shock and surprise.

THE HMMWV CAN MOVE INTEGRAL TACTICAL UNITS

The HMMWV is currently available in airborne units today yet not used as an infantry carrier. It is used to enhance the mobility of Anti-tank, Artillery, combat support and combat service support units. The centerpiece of airborne combat power, the infantry, has no organic vehicle to increase its mobility. It must rely on temporary augmentation of helicopters or wheeled vehicles. Temporary assistance from helicopters or trucks merely serve to reposition a foot-mobile force. There is no inherent secondary mobility after the paratrooper exits. The HMMWV would give airborne infantry units sustained tactical mobility to maneuver their combat power about the battlefield.

The strength of airborne forces comes from the skill, courage, and discipline of the individual paratrooper. The paratrooper's abilities are enhanced by the teamwork and cohesion that develop in squads and platoons. This teamwork and cohesion is essential to the survival and success of airborne forces in close combat.

FM 90-26 Airborne Operations (p. 1-2 and 1-3)

Airborne Infantry squads and platoons are the primary deliverers of combat power of the airborne force. Our military planners have often attempted to increase the combat power of airborne forces with additional firepower. The lack of inherent ground mobility of the squads and platoons have limited the success of these efforts. The HMMWV gives squads and platoons a base of mobility that increases the overall combat power of airborne forces. The augmentation of armor or anti-tank systems reaches a point of diminishing returns if the base force, the Infantry, is limited to foot mobility. The HMMWV provides the Infantry component with the same mobility as other components of the airborne forces. By focusing on increasing the mobility of the basic unit, the rifle squad, the overall combat power of the entire airborne force is increased geometrically.

THE HMMWV WOULD INCREASE MOBILITY NOW

The ground tactical mobility of airborne forces must be increased now. Recent combat operations of U.S. airborne units required paratrooper Infantry units be augmented with HMMWVs in order to accomplish their missions. HMMWV mounted squad to Infantry battalion sized units were temporarily organized for combat operations. In the case of Operation Just Cause, plans for mobile organizations were developed during the alert sequence prior to deployment. There was no opportunity for the airborne infantrymen to develop any mounted battle drills. Operation Desert Storm provided limited training time to develop and practice mounted battle drills. Airborne units cannot assume future combat deployments will allow a train-up period. The HMMWV is available to allow paratroopers to routinely train in mounted

operations.

**THE HMMWV HELPS AIRBORNE UNITS COMPLY WITH TODAY'S
STRATEGIC REQUIREMENTS**

The strategic mobility of airborne forces permits rapid employment to meet contingencies across the operational continuum in the world. Airborne forces provide a means by which a commander can decisively influence operations. Airborne forces when augmented with appropriate combat, combat support, and combat service support can conduct sustained combat operations against any enemy.

FM 90-26 Airborne Operations p. 1-3 and 1-4.

Today's National Military Strategy requires a rapid deployment force to arrive with sufficient combat, combat support, and combat service support. The requirement is to defeat a foe early prior to the escalation of conflict by either side. There may not be enough time for follow-on augmentation. Airborne forces must retain their ability to decisively influence operations after the initial drop. Our power projection strategy assumes forces with power projection tactics. Only this type of force will deliver the overwhelming combat power that will yield a quick decisive victory our nation traditionally seeks in its wars.

Prolonged conflict is not easily accepted in our nation. Today our national leadership and the American public assumes their airborne forces have more than just a forced entry capability. They will expect the success they have seen in recent combat operations. They expect U.S. airborne forces to parachute into an enemy territory and strike at the enemy's heart and head. They will not understand if an American airborne task force is held captive in an airhead by a more mobile enemy force.

Our national leaders and public will not understand an airborne force unable to conduct a forced entry to rescue American citizens due to overwhelming enemy air defenses. It is assumed (in light of today's sophisticated technology) that we have the capability to parachute into a remote drop zone, mount vehicles and infiltrate into enemy territory avoiding enemy air defense coverage. Our nation relies on us to fight intelligently and keep friendly losses to a minimum. The American people accept the inherent danger of parachute operations but they also assume that we have progressed since WWII. It would be hard to explain why other nations have managed to supply their airborne forces with a ground tactical troop carrier, while today's U.S. paratroopers still fight as their WWII foot-mobile predecessors.

THE HMMWV INCREASES COMBAT POWER

The HMMWV successfully withstands the analysis of the dynamics of combat power. The mobility of the HMMWV significantly increases the dynamics of maneuver, firepower, protection and leadership of an airborne unit.

Maneuver- The HMMWV gives an airborne squad more speed in order to get to the decisive point faster than the enemy. A mounted squad is far more agile and has an advantage of sustaining the initial surprise from an airborne insertion. A HMMWV mounted force can destroy the enemy commander's plan by striking quickly, stealthily and repeatedly.

Firepower- The potent firepower of the mounted unit comes from the direct fire system on board and the weapons of the members of the mounted unit. The ability to request and control lethal indirect fires is

enhanced by the on-board communications system and the vehicle's ability to get to a critical observation point quickly.

Protection- The HMMWV's ability to travel quickly between positions enhances the protection of the airborne unit. The HMMWV does lack the inherent protective capabilities that an armored vehicle can provide. The ultimate goal must be to produce an armored vehicle for U.S. airborne forces.

Leadership- Airborne leaders traditionally exhibit uncommon initiative. The mobility of the HMMWV exploits this initiative. The HMMWV gives airborne leaders the ability to preempt the enemy plan, not just wait to counteract it. The HMMWV allows airborne units to practice the tenet of agility well after the parachute insertion.

Future infantrymen must be bold, nimble, an expert shot, but equally apt in exploiting mobility and surprise - such an infantryman can seize or create many opportunities for vital intervention on the modern battlefield.

Liddell Hart⁵⁷

RECAPITULATION

The HMMWV allows U.S. airborne forces to meet the requirement for increased ground tactical mobility. The HMMWV will allow airborne forces to fight more effectively in today's highly mobile battlefield environment. HMMWV mounted airborne units would be more conducive to today's power projection strategy.

APPENDIX: Possible Mounted Packages

MISSION: SEARCH and ATTACK

<u>Phase</u>	<u>Size Unit</u>	<u>Veh/Wpns</u>	<u>Task</u>
1. Airfield Seizure	Inf Plt(+)	4 HMMWVs 2MK 19s 2.50 cals 2 Sheridans	TF Reserve
2. Search and Attack	Inf Plt(+)	(see above)	TF Reserve
	AT Plt	4 HMMWVs 2 MK 19s 2.50 cals	Convoy Security

MISSION: Airfield Seizure/Lodgement

<u>Phase</u>	<u>Size Unit</u>	<u>Veh/Wpns</u>	<u>Task</u>
1. Airfield Seizure	Inf Plt(+)	(see above)	TF Reserve
2. Expand Airhead	Inf TM*		Counter
	2 Inf Plts	8 HMMWVs	Recon
	Sct Plt	9 Motor cycles	
	AT PLT	4 HMMWVs 4 TOWs**	
	Co Hqs	2 HMMWVs	

Inf Plt	4 HMMWVs	TF Reserve
Tank Plt	4-5 Sheridans	TF Catk Force

* The nucleus of this Inf Tm would be comprised of the Inf Company that had the mission of seizing the key facilities. It would hand that mission over to D Co(-) and fall in on their HMMWVs that would have been delivered to the airhead after the airfield was secure. It would leave one of its platoons as the TF Reserve.

** The valuable asset is the TOW night sight for surveillance. These vehicles would also bring .50 cal MGs.

MISSION: Long Range Infiltration

<u>Phase</u>	<u>Size Unit</u>	<u>Vehs/Wons</u>	<u>Task</u>
1. Airborne Insertion	Inf Plt	4 HMMWVs	TF Reserve
(balance of task force would have their vehicles inserted by airland)			
2. Build up Cbt Power	Sct Plt	9 Motorcycles	Route Recon
	AT Co(+)		Advance
	4-5 AT Plts	5-6 HMMWVs	Guard
		MK 19s/.50 cal	
3. Infiltration	Inf TF	(as per METT-T)	Assault Element

ENDNOTES

1. C.R. Kutz, War on Wheels (Harrisburg, Pa. : Telegraph Press, 1940).
2. Col. Creighton W. Abrams, "Mobility vs. Firepower", (USA War College Study, 1953).
3. BG Maurice Tugwell, "Day of the Paratroops", Military Review (March 1977), p.40.
4. John Weeks, Airborne Equipment (New York : Hippocrene Books Inc., 1976), p.142.
5. Maj. F.O. Miksche, Paratroops (New York : Random Books, 1943), p.105.
6. John Weeks, The Airborne Soldier (Poole, U.K. : Blandford Press, 1982), p.151.
7. Center of Military History : U.S. Army, Airborne Operations : A German Appraisal (Wash. D.C. : U.S. Govt. Printing Office, 1989), p.13.
8. Ibid, p.45.
9. Roger Edwards, German Airborne Troops : 1939-45 (Garden City, New York : Doubleday, 1974), p.141.
10. Center of Military History, Ibid, p.16.
11. Edwin P. Hoyt, Airborne : History of American Parachute Forces (New York : Hein and Day, 1979), p.81.
12. Weeks, The Airborne Soldier, p.149.
13. Weeks, Airborne Equipment, p.146.
14. Martin Cardin and Jay Barbee, Bicycles in War (New York : Hawthorn Books, 1974), p.27
- 15 Michael J. Kazmerski, "United States Power Projection in the 21st

- Century", (USACGSC, MMAS, 1990), p.84.
16. Weeks, Airborne Soldier p.155.
 17. Ibid, p.153.
 18. Maj. Joel J. Snow, "United States Army Airborne Forces",
(USACGSC, MMAS, 1984), pp.77.
 19. David M. Glantz, The Soviet Airborne Experience, (USACGSC, 1984),
pp. 144-145.
 20. Kazmerski, p. 41.
 21. Ibid, p.42.
 22. Ibid, p. 43.
 23. Ibid, p. 76-79.
 24. Ibid, pp. 83-84.
 25. Ibid, pp. 80-81.
 26. James A. Houston, Out of the Blue (West Lafayette, Illinois : Purdue
Univ, Studies, 1972), p.240.
 27. Michael Hickey, Out of the Sky (New York : Charles Scribner's Sons,
1979), p.192.
 28. Charles E. Heller and William A. Stofft, America's First Battles
(Lawrence, Kansas : University Press of Kansas, 1986), p.326.
 29. Paul H Herbert, "Deciding What Has To Be Done" : Leavenworth Paper
No.16, (USACGSC : 1986), p.36.
 30. Center of Army Lessons Learned, Bulletin No. 90-9 (USACAC, Oct
90), p.11-11
 31. Roger A Beaumont, "Airborne: Life Cycle of a Military Subculture".
Military Review (Vol.51, No.6., June 1971), p.54.
 32. Brian Bond, Liddell Hart: A Study of His Military Thought (London:

Cassell Ltd., 1977), p.24.

33. Roger H. Kupperman and William J. Taylor Jr., Strategic Requirements for the Army to the Year 2000 (Lexington Books, 1984), p.185.
34. Wass de Czege, "Toward a Science and Art of War", p.14.
35. Miksche, Atomic Weapons and Armies, p.37.
36. J.F.C. Fuller, Armored Warfare (Harrisburg, Pa. : Military Service Publishing Co., 1934), p.97.
37. Draft FM 100-5 Operations, (21 August, 1992) p.3-2.
38. Kupperman and Taylor, p.78.
39. J.F.C. Fuller, Machine Warfare (Richmond, Va. : Garret and Massie, 1943), p.89.
40. Liddell Hart, The Future of Infantry (Harrisburg, Pa. : Military Service Publishing Co., 1936), p.35.
41. Wass de Czege, "Toward a New American Approach to Warfare". (USACGSC, 1983), p.49.
42. Ibid, p.43.
43. Miksche, Atomic Weapons and Armies, p.37.
44. FM 100-5 Operations, (May, 1986), p.12.
45. Huba Wass de Czege, "Understanding and Developing Combat Power", (USACGSC, 1984) p.8.
46. Antoine Henri Jomini, The Art of War from Roots of Strategy : Vol. II (Harrisburg, Pa. : Stackpole Books, 1987), p. 492.
47. Kutz, p.127.
48. Richard E. Simpkin, Mechanized Infantry (Oxford, U.K. : Brassey, 1980), p.57.

49. Michael Howard, "Military Science in an Age of Peace" (Speech at Chesney Memorial Gold Medal Lecture, 1973)
50. Anthony Farrar-Hockley, Infantry Tactics 1939-1945 (Surrey, U.K. : Almark Publishing Co., 1976), p.41.
51. Kutz, p.53.
52. Ibid, p.19.
53. S.L.A. Marshall, The River and the Gauntlet (Westport, Conn. : Greenwood Press Publishers, 1953)
54. Hart, p.71.
55. FM 100-5, p.14.
56. Hart, p.69.
57. Hart, p.71.

Bibliography

Books

- Barbee, Jay, and Martin Cardin. Bicycles in War. New York : Hawthorn Book Inc. , 1974.
- Bond, Brian. Liddell Hart: A Study of His Thought. London: Cassell Ltd., 1977.
- Carver, Field Marshall Lord. The Apostles of Mobility : The Theory and Practice of Armoured Warfare. London : Weidenfeld and Nicolson , 1979.
- Center of Military History. Airborne Operations: A German Appraisal. Wash,D.C.: U.S. Government Printing Office, 1989.
- Edwards, Roder. German Airborne Troops : 1939 - 1945. Garden City , New York : Doubleday and Company , 1974.
- English, John A. A Perspective on Infantry. New York : Praeger , 1981.
- Farrar- Hockley, Anthony. Infantry Tactics 1939-1945. Surrey,U.K.: Almark Publishing Co., 1976.
- Fuller, J.F.C. Armored Warfare. Harrisburg, Pa. : Military Service Publishing Company , 1934
- Fuller, J.F.C. Machine Warfare. Richmond, Va. : Garret and Massie , 1943.
- Glantz, David M. The Motor - Mechanization Program of The Red Army. Ft. Leavenworth, Ks. : Soviet Army Studies Office, U.S. Army CAC , 1990.
- Glantz, David M. The Soviet Airborne Experience. Ft. Leavenworth, Ks. : Command and General Staff College , 1984.
- Hart, Liddell. The Future of Infantry. Harrisburg, Pa. : Military Service Publishing Company , 1936.

- Heller, Charles E. and Stofft, William A. America's First Battles. Lawrence, Ks.: University Press of Kansas, 1986.
- Hickey, Michael. Out of the Sky. New York : Charles Scribner's Sons , 1979 .
- Hoyt , Edwin P. Airborne : The History of American Parachute Forces . New York : Hein and Day , 1979 .
- Huston , James A. Out of the Blue . West Lafayette , Illinois : Purdue University Studies , 1972 .
- Jomini, Antoini Henri, The Art of War from Roots of Strategy: Vol.II. Harrisburg, Pa. : Stackpole Books, 1987.
- Kupperman , Roger H. , and William J. Taylor Jr. Strategic Requirements for the Army to the Year 2000 . Lexington , Mass. : Lexington Books , 1984 .
- Kutz , C. R. War on Wheels . Harrisburg , Pa. : Telegraph Press , 1940 .
- Larson , Robert H. The British Army and the Theory of Armored Warfare 1918 - 1940 . Cranbury ,N.J. : Associated University Press , 1984 .
- Macksey , Kenneth . Guderian Creator of the Blitzkreig . New York : Stein and Day , 1976
- Marshall, S.L.A. The River and the Gauntlet . Westport,Conn. : Greenwood Press Publishing, 1953.
- Miksche , F.O. Paratroops . New York : Random House , 1943 .
- Miksche , F.O. Atomic Weapons and Armies. New York: Praeger, 1955.
- Military Intelligence Service. Enemy Airborne Forces . Washington D.C. : War Department , 1942 .
- Record , Jeffery. The Rapid Deployment Force and U.S. Military Intervention in the Persian Gulf . Cambridge, Mass. : Institute for Foreign Policy Analysis Inc. , 1981

Rosen, Stephen Peter. Winning the next War : Innovation and the Modern Military. Ithaca, N.Y. : Cornell University Press, 1991.

Stillman, Richard J. The U.S. Infantry : Queen of Battle. New York : Franklin Watts Inc., 1965.

Tugwell, Maurice. Airborne to Battle : A History of Airborne Warfare. London : William Kimber, 1971.

Turbiville, Graham H. Jr. Soviet Airborne Troops. Ft. Leavenworth, K.S. : Soviet Studies Office, 1986.

U.S. Army. Motorized History : 2nd Battalion 23rd Infantry. Ft. Lewis, Wa., 1990.

Weeks, John. Airborne Equipment : A History of its Development. New York : Hippocrene Books Inc., 1976.

Weeks, John. The Airborne Soldier. Poole N.Y. : Blandford Press, 1982.

Wheldon, John. Machine Age Armies. New York : Abelard - Schuman, 1968.

Articles

Beaumont, Roger A. "Airborne: Life Cycle of a Military Subculture". Military Review. Jun, 1971.

Editors. "Tomorrow's Troop Carrier." Infantry Journal. 1939.

Editors. "Truck Tactics." Infantry Journal. 1937.

Galloway, Joseph L. "There are Limits to Power". U.S. News and World Report, Oct 1990.

Grow, R.W. "A Lesson in Mobile History." Armor Magazine. 1954.

Tugwell, Maurice. "Day of the Paratroops". Military Review, Mar, 1977.

Wass de Czege. "Three Kinds of Infantry." Infantry Magazine. 1985.

Speech

Howard , Michael C. " Military Science in a Age of Peace. " . Chesney Memorial Gold Medal Lecture . 1973 .

Unpublished Papers

Abrams , Creighton W. "Mobility vs. Firepower." Army War College Study, 1953 .

Brooks , Johnny W. "Army Contingency Forces: What should they be ?", SAMS Monograph, 1992 .

Finehout , Arthur W. " The Contingency Army : Structured for Operational Success. " SAMS Monograph, 1991.

Herbert, Paul H. "Deciding What Has To Be Done", Leavenworth Paper No.16, Ft. Leavenworth, Ks., 1988.

Kazmierski , Michael J. "United States Power Projection in the 21st Century.", MMAS Thesis, 1990 .

Marchant , Richard J. "Are Motorized Forces Essential to the United States Army . " SAMS Monograph, 1989.

Mornston , Harry E. "The Emerging National Military Strategy of Power Projection and The Contingency Corps ." MMAS Thesis, 1991.

Snow , Joel J. "U.S. Army Airborne Forces : An Instrument of Land Power 1990 - 2000. " MMAS Thesis, 1984.

Wass de Czege , Huba. "Toward a New American Approach to Warfare." ,1983.

Wass de Czege , Huba. "Toward a Science and Art of War." , 1983.

Wass de Czege , Huba. "Understanding and Developing Combat Power." ,1984.

Bulletin

Operation Just Cause Lessons Learned: Volumes 2&3, Oct 1990

Manuals

Field Manual 90-26, Airborne Operations. Wash., D.C. : Headquarters, Department of the Army, 1990.

Field Manual 100-5, Operations. Wash., D.C. : Headquarters, Department of the Army, 1986.

Draft Manual 100-5, Operations. Wash., D.C. : Headquarters, Department of the Army, 21 August 1992.