ARTILLERY STRIKE FORCE

A MONOGRAPH
BY
Major Michael G. Koba
Field Artillery

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

First Term AY 96-97

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	20 Dec 96	MONOGRAPH

4. TITLE AND SUBTITLE

Artillery Strike Force

5. FUNDING NUMBERS

6. AUTHOR(S)

Michael G. KOBA

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

School of Advanced Military Studies
Command and General Staff College
Fort Leavenworth, Kansas 66027

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Command and General Staff College
Fort Leavenworth, Kansas 66027

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

see attached.

14. SUBJECT TERMS

Artillery Strike Force

15. NUMBER OF PAGES
47

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNLIMITED

SCHOOL OF ADVANCED MILITARY STUDIES

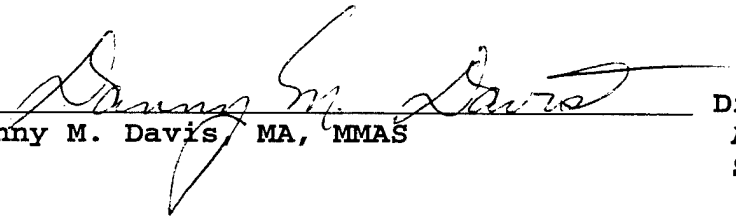
MONOGRAPH APPROVAL

Major Michael G. Koba

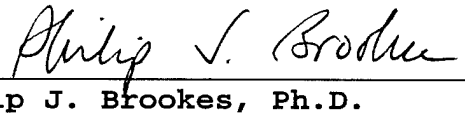
Title of Monograph: *Artillery Strike Force*

Approved by:

LTC Charles O. Hammond, MS, MMAS — Monograph Director



COL Danny M. Davis, MA, MMAS — Director, School of Advanced Military Studies



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

Accepted this 20th Day of December 1996

ABSTRACT

ARTILLERY STRIKE FORCE by MAJ Michael G. Koba, USA, 44 pages.

This study investigates the concept of the Artillery Strike Force as a means of accomplishing tactical tasks assigned to the field artillery. Currently the field artillery is assigned a tactical mission (direct support, reinforcing, general support reinforcing, or general support). Traditionally these missions have placed the artillery in the role of providing support to maneuver forces. The increased capabilities of artillery now allow artillery to accomplish tactical tasks, yet this is not recognized by current doctrine.

This monograph reviews the tenets of Army operations and the elements of combat power. The author analyzes the Artillery Strike Force by these tenets and elements. The capabilities of current artillery weapons and munitions are examined along with the concepts of asymmetrical engagement and the ascendancy of fires. The employment of artillery in the Vietnam War and the Gulf War are reviewed for insights for the employment of artillery.

The study concludes that the Artillery Strike Force is a valid concept. The Artillery Strike Force not only supports the tenets of Army operations but increases a commanders agility and versatility. The author recommends that the Army develop doctrine that incorporates the assignment of tactical tasks to artillery organizations.

TABLE OF CONTENTS

I. INTRODUCTION

> *Artillery developed as the means by which an enemy could be hit at longer ranges or with a greater effective weight of fire than those which infantry, cavalry and, later, armor could achieve. Artillery has been most prized according to its ability to undertake this task relative to other arms. As a result, at different periods of history artillery has been seen either as the decisive arm on the battlefield or, more often, as the arm which merely supports the front line troops who will decide the outcome of battle.*[1]

The current mission of the field artillery is to destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to integrate all fire support into combined arms operations.[2] Traditionally, this mission has placed the artillery system in the role of providing support to maneuver forces. Though this is an important and essential role for the artillery, it has limited our ability to leverage combat power. The field artillery is the most flexible and readily available source of firepower to a division. The increased precision and extended range of field artillery systems makes them more lethal than ever before, yet artillery doctrine is lacking in how best to exploit this increased lethality. The Army must develop doctrine that fully incorporates increased capabilities of the field artillery if we are to maintain a US firepower advantage.

The Army must critically reflect on policy and procedure to ensure that it is making the most of its capabilities. Since 1990 the Army has seen its budget reduced approximately 40 percent and its manpower reduced by 450,000. Additionally, the Army has experienced a drastic increase in military operational tempo, with deployments increasing by 300 percent since 1990.[3] The fall of the

Berlin wall and the end of the Cold War fundamentally changed the way the United States Army approached its mission. The Army began its transition from a threat based force to a capability based force. This shift requires the Army to vigorously examine how it conducts operations today.

The combination of decreased resources and increased commitments clearly calls for the Army to be as flexible and innovative as possible. During this same period of time, the capabilities of the artillery have also been increasing. The artillery has introduced new systems, extended its ranges, increased its lethality, and enhanced its survivability. The artillery strike force may provide commanders a new and innovative way to capitalize on these new capabilities and maximize the potential of the artillery system.

This is not the first time the Army has found itself in the position of having to reexamine its capabilities with a view towards innovation and modernization. At the beginning of World War II , the United States was employing its tanks as support for the infantry. It was through the bloody crucible of war that the Army came to realize that this was not the most advantageous use of the tank. From its experiences in World War II the Army developed the tank into the preeminent tool for the conduct of combat on land. The Army had a similar experience with its doctrine for the employment of attack helicopters in the 1980s. The Army recognized that the capabilities of attack helicopters had evolved such that attack helicopters were much more than just a supporting arm. Aviation has matured into a separate branch of the Army and is today considered a maneuver arm. Like armor and aviation before it,

the artillery has undergone an evolution in its capabilities. Now, as in the past, changing conditions require the Army to examine its doctrine in the employment of artillery.

An advocate for change is General Glen K. Otis. GEN Otis sees the Army at the threshold of major change for the combined arms team, that being the "Ascendancy of Fires". The concept of ascendancy of fires aims at achieving decisive results through the use of firepower from longer ranges to minimize the high casualties of the direct fire battle. Under this concept, the intent will be to fight the enemy by fire first, and then by movement and fire. This will avoid the exposure of our forces to the effects of enemy fires.[4]

The purpose of this monograph is to introduce the concept of the Artillery Strike Force as a valid way of accomplishing the Field Artillery's mission in support of Army operations. An Artillery Strike Force is an organization based on an artillery unit (battery, battalion, division artillery, or field artillery brigade) that has been given a mission with the purpose to disrupt, divert, delay, limit, defeat, or destroy an enemy. This unit would be task organized with the appropriate supporting assets required to accomplish its mission.

In this monograph I will first conduct a review of doctrine. I will address the tenets of Army operations and the elements of combat power. I will later use these tenets and elements to asses the artillery strike force concept. Also in the review I will discuss the difference between artillery tactical missions and tactical tasks and point out the void that exists in current artillery doctrine. In Chapter III, I will detail

some of the current capabilities of the artillery system and analyze what this holds for the employment of artillery. Chapter IV will address the concepts of asymmetrical engagement and ascendancy of fires, and what they may offer for the employment of artillery. Chapter V will cover the historical employment of artillery in Vietnam and the Gulf War. In Chapter VI, I will define the concept of the artillery strike force, and explore the employment considerations for this force. I will asses the Artillery Strike Force against the tenets of Army operations and elements of combat power and propose scenarios for employment to illustrate its utility.

II. DOCTRINAL REVIEW

The Army conducts operations in accordance with five basic tenets: initiative, agility, depth, synchronization, and versatility.[5] All doctrine derives directly from and must support the fundamental tenets.[6] It is against these tenets that this paper will asses the concept of the Artillery Strike Force.

Initiative sets or changes the terms of battle by action. It is the effort to force the enemy to conform to one's operational tempo and purpose, while retaining freedom of action. Initiative is the effort to force the enemy to the commander's will. Through initiative, the commander seeks to limit the enemy's options while retaining his own.

Agility is the ability to act faster than the enemy. It is a prerequisite for seizing and holding the initiative. Agility allows the rapid concentration of combat power against enemy vulnerabilities. Agility is a mental, as well as physical, characteristic.

Depth is the extension of operations in time, space, resources and purpose. Thinking in depth allows a commander to anticipate and forecast likely events, so that the enemy can be attacked simultaneously and sequentially throughout the depth of the battlefield.

Synchronization is the focus of resources and activities in time and space to mass at the decisive point. Effective synchronization uses every resource when and where it will make the greatest contribution to success.

Versatility is the ability to shift focus, to tailor forces, and to move from one mission to another rapidly and efficiently. Versatility ensures that units can conduct different kinds of operations, either sequentially or simultaneously with success.[7]

Joint publication 1-02 defines combat power as: The total means of destructive and/or disruptive force which a military unit/formation can apply against an opponent at a given time. Combat power determines the outcome of battles and engagements. The Army strives to achieve overwhelming combat power to ensure success and to deny the enemy any chance of escape or effective retaliation. For the Army, combat power is created by combining the effects of maneuver, firepower, protection, and leadership.[8] The combination of these effects attempts to convert the potential of forces, resources and opportunities into capabilities.

Maneuver is the movement of combat forces to gain positional advantage, usually in order to deliver or threaten delivery of direct and indirect fires. Maneuver is used to achieve surprise, psychological shock, physical momentum, massed effects, and moral dominance. Maneuver is rarely effective by itself, it requires firepower and protection to maximize its effects.[9]

Firepower is the potential capacity (product) of all weapons systems available to the force commander. Firepower provides the destructive force that is essential in defeating the enemy's ability and will to fight. Firepower is most effective when combined with the maneuver force.[10]

Protection conserves the fighting potential of a force so that a commander can apply it at the decisive time and place. Protection incorporates operational security (OPSEC), safety, health and maintenance, and anti-fratricide measures.

Leadership is provided by competent and confident officer and noncommissioned officer leaders. They provide purpose, direction and motivation. Leaders determine how the elements of combat power are employed.[11] This monograph will demonstrate how the concept of the Artillery Strike Force increases combat power through these elements .

Maneuver units are assigned a tactical task as part of their mission statement. Field artillery doctrine, however, calls for artillery units to be assigned one of four tactical missions: direct support (DS), reinforcing (R), general support (GS), or general support reinforcing (GSR). There are seven inherent responsibilities of field artillery missions that vary between the tactical missions. The inherent

responsibilities of a field artillery mission cover areas such as: the priority in which a unit answers call for fire, to whom a unit must furnish fire support teams or liaison officers , with whom a unit must establish communications, and who positions it. Unlike a mission that contains a tactical task and purpose, field artillery tactical missions are really only support relationships and have little impact on the accomplishment of the artillery mission to destroy, neutralize or suppress the enemy. The term "artillery tactical mission" for what is, in reality, a support relationship has left a void in artillery doctrine. Units have conducted operations that have a tactical task as a purpose and called them an artillery raid.

When reviewing artillery operations in the Gulf War, the term "raid" was inappropriately applied to many artillery operations. Field Manual 101-5-1 defines a raid as a type of deliberate attack, usually small-scale, involving a swift penetration of hostile territory to secure information, to confuse the enemy, or to destroy his installations. It ends with a planned withdrawal upon completion of the assigned mission. Most of the artillery operations conducted during the Gulf War did not involve any ground penetration into hostile territory, and most were conducted by at least battalion sized forces, some even involving in excess of five battalions. Additionally, the only references to artillery raids in current artillery doctrine can be found in FM 6-50, and ARTEP 6-127-30-MTP Mission Training Plan for the Cannon Firing Battery 105mm, Towed. Both of these manuals refer specifically to an air assault raid by a battery. This is not to say that an artillery force could not conduct a ground raid, however, a void exists in current artillery doctrine which does not

support this concept.

The Artillery Strike Force is capable of accomplishing certain tactical tasks. Tasks that an Artillery Strike Force could be assigned include disrupt, divert, delay, limit, defeat, and destroy. A better understanding of the meaning of these terms may be necessary. *Disrupt* is to break apart, disturb, or interrupt an enemy formation, function or tempo; cause premature commitment of forces and/or to piecemeal their attack. *Divert* is to force an enemy to alter a particular course of action once he is already in his execution phase. *Delay* is to slow the arrival of a unit on the battlefield. *Limit* is to restrict the enemy's capability to pursue a particular course of action. *Defeat* is to prevent the enemy from accomplishing ***a course of action*** or function. *Destroy* is to prevent the enemy from accomplishing ***any course of action*** or function. Use of the term destroy can be confusing as there are a number of different definitions that are service, and even branch, particular. Because of the different definitions for destroy, it ultimately rests with the force commander to clearly articulate what his desires are if he uses the term.

An area of potential confusion is the distinction between tactical tasks and effects of fire. Tactical tasks such as limit , disrupt, delay, divert, destroy, and damage are used to describe the effects of attack on enemy capabilities. They should not be confused with the terms harass, suppress, neutralize, or destroy, which are used as attack criteria to determine the degree of damage or duration of effects on a specific target. The effects that fire can have are; harass, suppress, neutralize, or destroy a target. The effects that a commander wishes to achieve are specified as part of the

targeting process and are articulated in the attack guidance matrix. It is important to understand the differences between these types of fire. *Harassing fire* is fire designed to disturb the rest of enemy troops, to curtail movement and, by threat of losses, to lower morale. *Suppression fires* are fires on or around a weapons system, to degrade its performance below the level needed to fulfill its mission objectives. Suppression lasts only as long as the fires continue. *Neutralization fires* are delivered to render a target ineffective or unusable for a temporary period. Neutralization fire results in enemy personnel or material becoming incapable of interfering with an operation or course of action (COA). *Destruction fires* physically render the target permanently combat-ineffective or so damaged that it cannot function unless it is restored, reconstituted, or rebuilt.[12]

Until recently, the ability of artillery to achieve destruction of hard targets was negligible. Destruction required a direct hit with high-explosive or concrete-piercing shells and a large expenditure of ammunition not considered economical. The advent of precision munitions like Copperhead and SADARM, and the ability of MLRS to deliver large volumes of munitions quickly, have now made destruction a viable mission for the field artillery. The next chapter will take a detailed look at the current capabilities of the artillery system.

III. CAPABILITIES

Today, the US Army artillery finds itself in a period of tremendous change. Specific areas of change include the introduction of new weapon systems, more accurate and lethal munitions, new tactics techniques and procedures, and organizational changes. It has been a hundred years since the artillery community has experienced such a period of enormous change. It was in the four decades preceding World War I that the artillery underwent a comparable transformation in tactics and technologies. It was then that the techniques of indirect fire were developed and modern artillery was born. To be thoroughly prepared for the coming change, we must first understand what capabilities exist.

The first area this section will examine is weapons systems. The M270 Multiple Launch Rocket System (MLRS) is a self propelled , ballistically protected, highly automated delivery system for a suite of rockets and missiles. The MLRS system was introduced in the late 1980s and was used for the first time in combat during the Gulf War. The MLRS system is organized into batteries (9 launchers) and battalions (27 launchers). Currently, each heavy division has a MLRS battery organic to its division artillery (DIVARTY), and MLRS battalions can be found in the Field Artillery brigades of Corps Artillery. Characteristics of the system include a cross country speed of 40 miles per hour and a cruising range of 300 miles. The M270 weighs 55,000 pounds combat loaded. The M270 launcher is capable of being lifted by

C141- B, C5A and C17 aircraft.[13] Each MLRS launcher has a crew of three. It can fire rockets individually or volley fire 12 rockets at 5 second intervals at up to six aimpoints. Additionally, it can fire two missiles at an 18 second interval at one or two aimpoints. Each M270 holds either two launch pod container (LPC) 6 rockets each, or two guided missile launch assembly (GMLA) one missile each: you cannot mix rockets and missiles on the same launcher.

Another major weapons system recently introduced is the Paladin howitzer. The M109A6 Paladin incorporates several technological advances into the M109 family of howitzers. These advances improve survivability, responsiveness, reliability, availability, maintainability and range. The Paladin makes possible the adoption of true "shoot and scoot" tactics for a cannon system for the first time. The M109A6 uses the M182A1 gun mount and the M284 cannon assembly which allow the use of the M203 series propelling charge. These give the Paladin a maximum range of 22 km unassisted and 30 km with rocket assisted projectile (RAP). This is approximately a 20% increase over the M109A2/A3 currently in operation. The Paladin can attain a maximum speed of 38 miles per hour and has a cruising range of 300 km. The automatic fire control system (AFCS) provides position location and directional reference, a ballistic computer for on board technical fire control, and gun-drive servos which automatically orient the tube for deflection and quadrant.

Another tremendous change is in the area of munitions. Both MLRS and cannon systems are making great strides forward in this area. The MLRS Family of Munitions (MFOM) consists of rockets and missiles. The MLRS rockets are tube-

launched, spin stabilized, free-flight projectiles. The MLRS rocket follows a ballistic, free flight (unguided) trajectory. The M26 is the basic rocket for the MLRS. It can be used against personnel, soft, and lightly armored targets. Each M26 rocket dispenses 644 M77 dual-purpose improved conventional munitions (DPICM) submunitions over the target area. The M77 submunition can penetrate up to four inches of armor, and produces anti-personnel effects out to a four meter radius. The M26 has a minimum range of 10 kilometers and a maximum range of 32.5 kilometers.

Currently under going testing is the extended range MLRS rocket (ER-MLRS). The ER-MLRS will contain 518 XM85 submunitions, and will have a minimum range of 13 km and a maximum range of 45 km. This rocket aims to improve the range the M26 rocket by 50% and reduce the dud rate of sub-munitions to 1%. Other efforts under development include a guided ER-MLRS rocket (payload of 322-469 XM85, with a minimum range of 15 km and maximum range of 50-70 km) and a MLRS smart tactical rocket (MSTAR) which would be capable of deploying smart submunitions and having a maximum range of approximately 50+ km.

The family of missiles for the M270 launcher is the Army Tactical Missile System (ATACMS). The ATACMS are ballistically launched , inertial guided missiles. The M39 (ATACMS Block I) can be used against personnel and soft targets. The M39 is not effective against armored targets. Each M39 missile contains 950 M74 anti-personnel anti-material (APAM) submunitions. The M74 grenade is filled with composition B explosive filler and is covered in a steel shell.

Each M74 also contains incendiary material and has an antipersonnel radius of 15 meters. The M39 has a minimum range of 25 km , a maximum range of 165 km and three dispense patterns for different target area coverage.

ATACMS Block IA are being fielded now. The Block IA is a semi-ballistic missile carrying 300 M74 submunitions with a minimum range of 100 km and maximum range of 300 km. The Block IA incorporates a global positioning system (GPS) into the inertial navigation system. Other missiles under development include the Block II and IIA, these missile will give the ATACMS an armor kill capability. The Block II is a semi-ballistic missile designed to attack targets up to 140 km: it will deliver 13 brilliant anti-armor submunitions (BAT) into a target area and dispense them. The BAT submunition is designed to defeat moving armored vehicles (tanks, APCs, SP ADA and artillery) by top attack. It has acoustic and IR sensors and a tandem shaped charge warhead. The Block IIA will carry 6 BAT P3I submunitions out to a range of 280 km, the BAT P3I will be able to engage moving and stationary armored and wheeled vehicles.

New advances in 155mm cannon munitions include the M864 extended range DPICM and the XM898 sense and destroy armor munitions (SADARM). The M864 is a 155mm base burn projectile which extends the maximum DPICM range of the M109A2/A3 to 22 km and the M198/M109A5/A6 to 27.8 km. This extends the range of DPICM approximately 20%. The M864 has a payload of 72 grenades, 24 M46 and 48 M42.

SADARM is a day-night, fire and forget, top attack munition. Each 155mm projectile carries two SADARM submunitions, with a maximum range of 22.5 km with the M203A1 charge. Each SADARM submunition has four sensors to achieve all weather target detection; an active millimeter-wave (MMW) radar, a MMW passive radiometer, an imaging infrared (IR) sensor and a magnetometer. A computer software algorithm correlates the data from all the sensors and when they confirm a target, the submunition fires an explosively formed penetrator (EFP). The EFP travels at 2,300 meters per second defeating the top armor of any known combat vehicle by kinetic energy. The submunition incorporates a self-destruct device for those munitions that do not acquire targets.

Another 155mm munition that saw its first combat use during the Gulf War was the M712 Copperhead round. The M712 is a cannon launched guided projectile (CLGP) which employs a shaped charge to defeat moving or stationary hard and armored targets. The M712 guides onto a target that is being illuminated by a ground/vehicle laser locator designator (G/VLLD), it has a minimum range of 3 kilometers and a maximum range of 16 kilometers. The G/VLLD can be mounted on a M981 Fire Support Team Vehicle FISTV, HUMVV, or on a ground tripod. It can lase moving targets out to 4 kilometers and stationary targets out to 5 kilometers. Additionally the OH-58D has the ability to designate targets for the Copperhead round.

The capabilities detailed previously hold great potential for the artillery system. The MLRS gives a commander a tremendous increase in the volume of fire available

to him. A MLRS battery firing one volley delivers the same amount of DPICM as a twenty-four gun M109 battalion firing over forty volleys. In one minute a MLRS battalion can deliver the equivalent of one-hundred-twenty M109 battalion volleys. Additionally, MLRS can deliver DPICM 75 percent further then the M109A2/A3 can currently.

The increased ranges that these systems and munitions have, now allow a commander to engage the enemy throughout the depth of his battlespace. The ATACMS is suitable for attacking a number of different types of targets, i.e. command and control sites, air defense artillery sites, surface to surface missile sites, forward area rearm and refuel sites, and other logistics sites. Because many of these targets were located far from the forward edge of the battle area and moved around, a commander had a difficult time engaging them consistently. ATACMS now gives the commander the ability to attack time sensitive, high payoff targets, throughout the depth of his battlespace at all times and in all weather conditions.

The SADARM and Copperhead have significantly increased the lethality of the 155mm family of weapons. In the counterfire role against a self propelled howitzer battery, SADARM was 700 percent more lethal than DPICM, needing only 14 rounds to achieve the same results as 102 rounds of DPICM. In the close support role against an armor company in attack formation, only 24 rounds of SADARM were needed to achieve the same results as 513 rounds of DPICM.[14] With precision guided munitions and armor defeating munitions, artillery cannon systems now have hard kill capability. No longer is artillery just an area fire weapon.

Both the MLRS and Paladin incorporate systems that allow the adoption of shoot and scoot tactics. Shoot and scoot refers to the ability of artillery systems to make short, quick, survivability moves immediately after the completion of fire missions. This ability relies on the MLRS and Paladin's capability to rapidly displace, move cross country, occupy a new fire position, and establish a firing capability all within a short period of time. Prior to Paladin , an M109 unit occupying a firing position had to conduct an elaborate set of actions to select, occupy and prepare a firing position. Prior to being able to fire, the howitzers had to be brought into position, oriented on the azimuth of fire, laid for direction, and report their individual location to the unit Fire Direction Center (FDC). Additionally, with the M109A2/A3 these procedures required the crew to exit the vehicle to release the tube travel lock, emplace the spades and to emplace the collimator, thus exposing the crew members to the hazards of the modern battlefield. A good example of the impact that these improvements have made can be seen in a comparison of the time standards for the occupation of a position and fire mission processing. The M109A2/A3 time standard for the occupation of a position is 8 minutes during daylight and 15 minutes at night, while the M109A6 standard for occupation is 2 minutes. These improvements provide an increase in artillery weapon system survivability, and a quantum leap in responsiveness.

These increases in volume of fire, range, lethality, responsiveness and survivability all have greatly increased the versatility of the artillery system. These capabilities give the artillery the ability to accomplish tactical tasks. These

capabilities must be combined with new and innovative tactics techniques and procedures to fully realize their potential.

In the next chapter, I will look at some concepts that offer insight to how these capabilities can be used to enhance the employment of artillery.

IV. CONCEPTS

In this time of decreasing resources and increasing requirements, the Army must leverage its ability to apply combat power in new and innovative ways. The Army must engage the enemy at a time, in a place and in a manner that is unexpected. One way to do this is through the concept of asymmetrical engagement. Historically, forces have had symmetrical engagements; like systems fighting like systems: tank versus tank, aircraft versus aircraft, and artillery firing counterfire. This symmetrical thinking led to the development of weapons with specific roles, i.e. the anti-tank missile system and air defense guns and missiles. The asymmetrical engagement aims to break this paradigm that "like fights like" by applying one systems strength against another systems weakness. Occasionally innovative thinkers have seized on a weapons capabilities and applied them in ways not previously considered. An example of this would be the German use of the 88mm anti-aircraft gun as an anti-tank gun in North Africa. It is of interest to note that the British had in their possession a gun that would have equaled the German 88mm in the role of an anti-tank gun. Their use of the 3.7 inch anti-aircraft gun was ruled out on grounds based

solely on theory and principle.[15] Often the hardest thing to overcome in the development of an asymmetrical engagement concept is the institutional bias towards the status quo. The increased capabilities of artillery systems now present the Army with the ability to engage targets not previously considered good artillery targets. These capabilities provide an opportunity to employ artillery in asymmetrical engagements. The increased ranges, precision, and lethality of artillery systems when combined with new employment principles give the commander an innovative way to engage the enemy.

General Otis's proposal for the "Ascendancy of Fires" is to fight the enemy by fire first and then by movement and fire. General Otis sees this as a major change for the combined arms team. The concept of ascendancy of fires aims at achieving decisive results through the use of firepower from longer ranges. The use of firepower will help to minimize the usual high casualties of the direct fire battle, by limiting the exposure of our forces to the effects of enemy direct fire. The concept of fighting the enemy by fire first and then by movement and fire, is not a new concept. Napoleon used his artillery to create conditions for his infantry and cavalry to exploit. Napoleon's employment of the *grande batterie* is a good example of using artillery to set conditions for other arms to exploit. The *grande batterie* is where Napoleon physically massed the preponderance of his artillery on the battlefield and used it to blast a hole in the enemy line thus permitting his infantry to advance. This period of the ascendancy of fires lasted until the introduction of the cylindro-conoidal bullet.

The increased range that this bullet gave to the rifle soon drove the artillery to ranges from which it was less effective.

Another good example of the ascendancy of fires concept is the tactics developed by Colonel Georg Bruchmuller for the German Army in World War I. The goal of Bruchmuller's tactics are best shown through his own words; " We desired to break the morale of the enemy, pin him to his position, and then overcome him with an overwhelming assault." [16] Bruchmuller tried to deliver a large volume of fire quickly relying on surprise to enhance its effectiveness. The first time Bruchmuller's tactics were used was at the battle of Riga, where in a five hour preparation the German guns fired over 560,000 rounds.[17] Bruchmuller's tactics continued to gain support throughout the war and were used to support Ludendorff's 1918 offensives. Unfortunately the benefits of Bruchmuller's tactics could not be fully realized because the German Army suffered from a lack of mobility with which to exploit the breakthroughs that they achieved.[18] After World War I Bruchmuller's tactics were mostly abandoned by the German and Allied Armies. The one Army that continued to develop its artillery doctrine along these lines in the years after the war was the Russians.[19] Even today Russian doctrine calls for artillery and the effects of its fire to establish the conditions for maneuver to exploit. Even though the "Ascendancy of Fires" is not a new concept, it does offer a different way to approach the employment of artillery.

The combination of current capabilities with the principles underlying these concepts will allow the Army to realize the potential of the artillery system.

V. HISTORICAL REVIEW

The Army's current doctrine is lacking in the tactics techniques and procedures to maximize current artillery capabilities. A careful examination of the historical employment of artillery lends useful insights. The historical examples this paper will cover are artillery raids and operations in Vietnam, and artillery operations during the Gulf War to include Divisional Artillery units, Field Artillery Brigades and Marine Corps artillery units.

Vietnam

At the height of the war the Army had 65 battalions of artillery deployed in Vietnam. During the course of the conflict, US Army artillery units expended over 20 million shells of all calibers.[20] The artillery raid played a significant part in the overall fire support effort during the Vietnam war. From 1968 until October 1969, the artillery raid was the principal offensive operation conducted.[21] Major General Ott gives a good description of the artillery raid in Vietnam;

> It was a combined arms effort, but unlike other types of offensive operations, the entire effort supported the field artillery rather than the maneuver force. The artillery raid was designed to mass fires on enemy units, base areas, and cache sites beyond the range of artillery at a fixed fire base. Artillery raids involved the displacement of artillery to supplementary positions, engagement of targets with heavy volumes of field artillery and other supporting fires, and withdrawal from the supplementary positions. The entire operation was conducted as rapidly as possible to achieve surprise.[22]

In today's terms this would be called extending a commander's battlespace. This description clearly shows the raid as an offensive operation that combines firepower and maneuver to achieve mass and surprise on an unsuspecting enemy force. In the planning for artillery raids in Vietnam consideration was given to: security of the route and position area, use of air observers to exploit fires and call additional fires, and ammunition resupply.[23] These very same considerations remain valid today and will need to be considered when similar types of operations are planned in the future.

As the war progressed maneuver and artillery units developed specialized types of operations to deal with the situation. A type of artillery task force developed in Vietnam was the "Night Hunter Task Force". This task force consisted of an AN/TPS-25 radar (a field artillery ground surveillance radar), an air cavalry element, waterborne roving patrols, gun boats, and artillery units. This task force used the radar to develop targets. Once a target of sufficient size was acquired, the task force went into action. The mission began with the artillery units firing a time on target (TOT) mission using variable time fused high explosive and illumination shells. The air cavalry unit was timed to arrive at the target area at the TOT to reinforce the shock and surprise of the artillery mission. Additionally, the waterborne force was sent to attack enemy trying to flee the target area. The air cavalry fire team leader continued to adjust artillery fire into the target area until it had been neutralized.[24]
A key insight to be garnered from artillery operations in Vietnam include the emphasis on supporting the artillery with the required assets to accomplish a mission. Even though an effort was made to organize other assets around an artillery

unit to perform tactical tasks, the capabilities of the artillery system of the time limited its usefulness. The capabilities of the artillery system have made tremendous progress since the Vietnam War.

Gulf War, US Army Artillery

US Army artillery forces conducted operations of all sizes leading up to G-day during operation Desert Shield and Desert Storm. These operations ranged from single MLRS launchers firing ATACMS missiles to multiple battalion operations organized and controlled by Field Artillery Brigades and even Corps Artillery Headquarters.

Artillery combat operations began on January 18 when a Staff Sergeant commanding a M270 MLRS and his two crew members from A Battery 1-27th Field Artillery received the order to strike an Iraqi surface-to-air missile site more than 100 kilometers away. At the time they received the mission they were completing a six hour road march on the congested Tapline road. They successfully engaged the al-Abraq SA-2 surface-to-air missile site, opening a key Air Force transit route into the Kuwaiti Theater of Operation.[25]

Other examples of small unit operations included those by both the 1st Cavalry Division and 24th Infantry Division to destroy enemy border and observation posts. These operations employed M109 units firing Copperhead munitions to engage and destroy hard point targets. On February 7th the 1-82 Field Artillery Battalion of the 1st Cav engaged a 15 meter tall cement block observation tower with two

Copperhead rounds and 46 rounds of DPICM. The need for this mission arose when a AH-1 Cobra helicopter from the division cavalry squadron received fire from this complex. The aircraft returned fire with its 2.75 rockets, but caused little damage to the building. So the mission of destroying this building fell to the artillery. In addition to the 1-82 FA, the unit doing the actual firing, there were a number of other 1st Cav units supporting this operation. The 1st Cav DIVARTY oriented a Q-37 Firefinder radar and had the divisional MLRS battery prepared to respond with counter battery fire if any Iraqi artillery or mortars responded. Additionally 1-7 Cav positioned air assets to respond if necessary and the Division provided a security element to accompany the FISTV to its observation post.[26] The 1st Cav repeated this process two more times and destroyed two additional observation posts prior to the start of the ground campaign. These were important missions for the 1st Cav because they denied the Iraqis the ability to see deep into 1st Cav's sector. Prior to the strikes the towers could observe up to 30 kilometers into the 1st Cav's sector.[27] In the 24th ID sector Bravo Battery 4-41st Field Artillery employing a single copperhead round attacked and destroyed an Iraqi border post killing four enemy on Feb. 19th. The division followed this up with another copperhead strike on a second border post on Feb. 21st.

On 13 February the 1st Cav DIVARTY organized and conducted a three battery MLRS operation (their own divisional battery and two additional batteries from 1st Battalion 27th Field Artillery from the 42nd Field Artillery Brigade) to destroy divisional high-payoff targets (HPTs). Targets for this operation included three

artillery battalions and two brigade command posts. The concept for this operation included having the division provide an armored cavalry screen to secure the firing positions, having Bradley fighting vehicles escort the firing units, and to have a mine plow clear a route for the units to use on egress from their firing positions. The concept for the operation was to have two batteries engage the HPTs while the third battery linked to a Q-37 radar stood by to provide immediate counterfire. If the enemy did not respond with fires within 25 minutes the counterfire battery was to fire on additional HPTs and then exit the area. On this operation a total of 24 targets were engaged at ranges between 21 and 30 kilometers. The first two batteries engaged 15 targets with 181 rockets, and the third battery engaged 9 targets with 106 rockets. Total firing time for all missions was less than 5 minutes, in that time this operation showered the targets with over 184,000 DPICM bomblets (the equivalent of a cannon battalion firing 71 battalion volleys).[28]

On the night of 16 February and early morning of 17 February VII Corps artillery controlled the largest pre G-Day operation. The operation consisted of five battalions of artillery (4 cannon battalions from the 1st Cav DIVARTY and 42nd FA BDE, 1-27 FA MLRS, and the 1st Cav MLRS battery) and the Apaches of the 2-6th Cavalry from the 11th Aviation Brigade. The artillery units massed their fires to destroy Corps HPTs while the Apaches conducted a feint to deceive the Iraqis of the location of the VII Corps main effort. Just prior to the operation beginning, the Corps was informed that an active SA-9 radar had been acquired by an orbiting electronic warfare aircraft. This air defense radar was directly in the path of the Apaches, so it was immediately

engaged by a MLRS unit with 12 rockets. The radar subsequently shut down and the Apaches were able to accomplish their portion of the mission without interference.[29]

A sense of the scope of artillery raids/operations fired during the Gulf War can be gained by looking at some mission totals. The 75th Field Artillery Brigade fired 18 ATACMS, 702 MLRS rockets, and 3394 rounds of 155mm ammunition in 150 missions during pre G-Day artillery raids.[30] These numbers represent 54% of the total missions fired by the Brigade and 62% of the ammunition expended by the Brigade during the Gulf War.

Gulf War Marine Artillery

> *The artillery raid has been an insignificant "footnote" during my two tours as a student at the Field Artillery School, Fort Sill, Oklahoma, and 10 years in Fleet Marine Force (FMF) artillery organizations. It receives little mention in print or professional discussions among artillerymen. In fact the only mention of it I've been able to find in our doctrinal publications is in TC 6-50 Field Artillery Cannon Battery, and that deals strictly with the air assault raid.* [31]

The Marines in the Gulf conducted numerous and varied types of artillery raids. The Marines conducted raids with M109A3s, M198s (155mm Towed) , and M110A2s(203mm SP). Generally the Marine raids were conducted by an artillery battalion though some were conducted by batteries. All Marine raids were combined arms operations, with the artillery receiving support from ground and air assets.

A typical Marine artillery raid was the raid conducted by 5/11th Marines on an Iraqi infantry brigade command post near Al Manaquish. The raid force consisted of two batteries, one each of M198s and M109s. Additionally these batteries received a

company of light armored vehicles (LAVs) from Task Force Shepherd to provide security. Additional supporting assets included remotely piloted vehicles (RPVs) for target acquisition, fixed wing aviation EA-6B to jam Iraqi radars and F/A-18, AV-8B, and A-6E to provide support and attack targets in conjunction with the artillery. The raid began with S battery 5-11 FA engaging the Iraqi brigade command post. While they were doing that Q battery 5-11 FA engaged an Iraqi border police post that was near the position of S battery. While S battery continued to engage the command post, Q battery was adjusted on to an Iraqi patrol that had arrived near S battery's location. As S battery completed its mission and egressed from the area, Q battery shifted fire onto a suspected D-30 location and FA-18's delivered Rockeye bombs on the command post and border post.

Two other significant Marine artillery raids were on a SIGINT site near Umm Gudair and an artillery ambush on Iraqi multiple rocket launchers. The first raid is of interest because of the use of M110A2 203mm self-propelled howitzer. This weapon system was selected because of its increased range and payload. On the first raid an Iraqi SIGINT site and a Cymbeline radar site which had been previously out of range were engaged by a battery of M110A2s firing DPICM and a battery of M198s firing rocket assisted projectiles (RAP). The second raid was an artillery ambush conducted by two batteries of M198s and a pair of FA-18s. This raid began with the M198s engaging a pair of known D-30 positions with RAP. Unlike previous raids, the marines did not jam the Iraqi radars and purposely broadcast on the radio. The Iraqis rose to the bait and attempted to engage the M198s with multiple rocket

launchers. This was exactly what the Marines were hoping for and a pair of FA-18s. waiting on station, immediately engaged and destroyed the Iraqi multiple rocket launchers.[32]

As these historical vingettes have shown the capabilities of artillery have risen to a point where artillery units are capable of achieving tactical tasks. What is required now is that this capability be incorprated into doctrine and that tactics, techniques and procedures be developed to exploit this ability.

VI. ARTILLERY STRIKE FORCE

In this section I will define the concept of the Artillery Strike Force and explore the employment considerations. Additionally, I will asses the validity of this concept in reference to Army operational tenets and the dynamics of combat power.

Artillery Strike Forces will be temporary combinations of battle assets tailored to a specific threat or engagement and designed for a specific mission or tactical task. They will allow a commander to attrit the enemy, expand his battlespace and/or change the tempo of operations. An Artillery Strike Force is an organization based on an artillery unit (battery, battalion, division artillery, or field artillery brigade) that has been given a tactical task such as, disrupt, divert, delay, limit, defeat, or destroy. This organization would be task organized with the appropriate supporting assets required to accomplish its mission. The Artillery Strike Force would be temporary in nature, only being formed when required for a task. The temporary nature of the Artillery

Strike Force retains a commander's flexibility in the organizing of artillery for combat. Strike forces will be highly lethal, and responsive organizations designed to track down and kill specific enemy targets.

The decision on whether or not to employ an Artillery Strike Force will be based on the same factors as for any other tactical operation, those being: mission, enemy, terrain, troops and time available (METT-T). Mission includes the who, what, when, where and why that must be accomplished. Artillery Strike Forces have strengths and limitations that must be considered when assigning them a mission. Types of tactical tasks that an Artillery Strike Force is suitable for include disrupt, divert, delay, limit, defeat, and destroy.

Considerations for enemy include: current information concerning strength, location, disposition, activity, equipment, capability, vulnerability, and a determination as to the enemy's probable course of action. Because of the indirect nature of the Artillery Strike Force, these considerations for enemy may be the most critical considerations when determining whether or not to employ an Artillery Strike Force. The Army targeting methodology of decide, detect, deliver, and assess (D3A) adequately supports an Artillery Strike Force. The D3A methodology allows a commander to determine a specific target for engagement. The target is then acquired, tracked if necessary, engaged, and the results of the engagement determined.

Terrain and weather considerations include: information about vegetation, soil type, hydrology, climate conditions, and light data. This information is analyzed to

determine the impact the environment can have on current and future operations for both enemy and friendly operations. These considerations can have significant impact on the types and quantities of munitions used to engage targets. For example, cloud height affects the employment of Copperhead munitions because they must be designated by a laser. Fog, dust, rain, snow and visibility all impact on Copperhead's employment. Vegetation and soil type can also have an impact on munitions employment. For example, DPICM is not suitable for employment in forested or jungle environments. Some units experienced high dud rates for DPICM when firing into soft sandy areas during the Gulf War. A thorough understanding of munitions capabilities and limitations is required to ensure their proper use.

Troops available considerations include: the quantity, level of training, and psychological state of friendly forces. Critical considerations for the Artillery Strike Force in this area include: types and quantities of weapon systems, targeting sources, and ammunition status.

Time available considerations include: time available to plan, prepare, and execute operations for both friendly and enemy forces. The capability for an Artillery Strike Force to shift its fires quickly from one area of the battlefield to another, and its ability to engage the enemy throughout the depth of the battlefield simultaneously, are great assets for a commander.

When organizing an Artillery Strike Force, consideration must be given to the battlefield operating systems (BOSs). Things to consider under the maneuver BOS would be the potential assignment of armor, infantry, or cavalry units to the strike

force. These maneuver forces could provide security to the strike force or augment its firepower. Additionally, certain Artillery Strike Force employments may call for the securing or seizing of terrain from which the strike force would operate. Another possibility would be using certain Army aviation units to develop or confirm targets for engagement by Artillery Strike Forces.

Items for consideration under the air defense BOS, include coordinating Artillery Strike Force operations with theater air defense artillery coverage to ensure they are within its coverage. If the enemy air threat warrants it, Artillery Strike Forces would need to include short-range air defense systems (SHORAD), such as Avenger, the Bradley Stinger Fighting Vehicle, and Stinger MANPADS teams. These SHORAD systems would detect and kill rotary-wing aircraft, close support aircraft, and UAVs. The SHORAD systems also provide the Artillery Strike Force access into the forward area air defense (FAAD) C3I system.

The intelligence BOS is one of the most critical for the operation of Artillery Strike Forces. The Artillery Strike Force relies on the intelligence BOS to provide timely, concise, accurate, relevant, and synchronized intelligence and electronic warfare (IEW) support. Specific systems that may be employed with Artillery Strike Forces would include the ground-based common sensor and the advanced Quickfix, these systems provide electronic support through the intercept and DF of COMINT and ELINT, electronic attack of COMINT systems, and targeting location data. A common ground station would provide the Artillery Strike Force the ability to access Joint Surveillance Target Attack Radar System (JSTARS), Guardrail common sensor,

and Unmanned Aerial Vehicles (UAVs) downlinks. These systems will greatly increase the amount of targeting data available to an Artillery Strike Force.

Command and control and combat service support would be provided by the artillery unit that forms the base of the strike force, under certain circumstances this may need to be augmented by the parent unit of the unit forming the strike force. Because of the temporary nature of the strike force, combat service support requirements should be minimal. Mobility/Countermobility and survivability considerations will be of particular importance if the strike force will be operating across the forward line of own troops, in that case engineer assets capable of reducing obstacles should be included.

This monograph will now asses how the Artillery Strike Force supports Army operational tenets. The Artillery Strike Force provides for initiative by allowing a commander to engage and disengage the enemy at will. By attacking with indirect fires, it allows a commander to retain freedom of action by not tying forces up in costly direct fire fights. The Artillery Strike Force allows a commander to choose the time and place of engagement: he can engage targets regardless of the weather or intervening terrain. The responsiveness of an Artillery Strike Force allows a commander to set the operational tempo.

The Artillery Strike Force contributes to agility by allowing the rapid concentration of combat power against enemy vulnerabilities. There is no other maneuver force ground or air that can engage a target one minute, and the next fire on a separate target over 100 kilometers from the first target. Artillery is the most

responsive form of firepower for a division. Unlike other types of forces, there is no requirement to mass the weapon systems of the Artillery Strike Force in order to mass its fires. The Artillery Strike Force provides a commander the flexibility to react rapidly to changing situations at all times in all conditions.

The Artillery Strike Force provides for depth through its precision munitions and extended ranges. An Atillery Strike Force can attack the enemy simultaneously and sequentially throughout the depth of the battlefield. One MLRS battery has the ability to simultaneously engage all the main and forward regimental command posts in a division. If facing a combined arms army the battery could simultaneously engage the army main command post, the four divisional main command posts, and the four lead regimental main command posts.

The Artillery Strike Force supports synchronization by using the resources available to a division when and where they will make the greatest contribution to success. By accomplishing a tactical task, the Artillery Strike Force can free up maneuver forces to accomplish other tasks. Additionally, because of its unique capabilities, it may be the only force capable of accomplishing certain tasks that other forces are prevented from accomplishing due to constraints or limitations.

The Artillery Strike Force allows for versatility by giving a commander the ability to tailor weapon systems or munitions to a specific mission, and the ability to rapidly shift focus through the use of artillery's maneuver capability and extended weapons ranges. The Artillery Strike Force can engage a wide variety of targets: it can engage large area targets, small hard targets, and even moving targets. Versatility calls for a

multifunctional capability. The Artillery Strike Force is an extremely versatile organization. It can function in all tactical environments, in all weather conditions, day or night, across the entire spectrum of conflict.

After reviewing what an Artillery Strike Force brings to a commander, it is clear that the Artillery Strike Force fully supports Army operational tenets. I have shown how the Artillery Strike Force can enhance a commander's initiative by providing him agility. Additionally, the increased depth and versatility of the Artillery Strike Force affords a commander an opportunity for increased synchronization.

This monograph will now assess how effective the Artillery Strike Force is at generating combat power. Though artillery systems are not currently considered as a maneuver force by US doctrine, they possess significant maneuver potential. Current artillery systems possess significant movement capability, and in conjunction with its munitions' extended ranges, is able to gain positional advantage over enemy forces. The Artillery Strike Force is firepower. Artillery is clearly the most flexible and responsive source of firepower in a division. The Artillery Strike Force increases an organization's protection through its ability to shoot and move quickly. Engaging an enemy force with indirect fire enhances protection by avoiding costly direct fire engagements. Artillery Strike Forces gain protection by the distance they are able to maintain from a target area. The Artillery Strike Force combines firepower and maneuver to a degree not previously possible. The ability of the Artillery Strike Force to strike anywhere on the battlefield with great precision and lethality against

all types of targets, moving and stationary, area and point; converts the potential of these forces, resources and opportunities into capabilities.

In this section I will present two scenarios for the employment of an Artillery Strike Force.

Offensive scenario

An enemy division has assumed hasty defensive positions. The division commander, in preparation for an attack, has ordered the DIVARTY commander to disrupt enemy command and control and to attrit the enemy artillery. In order to accomplish this mission, the DIVARTY commander decides to form an Artillery Strike Force. Because of range considerations, this will require the DIVARTY commander to maneuver forces into the enemy security zone in order to strike high payoff targets. Through mission analysis, the commander determines he will need a mechanized infantry battalion task force (which he requests through division) to assist the strike force through the enemy security zone and to secure position areas for the artillery to strike required targets. The artillery component of the strike force includes a MLRS battalion, a M109 battalion, and a Q-36 radar. The DIVARTY commander assigns one of the field artillery brigade headquarters supporting the division as the command and control headquarters for the strike force.

The MLRS battalion would have a platoon of launchers loaded with ATACMS with which it would engage the Division main, forward and rear command posts simultaneously. The remaining six launchers from that battery would remain on

stand-by ready to fire any counterfire targets that may respond to the strike force. The other two batteries of the MLRS battalion would engage the units of the divisional artillery group concentrating their fires on multiple rocket launchers systems and long range cannon systems (BM21, BM22, 2S7). The M109 battalion would fire a battalion two of SADARM (48 rounds, 96 submunitions) on the division combined arms reserve, then shift its fires to the units in the regimental artillery groups. After five minutes the strike would be complete. If the situation warranted, the units could move to alternate positions, reload and engage additional targets. The decision to remain forward and to continue to attack additional targets is a high risk proposition, even though the systems going forward can all employ shoot and scoot tactics. The longer the artillery strike force remains forward, the greater the likelihood of its detection and engagement. This is a high risk, high-payoff option.

Defensive scenario

A division has been given a sector to occupy and defend on a disputed border. Currently there is an armored cavalry regiment screening in the vicinity of the border. The enemy has begun preparations to conduct an attack, the division is still in its assembly area 150 kilometers from its intended area of operations. Intelligence indicates that the enemy will be attacking in 24 - 48 hours, it has located and identified three ROM sites and a helicopter forward area refuel and rearming site approximately 75 kilometers from the border. The armored cavalry unit has had repeated contacts with reconnaissance patrols and cross border fires have been

authorized. The Division commander has tasked the DIVARTY commander to delay and disrupt the enemy to allow the division time to move into and establish its defense. The DIVARTY commander forms an Artillery Strike Force based on his organic MLRS battery, which he augments with a mechanized infantry platoon to act as an escort and security force. The Division gets its LNO to the ACR to clear a position area from which the strike force can range all its targets. As the strike force moves into its position area, Division receives intelligence from Echelons Above Corps assets that a command and control node has activated and been identified in the vicinity of the ROM sites. When the battery notifies the DIVARTY that it has occupied its position, it is given the command and control node as an additional target. Five minutes after receiving the new target the battery reports rounds complete and begins its move back to the Division assembly area. On the other side of the border, the enemy commander decides to delay his attack while he assesses the loss of his forward command post, three of four refuel sites and an aviation refuel rearm point.

VII. CONCLUSION

In this time of increasing demands and diminishing resources, the Army must leverage its ability to apply combat power in new and innovative ways. The Army

must critically reflect on its policies and procedures to ensure it is maximizing its potential capabilities.

This monograph detailed the tremendous increases in effectiveness that current artillery systems offer. The new systems, increased volumes of fire, ranges, lethality, survivability and responsiveness now allow an artillery force to accomplish tactical tasks. The beginning of this ability was seen in Vietnam and the Gulf War. Similar to how armor and aviation were used as support arms until their capabilities matured, the capabilities of artillery have now reach the point where the artillery is capable of accomplishing tactical tasks. As a capabilities based force it is imperative that the new systems, extended ranges, increased lethality, and improved survivability of the artillery are fully understood so that the Army can maximize their potential.

In the concepts chapter, this monograph reviewed the concepts of asymmetrical engagements and ascendancy of fires as a possible means of increasing the efficiency of Army operations. As shown, neither of these concepts is new, but they do both offer some useful insight into the potential employment of Artillery Strike Forces.

The Artillery Strike Force combines the efficiencies of new employment concepts with the effectiveness of new capabilities to maximize the potential of the artillery system. The Artillery Strike Force, like armor, infantry and aviation task forces, is capable and ready to accomplish tactical tasks. Some tactical tasks that an Artillery Strike Force could accomplish include disrupt, divert, delay, limit, defeat and destroy.

This monograph does not propose that the Artillery Strike Force replace armor, infantry and aviation task forces. The Artillery Strike Force does not compete with armor, infantry and aviation task forces but offers a complementary capability to a commander. The Artillery Strike Force is one more tool for a commander to use to ensure that he wins quickly, decisively and with a minimum of casualties. This monograph has shown how the Artillery Strike Force supports the tenets of Army operations, particularly in the areas of agility and versatility. Additionally, this monograph has shown how effective the Artillery Strike Force is at combining the elements of combat power, particularly firepower and maneuver to increase a commanders combat power.

As a result of this study, I recommend that the Army fully develop doctrine that incorporates the assignment of tactical tasks to artillery organizations. This concept needs to be included in FM 6-20 *Fire Support in The Airland Battle.* Additionally, all Field Manuals that detail artillery capabilities need to be updated to include the most current capabilities of the artillery system. The areas that are most lacking in these Field Manuals are the Paladin howitzer, MLRS Family of Munitions, and new 155mm munitions such as SADARM. The increased precision, extended ranges and survivability of current artillery systems makes them more lethal than ever before. The Artillery Strike Force is a way for the Army to maximize the potential of the artillery system.

ENDNOTES

[1] J.B.A. Bailey, *Field Artillery and Firepower*, (Oxford: The Military Press, 1989), 5.

[2] US Army, *Field Manual 6-20 Fire Support in The Airland Battle*, (Washington DC: Department of the Army, 1988), 2-8.

[3] General Dennis J. Reimer, "Soldiers are our Credentials" *Military Review* September - October 1995, 5.

[4] General Glen K. Otis, "Ascendancy of Fires: The Evolution of the Combined Arms Team" *Field Artillery* June 1995, 18.

[5] US Army, *Field Manual 100-5 Operations*, (Washington DC: Department of the Army, 1993), 2-6.

[6] Ibid.

[7] US Army, *Field Manual 71-100 Division Operations*, (Washington DC: Department of the Army, 1996), v.

[8] US Army, *FM 100-5*, 2-9.

[9] Ibid., 2-10.

[10] Ibid.

[11] Ibid., 2-10 -- 2-11.

[12] US Army, *Field Manual 6-20-10 Tactics, Techniques, and Procedures for The Targeting Process*,(Washington DC: Department of the Army, 1996), 2-8.

[13] Though the M270 is capable of being lifted by the C141, during Desert Shield the Air Force had to constrain each maximum cabin load to lighter than the weight of the M270.

[14] US Army, *Prairie Warrior 1996 Mobile Strike Force 2010 Selected Fire Support Readings, Tab F, Briefing Excerpts: Sense and Destroy Armor Munitions, Lethality slide.*

[15] Barrie Pitt, *The Crucible of War 2: Auchinleck's Command* (London: Papermac,1986), 254.

[16] David T. Zabecki, *Steel Wind: Colonel Georg Bruchmuller and The Birth of Modern Artillery*, (Westport: Praeger, 1994), 33.

[17] Ibid., 25.

[18] Ibid., 107.

[19] Ibid., 126-134.

[20] Robert H. Scales, Jr., *Firepower in Limited War* , (Washington DC: National Defense Univeristy Press, 1995), 84.

[21] Major General David Ewing Ott, *Vietnam Studies Field Artillery 1954-1973* , 184.

[22] Ibid.

[23] US Army, *Organization and Employment of US Army Field Artillery Units in RVN*, Volume two of two, (San Francisco, 1969), F-2.

[24] Ibid., F-3.

[25] General Robert H. Scales, *Certain Victory: The US Army in the Gulf War* , (Washington DC: Government Printing Office, 1994; Fort Leavenworth: U.S. Army Command and General Staff College Press, 1994), 192-193.

[26] Lieutenant Colonel Timothy R. Puckett. "Copperhead: More than a Tank Killer", *Field Artillery* . October 1994, p.20-23.

[27] Scales, *Certain Victory*, 201 -202.

[28] This account is a complication from the following sources: Major Mark S. Jensen, "MLRS in Operation Desert Storm", *Field Artillery*, August 1991, 30-34; also 42nd Field Artillery Brigade Desert Campaign AAR from Gulf War Collection; and Scales, *Certain Victory*, 203.

[29] Ibid., Jensen, 33; 42nd FA BDE AAR; Scales, *Certain Victory*, 204.

[30] 75th Field Artillery Brigade AAR briefing slides contained in Gulf War Collection.

[31] Lieutenant Colonel James L. Sachtleben, "Artillery raids in Southwestern Kuwait" *Field Artillery*, October 1991, 25-29.

[32] Compilation of Sachtleben, "Artillery raids in Southwestern Kuwait"; 11th Marines Summary of Action Operation Desert Storm, 11th Marines Raid Summary; Lieutenant Colonel Andrew F. Mazzara, "The Opening of Desert Storm Artillery in the Desert, 1991 Report #1" *Marine Corps Gazette* April 1991; and Lieutenant General Bernard E. Trainor, The Artillery Raid Technique" *Marine Corps Gazette* June 1992.

BIBLIOGRAPHY

Books and Papers

Bailey, J. B. A. *Field Artillery and Firepower*. Oxford: The Military Press. 1989.

Bellamy, Chris. *Red God of War: Soviet Artillery and Rocket Forces*. London: Brassey's Defense Publishers, 1986.

_____. *The Evolution of Modern Land Warfare*. New York: Routledge, 1990.

_____. *The Future of Land Warfare*. New York: St. Martin's Press, 1987.

Dupuy, Trevor N. *The Evolution of Weapons and Warfare*. Fairfax: Hero Books, 1994.

Gudmundsson, Bruce I. *On Artillery*. Wesport: Praeger Press, 1993.

Hogg, Ian V. *Artillery 2000*. London: Arms and Armor Press, 1990.

Ott, MG David Ewing. *Vietnam Studies Field Artillery 1954-1973*. Washington DC: Goverment Printing Office, 1975.

Pitt, Barrie. *The Crucible of War 2: Auchinleck's Command*. London: Papermac, 1986.

Scales, Robert H., Jr. *Firepower In Limited War*. Washington D.C: National Defense University Press, 1995.

_____. *Certain Victory: The US Army in the Gulf War*. Washington DC: Goverment Printing Office, 1993.

Swain, Richard M. *"Lucky War" Thrid Army in Desert Storm*. Fort Leavenworth: U.S. Army Command and General Staff College Press, 1994.

Zabecki, David T. *Steel Wind: Colonel Greorg Bruchmuller and the Birth of Modern Artillery*. Westport: Praegor, 1994.

U.S Government: Printed Materials

Regulations, Manuals, and Handbooks.

Department of the Army. *Field Manual 6-20, Fire Support in the Airland Battle*. Washington, DC: Department of the Army, May 1988.

_____. *Field Manual 6-20-10, Tactics, Techniques and Procedures for the Targeting Process*. Washington, DC: Department of the Army, February 1995.

_____. *Field Manual 6-20-30, Fire Support for Corps and Division Operations*. Washington, DC: Department of the Army, October 1989.

_____. *Field Manual 6-50, The Field Artillery Cannon Battery*. Washington, DC: Department of the Army, November 1990.

_____. *Field Manual 6-60, Multiple Launch Rocket System (MLRS) Operations*. Washington, DC: Department of the Army, September 1992.

_____. *Field Manual 71-100, Division Operations*. Washington, DC: Department of the Army, 1996.

_____. *Field Manual 100-5, Operations*. Washington, DC: Department of the Army, June 1993.

_____. *Field Manual 100-5-1 Operational Terms and Graphics Final Draft*. Washington DC: Department of the Army, 1995

_____. *TRADOC Pamphlet 525-5, Force XXI Operations*. Washington, DC: Department of the Army, August 1994.

_____. *TRADOC Pamphlet 525-200-3, Depth and Simultaneous Attack*. Washington, DC: Department of the Army, June 1994

U.S. Government: Manuscript Materials

Operational and After Action Reports, Other Reports, and Studies.

Army Concept Team in Vietnam. *"Oraganization and Employment of US Army Field Artillery Units in RVN Volume One of Two."* Department of The Army: San Francisco, October 1969.

_____. *"Organization and Employment of US Army Field Artillery Units in RVN Volume Two of Two."* Department of The Army: San Francisco, October 1969.

Dastrup, Dr. Boyd L. *King of Battle: A Branch History of the U.S. Army's Field Artillery. TRADOC Branch History Series* . Washington, DC: Center of Military History United States Army, 1993.

VII Corps Desert Campaign After Action Report Volume 4, Part 3 -- Documentation TAB B Annex D (Fire Support) to VII (US) Corps OPLAN 1990-2 (Operation Desert Saber) (U).

VII Corps Desert Campaign After Action Report Part 4, Volume 14B, Chapter 2, Section VIII, 42nd Field Artillery Brigade

75th Field Artillery Brigade, Desert Storm After Action Report Briefing Slides.

U.S. Army Field Artillery Center and School, *"Prairie Warrior 1996 Mobile Strike Force 2010 Selected Fire Support Readings."* Fort Sill, OK: United States Army, 1995.

U.S. Marine Corps, "11th Marines Summary of Action, Operation Desert Storm." Photocopy.

Published Articles

Baxter, BG Leo J. "Field Artillery Vision 2020." *Field Artillery*, December 1994.

Boice, MG William M. "Fires and Maneuver--One and the Same." *Field Artillery*, August, 1992.

Cline, COL Dennis C. and Taylor, LTC Joe G. "Deep Interdiction--The MLRS Deep Strike Option." *Field Artillery*, April 193, 26-31.

Dastrup, Dr. Boyd L. "Modernizing the King of Battle: An Overview." *Field Artillery*, August 1993, 28-32

Dubia, MG John A. "Force XXI and the Field Artillery: State of the Branch 1994." *Field Artillery*, December 1994.

Gilbert, MAJ Rex L. "The Artillery Combat Team: Providing Versatility for America's Tank Division." *Field Artillery*, April 1993.

House, LTC John M. "It's Time for FA to Maneuver." *Field Artillery*, April 1994.

Jensen, Maj Mark S. "MLRS in Operation Desert Strom." *Field Artillery*, August 1991.

Jones, LTC William A. "Fighting With Fires--A Warfighting Philosophy." *Field Artillery*, April 1993.

Mazzara, LtCol Andrew F. "Artillery in the Desert, 1991 Report #1." *Marine Corps Gazette*, April 1991.

Nizolak, MAJ Joseph P., Jr. "The Soviet OMG: Fire Support Lessons for Airland Battle-Future." *Field Artillery*, August 1991.

Otis, GEN (Retired), Glenn K. "Ascendancy of Fires: The Evolution of the Combined Arms Team." *Field Artillery*, June 1995.

Puckett, LTC Timothy R. "Copperhead: More Than a Tank Killer." *Field Artillery*, October 1994.

Reimer, GEN Dennis J. "Soldiers Are Our Credentials." *Military Review*, Sep-Oct 1995, No 5.

Rigby, BG Randall L. and BG Lon E. Maggert, "Shaping Battlespace: More Than Just Deep Attack." *Field Artillery*, Nov-Dec 1995.

Sachtleben, LTC James L. "Artillery Raids in Southwestern Kuwait." *Field Artillery*, October 1991.

Trainor, LtGen Bernard E. "The Artillery Raid Technique." *Marine Corps Gazette*, June 1992.

Winicki, 1stLt Anthony A. "The Marine Combined Arms Raid." *Marine Corps Gazette*, December 1991.

Wood, COL John R. and MAJ Steven A. Greene. "The Emerging National Military Strategy--Enduring Goals, Evolving Ways and Means." *Field Artillery*, June 1994.