To Fight or Not to Fight?

Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar Years to Operation IRAQI FREEDOM

Robert S. Cameron, Ph.D.

Combat Studies Institute Press
US Army Combined Arms Center
Fort Leavenworth, Kansas

Cover photograph courtesy *Armor Magazine*.

To Fight or Not to Fight?

Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar Years to Operation IRAQI FREEDOM

Robert S. Cameron, Ph.D.

Combat Studies Institute Press
US Army Combined Arms Center
Fort Leavenworth, Kansas

Library of Congress Cataloging-in-Publication Data

Cameron, Robert S., 1965-
To fight or not to fight? : organizational and doctrinal trends in mounted maneuver reconnaissance from the interwar years to Operation Iraqi Freedom / Robert S. Cameron.
p. cm.
Includes bibliographical references and index.
1. United States. Army. Cavalry--History--20th century. 2. United States. Army. Cavalry--History--21st century. 3. United States. Army--Armored troops--History--20th century. 4. United States. Army--Armored troops--History--21st century. 5. Organizational change--United States--History. 6. Military doctrine--United States--History. 7. Maneuver warfare--History. 8. Military reconnaissance--History. 9. United States--History, Military--20th century. 10. United States--History, Military--21st century. I. Title.

UA30.C35 2010
355.4'13--dc22

2009051654

Foreword

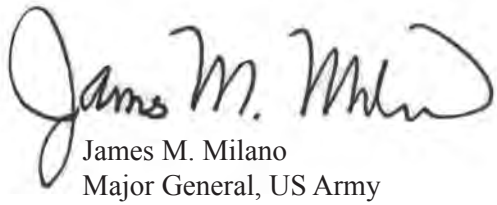
Dr. Robert S. Cameron's *To Fight or Not to Fight? Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar Years to Operation IRAQI FREEDOM* provides a narrative analysis of US Army reconnaissance, scout, and cavalry evolution from the post-World War I era through the Iraqi conflict. It outlines key developments in the concepts governing reconnaissance units from the armored cavalry regiment down to the maneuver battalion scout platoon. These changes are placed in the context of national defense policy decisions and major Army initiatives. The title derives from the almost cyclic shifts between reconnaissance organizations oriented on information collection and those designed for a broader mission set. The text focuses on doctrinal and organizational changes, but training, materiel development, and the impact of combat operations constitute important supporting themes. This study also traces the transition from horse to vehicular reconnaissance, later bolstered by air cavalry and more recently with a variety of sensors and unmanned systems. The chronicle of this transition highlights another persistent theme: the impact of technology on reconnaissance. It addresses an issue with which scouts in today's high-tech world continue to grapple: finding the correct balance between man and machine for effective reconnaissance.

The trend analysis included in these pages shows how mounted reconnaissance arrived at its current state. The author provides a clear depiction of past evolution to guide future reconnaissance development. Given the ongoing changes today within the Army generally and the reconnaissance community in particular, such an analysis has immediate relevance. The insights and information provided help to determine those capabilities scouts need on future battlefields and how best to acquire them. In this sense, this book is part of a larger effort by the Armor Branch to shape future mounted maneuver reconnaissance in a sensible and effective manner. However, it is clear from this text that developing the right doctrine, organization, and platform to ensure our reconnaissance Soldiers are configured for success in ever-changing operational environments is a complex process.

To Fight or Not to Fight? is a must read for those responsible for designing reconnaissance organizations, writing the related doctrine, establishing the materiel requirements, and training scouts. It is also recommended for those serving in reconnaissance organizations who every day discover new trails for others to follow. Much has been written about cavalry and

reconnaissance, but this literature generally focuses on a specific era, platform, combat operation, or personal account of service. Missing from this body of literature is an overarching analysis of American cavalry and reconnaissance development. This book fills that void, providing a single source reference for a critical dimension of mounted maneuver history. These pages should resonate with anyone who has served in or supported a cavalry, reconnaissance, or scout unit. They remind us of the importance of what the horse cavalry once called "mental mobility."

Scouts Out!



James M. Milano
Major General, US Army
Commanding General
US Army Armor Center and Fort Knox

Contents

Page

Figures

Page

Page

Page

Page

Page

Page

Tables

Introduction

Past as Prologue

In 1999, the annual Armor Conference featured a typical lineup of guest speakers, technology demonstrations, and discussion venues intended to showcase the Armor Branch and generate new ideas for its future development. The conference included a short information briefing on the status of the Future Scout and Cavalry System (FSCS). At the time, this platform was to become the primary mounted reconnaissance vehicle. The presentation proved unremarkable until the speaker mentioned the medium caliber armament intended for the FSCS. Questions quickly arose from the officers, noncommissioned officers (NCOs), Army civilians, and Defense contractors in attendance regarding the need for this weapon. Before the briefer could respond, other audience members rose to the defense of the intended armament. The event disintegrated into a verbal fisticuff.

The ensuing argument focused on the scout's need and usage of a powerful weapon. Some felt the scout's proper role lay in the undetected collection of information on the battlefield. Anything that detracted from this singular purpose, including combat, undermined the scout's ability to gather information necessary for effective command decisions. A powerful weapon encouraged the scout to engage targets and be drawn into firefights that at best compromised its reconnaissance role while increasing the likelihood of its destruction. For this school of thinking, the ability to see the battlefield and report findings constituted the scout's most important assets. Therefore, the scout needed only a small weapon for self-defense or, if surprised by an enemy force, to disengage.

The opposing view stressed the importance of possessing the means to fight for information and survival. Scouts unable to penetrate a hostile security screen or survive a chance contact were not likely to obtain key information, particularly regarding the enemy's morale and willingness to fight. Without a combat capability, the scout's effectiveness would be nullified if confronted by a hostile force. Similarly, the scout became vulnerable to ambush. Given the forward nature of the scout's position on the battlefield, contact with the enemy was likely. Hence, the scout required the means to fight and survive should combat become necessary. With these tools, the scout also became capable of more effective security and counterreconnaissance operations. This viewpoint considered combat an inherent and unavoidable part of the scout's primary mission of information collection.

These contradictory perspectives reflect a longstanding debate within the mounted maneuver component of the US Army. Should reconnaissance

organizations fight for information and participate in combat in situations other than self-defense? This simple question belies far more complex but related doctrinal, organizational, training, materiel, and resourcing issues. The weapons, platforms, equipment, concepts of employment, and configuration for a reconnaissance unit intended for combat necessarily differed from one intended for stealthy operations. These differences also affected the composition of higher organizations controlling scouts. How the scouts operated determined the type of support they would require from their parent unit and what if any augmentation they would require in particular circumstances. Finally, training needed to reflect actual battlefield employment. Combat operations necessitated training in maneuver and direct fire engagements—skills not as important for a scout seeking to operate undetected via stealth and infiltration.

Whether scouts should fight or not remains a subject of controversy today and will remain so in the near future. The related issues continue to defy permanent resolution, and, in fact, have been recurring points of debate at least since the 1930s. Since then, extensive combat operations and the steady march of technology have generated a wealth of operational experience coupled with new capabilities. In contrast, the parameters of the reconnaissance debate have changed little over time, partly because analysis of past experience tends to validate the value of both fighting and stealthy reconnaissance. They are complementary with each type offering a set of unique, desirable capabilities for the battlefield commander. Still, the trend in American mounted maneuver reconnaissance development since before World War II has been to favor alternatively one reconnaissance style over the other. This fluctuating emphasis contributed to the reconnaissance controversy by generating doctrinal and organizational turbulence without resolving underlying issues.

This work chronicles the principle developments in mounted maneuver reconnaissance from the interwar period to the present. In particular, it charts and analyzes doctrinal, organizational, materiel, and training trends from the platoon to regiment and division levels. It is in this realm that reconnaissance has proven to be the most controversial and, at times, subject to radical change. However, this study does not offer significant coverage of parallel developments among dismounted or aerial reconnaissance—these subjects lie outside the purview of this work.

The analysis begins with the Army's adoption of a new mechanization policy and the related establishment of the 7th Cavalry Brigade (Mechanized) in 1931. This unit revolutionized command and control in the Army and developed the fundamental principles that continue to guide

mounted maneuver operations today. The creation of the mechanized cavalry also marked the start of the Army's transition to a vehicle-based force structure. This shift directly influenced reconnaissance. Previously, mounted reconnaissance remained the responsibility of the Cavalry Branch, whose soldiers relied on the horse for tactical mobility. Thus mounted, the rifle-equipped trooper could traverse most terrain, operate mounted or dismounted, and collect information by the most appropriate means. Combat power remained necessarily limited to what the horse could carry, encouraging action via stealth. The low-tech nature of the horse cavalry coupled with the absence of alternatives to this form of ground reconnaissance resulted in noncontroversial reconnaissance principles.

The mechanized cavalry's emphasis on fast-paced, aggressive operations necessarily required a different style of reconnaissance. The speed of operations desired made reliance on stealth or dismounted action unlikely. Armored vehicles carrying radios and machineguns provided significantly greater combat power than the horse-mounted trooper. Early mechanized cavalry doctrine embraced this capability by acknowledging the need to fight for information and the likelihood of combat for its reconnaissance elements. Hence, the mechanized cavalry favored a more combative and aggressive style of reconnaissance based on armored fighting vehicles seeking out enemy weaknesses.

The origins of the debate that continues to influence reconnaissance development can be seen in the different methods of information collection adopted by the mechanized cavalry and the horse cavalry. The horse cavalry favored a more deliberate, stealthy approach that sacrificed combat power for mobility and quietness of operations. Even after the horse cavalry disappeared from the Army, the trend it established continued to attract support in subsequent decades and influenced platform design, organizational configuration, doctrine, and training. Conversely, the emphasis on combat power, survivability, and the ability to fight for information embraced by the 7th Cavalry Brigade (Mechanized) found validation in combat and prompted subsequent armored cavalry development. Both trends remained in evidence throughout World War II and the Cold War, although the mechanized threat posed by the Warsaw Pact tended to elevate the prominence of fighting reconnaissance. The stability and support missions of the 1990s, coupled with major advances in information technology, marked a major resurgence in stealthy reconnaissance. Army Transformation and modularity sustained this emphasis, but combat operations in Iraq called into question the wisdom of overreliance on light reconnaissance organizations with minimal combat power.

Today stealthy and fighting reconnaissance continue to attract staunch advocates and maintain an uneasy coexistence within the mounted maneuver community. Understanding the origins and evolution of these competing schools of thought provides a frame of reference within which to approach future development. Given past developments and the inability to resolve fundamental differences in how reconnaissance should be conducted, it is certain that the debate will continue. New technologies will likely cloud the discussion, but they will not alter the essence of either view. For an Army whose doctrine revolves on information dominance to overwhelm an enemy through combined arms maneuver and precision effects, the importance of mounted maneuver reconnaissance—and the related debate regarding its nature—cannot be understated. It is in the Army's interest to determine the optimal reconnaissance organization, principles, materiel, and training programs.

This work is intended to contribute to this goal. It seeks to facilitate understanding of what has occurred, inspire insights, and provide a base of knowledge applicable to today's environment. These lofty ambitions are made more realizable by the recurring nature of the reconnaissance debate, which comprises the central content of the following pages. Combat developers, trainers, doctrine writers, and soldiers constitute the target audience for this study. These individuals bear direct responsibility for future reconnaissance developments, and they are thus optimally situated to apply the lessons of the past. Their efforts to chart a course for reconnaissance organizations should occur not in darkness and uncertainty but in the afterglow and certainty of what has gone before.

Reconnaissance studies have been written before, but they have generally focused on a specific event, timeframe, or platform. This work attempts a comprehensive depiction of trends over an 80-year period to provide a single source reference. It offers a broad sweep of the salient features of the debates regarding reconnaissance during the timeframe addressed. Readers will find a degree of repetition as the pages move them from the interwar period through World War II and into the Cold War and beyond. This effect is intentional, partly because it reflects the cyclic nature of reconnaissance developments that actually occurred and because it provides a solid context for understanding the current state of affairs. The concepts inherent to the battlefield surveillance brigade can be traced to the cavalry's emphasis on stealthy information collection in the interwar years. Conversely, the last remaining Active Component armored cavalry regiment marks a recurring interest in a general purpose organization that reflected dissatisfaction with the mechanized cavalry experience in World War II. Similarly, the tactical experience of reconnaissance organizations

in Operation IRAQI FREEDOM bears resemblance to the counterinsurgency operations of armored cavalry and maneuver battalion scouts in Vietnam.

The following pages will not satisfy every reader. This work does not constitute the definitive study of mounted maneuver reconnaissance. It is not, for example, unit oriented. Individuals seeking to find detailed coverage of a particular organization will not find it here. Nor will they find the level of narrative detail in the coverage of combat operations found in other publications. These pages constitute a trend analysis focused on major themes rather than specific people, places, or events. Platform development is addressed by linking specific vehicles to the broader context of concept and doctrine development rather than through narration of the technical issues surrounding each vehicle. Only those platforms that exerted a significant influence on reconnaissance are addressed. In this study, technological development constitutes one of several influences shaping the discourse surrounding reconnaissance, and the coverage devoted to it tends to increase in the post-World War II chapters. The greater attention reflects the Army's growing reliance on technology in the same period, which came to a climax with the abortive development of the Future Combat System (FCS) with its related collection of aerial drones, unmanned ground vehicles, and networked platforms.

The source material for this study largely reflects documentation readily available within the Armor Center. The most significant data collections utilized were those within the Armor Branch archives and the Armor School Library. The former includes information regarding doctrine, combat development, training, and some combat activities. The latter's published materials, field manuals, student papers, and organizational data proved invaluable to charting changes over time in unit configurations, sensing the evolving views of armor soldiers, and placing reconnaissance developments in a broader historical context. *Armor Magazine*, the branch journal, proved invaluable for the insights its writers provided. Letters to the editor offered a surprising wealth of detail on activities within units, while the range of articles over the years offered a range of perspectives from NCOs, junior officers, and commanders. Archival material from the National Archives and the Army Heritage and Education Center (which includes the services previously provided by the Military History Institute) has also been utilized. In general, travel and time constraints precluded an exhaustive mining of key document repositories in the private and public sectors. These limitations encouraged the study's overall emphasis on trends. However, many of the sources utilized are readily accessible and can provide a springboard for more detailed research.

This work is dedicated to mounted maneuver scouts currently serving in the Army and those who have preceded them. It is also an acknowledgment of the work performed by teams of soldiers and civilians, laboring behind the scenes to generate sensible doctrine, materiel that works, and adaptive tactical organizations.

Scouts Out!

Chapter 1

Setting the Stage: The Interwar Era

The years between the world wars witnessed the transition of the US Army from a muscle-powered force into an increasingly mechanized and motorized one. New ideas and organizational concepts dominated the era, but the full effects of this change did not occur until the mass fielding of new equipment and the large-scale expansion of the Army at the onset of World War II. Mounted reconnaissance developments reflected the impact of mechanization through the emergence of principles developed by the 7th Cavalry Brigade (Mechanized). Mechanized cavalry leaders considered combat a likely occurrence for effective reconnaissance. They differed from horse cavalry officers in the greater emphasis they placed on the need to fight for information. Although the doctrine associated with both cavalry types preferred reconnaissance by stealth and the avoidance of detection, the mechanized cavalry preferred to equip their scouts with the means to survive chance encounters with hostile forces. Horse cavalry leaders leaned toward greater use of stealth. The creation of the Armored Force decentralized responsibility for reconnaissance development and ensured the expression of both viewpoints within the Army.

In the Beginning

Prior to World War I, the Cavalry constituted the Army's mobile arm. Its tactical components utilized the horse for superior mobility over the predominantly foot-mobile formations they supported. The cavalry's broad mission set included attack, defend, exploitation, pursuit, reconnaissance, security, delay, raid, and harassment operations. Doctrine required the ability to perform these missions either mounted or dismounted. Consequently, cavalry organizations proved versatile and flexible, characterized by rapid action and decisiveness. Cavalry units lacked the ability for sustained combat, but this did not constitute the primary purpose of the mounted arm.

Cavalry units relied on their favorable mobility differential to perform reconnaissance and security forward of friendly formations. Moving as individuals, small patrols, or entire units, they sought out hostile forces. Once the cavalry located the enemy, mounted troopers remained in contact and provided a steady flow of information regarding hostile activities. In this manner, cavalry organizations shaped the nature and circumstances in which battle occurred. Their information drove command decisions at all levels, and as a security force, cavalry provided early warning of enemy action and protected against surprise.

In the late 19th century, the multidimensional nature of American cavalry became exemplified in Frederic Remington's 1898 drawing of a trooper in the 3d Cavalry Regiment prior to the unit's departure for Cuba in the Spanish-American War. Better known as *Old Bill*, the drawing became a cavalry icon. The image depicts a soldier with his rifle sitting astride his horse. *Old Bill* epitomized the qualities of firepower, mobility, and shock power associated with the cavalry. He also exemplified the ability of the trooper to perform reconnaissance on demand, relying on the patrolling skills inherent to cavalry training and further instilled through experience. The horse provided unparalleled tactical mobility and could be easily mounted or dismounted. Quiet and readily concealed, the horse moved at a reasonable speed, and its height offered the rider good visibility. Through careful, stealthy movement, a horse-mounted scout could remain nearly invisible, relying on his weapon primarily to protect himself in an emergency.

Courtesy *Armor Magazine*

Figure 1. *Old Bill*.

Unfortunately, even *Old Bill* had difficulty practicing his craft on the highly lethal battlefields of World War I. The Great War augured in a new style of warfare characterized by trenches, barbed wire, mines, and a shell-pocked landscape. Lethality increased with widespread use of machineguns, mortars, and increasingly accurate artillery and aircraft. In this environment, horse cavalry proved especially vulnerable and mounted operations became the exception rather than the norm. Consequently, the American Expeditionary Forces sent to fight on the Western Front included only a small cavalry contingent. Reconnaissance became the responsibility of aircraft and dismounted infantry patrols.

The marginal contribution of US cavalry complicated efforts to define the role of the mounted arm after the war. The new technologies introduced on the World War I battlefields continued to mature and gain in effectiveness. Tanks and motor vehicles became commonplace among Army organizations and found inclusion in training and doctrinal guidance.

The expansion of vehicle use challenged the traditional dependence on the horse for transport and combat functions. Moreover, the likelihood of encounters with armored vehicles on future battlefields also increased. As the reliability of tanks and combat vehicles improved, so too did their mobility, particularly over developed roads. Horse-based organizations became hard-pressed to keep pace with the growing versatility and effectiveness of mechanized and motorized combat units.

Reconnaissance organizations required an ability to move faster than parent formations. Where the latter moved at the pace of a soldier on foot, scouts on horseback possessed a favorable mobility differential. This differential shrank in the interwar years as the Army's use of vehicles expanded. Motorization and mechanization trends also benefited from the major strides in automotive technology made in the same period. These changes occurred slowly, constrained by budgetary concerns and uncertainty about the precise manner in which tactical organizations would integrate vehicles.

Such uncertainty did not afflict the Cavalry. The branch leadership remained convinced of the continuing utility of horse cavalry and worked diligently to highlight its strengths, particularly in comparison with vehicular units. They waged an aggressive campaign to promote their branch, drawing unfavorable comparisons between the terrain sensitivity of vehicles and the yet unmatched tactical mobility of horse organizations.[1] Mounted riders remained much easier to conceal, transitioned easily

Courtesy *Armor Magazine*

Figure 2. Early armored car used in the interwar period.

to dismounted operations, and possessed a minimal noise signature—important considerations for reconnaissance. Logistical considerations favored the horse as well. While horses could live off the land if necessary, vehicles could not operate without fuel. The small number of vehicles in most combat units made the loss of even one a significant detriment to effectiveness, unlike horse organizations that maintained their own replacement mounts.[2] In general, mechanized and motorized organizations were depicted as brittle and dependent on highly favorable conditions for their effective employment in contrast to the versatility and agility of horse cavalry.

The *Cavalry Journal* supported these efforts. It printed articles showcasing cavalry exploits throughout history. Its coverage of World War I focused on theaters other than the Western Front to depict effective cavalry employment. British cavalry operations in the Middle East received particular emphasis. They incorporated the principal characteristics of firepower and mobility associated with American cavalry and demonstrated cavalry's traditional ability to achieve decisive results, improved weaponry notwithstanding.[3] A powerful endorsement came from Field Marshal Viscount Edmund H.H. Allenby, who commanded British forces in Palestine. In a letter to the *Cavalry Journal* editor, Allenby acknowledged the attention given to his command and defended the value of horse cavalry in all theaters of operation, including Western Europe. However, he also advocated experimentation with the use of tanks, armored cars, and trucks in cavalry roles and noted that aircraft had largely replaced horse cavalry in long-range reconnaissance.[4]

Allenby's views found reflection in American cavalry developments throughout the interwar years. Increased emphasis on terrain use and maneuver to exploit the horse's mobility complemented a parallel tactical emphasis on dispersion to reduce vulnerability. Cavalry organizations in general increased their firepower and motorized their trains and support services. They also pioneered antitank tactics and by the late 1930s were experimenting with "portée cavalry." This type of cavalry relied on large trucks to move men and horses long distances via roads, restoring a degree of strategic mobility to the horse cavalry. In the parlance of a later generation, the horse became a battlefield taxi rather than a combat platform. Mounted charges remained a part of cavalry doctrine, but not the dominant expression of the mounted arm in combat.[5]

Interest in the use of tanks and motor vehicles in cavalry roles symbolized the branch's willingness to experiment with new technology, but public law limited its ability to do so. The National Defense Act of 1920

established the guidelines under which the Army was organized and functioned in the interwar period. Section 17 assigned exclusive responsibility for tank development, including tactics and organization, to the Infantry. Hence, cavalry organizations could do little beyond exploring possibilities with armored cars.[6]

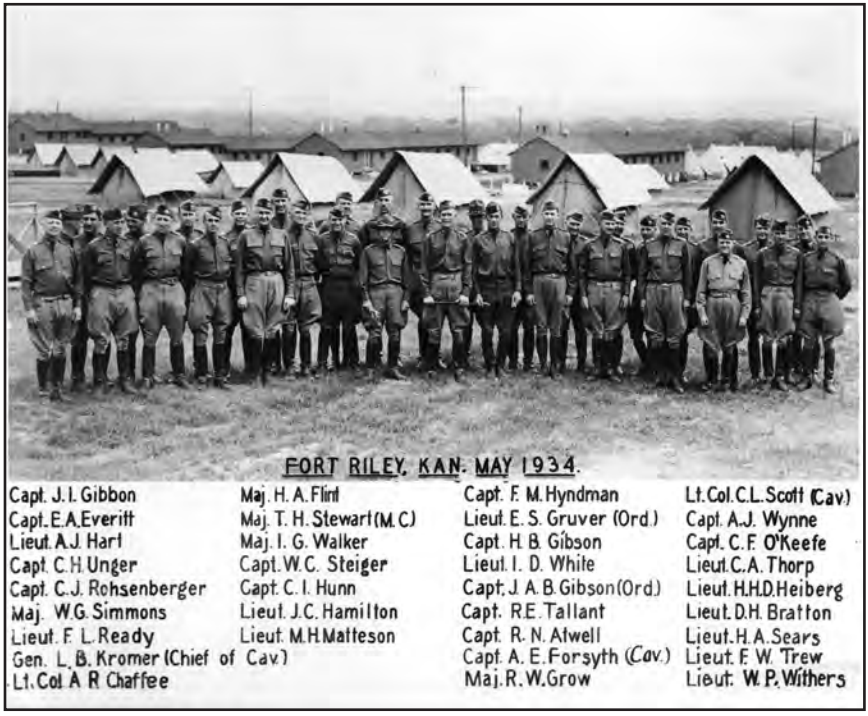
Courtesy *Armor Magazine*

Figure 3. Another early armored car showing some refinement in design.

The 1st Cavalry Division served as a test-bed organization for such experimentation. It utilized a small number of armored cars to develop appropriate tactics, techniques, and procedures for their use in reconnaissance and security roles. During maneuvers in 1929, the 1st Cavalry Division attached armored cars to one of its cavalry regiments. The vehicles operated 10 miles forward of their parent regiment, updating the latter on tactical developments via radio. The cars demonstrated their potential value as information gatherers, but the maneuver experience triggered interest in a variety of other activities, including antitank operations. The armored car's attractiveness stemmed from its low cost in comparison to other combat vehicles and its weight. The 1st Cavalry Division continued to formulate principles to guide the use of armored cars in subsequent field exercises and maneuvers, stressing the value of radios to coordinate operations. The principal limitations to this groundbreaking work in vehicle reconnaissance stemmed from the mechanical frailty and road-bound nature of the armored cars in service.[7]

Parallel efforts occurred at the Cavalry School at Fort Riley, Kansas. In the 1934 maneuvers held there, scout car platoons were attached to

horse cavalry squadrons to perform reconnaissance and track hostile mechanized forces. The wheeled, open-topped scout cars carried light armor protection and a machinegun armament. Platoons were augmented with a .50-caliber machinegun section to provide additional firepower and an antitank capability.[8]



Armor Branch Archives

Figure 4. Principal cavalry leaders present at the 1934 Fort Riley maneuvers.

The Cavalry School envisioned the permanent assignment of scout cars to cavalry regiments for reconnaissance. They were to penetrate hostile screens and report on enemy dispositions via radio. However, emerging doctrinal guidance discouraged commitment to battle or other actions that diverted the scout car from its primary role of information gathering: "The sole purpose of the reconnaissance vehicle with horse cavalry is to gather information by observation. Its use for combat will be accidental, emergency, or self-protective. It is employed in small group which are enjoyed to avoid fighting."[9]

By 1936, reconnaissance developments at the Cavalry School and in the 1st Cavalry Division embraced both scout cars and armored cars. The scout car was a "wheeled fighting vehicle designed for reconnaissance and limited defensive action, high road speed, fair cross-country mobility,

heavy flexible firepower, and limited armor protection." The armored car was "similar to the scout car, operates at greater distance from supporting troops, [and is] more effectively armored."[10] Armored cars supported the cavalry division, while the regiment benefited from the assignment of scout cars. The distinct qualities of each car and their intended allotment reflected the reconnaissance needs of different command echelons.

Courtesy *Armor Magazine*

Figure 5. M1 Scout Car, distinguishable from armored cars by its open top and limited armor protection.

Scout cars also supported regimental command and control functions. Their radios represented an important boost to the unit's communications. During the 1934 Cavalry School maneuvers, scout cars provided additional radio support and served as radio relay stations.[11] This function became an accepted role for scout cars, although it diverted them from reconnaissance missions. In 1936, the 6th Cavalry formally demonstrated this command support role at Fort Benning, Georgia. Subsequently, scout cars found themselves employed in similar activities, and regimental command and control became identified in horse cavalry doctrine as an acceptable secondary mission.[12]

Horse Cavalry Doctrine

The apex of interwar horse cavalry reconnaissance doctrinal thinking emerged with the publication of *Cavalry Field Manual, Vol. I: Horse*

Cavalry in 1938. This manual governed the full range of cavalry missions and incorporated lessons learned in preceding years. It provided detailed guidance for the conduct of reconnaissance from individual scouts to entire units, including the scout car platoon. In the execution of reconnaissance, horse scouts were to avoid detection and hostile forces wherever possible, making careful use of terrain and inclement weather. Dismounted movement and observations were considered normal activities, particularly in rugged, wooded, or urban terrain. Trained to locate obstacles to movement, scouts used wire cutters to clear barbed wire—the principal obstacle to horse cavalry mobility. The entire focus of reconnaissance effort lay in the timely receipt of information to the unit commander. Hence, the timeline for the reconnaissance mission hinged on when the commander required the objective information.[13]

Reconnaissance patrols sought information on the enemy, but strove to avoid contact unless required by the mission. Reconnaissance by fire, nevertheless, was encouraged when observation alone could not disclose an enemy's presence. In such instances:

> After careful observation has failed to disclose the presence of the enemy, the scout leaves his observation point and boldly rides or walks in plain view to within 500 or 600 yards of the area or locality, which he is reconnoitering. Suddenly, as though he had observed a target, he opens fire with his rifle on the suspected area. After firing one or more shots he turns and gallops or runs to the nearest cover. This procedure will almost invariably draw enemy fire if the locality is occupied.[14]

Security constituted another principal activity for horse cavalry. Like reconnaissance, security patrols sought the enemy's presence. They oriented their movement on friendly forces and provided early warning of hostile activity. Unlike reconnaissance missions, security details bore responsibility for locating and engaging hostile elements. Through combat, security forces denied enemy patrols information on friendly activities and destroyed them if possible. Security operations entailed a degree of counterreconnaissance in addition to preventing surprise attacks. In their execution, the cavalry field manual considered combat a likely and frequent occurrence.[15]

Cavalry regiments included scout car platoons of 10 scout cars and 4 motorcycles. The platoon headquarters consisted of one car and one motorcycle. Three scout sections, each with three cars and one motorcycle, completed the platoon. The motorcycle riders served as couriers and

Courtesy *Armor Magazine*

Figure 6. Horse cavalry training at Fort Riley.

relied on a professional skill set that included combat intelligence. They supplemented radio transmissions and often provided a firsthand description of enemy activity to the regimental command group. The scout car platoon possessed considerable firepower, high road mobility, and a long radius of action. These qualities permitted it to conduct reconnaissance beyond the normal range of horse patrols. The scout cars further achieved a degree of self-sufficiency through the delegation of basic maintenance tasks to vehicle crews.[16]

Reconnaissance constituted the scout car platoon's primary mission. Sections generally operated together, with two forward and one in reserve. Movement occurred by bounds in which the leading car advanced and the rest of the section observed its movements, ready to pinpoint enemy locations or provide support as necessary. The manual outlined simple drills to govern movements through defiles, over bridges, and through small urban areas. However, dismounted operations were encouraged, particularly in wooded, urban, or rugged terrain. The section leader possessed considerable discretion as to the precise manner of executing his mission. The manual provided guiding principles only, encouraging commanders to make their dispositions according to the tactical situation rather than prescribed actions.[17]

Careful reconnaissance necessitated slow movement and frequent dismounted observation. This method provided the most detailed information, but it proved time-consuming. When rapid results were required, scout cars performed mounted reconnaissance. They moved quickly by

bounds until they encountered the enemy, employing reconnaissance by fire against suspected enemy positions. Mounted reconnaissance increased the possibility of unexpected contact. In the event of an ambush, scout cars were to ". . . go around an obstacle, mission permitting, rather than to engage in a prolonged fire fight or risk an unfavorable outcome."[18] Still, when action could not be avoided and disengagement proved impossible, scout car crews employed basic fire and maneuver principles, fighting dismounted if more likely to generate success.[19]

Secondary missions for the scout car platoon included security, antitank, command support, seizure of distant objectives, harassment, and delay. Security actions followed the same principles as horse patrols and possessed an implicit information-gathering mission. The scout car's firepower and ability to operate over long distances permitted it to maintain a screen line forward of the regiment. The .50-caliber machinegun armament gave the scout car its antitank capability. Mobility and firepower also suited the needs of delay and harassment missions in which the objective lay in the disruption of enemy movements. By 1938, the use of scout cars for command and control functions had become common enough to identify it as an acceptable secondary mission for the platoon. In this role, scout cars provided communications support to the regimental commander and performed liaison duties.[20]

Courtesy Patton Museum of Cavalry and Armor

Figure 7. M3 Scout Car with full crew and weapons.

In essence, the scout car platoon constituted a valuable asset for the regimental commander. With its radio communications, firepower, and mobility, the platoon proved multifunctional. Determining how to employ

it at any given moment was a decision for the regimental commander, who directed the platoon through his S2 in deference to the platoon's primary information-gathering mission.[21] The unit's capabilities and value led to less than clear guidance concerning commitment to combat. The manual writers did not want to preclude combat actions nor did they wish to encourage the destruction of this highly prized asset in avoidable engagements. Therefore, the decision remained the purview of platoon, section, and car commanders. These leaders were reminded, "Sections and individual cars must never lose their freedom of maneuver by becoming too closely engaged. Leaders must be guided by the principal that the cars are intended essentially for reconnaissance and security purposes and not combat."[22]

Mechanized Cavalry

The National Defense Act of 1920 placed primary responsibility for tank development with the Infantry. This law effectively discouraged experimentation with tactical organizations built around the tank that could perform roles other than infantry support. Although interest in such experimentation remained high, not until 1928 did the first significant deviation in mechanized development occur. In that year, the War Department established the Experimental Mechanized Force, patterned after a British organization with a similar name. The unit lasted less than 3 months before disbanding.[23]

In 1930, the Army undertook further experimentation with a mechanized unit through the creation of the Mechanized Force. This organization included representative elements from the different branches, but its principal combat power lay in its tanks. The Mechanized Force became a test bed to develop the organization and employment concepts of a mechanized unit through a series of maneuvers and field tests.[24] In 1931, however, the budgetary impact of the Great Depression forced the Army leadership to choose between personnel retention and continued support for the mechanized force. Army Chief of Staff General Douglas MacArthur considered people more important than machines and disbanded the innovative but expensive Mechanized Force.[25]

MacArthur believed in the value of mechanization for the entire Army. He, therefore, decentralized responsibility for further mechanized development among the branches. The Cavalry saw in this policy an opportunity to expand its work with scout cars and armored cars to include a broader range of tactical vehicles, including tanks. The 1st Cavalry Regiment replaced its horses with a motley collection of vehicles to

Courtesy *Armor Magazine*

Figure 8. The mechanized force on maneuvers.

become the 1st Cavalry Regiment (Mechanized) and relocated from Marfa, Texas, to Fort Knox, Kentucky, in 1933. There it joined remnants of the Mechanized Force previously renamed the Detachment for Mechanized Cavalry Regiment.[26]

In its early years, the 1st Cavalry Regiment (Mechanized) functioned as an experimental unit, charged with determining the optimal organization, doctrine, and materiel for a mechanized cavalry regiment. The mission of the latter lay in the performance of independent operations and providing reconnaissance and security for a parent corps or army. Initial development built on concepts already established for horse cavalry organizations and on the experience of the Mechanized Force. In particular, the latter's armored car troop received considerable attention in the formulation of reconnaissance doctrine for the new mechanized cavalry. The troop included 10 vehicles that routinely operated forward of the parent organization and reported on tactical and terrain conditions.[27] This usage reflected similar use of armored cars by the 1st Cavalry Division.

Within the 1st Cavalry Regiment, the covering squadron included an armored car troop and a scout car troop with 10 and 7 vehicles, respectively.[28] Together with the rest of the regiment, the squadron made its maneuver debut during the 1934 Cavalry School maneuvers, which also

served as a field test of emerging mechanized cavalry concepts of employment and organization. In these maneuvers, the armored car and scout car troops performed different functions, the former ranging far ahead of the regiment while the latter remained just forward of the main body.

Courtesy Patton Museum of Cavalry and Armor

Figure 9. The 1st Cavalry Regiment (Mechanized) arriving at Fort Knox in 1933.

The covering squadron bore responsibility for reconnaissance and security operations. The armored car troop moved over a broad frontage, seeking hostile forces. Once located, the troop maintained contact and observed hostile activity until the regiment's combat elements arrived. The armored cars then transitioned to flank security, observing the enemy while the regiment attacked, before resuming their forward reconnaissance. The cars often operated beyond the effective reach of friendly support. The troop functioned as a command element and two platoons. Each platoon in turn maneuvered as two sections with two armored cars and a motorcycle. The cars utilized the same bounding movement technique developed by the horse cavalry, while the motorcyclist performed detailed reconnaissance of select points. The scout car troop followed in the wake of the armored cars. It performed a security role for the regiment by identifying potential threats bypassed or missed by the armored cars. The scout cars also served to protect the regiment from ambush or surprise attack.[29]

Analysis of the maneuvers led to a reorganization of the 1st Cavalry. The covering squadron disappeared in favor of a single, expanded armored

car troop. The latter grew to 17 armored cars, organized into 4 platoons. Platoon strength remained at four cars, subdivided into two sections. The troop headquarters included an armored car and a passenger car for command functions, three trucks for maintenance and supply, and five motorcycles intended for platoon attachment. Expansion of the armored car troop effectively streamlined the regiment's reconnaissance and security assets. The replacement of scout cars with armored cars simplified supply and maintenance concerns. Tactically, the new troop organization eased command and control and provided greater flexibility of employment. It also ensured that the primary reconnaissance platforms possessed the same level of armored protection.[30]

Courtesy Patton Museum of Cavalry and Armor

Figure 10. Elements of the 1st Cavalry Regiment (Mechanized) in 1934.

The 1st Cavalry's participation in the 1936 Second Army maneuvers provided an opportunity to field test the new armored car troop. In general, the armored cars, operating by platoons and sections, maneuvered far forward of the regiment to locate enemy positions and keep hostile forces encountered under observation. In the course of these activities, the armored cars also sought to locate and if possible destroy antitank weapons. These posed a threat to the regiment's ability to maneuver and to its operational tempo. Overall, the armored cars did locate enemy concentrations and kept them under observation until the regiment's advance guard arrived. The cars then sought routes around the enemy's flank and continued to reconnoiter forward. When the regiment committed to an attack, the

armored car platoons assumed the role of flank security and tracked the battle's progress. When combat operations diminished, they again advanced and resumed their leading reconnaissance efforts. However, the aggressive nature and rapid pace of the armored cars also triggered repeated contact with enemy forces and a correspondingly high loss rate. In the worst case, the troop lost half its strength in a single scenario.[31]

Courtesy Patton Museum of Cavalry and Armor

Figure 11. Mechanized cavalry armored car at Fort Riley for the 1934 maneuvers.

Nevertheless, the maneuver experience of the 1st Cavalry's armored car troop demonstrated key principles guiding mechanized reconnaissance. The regiment depended on the timely receipt of information concerning the location of the enemy's principal force concentrations. The armored car troop secured this information by thrusting its platoons and sections far forward of the regiment to aggressively probe for the enemy. Until they reached their objective, they bypassed obstacles and hostile patrols. They reported the location and size of each obstruction, but continued to press forward, relying on the firepower and ballistic protection of the armored cars to survive chance contacts. When the reconnaissance teams located their target objective, they kept the enemy under observation and reported all activity via radio. The regiment's combat assets advanced to the point of contact, orienting their movements on the steady flow of information received. When they attacked, the role of the armored cars lay in monitoring the ensuing battle and seeking a favorable opportunity to continue their forward probing.

Often the armored car troop resorted to hasty, mounted reconnaissance techniques rather than the more deliberate and stealthy approach preferred by the horse cavalry. Mechanized cavalry routinely sought a high operational tempo that placed them inside the enemy's decision cycle. Hence, rapidity of action became a prized quality and permeated the actions of all regimental assets, including the armored car troop. The armored cars, characterized by their speed, long range, and relative quietness of operation, were suited to rapid forward movements and relied on their armor and weapons as security against surprise. However, the aggressive mounted reconnaissance practiced by the mechanized cavalry also entailed risk. In the Second Army maneuvers, it resulted in the rapid erosion of the 1st Cavalry's information-gathering capability.[32]

Courtesy Patton Museum of Cavalry and Armor

Figure 12. Combat cars, motorcycles, and halftracks of the 1st Cavalry Regiment (Mechanized) in 1936.

The link between effective reconnaissance and the battlefield influence of the regiment became still clearer in 1937 and 1938. By then, the mechanized cavalry had expanded through the addition of the 13th Cavalry Regiment (Mechanized) and the attachment of the 68th Field Artillery (Mechanized). The latter was charged with developing artillery techniques suited to mechanized units. Together with the 1st Cavalry, this grouping constituted the 7th Cavalry Brigade Mechanized, the Army's only combined arms unit in the 1930s. This unit built on the pioneering efforts of the 1st Cavalry, including its groundbreaking work in mounted

reconnaissance. Since the brigade did not possess its own reconnaissance organization, the focus of information gathering remained the armored car troops within each regiment. Their diversion into secondary roles was discouraged. Although the horse cavalry regiments made use of their scout cars to support command functions, provide courier services, and act as radio relay stations, mechanized cavalry leaders found these practices counterproductive. They reduced the regimental commander's ability to see and understand the battlefield.[33]

Conversely, by integrating air and ground reconnaissance platforms, commanders could increase their understanding of the battlefield long before they entered it. In 1938, the 7th Cavalry Brigade undertook a road march from Fort Knox to Fort Oglethorpe, Georgia, using aircraft to guide their movements. The return march ended in a maneuver on Fort Knox pitting the mechanized cavalry against an infantry brigade using innovative antitank tactics. Aircraft and armored cars ranged far ahead of the mechanized cavalry columns to begin identifying and reporting hostile troop locations. This information permitted the brigade leadership to plan its attack while en route to Fort Knox and then commence operations without pause when it reached the installation. The simulated battle ended with the mechanized cavalry poised to strike the rear of the infantry brigade despite the latter's antitank measures, which received Army-wide acclaim.[34]

In these maneuvers, radio communications proved critical to the success of the 7th Cavalry Brigade. Radio provided the fastest means

Courtesy Patton Museum of Cavalry and Armor

Figure 13. Mechanized cavalry halftracks, 1936.

of transmitting data over distance in the interwar era. The mechanized cavalry pioneered new techniques to exploit its capabilities, particularly the use of radio nets linked to command echelons and tactical functions. These nets provided a degree of communications flexibility that paralleled equally innovative command developments. These included the adoption of techniques similar in principal to those associated with mission type and fragmentary orders. The collective impact of state-of-the-art communications technology and innovative command processes was a highly responsive and adaptive organization. It facilitated rapid decisionmaking and the transmission of orders, which in turn reduced the timelag between a command decision and its execution by subordinate leaders. These qualities relied on the timely receipt of accurate information from reconnaissance assets, making them the axis around which command and combat effectiveness spun.[35]

Unfortunately, the mechanized cavalry's widespread reliance on radio communications was not reflected throughout the Army. Indeed, questions about the reliability of the radios themselves and the potential interception

Courtesy Patton Museum of Cavalry and Armor

Figure 14. Mechanized cavalry combat car.

of transmissions triggered a conservative policy toward radio use. The mechanized cavalry addressed operational security concerns through the adoption of command procedures that did not mandate sending details of unit activities over the airwaves. However, maneuver operations of the 7th Cavalry Brigade in 1937 and 1938 still incurred criticism for excessive radio use. The mechanized cavalry ignored these complaints, because radio use saved time otherwise spent writing and distributing orders by hand. It also facilitated the coordinated maneuver of dispersed combat elements. Consequently, mechanized organizations sustained a steady momentum during maneuvers, despite rugged terrain, innovative antitank tactics, and the careful use of terrain by opposing forces.[36]

The year 1938 marked the apex of mechanized reconnaissance doctrine development. The publication of the cavalry field manual included a separate volume dedicated to mechanized cavalry that incorporated the analysis and maneuver experience accumulated since 1931.[37] The other volumes in the three-volume manual addressed cavalry operations in general and the horse cavalry in particular. Indeed, this manual represented a major milestone in cavalry development and its coverage of horse reconnaissance as noted above.

The volume devoted to the mechanized cavalry focused much of its guidance for reconnaissance operations on the armored car troop. This unit constituted the primary means of reconnaissance for the regiment and brigade, because the latter lacked its own information gathering organization. Much of the manual's text confirmed the method of operation demonstrated in prior maneuvers. In all movements, the armored car troop preceded the regiment, commencing operations up to 2 hours before the main body. The troop functioned either independently or semi–independently, ranging far ahead of the parent regiment. It sought to gain contact with hostile forces and determine their size, composition, and flanks in time to shape regimental actions. The troop's leadership began operations with a clear sense of the parent regiment's mission, status, and orders. This information shaped the context of the reconnaissance mission and helped to coordinate the activities of the armored car troop and its parent regiment.[38]

The integration of aerial and ground reconnaissance was strongly encouraged, since an almost symbiotic relationship seemed to exist between them. Aircraft offered a means to identify advance routes for the troop and mark hostile roadblocks and battle positions. The armored cars could utilize this information to guide their own movements and retain a high speed of operations. Conversely, the cars could operate in weather

impenetrable from the air. Although experimentation with aircraft had been conducted, mechanized cavalry tables of organization included no organic airplanes.[39]

When the armored cars located enemy troop concentrations, they reported to regimental headquarters via radio and remained in contact to monitor hostile activity. The regimental commander used the information from his armored cars to guide the dispatch of combat assets to engage the enemy. However, the reconnaissance team remained vulnerable during the period between its location of the enemy force and the arrival of friendly forces to engage them. Doctrine required maintaining contact once established. Therefore, the reconnaissance team relied on stealth, mobility, and the armored car's firepower and protection for survival.[40]

Courtesy US Army Military History Institute

Figure 15. Chief of Cavalry Major General John K. Herr and 7th Cavalry Brigade (Mechanized) Commander Brigadier General Adna R. Chaffee Jr. meet at Fort Knox, 1939.

Once regimental combat assets advanced to engage the enemy concentration, the armored cars transitioned to flank security operations. They monitored enemy action and searched for his flanks. Alternatively, the regimental commander might employ the armored car troop as his reserve during combat. When the battle ended, the armored cars again moved forward to resume their reconnaissance, harass a retreating enemy,

or cover the withdrawal of friendly forces. In this progression of activity, the armored cars continuously transitioned from one function to another. This ability was demonstrated during maneuvers and reinforced in training. The result was a versatile reconnaissance team that contributed far more to the overall success of the parent regiment than simply the provision of information. Indeed, the manual identified the seizure of distant, critical objectives as an acceptable special mission, well suited to the armored cars' combination of far-ranging reconnaissance, firepower, and mobility.[41]

The armored car troop was intended to operate as a collection of platoons. The commander's job lay in managing the separate activities of each platoon to satisfy a regimental objective, often oriented on the collection of specific information. The troop headquarters possessed few assets under its direct control other than one armored car, a passenger car, and several trucks for supply and maintenance purposes. Therefore, the troop commander was encouraged to retain one of his four platoons as a reserve. When available, this unit became the principal means by which he could reinforce or influence the action of his other platoons through direct action. The troop also included several motorcycles, but these generally supported the platoons as scouts and messengers and did not constitute a significant tactical force.[42]

The platoon included four armored cars and their crews divided into two two-car sections. The latter constituted the smallest unit considered viable for reconnaissance operations. Each platoon received a zone or route to reconnoiter. The former included a specified area, while the latter focused on a specific road or avenue of advance. The platoon leader often broke down these assignments into section assignments. All platoon and section movement occurred by bounds, with either one section or car always prepared to support the other. Vehicle crews trained to conduct mounted and dismounted operations, but observation and accurate reporting constituted their most important functions, particularly regarding terrain conditions and enemy activity. Such information proved critical for the terrain-sensitive mechanized cavalry to sustain a rapid pace of operations. The armored car platoons represented probing fingers, whose efforts guided the actions of their parent regiment. In later years, this linkage would become more commonly known as "recon-pull."[43]

One of the most important decisions facing a platoon or section leader lay in whether or not to engage in combat. Doing so advertised the reconnaissance team's presence and exposed it to possible destruction: "The temptation to engage targets of opportunity and fight its way through hostile detourable resistance encountered en route must be guarded against.

Courtesy *Armor Magazine*

Figure 16. Armored car of the 13th Cavalry Regiment (Mechanized).

The most effective reconnaissance platoon is the one that sees without being seen."[44]

This statement reflected a clear logic and the influence of horse cavalry doctrine. Even so, its inherent caution differed from the generally aggressive tone found throughout the mechanized cavalry volume of Field Manual (FM) 2-10, which emphasized the importance of rapid, decisive action. For example, under the discussion of armored car platoon operations, antitank guns were identified as priority targets. When encountered as part of a roadblock, the manual recommended their elimination through the employment of fire and movement tactics by the entire platoon. Techniques for employing armored cars in harassing attacks on enemy columns and in impeding hostile attacks through delaying actions relied heavily on firepower and mobility. In the case of ambush, armored cars were expected to retain their mobility and quickly establish fire supremacy. Clearly, the armored car was intended for something more than just stealthy observation.[45]

In effect, the critical decision to engage in or avoid combat remained with the platoon, section, and car commanders, much as it was left to scout car leaders in the horse cavalry regiment. The advantages and disadvantages of engagement were identified, but the reader was not bound to a particular course of action. This empowerment of junior leaders reflected the overall decentralization of command characteristic of the mechanized

cavalry. The operation of fast-moving teams over a broad frontage necessitated a flexible command and control structure. Armed with knowledge of the troop and regiment's mission and their own orders, armored car platoon leaders were expected to act on their own discretion without waiting for guidance from higher, especially when enemy action jeopardized friendly plans: "When on a mission of battle reconnaissance the platoon commander upon his own initiative promptly and vigorously employs his maximum effectiveness to counter any hostile development which constitutes an immediate threat to the success of the regiment in combat."[46]

The platform also influenced the decision to engage or avoid combat. The armored car in use was a fully armored vehicle with a machinegun armament carried in a revolving turret. Although it could not sustain hits from most antitank weapons, it could deflect small arms fire and protect the crew from fragmentation. The car could operate effectively on roads and hard surfaces, but its cross-country mobility, especially in rugged terrain, proved limited. Nevertheless, its .30-caliber and .50-caliber machineguns were capable of destroying soft targets and neutralizing light tanks and other thinly armored vehicles. In addition, the machineguns could be removed from the car and used to support dismounted operations. The combination of firepower and at least fair mobility made combat a viable,

Courtesy Patton Museum of Cavalry and Armor

Figure 17. Mechanized cavalry scout car.

if not always the best, course of action. Armor protection "gives the car reasonable protection against small arms fire and a sense of security and protection to the crew which is conducive to boldness."[47] It also helped to ensure survival during ambushes and chance encounters with the enemy.

The benefits of armor protection also affected the operability of reconnaissance vehicles. In an article published in the *Cavalry Journal*, these detrimental effects became the target of a cavalry officer who questioned the wisdom of any armor for armored and scout cars. In his view, armor reduced already poor off-road mobility, increased fuel consumption, reduced visibility, and raised the silhouette of both vehicles. Armor further encouraged the employment of the vehicles as machinegun platforms for combat rather than reconnaissance. Armor detracted from the ability of either vehicle to gather information, but it could not provide sufficient protection to the crew and vehicle without becoming too heavy for its mission. The article also postulated the potential benefits of removing armor protection:

> In short, if the cavalry reconnaissance cars, by elimination of armor, can:
>
> a. Increase road mobility
> b. Reduce silhouette
> c. Increase visibility for observers
> d. Decrease fuel consumption per mile, thus increasing the range
> e. Increase the effectiveness of weapons
> f. Increase the speed and ease of replacement
> g. Increase cross-country mobility
> h. Reduce the temptation to use reconnaissance cars as fighting vehicles, why not eliminate armor from horse cavalry reconnaissance vehicles?[48]

This view amounted to heresy within the mechanized cavalry community. Colonel Charles L. Scott considered the article ". . . the most inane, asinine proposal that's ever been submitted. To take such action would be the most backward step that the cavalry could possibly take. I am ashamed that the *Cavalry Journal* would even print it."[49] Scott strongly supported some degree of armor protection and combat capability for reconnaissance units. He believed that any organization consistently in contact with enemy forces would eventually be required to fight, necessitating armor and weapons. He refuted the wisdom of an exclusively stealthy reconnaissance doctrine in which scouts moved in unarmored vehicles and eschewed combat. In his view, "One that is not trained and equipped to fight but on

the contrary told to avoid combat under all conditions will always be a spineless adjunct to the regiment."[50]

This difference of views reflected differences in emphasis concerning the nature of mounted reconnaissance. By the late 1930s, the mechanized cavalry embraced reconnaissance organizations with versatility and combat power. The horse cavalry favored the use of terrain and stealth to ensure survivability on the battlefield. This trend extended to reconnaissance and manifested itself in the preference for a light, mobile platform that was easily concealed and provided maximum visibility. While horse cavalry doctrine did not exclude combat from reconnaissance activities, it was not encouraged. Indeed, Fort Riley became the testing site for a small, unarmored wheeled vehicle intended as a possible replacement for motorcycles. Light and fast, early models suffered from insufficient power for tactical operations, but design modification and analysis continued. This effort led to the award of an Army contract in 1940 and the fielding in 1941 of a small, lightweight truck better known as the jeep.[51]

For the mechanized cavalry, development of this platform constituted a misstep in the evolution of reconnaissance platforms precisely because it lacked armored protection. However, while the jeep remained a design concept, the 7th Cavalry Brigade began to receive new vehicles to replace its armored cars. The open-topped M3 scout car lacked the all-round armor protection of the armored cars, but it carried six men and a radio. It possessed similar armament to the armored car, but a skate ring along the top of the vehicle permitted its machineguns to be mounted and moved along the ring to fire in any direction. In addition, the weapons could be easily removed and fired from the ground to support dismounted operations. The open-topped configuration enhanced visibility and simplified passenger egress. M3 fielding increased the dismounted strength of the reconnaissance platoons, and it offered a mechanically more robust machine than the armored cars it replaced.[52]

The new scout cars made their debut during the First Army maneuvers in August 1939. This event demonstrated the viability of the reconnaissance principles developed by the 7th Cavalry Brigade in the 1930s. Reconnaissance platoons moved 2 hours in advance of their parent regiments and began collecting information on opposing force dispositions. They particularly sought to identify strongpoints, roadblocks, and antitank weapons, reporting via radio. Equipped with this information, the mechanized cavalry regiments quickly enveloped the opposing force before fanning out across its rear area, destroying one antitank position after another. Regimental combat assets moved faster than the opposing force could

Courtesy Patton Museum of Cavalry and Armor

Figure 18. The 7th Cavalry Brigade (Mechanized) at the US Military Academy, 1939.

react and with a precision impossible without the steady flow of information provided by the reconnaissance platoons. Once inside the enemy's decision cycle, the 7th Cavalry Brigade remained there and accelerated the breakdown of resistance.[53]

The success of the mechanized cavalry stemmed largely from the widespread reliance on rapid communication via radio. At the time of the maneuvers, the 7th Cavalry Brigade (Mechanized) utilized 158 radios, the greatest concentration of radios throughout the Army. Robust communications complemented the success of the reconnaissance platoons in securing key information. However, the platoons often met hostile forces and the frequency of encounters increased the further they pushed into the enemy rear area. Reflecting on this experience, the brigade commander, Brigadier General Adna R. Chaffee Jr., concluded, "Reconnaissance from unarmored vehicles is of doubtful value and very liable to be most costly in men and vehicles."[54]

Mounted Reconnaissance in Transition

Within days of the conclusion of the First Army maneuvers, Germany invaded Poland, precipitating the beginning of World War II. Within weeks, German mobile formations overran Poland and it ceased to exist as

a national entity. In the US Army, the lightning campaign triggered interest in a large-scale expansion of mechanization, but no consensus emerged to govern how this growth would occur. In May 1940, the Third Army maneuvers in Louisiana demonstrated the need to establish permanent mechanized divisions in lieu of improvised formations in the field. The same month marked the German invasion of France and the Lowlands. In a 6-week campaign in which German panzer and motorized infantry divisions played a prominent role, the French suffered defeat and occupation. These two events spurred the US Army to establish a separate organization to organize and train American formations similar in capability to the German panzer division.

Therefore, in July the Army created the Armored Force. It incorporated all tank units and the mechanized cavalry. These assets were reorganized to form the 1st and 2d Armored Divisions and the 70th Tank Battalion. The Armored Force consolidated the previously separate mechanization efforts of the Infantry and Cavalry. It focused on the fielding of armored divisions and the related development of doctrine and training programs. In the process, Armored Force leaders borrowed heavily from the experiences of the 7th Cavalry Brigade (Mechanized). General Chaffee's appointment as commander of the Armored Force embodied this linkage, because of his prior command of the 7th Cavalry Brigade and his prominent role in mechanized cavalry development throughout the 1930s.

Courtesy Patton Museum of Cavalry and Armor

Figure 19. The 7th Cavalry Brigade (Mechanized) at the 1939 World Fair in New York City.

These changes directly influenced the continued development of mounted reconnaissance. The Cavalry branch remained responsible for horse cavalry, special mixed horse and mechanized cavalry regiments, division cavalry assignments to infantry divisions, and motorcycle units. Nevertheless, reconnaissance development became much more constrained. Previously, it had been integral to all mounted doctrine and organizations, resulting in general purpose combat units with reconnaissance capabilities and components. The creation of the Armored Force severed this link. The Cavalry retained responsibility for reconnaissance doctrine, but not mechanized combat units in general. Hence, those mechanized assets left to the Cavalry began to transform into specialized organizations intended for reconnaissance only.

At first, this change seemed imperceptible. In August 1940, the Cavalry published FM 2-5, *Horse Cavalry*. This manual made few changes to the reconnaissance principles already established for horse cavalry, but the inclusion of illustrations and detailed guidance for the operation of reconnaissance and security patrols enhanced its training value. The emphasis given to the use of cover and concealment increased, reflecting the horse's vulnerability on an increasingly mechanized battlefield. Reconnaissance patrols that encountered hostile armored vehicles were directed to scatter, seeking cover in rugged terrain and exploiting the horse's greater tactical mobility. Whether to engage in combat or not remained the patrol leader's decision—subject to rules of engagement established at the outset of a mission. In general, reconnaissance elements sought to avoid combat

Courtesy Patton Museum of Cavalry and Armor

Figure 20. Horse cavalry along the US–Mexican border.

except for self-preservation. Even so, the manual continued to acknowledge multiple instances in which combat was not only unavoidable but also intended, especially counterreconnaissance, screening, and security operations.[55]

Guidance for the scout car platoon in horse cavalry organizations similarly reflected few changes. The platoon retained its 10-car structure, and by 1940 was equipped with the same M3 scout car previously issued to the 7th Cavalry Brigade (Mechanized). Reconnaissance remained the platoon's primary mission, but additional functions included security, command support, communications, and combat. Each platoon maneuvered by section, employing bounding overwatch techniques for both reconnaissance and security operations. The manual replaced earlier requirements for soldiers to carry wire cutters to remove wire obstacles with a broader requirement for pioneer and demolition work. The platoon did not carry the special equipment to perform this action, instead relying on its provision from the parent troop when required. Since the scout cars were expected to operate near their troop headquarters, this arrangement was not considered a restraint on their activities.[56]

FM 2-5 proved an effective, well-written update to cavalry doctrine. What it could not and did not do was provide an overarching set of principles to guide Army reconnaissance. The manual offered little guidance for the development and employment of reconnaissance within the new armored divisions, which remained the purview of the Armored Force. The Army's shift from horse to armored organizations ensured a reduction in the cavalry's influence on mounted reconnaissance while that of the Armored Force grew. Exactly how these two organizations would influence reconnaissance development remained uncertain.

Notes

1. US Congress, House, Subcommittee of the Committee on Appropriations, *War Department Appropriation Bill for 1935 Military Activities, Hearings*, Part 1, 73d Congress, 2d Session, 1934, 302–303; Major General Leon B. Kromer, "Cavalry," Lecture at the US Army War College (AWC), 1 October 1937, AWC Curricular Archives, US Army Military History Institute (MHI) Archives, Carlisle, PA; Major General John K. Herr, "The Cavalry," Lecture at AWC, 19 September 1938, AWC Curricular Archives, MHI Archives.

2. George S. Patton Jr. and Clarence C. Benson, "Mechanization and Cavalry," *Cavalry Journal* XXXIX, no. 159 (April 1930): 234–240.

3. For examples of the *Cavalry Journal*'s interest in British cavalry operations in Palestine, see George E. Mitchell, "The Rout of the Turks by Allenby's Cavalry," *Cavalry Journal* XXIX, no. 119 (April 1920): 28–43; George E. Mitchell, "The Rout of the Turks by Allenby's Cavalry," *Cavalry Journal* XXIX, no. 120 (July 1920): 174–205; Edward Davis, "The British Cavalry in Palestine and Syria," *Cavalry Journal* XXXI, no. 127 (April 1922): 123–129; Edward Davis, "The British Cavalry in Palestine and Syria," *Cavalry Journal* XXXII, no. 130 (January 1923): 56–65; Edward Davis, "The British Cavalry in Palestine and Syria," *Cavalry Journal* XXXII, no. 132 (July 1923): 286–295; Edward Davis, "The British Cavalry in Palestine and Syria," *Cavalry Journal* XXXII, no. 133 (October 1923): 435–444; J.R.H. Cruikshank, "From Acre to Aleppo with Allenby," *Cavalry Journal* XXXIII, no. 134 (January 1924): 52–62; Edward Davis, "The British Cavalry in Palestine and Syria," *Cavalry Journal* XXXIII, no. 134 (January 1924): 47–51.

4. E.H.H. Allenby, "Letter to the Editor," *Cavalry Journal* XXX, no. 122 (January 1921): 1–2.

5. US Congress, House, Subcommittee of the Committee on Appropriations, *War Department Appropriation Bill for 1936 Military Activities, Hearings*, Part I, 74th Congress, 1st Session, 1935, 355; US Congress, House, Subcommittee of the Committee on Appropriations, *War Department Appropriation Bill for 1937 Military Activities, Hearings*, Part I, 74th Congress, 2d Session, 1936, 19–20; L.W. Cramer, "Portée Cavalry: An Experiment with Commercial Trucks," *Cavalry Journal* XLIX, no. 3 (May–June 1940): 254–255.

6. US War Department, *The National Defense Act Approved June 3, 1916 as Amended by Act Approved August 29, 1916; Act Approved July 9, 1918; Act Approved February 28, 1919; Act Approved July 11, 1919; Act Approved September 29, 1919; Act Approved June 4, 1920*, 1920, Section 17, 15.

7. The Adjutant General's Office, *Official Army Register* (Washington, DC: Government Printing Office, 1931), 1294; E.C. McGuire, "Armored Cars in the Cavalry Maneuvers," *Cavalry Journal* XXXIX, no. 160 (July 1930): 386–399; George S. Patton Jr., "The 1929 Cavalry Division Maneuvers," *Cavalry Journal* XXXIX, no. 158 (January 1930): 9–10; George S. Patton Jr., "Tactical Lessons Derived from the Cavalry Division Maneuvers, October, 1929," 27 November 1929, in *The Patton Papers*, Vol. I, ed. Martin Blumenson (Boston, MA: Houghton Mifflin Company, 1972), 865.

8. Major General Leon B. Kromer, Address at Cavalry School, 1934, 5, Leon B. Kromer Papers, MHI Archives; Lieutenant Colonel John Milikin, "The Fall Maneuvers of the Cavalry School—1934," *Cavalry Journal* XLIV, no. 188 (March–April 1935): 45–52.

9. Colonel Bruce Palmer, "The Cavalry," Lecture at AWC, 12 October 1936, 9, AWC Curricular Archives, MHI Archives.

10. Matthew Darlington Morton, "Horses for 'Iron Ponies': The Interwar Development of Mechanized Ground Reconnaissance" (Master of Arts Thesis, Florida State University, 2001), 88.

11. Miliken, "The Fall Maneuvers of the Cavalry School—1934," 45.

12. Lieutenant Colonel Henry L. Flynn, "The Part Played by the 6th Cavalry in the Infantry School Maneuvers," *Cavalry Journal* XLV (September–October 1936): 367–368. At this time, the .50-caliber machinegun was considered an effective weapon against the armored fighting vehicles then in use by most armies.

13. US War Department, *Cavalry Field Manual, Vol. I: Horse Cavalry*, 3 vols. (Washington, DC: Government Printing Office, 1938), 199–209.

14. Ibid., 201.

15. Ibid., 203–205, 211.

16. Ibid., 273, 279.

17. Ibid., 274–277.

18. Ibid., 277.

19. Ibid., 276–277.

20. Ibid., 277–279.

21. Ibid., 274.

22. Ibid., 278.

23. Historical Section, Army Ground Forces, Army Ground Forces Study No. 27, "The Armored Force, Command and Center," 1946, 1–2.

24. Ibid., 2; Major Raymond E. McQuillen, Memorandum to Army War College Asst. Commandant, 1 March 1931, 25–26, AWC Curricular Archives, MHI Archives; Robert W. Grow, "The Ten Lean Years: From the Mechanized Force (1930)," 10, Robert W. Grow Papers, MHI Archives.

25. US Congress, House, Subcommittee of the Committee on Appropriations, *War Department Appropriation Bill for 1933 Military Activities, Hearings*, Part 1, 72d Congress, 1st Session, 1932, 17–18; S.D. Badsey, "The American Experience of Armour," in *Armoured Warfare*, ed. J.P. Harris and F.H. Toase (New York, NY: St. Martin's Press, 1990), 128.

26. Army Ground Forces Study No. 27, "The Armored Force, Command and Center," 1946, 3; Major General (Retired) Robert W. Grow, "A Lesson in Mobile History," *Armor* LXIII, no. 2 (March–April 1954): 3.

27. Grow, "A Lesson in Mobile History," 3; Arthur Wilson, "With the Mechanized Force on Maneuvers," *Cavalry Journal* XL, no. 166 (July–August 1931): 5–9.

28. Morton, "Horses for 'Iron Ponies,'" 64.

29. Major General Leon B. Kromer, Briefing, "The Cavalry Maneuvers, Fort Riley, Kansas, May 1934, June 1934," Leon B. Kromer Papers, MHI

Archives; US Army Cavalry School, Academic Division, *Mechanized Cavalry* (Fort Riley, KS: Cavalry School, 1932–33), 47; "The Cavalry Maneuvers at Fort Riley, Kansas, 1934," *Cavalry Journal* XLIII (July–August 1934): 5–14.

30. Colonel Bruce Palmer, "Mechanized Cavalry in the Second Army Maneuvers," *Cavalry Journal* XLV, no. 6 (November–December 1936): 461; Major Willis D. Crittenberger, Memorandum to CG, 7th Cavalry Brigade, Subj: Tables of Organization, T/O 423 P (Mecz), 5 July 1935, Office of the Chief of Cavalry, General Correspondence, Record Group (RG) 177, National Archives and Records Administration (NARA); War Department, *Cavalry Field Manual Vol. II, Mechanized Cavalry*, 3 vols. (Washington, DC: Government Printing Office, 1938), figure 1, 9.

31. Palmer, "Mechanized Cavalry in the Second Army Maneuvers," 461–478; Grow, "The Ten Lean Years: From the Mechanized Force (1930) to the Armored Force (1940)," 66.

32. Palmer, "The Cavalry," Lecture at AWC, 12 October 1936, 4–5, 10–11.

33. Morton, "Horses for 'Iron Ponies,'" 115.

34. Major General Daniel Van Voorhis, "Mechanization," Lecture at AWC, 29 September 1938, 19, in Army War College Lectures, 1938–39, Part 1, AWC Curricular Archives, MHI Archives; "The Mechanized Cavalry Takes the Field," *Cavalry Journal* XLVII, no. 4 (July–August 1938): 291–300.

35. *Cavalry Field Manual, Vol. II, Mechanized Cavalry*, 133–134, 136–139, 143–145; War Department, *Cavalry Field Manual, Vol. III, Employment of Cavalry*, 3 vols. (Washington, DC: Government Printing Office, 1938), 82; Van Voorhis, "Mechanization," Lecture at AWC, 13 October 1937, 9.

36. Discussion notes for lecture of Major General Van Voorhis at AWC titled "Mechanization," 13 October 1937, 8, 9–11; "The Mechanized Cavalry Takes the Field," 291, 296–297, 299, 300.

37. *Cavalry Field Manual, Vol. II, Mechanized Cavalry*.

38. Ibid., 92, 96, 102–106.

39. Ibid., 92, 94, 102–106.

40. Ibid., 103–104.

41. Ibid., 104–106.

42. Ibid., 102, figure 1.

43. Ibid., 97–102.

44. Ibid., 100.

45. Ibid., 98–99.

46. Ibid., 101.

47. Ibid., 94.

48. Major Clinton A. Pierce, "Armor for Horse Cavalry Reconnaissance Vehicles?" *Cavalry Journal* XLVII, no. 4 (July–August 1938): 327–328.

49. Quoted in Morton, "Horses for 'Iron Ponies,'" 162.

50. Colonel Charles L. Scott, "Armor for Cavalry Reconnaissance Vehicles is Essential," *Cavalry Journal* XLVII, no. 5 (September–October 1938): 430–433.

51. "Notes from the Cavalry Board," *Cavalry Journal* XLVII, no. 6

(November–December 1938): 551; Doug Stewart, "Hail to the Jeep! Could We Have Won Without It?" *Smithsonian* (November 1992): 62–64.

52. Lieutenant Colonel Robert W. Grow, "New Developments in the Organization and Equipment of Cavalry," *Cavalry Journal* XLVIII, no. 3 (May–June 1939): 204–207.

53. Adna R. Chaffee, "The Seventh Cavalry Brigade in the First Army Maneuvers," *Cavalry Journal* XLVIII, no. 6 (November–December 1939): 450–461; Adna R. Chaffee, "Mechanized Cavalry," AWC Lecture, 29 September 1939, 6, in "Army War College Lectures 1939–1940," Part 2, AWC Curricular Archives, MHI Archives.

54. Chaffee, "Mechanized Cavalry," AWC Lecture, 29 September 1939, 17, quotation from page 26.

55. War Department, FM 2-5, *Cavalry Field Manual Horse Cavalry* (Washington, DC: Government Printing Office, 1940).

56. Ibid., 255–264.

Chapter 2

The Crucible of Combat: World War II

From 1940 to 1945 the Army grew from a small national security force into one capable of sustaining a multiyear global conflict. The Armored Force expanded to 16 divisions by war's end. Reconnaissance units similarly proliferated. Their early development marked the dual and sometimes contradictory influences of two competing schools of thought—one focused on stealth and the other on aggressive action and fighting for information. Operations in North Africa tended to validate both views. By early 1944, this duality ended with the adoption of standard organizations and materiel coupled with a doctrine that limited the scope of mechanized cavalry operations to information collection. This simplification did not survive arrival on the battlefields of Europe. Combat experience there led to an expansion of the missions associated with mounted reconnaissance units and general dissatisfaction with existing organizations. By the end of the war, a clear desire for more robust and versatile reconnaissance assets had emerged.

Something Old, Something New, 1940–41

The creation of the Armored Force in 1940 concentrated development responsibility for mechanized doctrine, training, organization, and materiel. The Armored Force facilitated the rapid creation of armored formations similar to those employed by the German Army, but no similar concentration of mounted reconnaissance responsibility occurred. It remained split between the Armored Force and the Cavalry. The former focused its efforts on the reconnaissance requirements of the armored division and the separate tank battalions. The Cavalry included reconnaissance assets in horse cavalry organizations, motorcycle units, the special horse-mechanized regiments, and the triangular infantry divisions.

The large number of horse cavalry units in the Regular Army and National Guard ensured that the Cavalry retained responsibility for a large segment of the Army's reconnaissance needs.[1] The mounted branch, however, considered itself a combat arm in which reconnaissance constituted just one of several missions performed. Field Manual (FM) 2-15, *Employment of Cavalry,* described the branch as "that combatant arm of the ground forces organized to perform missions requiring great mobility and firepower." At the time of the manual's publication in 1941, those missions included both mounted and dismounted attack, pursuit, exploitation,

defense, delaying action, reconnaissance, security, counterreconnaissance, and special operations. The last category included use in a reserve, liaison, or screening role.[2]

The manual categorized reconnaissance operations, drawing on the Army field service regulations. Distant reconnaissance sought information to influence strategic decisions and occurred at great distance from the parent formation. Close reconnaissance provided information to drive tactical decisionmaking and served as the basis for commanders to engage in combat. This reconnaissance began as opposing forces moved to contact. Battle reconnaissance included detailed information concerning enemy forces and terrain. It entailed continuous observation of the enemy before, during, and after a battle. Both horse and mechanized cavalry were expected to perform battle and close reconnaissance, but the ability of mechanized cavalry to move further via roads and sustain cross-country operations for longer periods made it the preferred agent for distant reconnaissance.[3]

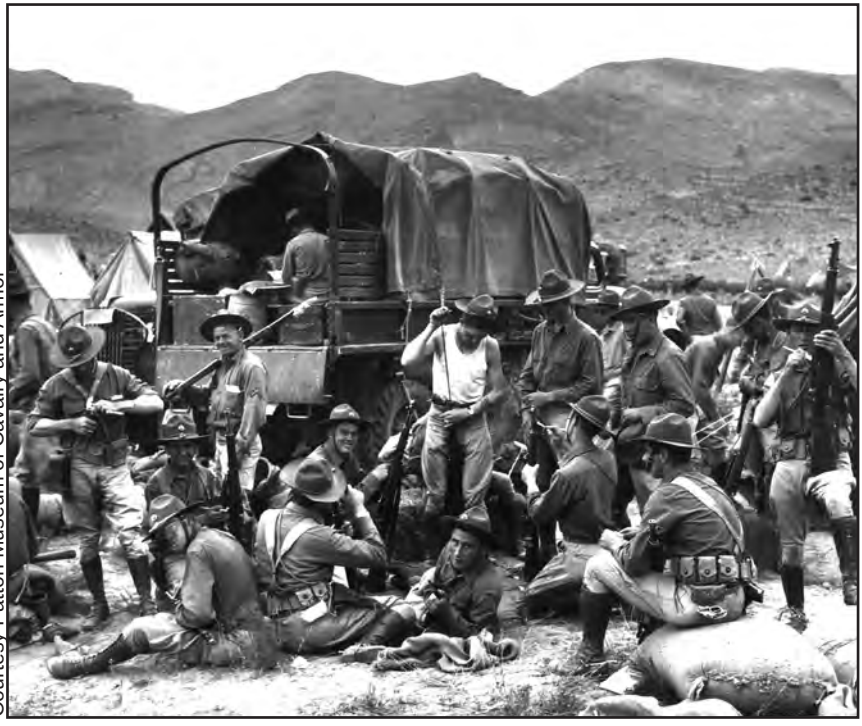
Typical reconnaissance operations included zone, route, and locality. Zone reconnaissance occurred when enemy dispositions remained unknown or covered a broad frontage. Route reconnaissance focused on a particular axis of advance, while locality operations addressed a particular geographic area or terrain feature. To perform these operations and provide information in a timely manner to the parent formation, reconnaissance assets were expected to operate anywhere from *1 hour* to *2 days* in advance of the main body. This large time differential reflected the variety of mounts found in 1941 cavalry organizations and the need for reconnaissance to precede other operations.[4]

The manual considered zone reconnaissance to be the most frequent type of reconnaissance activity performed, and it provided detailed guidance on its conduct. It identified sustained rates of operation that ranged from 4 miles per hour for horse cavalry to 15 miles per hour for mechanized cavalry, subject to terrain and road conditions. Units receiving a zone mission subdivided geographic responsibility among subordinate detachments, coordinating their actions through time-oriented phase lines. Once the patrols identified a hostile presence, it became the subject of a more detailed locality, or area, reconnaissance. Where possible, mechanized cavalry performed the zone reconnaissance and slower moving but less terrain sensitive horse cavalry reconnoitered those specific localities occupied by the enemy.[5]

Detachments constituted the principal instrument of reconnaissance. Such elements corresponded to the reconnaissance patrols described in earlier manuals. The detachment's main duty was to ". . . push forward

in search of information in accordance with assigned missions. It must overcome or avoid hostile resistance encountered in order to obtain the information required."[6] Clearly, detachments were expected to fight as necessary to gain the requisite information. Stealth remained the preferred method of operation, but ". . . it is frequently necessary for a detachment to engage in combat when its patrols are unable to penetrate the hostile screen. When combat becomes necessary, the detachment commander should employ his maximum combat strength at the time and place and under such conditions as appear most advantageous to accomplish the mission." Similarly, counterreconnaissance missions included an implicit requirement for combat.[7]

In addition to FM 2-15, detailed guidance for vehicular reconnaissance emerged with an updated FM 2-10, *Mechanized Elements*. This manual addressed horse, motorcycle, horse-mechanized, and mechanized units. Mounted scouting from a vehicle retained the same principles that governed horse patrols. Scouts utilized cover and concealment, moved by bounds, and focused on information gathering. They were expected to conduct much of their work dismounted, because moving vehicles were



Courtesy Patton Museum of Cavalry and Armor

Figure 21. Horse cavalry during pause in maneuver operations.

considered easier to spot than horses. Similarly, the difficulty of hearing and observing from a moving vehicle encouraged dismounted operations.[8]

The principal means of conducting reconnaissance remained the scout car platoon. In the triangular infantry division, the cavalry reconnaissance troop included a headquarters and three identical scout car platoons. Each platoon possessed 4 scout cars, 4 motorcycles, and 20 men divided into 2 sections of 2 scouts and 2 motorcycles. The platoon normally operated together, but it could maneuver by section. Its principal function remained reconnaissance, but secondary missions suited to its firepower and mobility included security, delay, harassment, and counterreconnaissance. Use of the platoon for radio relay and command support ceased to be acceptable alternative roles.[9]

The new manual retained the doctrinal preference for stealthy reconnaissance, but it left the decision to enter combat with the platoon or section commander.

> Combat is at times necessary in the accomplishment of scout car missions. The platoon leader and the leaders of sections and individual cars must decide when combat is necessary. Scout car elements must never lose their freedom of maneuver by becoming too closely engaged. Leaders must be guided by the rule that the cars are intended primarily for reconnaissance purposes, not combat, and that generally the best reconnaissance is performed by stealth. Scout cars, however, possess characteristics which make them a valuable agency for carrying out missions involving combat.[10]

In essence, the scout car platoon leader needed to understand his mission and intent. Through training and experience, he would develop the judgment necessary to determine whether to engage or avoid the enemy. The platoon leader needed to learn caution and restraint to conduct reconnaissance, but he required aggressiveness and decisiveness to execute security and counterreconnaissance missions successfully. Clearly, platoon leadership required the mental mobility stressed by the Cavalry throughout the interwar period.

This quality proved especially important in the horse-mechanized regiments intended for corps reconnaissance. These units tried to capitalize on the best traits of horse and mechanized cavalry. Intended to range up to 150 miles in advance of their parent corps, these regiments gathered information on enemy dispositions and coordinated their activities with division reconnaissance units operating closer to their parent formations.

The importance attached to these units led to a desire to avoid their loss in combat. Therefore, emerging doctrine for their employment in reconnaissance operations encouraged the avoidance of combat except for self-preservation. In this development lay the foundation for subsequent wartime organizations and doctrine that considered reconnaissance and combat separate rather than integral functions.[11]

The Armored Force focused its energies on the organization and training of new armored divisions. These formations included an armored reconnaissance battalion. In November 1940, this unit constituted a combined arms team that included a headquarters, two reconnaissance companies, an armored infantry company, and a light tank company. Its vehicle complement totaled 13 light tanks, 48 scout cars, and 23 halftracks. This robust organization reflected similar organizations in German armored formations, particularly its inclusion of armored infantry to hold key objectives.[12] The armored reconnaissance battalion's role lay in the execution of distant and close reconnaissance missions that stemmed directly from the division commander's intent.[13]

The armored division also included a reconnaissance company in its light armored regiment. Manned by 7 officers and 160 men, the company possessed a headquarters, three reconnaissance platoons, and a motorcycle platoon. Each reconnaissance platoon carried 1 officer and 25 men in four halftracks. These vehicles lacked the road mobility of scout cars and did not possess the cross-country mobility of a fully tracked vehicle. Nor did their light armor and open top constitute improved protection for passengers. However, the halftracks were intended as an interim measure pending the fielding of a suitable replacement to the scout car. Halftrack use reflected the challenge of mobilizing and equipping a mass army while the associated materiel remained in development.[14]

Armored reconnaissance doctrine retained the interwar preference for stealth. Furthermore, training and field exercises added new dimensions to the nature of reconnaissance. Armored leaders placed a premium on their reconnaissance assets and concluded that the enemy would do the same. Once discovered, he would attempt their destruction to keep their information gathering and transmission ability from enemy hands. This realization reinforced the importance of stealthy operations to avoid detection, but careful, deliberate reconnaissance required time. When conditions forced an acceleration of scouting activities, combat was more likely to occur. This conclusion, reinforced by the interwar experience of mechanized cavalry, provided a justification for ensuring reconnaissance units possessed armor protection and some degree of combat power.[15]

While the armored division and regiment possessed organic reconnaissance capabilities, the separate tank battalions did not. These units were intended to provide armor support to infantry divisions as necessary. They included tanks with a limited maintenance capability. Doctrine assumed these battalions would operate in close proximity to the supported formation. However, maneuvers in the spring of 1941 demonstrated the limitations of these battalions. One armor officer found these units, with their lack of reconnaissance, fire support, and radios, to be:

> . . . nothing more than a herd of elephants, and blind at that! In the Tennessee maneuvers, an attempt was made by the various high commanders to use them as mechanized troops, on mechanized missions, and it simply didn't work. The tanks, lumbering down the road without any reconnaissance in front, would run into one anti-tank gun, and there die on the spot![16]

Courtesy Patton Museum of Cavalry and Armor

Figure 22. Light tank passing horse cavalry during maneuvers in 1941.

When these maneuvers ended, the 2d Armored Division began testing a potential reconnaissance platoon organization for tank and armored infantry battalions at Fort Benning. The emerging platoon served to prevent the parent battalion's blind operation. Test personnel and observers soon

found the same direct correlation between time and reconnaissance effectiveness noted in cavalry doctrine. Thorough reconnaissance of an area required considerable time to complete, especially given the emphasis on dismounted scouting to avoid ambushes in suspect terrain and locations.[17] Guidance from the division commander, Major General George S. Patton Jr., further underscored the importance of dismounted reconnaissance:

> When any of you gets to a place where your experience tells you there is apt to be an anti-tank gun or mine or some other devilish contrivance of the enemy, don't ride up in your scout car or tank like a fat lady going shopping, stop your vehicle, take a walk or crawl and get a look but remember that in walking or crawling you must not go straight up the road, you must go well off to a flank probably as much as one thousand yards.[18]

Changes in the armored division's structure further encouraged the development of a battalion reconnaissance element. Throughout 1941, the armored division composition underwent continuous change, generally increasing the formation's vehicles and personnel. The armored brigade began to transition to a greater proportion of medium to light tanks, and all tank units were to include organic reconnaissance and support components. These measures made armor battalions more tactically self-sufficient, but it required time to develop doctrine for and train battalion reconnaissance platoons.[19]

1941 GHQ Maneuvers

The largest peacetime maneuvers in US Army history occurred in 1941. These maneuvers, controlled by the General Headquarters (GHQ), involved several hundred thousand soldiers conducting operations in different states to test Army combat readiness. Those held in Louisiana and the Carolinas provided opportunities to evaluate the new armored formations, assess the relevance of horse cavalry, and determine the viability of the tank destroyer concept.[20]

They also provided an opportunity to review the state of mounted ground reconnaissance. Several different reconnaissance organizations participated, including the horse-mechanized cavalry regiment, the armored division reconnaissance battalion, the armored regiment reconnaissance company, and the new battalion reconnaissance platoon. More traditional horse cavalry organizations also participated together with their scout cars. The maneuvers provided the first chance to observe the operations of these units during realistic field army operations.

For the Armored Force in general, the GHQ maneuvers highlighted significant deficiencies in training and leadership. The rapid creation and expansion of armored formations resulted in leaders at all command echelons still trying to master their responsibilities amidst simulated combat operations resulting in a number of tactical errors. Senior leaders possessed little experience and understanding of the correct methods of employing armored divisions. Consequently, participating armored divisions and tank battalions suffered a number of reverses and proved unable to replicate on simulated battlefields the real war successes of German panzer formations.[21]

Insufficient training and inexperience accounted for many of the difficulties experienced by armored units, but faulty reconnaissance also played a role. Armored reconnaissance units did not aggressively seek enemy weak points and did not effectively integrate their operations with attached observation aircraft. They remained excessively road bound and failed to perform route reconnaissance or seek alternate paths of advance around obstacles. Armored columns, therefore, remained unaware of nearby enemy units, blundered into obstacles and ambushes, and suffered unnecessary casualties and delays.[22] During operations in Louisiana, for example, the inability to find a viable off-road route into hostile positions resulted in the 69th Armored Regiment becoming dispersed and lost amid the swamps and dense woods of the Kisatchie National Forest. Its vehicles became mired, dispersed, and fell victim to marauding antitank teams.[23]

The maneuver experience clearly demonstrated that armored reconnaissance principles and units remained in a learning phase. Tactical failures attributable to reconnaissance proved common. In some instances, the eagerness of commanders to attack without any reconnaissance resulted in avoidable losses. Frontal assaults by tanks against entrenched antitank guns and mad dashes into narrow town streets underscored the importance of maneuver units and reconnaissance working together toward common objectives. Too often, this type of coordination did not occur.[24]

Cavalry organizations used the maneuvers to demonstrate their continued battlefield relevancy and the effectiveness of changes in equipment, organization, and doctrine. Horse cavalry generally performed well in both the Louisiana and Carolina phases. They exploited their cross-country mobility to advantage, unlike many vehicular organizations that remained road bound. Unfortunately, some horse cavalry reconnaissance proved equally as deficient as armored units, sometimes neglecting security missions. Scout car platoons often sought to emulate tanks and charge hostile positions, rather than reporting and bypassing opposition. In violation of doctrinal principles, scouts became embroiled in engagements

that resulted in heavy losses and ended the parent unit's ability to see and understand the battlefield.[25]

The horse-mechanized cavalry regiments faired poorly during the maneuvers. These units lacked sufficient forage and radio equipment, mandating the use of relay stations. Rapid strategic movement of the horses depended on specially designed trucks, but few of these had been delivered. Those available proved difficult to handle even on roads. General equipment shortfalls hampered operations, but the intervention of senior leaders made it impossible to assess the effectiveness of the horse-mechanized mix. At the start of the maneuvers, these regiments were split and the horse and mechanized components employed separately. This action nullified the entire purpose of the mixed regiments, whose subsequent development was halted.[26]

Ineffective reconnaissance during the maneuvers reflected the state of flux surrounding their materiel, doctrine, personnel, and leadership. Similar problems characterized the Army as a whole as it struggled with large-scale expansion and new equipment fielding. The maneuver experience underscored the direct relation between successful reconnaissance and mission success—although too often through negative examples. The extended period of field operations identified deficiencies and guided subsequent training efforts. Mounted reconnaissance benefited from this experience, but remedial measures required time to effect.

The maneuvers marked the apex of Army interest in the motorcycle as a reconnaissance platform. Cavalry interest in motorcycles emerged in the 1930s, inspired by reports of their use by European armies.[27] The Cavalry incorporated both single and sidecar models into mounted units, including the horse-mechanized regiments. Motorcycle units participated in the maneuvers conducted by the Third Army in 1940 and the GHQ in 1941. However, the cycle types then available proved too fragile for military use and were prone to break down. They could not cope with sand, mud, rough terrain, or poor roads. Use by scouts was further hampered by the cycle's tendency to overheat when idling or moving at low speeds.[28]

In 1941, the jeep (also known as the blitz buggy and peep) began to eclipse the motorcycle as a better utility vehicle with multiple applications, including reconnaissance. Design work began in the 1930s, when the Army began to pursue a small, lightweight, four-wheel-drive vehicle. In 1940, successful field tests led to the jeep's initial production. With its fold-down windshield, 3-foot height, powerful engine, and rugged frame, this new vehicle quickly gained popularity throughout the Army. In 1941, it entered production and began to equip units in the field.[29]

Courtesy *Armor Magazine*

Figure 23. Horse cavalry advancing during the 1941 GHQ maneuvers.

The jeep performed roles similar to those of the motorcycle, but it required far less maintenance, carried a radio, and attained sustained speeds of 60 miles per hour. It handled rough terrain better than the frail cycles, and competent drivers could be trained in a much shorter time than it took to produce skilled cyclists. These factors resulted in the gradual elimination of motorcycles from tactical roles after the GHQ maneuvers, but motorcycle units would remain in reconnaissance units throughout much of 1942.[30]

Cavalry experimentation with the jeep led to its adoption in the horse-mechanized regiments and division cavalry units. The 1st Cavalry Division's reconnaissance squadron, which participated in the maneuvers, included a headquarters, two scout troops mounted on scout cars and motorcycles, a rifle troop mounted on jeeps, and a light tank company. For reconnaissance operations, jeeps preceded the movement of scout cars, providing the latter early warning of enemy forces, obstacles, and terrain. The jeep's very low silhouette and mobility seemed ideally suited to scouting in which the ability to remain unseen was considered a key quality. The jeep's lack of protection for the crew further encouraged stealth to ensure survivability. As it became more commonplace, the jeep's particular characteristics began to influence the nature of reconnaissance, encouraging stealth at the expense of combat. Whereas scout cars offered reconnaissance patrol leaders the option of combat and some chance of survival in an ambush situation, the jeep did not.[31]

Reconnaissance in Transition, 1942

Large-scale expansion of the Army continued in the months following the GHQ maneuvers. In 1942 alone, the Armored Force grew from 3 to 12 divisions. Reconnaissance organizations experienced a similar growth. Expansion generated new challenges for training and equipment fielding. It also led to a reorganization of Army leadership to facilitate management of a global war effort. In March 1942, the creation of the Army Ground Forces (AGF) centralized responsibility for training, doctrine, materiel development, and organization. It replaced the GHQ and triggered the abolition of the branch chiefs save the chief of the Armored Force.[32]

Leadership of the AGF fell to Lieutenant General Lesley J. McNair, who had commanded GHQ. During his tenure as AGF commander, his views exerted a dominant influence on tactical organizations and doctrine. McNair believed formations should include only those assets they required for routine operations. He undertook to streamline divisions by removing components he considered excess. By culling division designs, McNair sought to increase their tooth-to-tail ratio. The smaller formations that resulted required less shipping space for overseas transport, while those elements considered excess became pooled in a central reserve. They could then be assigned as needed to other combat organizations for select missions, thereby maximizing their employment and providing a boost in combat power where required. Pooling appeared to promote both efficiency and effectiveness.[33]

A strong proponent of mechanization, McNair opposed the cavalry's continued reliance on horses. At his direction, all Regular Army separate cavalry regiments and the horse-mechanized regiments began to convert to mechanized cavalry organizations. The 1st Cavalry Division became an infantry formation in all but name, abandoning its horse cavalry heritage. The elimination of National Guard cavalry organizations before they could be federalized marked the end of horse cavalry.[34]

In September 1942, the Army approved McNair's recommendation to convert all nondivision regiments into battalions. Those cavalry regiments already undergoing mechanization transitioned into smaller mechanized cavalry squadrons to be pooled for possible attachment to corps and army formations in place of the horse-mechanized cavalry regiments.[35] At the division level, McNair disagreed with the need for a special organic reconnaissance unit and had once unsuccessfully fought to prevent its inclusion in the triangular division. By 1942, this formation possessed a mechanized cavalry troop. McNair did not remove it, but he did reduce its strength by one-fourth from 201 to 153 soldiers.[36]

Despite these actions, the Army retained a tiered reconnaissance structure that included a reconnaissance unit at every echelon from army and corps formations down to tank and armored infantry battalions. Equipment for these organizations remained problematic throughout 1942. Pending the arrival of new materiel, units made do with whatever was available. In the armored division, reconnaissance companies assigned at the division and regiment levels proved entirely different in composition. While the armored reconnaissance battalion included companies built around a mix of motorcycles and scout cars, the reconnaissance company of the armored regiment relied on motorcycles and halftracks..[37]

The motley collection of platforms had a detrimental impact on training. Early doctrine made little distinction among them and did not provide specific guidance for the employment of each one. Nor was the distinction between reconnaissance and scout platoons a clear one. Presumably, cyclist scouts were vulnerable and dependent on stealth in their operations more than the heavily armored scout cars and halftracks, but the implications of this difference remained unclear. In most cases, unit commanders were responsible for the application of doctrinal principles resulting in a lack of uniformity in training.

Doctrinal and organizational clarity began to emerge in May 1942 with the publication of FM 17-20, *Employment of Armored Units, Reconnaissance Platoon and Company*. The armored regiment and armored reconnaissance battalion now included the same reconnaissance company structure. It included a company headquarters and three identical reconnaissance platoons. The platoons constituted a combined arms team with two armored car sections, one scout section, one assault gun section, and a maintenance team.[38] At the time of the manual's publication, the armored car remained in development and its specifications could only be generalized. In the four-jeep scout section, two carried 60-mm mortars and two carried radios. The assault gun section included two halftracks, one mounting a 75-mm gun while the other carried ammunition. Each reconnaissance platoon was to be further supported by the attachment of a maintenance team from the company headquarters.[39]

The 1942 reconnaissance company was a powerful, self-sufficient organization. It reflected the preference for aggressive reconnaissance first manifest in the 7th Cavalry Brigade (Mechanized) and later embraced by the Armored Force. Within the company, "The armored reconnaissance platoon is a small tactical team consisting of mounted scouts capable of rapid and effective dismounted action, armored reconnaissance cars combining firepower, mobility, and all-around protection, supported by

an assault gun section."[40] The scouts exploited the jeep's low silhouette and quietness to provide a stealthy reconnaissance capability for the company. To offset their lack of protection, they relied on the firepower of the armored cars and the indirect fires of the assault gun.[41]

Overall, the reconnaissance platoon offered greater combat power than earlier configurations, but it remained weak in antitank measures. Plans for the armored cars included a 37-mm main armament.[42] Although a similar weapon equipped most tanks in the armored division, on battlefields abroad it was proving increasingly ineffective against armored targets. It remained to be seen whether this deficiency would adversely affect American reconnaissance units when they operated in the presence of German armored and mechanized formations.

Armored car development accelerated in 1940–41 as part of the Army's preparation for war. Light, medium, and heavy car designs were pursued, differing principally in the degree of armor protection carried. Other related projects included the development of a trackless tank and the development of still another armored car to meet British requirements. The variety of emerging designs included four-wheel and six-wheel versions and different levels of technological sophistication. They also reflected, to some degree, combat insights derived from the British and a desire to match the characteristics of German armored cars. However, the multiplicity of emerging designs lacked a uniformity of purpose and technical specifications. In 1942, General McNair ended this confusion through the establishment of a special board to review the various designs and select one for production and fielding. The board sought a cheap, light, and reliable platform for reconnaissance, settling on a Ford Motor Company design that became standardized as the M8 Light Armored Car. This decision overruled the preference of the Armored Force for a more robust, heavy car with a greater combat capability.[43]

Regardless of the armored car selected, the combat capability of the reconnaissance company suited its aggressive employment. According to FM 17-20:

> The principal mission of all reconnaissance agencies is to *obtain information* required by higher authority *and get it to the interested party in time* to be useful. While it is highly desirable to obtain information without being detected, time is the important factor. The reconnaissance platoon and company must therefore be prepared at all times to act both intelligently and aggressively.[44]

The manual's authors fully expected such action to include combat, observing that "while information should be gathered without fighting, it is repeated that this is seldom possible and the reconnaissance platoon must be prepared to attack vigorously to accomplish its mission."[45]

Reconnaissance operations faced a paradox. A clear preference existed for the undetected acquisition of information coupled with the realization that the time to do so would probably not be available. Therefore, the reconnaissance unit would have to move rapidly, increasing the likelihood of detection and/or combat. A direct correlation existed between the time available for reconnaissance and the quality of information obtained: "Unless adequate time is allowed reconnaissance agencies, information cannot be gathered in great detail."[46]

Emerging doctrinal guidance for reconnaissance built on concepts developed in the interwar years. Zone, area, and route constituted the principal types of reconnaissance. In zone and route operations, the platoon moved via main roads unless forced to maneuver cross-country by the presence of hostile screening elements. The platoon leader accompanied one armored section and the assault gun element on the main route of advance. The scouts and other armored car section advanced along parallel routes. The platoon leader could realistically expect to cover two main routes, corresponding to each of his scout squads. He coordinated his platoon activities via radio to ensure the rapid transmission of information, and employed dismounted patrols to reconnoiter in the presence of strong hostile forces.[47]

Courtesy *Armor Magazine*

Figure 24. Carrier vehicles to provide horse cavalry strategic mobility.

Reconnaissance constituted the principal mission of the company and platoon, but doctrine anticipated potential employment in a variety of other missions. These included counterreconnaissance, security, attack, pursuit, defense, delay, withdrawal, and special operations (e.g., the rapid seizure of key objectives).[48] Such missions carried a strong association with combat. Indeed, in their execution information gathering assumed a subordinate role to engaging enemy forces. However, as with earlier guidance, the determination as to when and whether to engage in combat remained with the platoon or section leader. It was a judgment call that would depend on training and experience.

By mid-1942, reconnaissance training had improved considerably since the first days of the Armored Force. The emergence of clear principles facilitated the training of reconnaissance personnel within the armored division and other mounted units. Clarification of concept tended to increase the degree of specialization. Basic skills included those required of all soldiers coupled with radio operation, map reading, aerial photograph interpretation, dismounted patrolling, navigation, armored vehicle identification, and the handling of prisoners. Scouts also learned the techniques of observation, reporting, and reading signs and tracks—very much a cavalry legacy. Uniform guidance improved unit training, providing graduated exercises and clear objectives for individual instruction through company operations. In FM 17-20, unit commanders received a detailed outline to help structure training activities, an invaluable asset for newly established reconnaissance organizations.[49]

Tank battalion reconnaissance platoons differed fundamentally from the platoons of the armored reconnaissance companies. The former included a halftrack, 4 jeeps, 2 motorcycles, and 26 men. The motorcycles acted as messengers rather than scouts, and the halftrack served as the platoon's headquarters platform, carrying the platoon leader and platoon sergeant. It provided the principal radio link to the battalion command net. This platoon structure served both the separate tank battalions and those of the armored divisions.[50]

FM 17-33, *The Armored Battalion,* was the principal source of doctrinal guidance for the tank battalion reconnaissance platoon. The platoon operated in close proximity to the parent battalion, providing reconnaissance and security within its means. It reconnoitered in advance of the battalion, participated in advance guard operations, and helped determine assembly area and rallying point locations. During combat operations, the reconnaissance platoon trailed the reserve tank company, maintained contact with adjacent units, or provided a flank screen. Ill equipped for combat operations, the platoon was expected to remain clear of engagements.[51]

Reconnaissance platoon activities necessarily focused on information gathering and observation. It lacked the combat power to either fight to secure intelligence or counter all but the lightest of enemy patrols. When the battalion advanced, the reconnaissance platoon preceded it with both sections on line and dispersed to cover the greatest frontage. The platoon leader and halftrack followed, moving along the main route of advance. The platoon's role lay in reporting all signs of enemy activity. When the parent battalion moved as a part of a larger force, the reconnaissance platoon provided flank security by moving parallel to the battalion, its sections advancing from one observation point to another. In defensive operations, the platoon conducted terrain analysis, assisted the movement of tanks to counterattack locations, maintained patrols between battle positions, or constituted part of the reserve. When the battalion engaged enemy forces, the reconnaissance platoon monitored the battle's progress.[52]

In all of these actions, the platoon was expected to perform its mission without recourse to combat. It patrolled, observed, and relied on stealth to avoid detection. In the presence of hostile forces, FM 17-33 encouraged soldiers to operate dismounted, while battalion commanders were cautioned to "not use the reconnaissance platoon as a point." Such guidance reflected the jeep's vulnerability and the limited combat power of the platoon. Instead, other battalion assets were to conduct those reconnaissance

Courtesy *Armor Magazine*

Figure 25. The M8 Howitzer Motor Carriage, which provided fire support for the mechanized cavalry.

and security actions likely to result in combat. Light tanks, for example, were to "feel out weak points in enemy resistance." They screened the battalion's advance when encounters with hostile forces might occur and routinely worked with the reconnaissance platoon in the performance of flank and rear guard missions.[53]

Aside from published doctrine, analysis of foreign combat experiences provided insights regarding the actual use of reconnaissance on the battlefield. In 1942, Major General Charles L. Scott served as an observer with the British Eighth Army in North Africa before assuming command of the Armored Force Replacement Training Center. He played a leading role in the development of the interwar mechanized cavalry and similarly helped to guide the Armored Force. Scott, an outspoken advocate of armed and armored reconnaissance, considered his views vindicated by the nature of operations in North Africa. There, the nonlinear nature of the battlefield underscored the importance of security operations by organizations possessing combat power. According to Scott, "This protection cannot be afforded by observation alone, but only by elements possessing some 'punch.'"[54]

He denounced as unrealistic reconnaissance concepts based on avoidance of combat. The prevalence of motorized and mechanized assets effectively eliminated the mobility differential between reconnaissance units and combat organizations. Against an opponent who employed combat and security units with similar mobility to friendly reconnaissance, the ability of the latter to conduct undetected observation and evade contact diminished. He concluded:

> *Weak* reconnaissance can get nowhere on its mission against this much stronger opposition. On the other hand, on many occasions it will be overrun and destroyed before it can obtain any information of value. Also, on occasions in the desert, it was not even possible for weak reconnaissance to *pause* long enough to send in valuable information that had been collected, and it was not unusual to see light, long distance reconnaissance piling pell mell back on the main body just ahead of a strong surprise attack. In this day and age, long distance reconnaissance must be organized to *fight in execution of its mission*, to *fight for time to send information in*, and to *fight for time for the main body to properly utilize the information sent in*.[55]

Through his observation of reconnaissance operations by German and British forces, Scott noted a pattern of transition that underscored the

importance of multicapable reconnaissance units. Initially, reconnaissance ranged ahead of friendly forces, seeking to find the enemy. Speed and observation constituted the most important qualities during this phase. Once contact was achieved with the enemy, the reconnaissance unit needed to continue tracking the hostile presence while friendly combat forces advanced to engage them. The reconnaissance unit then shifted to a flank security role while observing the flow of battle. Without sufficient combat power, reconnaissance organizations could neither sustain contact nor provide effective security. Scott reasoned, "A long distance reconnaissance unit, organized only to observe, is not worth its salt, let alone the road space it consumes." The armored division reconnaissance battalion appeared to possess the range of qualities he considered essential for successful operations on a fluid, nonlinear battlefield.[56]

Scott's views, influential as they were within the Armored Force community, were not the only ones to shape mounted reconnaissance. A collection of ideas and concepts that reflected maneuver experiences, foreign developments, training needs, and materiel coalesced to provide a doctrinal foundation. By the close of 1942, mounted reconnaissance became characterized by an emerging clarity of doctrine, tactical principles, and organization. Within the tank battalions, the reconnaissance platoons served largely as information gathering organizations. At regiment and division levels, however, the armored reconnaissance companies constituted more robust organizations capable of fighting for information. Related doctrine acknowledged the likelihood of combat occurring during reconnaissance missions and offered guidance for the junior leaders who had to make the decision whether or not to engage. Above the division mounted reconnaissance remained a work in progress. The mechanization of horse cavalry units provided a pool of reconnaissance assets, but the precise manner of their organization and assignment remained unclear.

Combat Operations in North Africa and Italy

The first application of the reconnaissance principles developed since the interwar years occurred in North Africa. In November 1942, American forces constituted a large percentage of the Allied forces that invaded the Vichy French colonies of Morocco, Algeria, and Tunisia. Subsequent operations pitted them against veteran German and Italian formations fighting to maintain an Axis presence in North Africa. The campaign ended in May 1943 with the surrender of the surviving German and Italian forces in Tunisia, but not without significant combat operations that revealed the strengths and weaknesses of American reconnaissance.

The 81st Armored Reconnaissance Battalion of the 1st Armored Division and the separate 91st Cavalry Reconnaissance Squadron played prominent roles throughout the campaign. These units represented mobile, general-purpose organizations, capable of a variety of missions. This versatility served them well in North Africa. The 81st Armored Reconnaissance Battalion secured key objectives, conducted raids, performed advance guard operations, collected information on terrain conditions and enemy forces, established and maintained observation posts (OPs), and operated mounted patrols. It also performed security and economy of force missions. Often dispersed over great distances, the subordinate companies did not always possess adequate self-sufficiency or combat power. Engagements with enemy forces, including German armor, proved frequent. During the fighting at Kasserine, the battalion lost an entire company while conducting delaying actions against German combined arms teams.[57]

The 91st Cavalry Reconnaissance Squadron also performed a variety of actions. It sustained contact between divisions and spent several weeks in a static role, defending a section of the front line. It operated as a dismounted organization, participating in several attacks on foot supported by weapons removed from their vehicles. Like the 81st Battalion, the reconnaissance squadron had to struggle to overcome German combined arms counterreconnaissance teams, since neither organization possessed a particularly strong antitank capability.[58]

The 81st Armored Reconnaissance Battalion and the 91st Cavalry Reconnaissance Squadron constituted the largest reconnaissance units employed in North Africa. Their operations, therefore, dominated subsequent analysis, but several cavalry reconnaissance troops also participated in the campaign, serving with infantry divisions. Like the larger reconnaissance organizations, these troops often performed a variety of activities other than information collection. They, too, experienced difficulties in encounters with German combat reconnaissance teams that possessed greater firepower. Therefore, the cavalry reconnaissance troops often relied on augmentation from division assets, including attached tank destroyers. Nevertheless, the troops proved too small. They could not sustain continuous operations or concentrate sufficient combat power to fight for information. Unlike larger organizations, they could not rotate their subordinate reconnaissance elements to prevent excessive wear and fatigue.[59]

Opinions concerning the effectiveness of the battalion reconnaissance platoons proved mixed. Light tanks often performed those functions likely to result in combat, while the lighter jeeps observed their action. The commander of the 1st Battalion, 1st Armored Regiment employed his jeep

Courtesy Patton Museum of Cavalry and Armor

Figure 26. The Tunisian battlefield.

scouts only when he felt confident they would not encounter hostile antitank weapons. The jeep scouts observed activities and ground conditions, reporting directly to the battalion commander. However, their limited armament and lack of armor protection minimized their employment. In the words of the battalion commander, "I need Rcn [reconnaissance] and did not have it and was seriously hampered. I had to use my light tanks for reconnaissance."[60]

In the 2d Battalion, 13th Armored Regiment, the reconnaissance platoon remained close to the main battalion column. Forward of it roved a platoon from the regiment's reconnaissance company. This leading platoon performed distant scouting for the battalion. However, even this layered reconnaissance could not offset the limited protection and firepower of the vehicles used: "Whenever they ran into heavy stuff they had to turn and come back and could then secure no information." They proved more effective when they could establish observation points and report on enemy activity undetected.[61]

Analysis of reconnaissance operations by 1st and 2d Armored Division personnel stressed the importance of maintaining contact with the enemy once established. At Kasserine, reconnaissance patrols lacked aggressiveness and failed to maintain contact with the German forces.[62] In some instances, jeep scouts found the enemy, but lost contact while maneuvering to protect themselves. These occurrences led to the following conclusion: "It is seldom that the desired information can be obtained without fighting for it." Proposed changes to the organization of the armored reconnaissance battalions focused on increasing combat power and ensuring the availability of the right type of weapons. In particular, heavier support

weapons were recommended, capable of firing a heavier high-explosive round, and the provision of the light tank company with 75-mm guns.[63]

The jeep-equipped scout sections possessed minimal protection and combat power. They often received augmentation from battalion and squadron commanders to boost their survivability and provide them some degree of firepower. Light tanks, assault guns, armored cars, and mortars proved common attachments, but uniform principles did not govern such reinforcement. The type and quantity of attachment varied from unit to unit. Ironically, enhanced scout units often departed from stealthy reconnaissance techniques, instead employing the same fire and maneuver concepts common throughout the Army. Support units fired on the objective to suppress the enemy or force him to reveal his position while maneuver elements moved on to the objective.[64] Such practices reflected the frustration encountered by scouts who understood too well that "if reconnaissance units do not overcome enemy reconnaissance units or small forward positions, the advance will be held up. Reconnaissance units have no difficulty in determining when they have reached an obstacle beyond their capabilities."[65]

These observations underscored the importance of configuring reconnaissance units with sufficient combat power to fight for information and to overcome German security and counterreconnaissance measures. However, battlefield experience also confirmed the value of undetected information collection. Lieutenant Colonel Charles J. Hoy commanded the 81st Armored Reconnaissance Battalion. He found the insertion of small teams into an enemy-held area to be the most effective means of securing information. In his view,

> The best jobs that we have done have been where lieutenants with a small crew, through cunning and daring, get an OP deep in the enemy territory, or on his flank, and sit there for hours and report vital information. We used to say about such things, "OK for maneuvers, but not in war." This is not so. As an example, I had a lieutenant and three men go up on an OP about 4-5000 yards in enemy territory, stay there for two days with a radio set dismounted from a peep, and send back the information necessary.[66]

In fact, much of the information gathering done by Hoy's battalion occurred through dismounted patrols and extensive use of OPs established by stealth. When reconnaissance platoons moving by bounds encountered the enemy and began taking fire, the scouts dismounted and sought cover.

The platoon leader scanned the terrain to locate a good location for an observation point. He assembled a small team, removed a radio from one of the vehicles, and dispatched the team on foot to the observation point.[67]

Despite the frequency of combat experienced by his unit, Hoy feared the accretion of too much combat power in reconnaissance organizations. In his words:

> Beware of that misused word "firepower." Don't tie a reconnaissance unit down with tanks, 81-mm mortars, 37 SP [self-propelled] guns, because it makes the unit too unwieldy, and few officers can take care of all those additions and still do the job of gathering information. Understand me, I am in complete accord with General Scott's statement that "Reconnaissance capable of only observation is not worth the road space it takes." The reconnaissance unit should have sufficient firepower, but too much is as bad as too little. Anyone in a reconnaissance unit who is not primarily a reconnaissance man must be there for a very good reason. If I get the armored car, then I don't want the light tank.[68]

The 91st Cavalry Reconnaissance Squadron commander considered his unit unbalanced. Its personnel strength proved insufficient for the number of vehicles and weapons included in its organization. Command and control problems resulted at the platoon level. The platoon leader struggled to coordinate the reconnaissance work of his scouts while simultaneously managing different types of weapons and vehicles. This difficulty led to the recommendation to add a second officer to each platoon responsible for effectively employing the unit's weapons. Freed from these duties, the platoon leader could concentrate on the action of his scouts.[69]

No amount of organizational change, however, could overcome the inexperience that plagued American reconnaissance efforts in North Africa. Unit commanders too often did not understand the ground on which they fought and received little assistance from their scouts, who similarly struggled to make sense of their environment. Lacking accurate maps, they learned the terrain by moving over it.[70] Maneuver units, dependent on accurate information of both the enemy and the terrain, suffered. In the 1st Armored Regiment, one commander noted, "In tank fighting nothing is more important than expert reconnaissance of your routes of advance and withdrawal. Several times both we and the Germans have moved up on what we thought was a good clear route only to find a dry wash nine or ten feet high blocking our way, causing us to withdraw."[71]

The inability to read the terrain and understand its implications for the movement of armored units endangered combat organizations. During the fighting around Faïd Pass, this lack of awareness resulted in American tanks blindly advancing along a route dominated by German antitank guns that decimated the armored column.[72] Similar failures during the retreat of the 1st Armored Division during the fighting at Kasserine Pass resulted in the loss of nearly 150 vehicles. Poor route reconnaissance resulted in the vehicles becoming mired and abandoned.[73]

Such failures were attributed to training rather than materiel deficiencies. The jeep's vulnerability led to questions about its battlefield utility, but these did not prevent its employment in dangerous environments. During tank engagements near Faïd Pass, "Our reconnaissance suffered less than anything else, yet they were right in the middle of it, but they were in peeps and could skid around."[74] Ironically, the armored halftrack became a more maligned platform than the jeep. Despite its better protection, the halftrack lacked effective cross-country mobility. It routinely threw its tracks, requiring either the vehicle's abandonment or the time-consuming work of replacing the track. Nevertheless, efforts to improve the firepower of battalion reconnaissance platoons included recommendations to mount a 37-mm gun on the organic halftrack as a counter to more heavily armed German patrols.[75]

This proposal became one of many surrounding reconnaissance operations to arise from the North African campaign. However, this combat experience did not result in a single set of reconnaissance principles. Instead, it tended to validate both the armed, aggressive style favored in the Armored Force and the stealthy, observation-oriented method promoted by the Cavalry School. These concepts were not mutually exclusive. Advocates of stealthy reconnaissance acknowledged the need for combat, and armed reconnaissance proponents similarly stressed the value of undetected operations whenever possible.

The Sicilian campaign of July–August 1943 provided additional experience for mounted reconnaissance. The Cavalry School considered the experiences of the 3d Cavalry Reconnaissance Troop, 3d Infantry Division indicative of the correct manner of employing the division troop. Reconnaissance constituted the primary role of this unit. During the initial invasion landings, a dismounted platoon from the troop performed route reconnaissance, flank security, and sought enemy counterattack forces. Once clear of the beaches, the troop moved forward of the division, conducting route reconnaissance. It routinely sought to gain and maintain contact without losing its ability to maneuver through combat. It performed

a deliberate, dismounted reconnaissance of a fortified position, detected and cleared mines, and successfully sought alternate paths around enemy opposition. However, the troop also seized key objectives in advance of the division, including a bridge that had to be cleared of demolitions. It exploited favorable opportunities to ambush enemy columns and provided flank security. When reconnaissance platoons encountered the enemy, they dismounted and observed. They provided information to the division that often led to an infantry assault or artillery strike on the enemy position. The troop concluded the campaign by directing artillery fire on Axis forces withdrawing by boat to the Italian mainland.[76]

The 3d Cavalry Troop's experience in Sicily exemplified the reconnaissance principles embraced by the Cavalry School. Reliance on dismounted patrols, maneuver, and observation constituted the principal forms of securing information. The unit clearly followed the basic dictum of see the enemy first, report the information, develop a plan of action in conjunction with friendly combat elements, and execute the mission. Combat occurred but only under favorable conditions or when no alternative existed. It did not constitute the first or even primary means of securing information. Through close coordination with the parent formation, the cavalry troop relied on division assets to eliminate obstacles.

The success of the 3d Cavalry Troop stemmed at least in part from the disorganized state of Axis defenses in Sicily. On the Italian mainland,

Courtesy Patton Museum of Cavalry and Armor

Figure 27. Reconnaissance column halts for map consultation in North Africa.

the rugged terrain and static nature of the operational environment precluded similar operations. Unable to operate according to doctrine, reconnaissance assets found employment in other roles. Scouts served as infantry in mountainous terrain, light tanks guided pack-mule trains and provided infantry support, whereas assault guns served as mobile artillery. In the 34th Infantry Division, the mechanized reconnaissance troop often entered combat as dismounted foot soldiers. Even during periods of limited advances, the presence of powerful German forces prevented reconnaissance units from forging far in advance of the main body of friendly forces. One reconnaissance troop reported its routine inability to advance more than 500 yards from its parent formation due to determined resistance.[77]

Opportunities to employ mechanized cavalry aggressively and penetrate hostile lines arose only during the pursuit of German forces following the fall of Rome and again during the final collapse of resistance at the war's end. In the former case, the 81st Armored Reconnaissance Battalion advanced as a collection of combined arms teams, each including additional infantry, artillery forward observers, tank destroyers, and at least one engineer officer. Overhead, spotter aircraft acted as aerial scouts. The combat power of these teams was concentrated wherever possible to overcome resistance. In these operations, combat and pursuit took precedence over reconnaissance.[78]

Refining Reconnaissance, 1943–44

In the wake of the North African campaign, the Army force structure continued to change. The period 1943–44 witnessed the culmination of General McNair's efforts to streamline combat organizations and standardize them. The Army adopted a flexible corps design that included only staff and signal elements as organic. All other assets were assigned from theater and army headquarters. The corps became a generic command whose components varied according to mission and available forces.

Similarly, the emergence of the group headquarters provided a controlling influence for those units pooled together for attachment. Tank destroyer and separate tank battalions, for example, could now be attached individually to particular corps and divisions, or they could be consolidated under a group headquarters and employed together. Like the corps, these groups possessed no permanent tactical units. They facilitated the employment of at least two tank or tank destroyer battalions and could accommodate attachments of other unit types.

The conversion of separate cavalry regiments into mechanized cavalry squadrons provided a pool of reconnaissance assets for attachment to

corps and army formations. In this role, the squadrons were subordinated to a cavalry group headquarters, which operated under the direct control of the corps or army commander. The group headquarters facilitated the dispersed operation of at least two cavalry mechanized reconnaissance squadrons. Like the tank and tank destroyer groups, the cavalry groups lacked permanent troop assignments, but they had no limits on the type of units that might be temporarily attached to them. The emergence of the flexible cavalry group marked the final step in the provision of a corps reconnaissance element to replace the now defunct horse-mechanized cavalry regiments. Together with the tank and tank destroyer groups, the cavalry group constituted the means by which pooled assets supported field operations.[79]

The armored division also underwent a major redesign in 1943 to improve organizational flexibility and reduce the tonnage required to deploy it overseas. These changes became evident in the September 1943 table of organization. The division shrank in size from 14,620 soldiers and 390 tanks to 10,936 soldiers and 263 tanks. Aptly described as a "federation of thirteen battalions led by a major general," it consisted of one engineer, one reconnaissance, one maintenance, one medical, three armored, three armored infantry, and three field artillery battalions.[80] The new structure embraced the combat command concept and the desire of armored commanders for self-sufficient battalions. The regiment disappeared, resulting in a chain of command that led from the division headquarters to the combat commands to battalions parceled out among task forces.[81]

The redesign of the armored division resulted in changes to its organic reconnaissance assets. The armored reconnaissance battalion gave way to a larger mechanized cavalry reconnaissance squadron. The elimination of the armored regiment also resulted in the loss of its subordinate reconnaissance company, leaving the division with no inherent reconnaissance capability between the division and the battalion. However, the companies lost were reconfigured into mechanized cavalry reconnaissance troops and became available for other employment, including attachment to a cavalry group. Within the armored infantry and armor battalions, the reconnaissance platoons exchanged their motorcycles for an additional jeep.[82]

The assignment of reconnaissance to divisions was not entirely consistent. The 2d and 3d Armored Divisions, for example, did not convert to the new formation design. They retained their heavier and larger structure, and continued to rely on an armored reconnaissance battalion rather than the mechanized cavalry reconnaissance squadron. Infantry divisions included only a single mechanized cavalry troop. These variations

reflected the different reconnaissance requirements associated with the different formations.

Mechanized cavalry squadron and troop structure underwent two major changes in 1943. Early in the year, a new squadron organization emerged which reflected lessons learned from North Africa. This configuration constituted a midpoint on the path of squadron development between the original concepts in 1942 and the final form adopted at the end of 1943. Although oriented toward cavalry and motorized infantry divisions, this squadron addressed the desire for reconnaissance capable of both fighting for information and stealthy operations. It included a headquarters component, three mechanized reconnaissance troops, and a support troop. Each mechanized troop controlled a small headquarters and three platoons. The strength of the latter totaled 1 officer and 45 soldiers divided between 2 sections—a pioneer and demolition squad and a support squad. Each section included an M8 armored car, four jeeps, and a motorcycle. In the first section, one of the jeeps was an amphibian, capable of crossing small bodies of water without special equipment. In the support squad, two jeeps and a trailer carried an 81-mm mortar, its crew, and ammunition.[83]

These platoons bore the primary responsibility for conducting operations on the battlefield. The motorcycles served less as scouts than as couriers, capable of delivering critical information in person or compensating for radio failure. Jeep-mounted scouts performed much of the actual reconnaissance duties. For firepower, the platoon relied on machineguns mounted on most jeeps, small arms, a mortar, and the armored car's 37-mm gun, which provided a degree of antitank capability. The pioneer and demolition squad offered the means and expertise to conduct limited mine clearance or to obstruct enemy movement during delay operations. Compared to its 1942 predecessor, this platoon exchanged some of its antitank capability for more reconnaissance and an organic ability to cope with mines. However, the asymmetrical mix of vehicles within each reconnaissance section complicated operations by smaller increments.[84]

The troop commander possessed few means with which to reinforce his platoons. The only combat assets in the troop headquarters were two armored cars and two jeeps intended for command group operations. The squadron commander possessed greater flexibility and the means to support subordinate units. At his disposal lay an antitank platoon, a pioneer and demolition platoon, and a support troop. The support troop included three light tank platoons to provide additional firepower as needed or to assume reconnaissance functions in difficult terrain. The antitank platoon comprised a headquarters element and three sections similarly capable of

Courtesy Patton Museum of Cavalry and Armor

Figure 28. Scouts conducting reconnaissance in North Africa, February 1943.

either unified or detached operations under troop control. Each section included one reconnaissance jeep and two M8 armored cars. The pioneer and demolition platoon contained the men and special equipment necessary for mine clearance and obstacle creation.[85]

The integration of pioneer and demolition teams at the squadron and platoon levels reflected lessons from North Africa. There mines interfered with mounted maneuver and posed a particular hazard for reconnaissance units ranging forward of friendly forces. Too often discovery of mines occurred only when a vehicle's passage detonated them. The 81st Cavalry Reconnaissance Squadron turned this accidental discovery into standard practice. Although its platoons carried mine detectors, the pace of operations generally precluded their use. Instead, the unit placed its heavier and presumably more survivable vehicles at the head of patrols and advanced until a mine exploded. Its presence was reported and marked, while a narrow lane was cleared. The survivors then continued their mission.[86]

Such measures reflected the absence of an effective means of rapidly detecting and clearing mines. One means of addressing this was the inclusion of pioneer and demolition teams in the mechanized cavalry squadron. Another lay in making minesweeping a required skill for reconnaissance personnel, paralleling the horse cavalry's prewar emphasis on wire clearance.[87] However, the identification and clearance of mines proved a time-consuming business, much like stealthy operations. Too often reconnaissance personnel, urged to accelerate the pace of their operations, simply did not have this time available.

The doctrinal guidance for the new squadron structure emerged with the March 1943 publication of FM 2-30, *Cavalry Mechanized Reconnaissance Squadron*. This manual identified the squadron's primary mission as the timely acquisition of information to influence decision-making. Secondary functions reflected the robust, self-sufficient nature of

the squadron and included security, counterreconnaissance, attack, pursuit, defense, delay, demolition, withdrawal, and special operations. The last category included actions associated with amphibious landings, river crossings, and operations in jungle and desert terrain. In effect, the squadron provided a broad range of reconnaissance and security operations for its parent formations.[88]

The squadron executed zone, route, and area reconnaissance missions. Often operating forward of the parent division, the squadron employed two troops abreast to reconnoiter along 10 major roadways or a frontage of 35 miles. The third troop constituted the reserve, which together with the light tanks supported the forward reconnaissance elements as required. On occasion, the coverage might be broadened to 50 miles by employing all reconnaissance platoons on line. Coordination across this area emphasized radio communications, supplemented by motorcycle courier, phase lines, and preselected terrain objectives.[89]

During initial advances, the squadron moved quickly and avoided hostile patrols. When hostile resistance prevented further undetected activity, the squadron attacked a weak point, penetrated the opposition, and continued to gather information on enemy forces. When friendly combat elements arrived, the squadron secured their flank or became part of the reserve. Between initial contact and the arrival of friendly forces, the squadron was expected to mount an aggressive reconnaissance effort to collect more detailed information on the enemy. This information guided the maneuver of friendly units, but its acquisition was expected to necessitate combat.[90]

The squadron possessed the means to "engage in offensive combat as an incident in the execution of any mission which it is assigned." Once engaged in battle, the manual expected the support troop to play a central role. The squadron employed the same principles applicable throughout the Army. Reconnaissance platoons provided the base of fire on which the support troop maneuvered. Further details with diagrams and illustrations depicted how various types of combat should be performed, clearly highlighting the writers' anticipation of combat as a regular part of squadron activity.[91]

The reconnaissance troop was identified as the basic component of the squadron. To it lay the primary task of gaining information on hostile activities. However, the unit was not expected to function by observation and stealth alone:

> Because of the rapidity with which its parent organization marches and maneuvers, limitations of time will

> frequently necessitate that the squadron abandon stealth and fight for information. This is called reconnaissance in force. It is imperative that in the tactical training of the reconnaissance troop of the reconnaissance squadron offensive combat, particularly combined offensive action with other reconnaissance troops and with the support troop, be stressed.[92]

The manual encouraged mounted combat. It depicted dismounted engagements as a degradation of the squadron's principal characteristics of mobility and firepower. The slower pace of dismounted operations also did not fit the fast-moving, time-constrained environment likely to surround reconnaissance operations. Therefore,

> The most desirable situation is one wherein the principle of fire and movement can be applied by the rapid transfer of fire power *in vehicles* with one unit supporting by fire the maneuver of another until a position is reached from which hostile opposition can be overcome by coordinated fire or overrun in a short, swift assault.[93]

The organization and concepts depicted in this manual did not remain in effect for long. The reorganization of the armored division in September 1943 coincided with another restructuring of mechanized cavalry reconnaissance. The Army adopted a uniform troop organization that was found in the infantry division, the armored division, and the cavalry reconnaissance groups. The number of troops assigned to each of these organizations constituted their principle difference in reconnaissance capability. The infantry division contained a single troop, while each of the squadrons assigned to the cavalry groups included three. Reflecting the dispersed nature of its operations, the redesigned armored division possessed a squadron with four troops.

The new troop organization included a headquarters element and three reconnaissance platoons. The former possessed administrative, maintenance, and supply components, but no significant assets with which to support the subordinate platoons. An armored car section and a scout section constituted each platoon. The scout section included six jeeps, three of which carried a 60-mm mortar and three mounting machineguns and radios. The section subdivided into three identical squads with a machinegun and a mortar jeep. The armored car section included three M8 armored cars, intended to work with and provide overwatch for each scout squad.[94]

The armored division and cavalry group squadrons shared a similar organization, varying only in the number of subordinate reconnaissance

troops. Both included a headquarters component, an assault gun troop, a light tank company, and either three or four reconnaissance troops. The tank company included 17 light tanks organized into 3 platoons. The assault gun troop comprised four platoons capable of concentrated or decentralized fire support.[95]

Compared to the earlier mechanized cavalry reconnaissance squadron, this new one marked a significant reduction in size. The pioneer and demolition teams found at the squadron and platoon levels disappeared. Similarly, the squadron antitank platoon was eliminated. Reconnaissance troop strength fell from 193 to 145 officers and men with similar reductions at the squadron level. Despite these reductions, the squadron increased its firepower through the addition of the assault gun troop. A similar shift occurred in the reconnaissance platoons. Their size fell from 46 officers and men to 29 and from 15 vehicles to 9. However, the platoon increased its complement of armored cars and mortars. Maintenance eased through the reduction of vehicle types from five to two, and the platoon's ability to break readily into identical teams simplified command and control.[96]

Organizational change triggered a shift in doctrine. Whereas previous manuals highlighted the versatility of mechanized cavalry, new guidance issued in 1944 narrowed the range of activities to information collection. Reconnaissance was separated from other functions and it became the primary purpose of mechanized cavalry. Actions involving combat either disappeared from doctrinal publications or became de-emphasized. The doctrinal debate between advocates of stealthy and aggressive reconnaissance appeared to have been decisively resolved in favor of the former. The 1944 field service regulations governing Army operations defined mechanized cavalry as units "organized, equipped, and trained to perform reconnaissance missions employing infiltration tactics, fire, and maneuver. They engage in combat only to the extent necessary to accomplish the assigned mission."[97] Their principal purpose lay in keeping their parent formations appraised of evolving tactical situations in a timely fashion.[98]

The emphasis on pure reconnaissance found expression in FM 2-20, *Cavalry Reconnaissance Troop Mechanized.*[99] The troop constituted the basic building block of the reorganized mechanized cavalry, and its principles of employment shaped the use of the squadron and group elements. The troop's mission statement reflected its singular purpose:

> The cavalry reconnaissance troop, mechanized, is organized, equipped, and trained to perform reconnaissance missions. Other types of missions are given only in the furtherance of a reconnaissance mission of the troop or

> the squadron of which the troop is a part, unless no other troops are available for other types of operations for the division or larger unit. Reconnaissance missions are performed by employment of infiltration tactics, fire, and maneuver. Combat is engaged in only to the extent necessary to accomplish the assigned mission.[100]

The manual offered only limited guidance for combat operations. The writers acknowledged that circumstances might trigger engagements, but they clearly expected reconnaissance soldiers to avoid combat to the extent possible:

> The troop employs infiltration tactics, fire, and maneuver to accomplish reconnaissance missions. It engages in combat only to the extent necessary to accomplish the assigned mission and to avoid destruction or capture. The troop should be reinforced before departing on a mission when sustained combat or the crossing of obstacles is anticipated. Infantry, field artillery, tanks, tank destroyers, and engineers are suitable attachments.[101]

Within the squadrons, where immediate augmentation was available through assault guns and light tanks, the reconnaissance troop "is prepared to fight for information if necessary."[102]

At the troop level, the platoon constituted the basic reconnaissance unit. The troop commander's job lay in managing the movements of each platoon and coordinating their activities with the parent formation. Often the troop was to move with two platoons abreast actively reconnoitering along a 10-mile-wide front, while one platoon trailed in a reserve capacity. Through rotation of the active and reserve platoons, the troop sustained continuous operations. The platoons functioned as collections of teams that included at least one armored car and one or two jeeps. Each platoon could employ a maximum of three reconnaissance teams. The armored car used its armor and weapons to overwatch the movement of the jeeps. If attacked, the moving vehicles sought cover while the stationary one(s) engaged the enemy. Whenever possible, each team sought to avoid enemy patrols and find unopposed routes.[103]

Security missions focused on force protection measures for the troop and platoon rather than actions intended to support the parent formation. Whereas cavalry doctrine previously expected combat to ensue from security operations, it now focused on the use of cover and concealment to avoid detection and the establishment of effective OPs from which to spot enemy activity. To emphasize the importance of these measures, the

chapters governing security included page after page of illustrations. In contrast, only four pages addressed employment in a guard or covering role.[104]

Combat operations overall received a similar deemphasis in comparison with earlier manuals. Reconnaissance platoons and teams were expected to engage enemy forces, which threatened or obstructed their mission, using fire and maneuver tactics common throughout the Army. However, they were also expected to minimize their time in action, lest the impact on their reconnaissance mission become too great. Defensive combat similarly was described within the context of information gathering activities, such as defense of an OP or key objective seized during the troop's advance. Where previous guidance emphasized the importance of concentrating combat power to overcome resistance, the new manual anticipated combat to occur at the platoon level and not involve the bulk of the troop's assets. The platoon leader's discretion concerning engagement was limited to small hostile patrols and against enemy forces that jeopardized mission success. Otherwise, he reported the situation to the troop leader and awaited instructions.[105]

An updated version of FM 2-30, *Cavalry Reconnaissance Squadron, Mechanized*, appeared in August 1944. It constituted the last significant doctrinal publication issued for mechanized cavalry during the war.

Courtesy Patton Museum of Cavalry and Armor

Figure 29. Mechanized cavalry during the drive to Rome, 1944.

This manual applied concepts from the earlier troop publication to the squadron. It confirmed the squadron's primary role of reconnaissance and included the same caveats for its use in other roles. The manual similarly relegated combat to the performance of reconnaissance missions and self-preservation. It did not preclude fighting for information, to reduce obstacles, or to defend key objectives, but it anticipated that such action would be of short duration and conducted on terms advantageous to the squadron. In the face of hostile resistance, the squadron commander employed his light tank company and assault gun platoons to reinforce subordinate reconnaissance teams. The assault guns were the preferred means of eliminating antitank guns and machineguns.[106]

In the execution of reconnaissance, the squadron typically employed two troops abreast (three for the larger squadrons of the armored divisions) and retained one as a reserve. The two leading troops spanned a breadth of 25 miles wide. While actively reconnoitering, the squadron was expected to sustain a rate of 10 miles per hour in open terrain and favorable conditions. The manual clearly depicted the role of reconnaissance in building command situational awareness starting with the establishment of contact followed by an intensification of activity to determine specific details of the hostile force before transitioning to a reserve status. As hostile counterreconnaissance activity rose, the squadron was expected to move through it by concentrating its attention on a weak point in the enemy screen.[107]

Compared to previous publications, this one offered more guidance for the organization and operation of reconnaissance detachments. It also addressed the coordination of squadron assets with tanks, tank destroyers, and aerial reconnaissance. An entire chapter devoted to logistics acknowledged the difficulties associated with sustaining subordinate troop commands dispersed over a broad area and moving quickly. Security missions focused on the provision of early warning, but they also included guidelines for the employment of squadron assets in a guard role to protect the squadron trains and execute counterreconnaissance. However, these subjects received less coverage than reconnaissance.[108]

Overall, this version of FM 2-30 built on and refined principles previously established. It also limited mechanized cavalry action and provided little guidance for the squadron's operation in the face of aggressive, combined arms opposition. It offered no guidance for the squadron's use in the broader mission set associated with cavalry. At the time of the manual's publication in August 1944, cavalry reconnaissance squadrons had already found themselves performing a variety of activities other than

reconnaissance. In the absence of doctrinal guidance, units improvised their own techniques and procedures.

Training paralleled the doctrinal shift toward a narrower definition of reconnaissance. In early 1943, training emphasized techniques suited to the versatility of mechanized reconnaissance and the incorporation of lessons learned from North Africa. Stealthy operations received attention together with the basic principles of fire and movement, bounding overwatch, and reconnaissance by fire. Personnel joining newly created mechanized reconnaissance units required instruction in their duties and responsibilities. Doctrine addressed this need through careful description of unit command and staff positions coupled with tips on how to perform these responsibilities. The 1943 version of FM 2-30 included guidance for unit training from the individual to the entire squadron. It also outlined the principles governing supply operations for a fast-moving, dispersed reconnaissance unit. To assist new commanders, it relied heavily on illustrations to show what right and wrong looked like.[109]

Performance of the myriad tasks associated with mounted reconnaissance increasingly required specialized training. Commanders were exhorted to apply care in the selection of reconnaissance soldiers, seeking only "men of the proper caliber." Such individuals needed intellect, an understanding of what information to obtain and how to do so, physical stamina, good judgment, and comprehensive knowledge of terrain, maps, military organizations, and weapons. The minimal competencies centered on navigation, map reading, acquiring accurate information, and providing complete reports.[110] This skill set increased with a doctrinal requirement for competency in combat intelligence to ensure effective observation and reporting. The range of objects to be reported also broadened to include a host of terrain and infrastructure-related items that impacted mechanized operations. These trends marked a greater emphasis on technical abilities commensurate with the greater reliance on motor vehicles.[111]

Training support for new commanders emerged in many forms. The most common included articles written by experienced reconnaissance officers. One such piece titled "Vehicular Reconnaissance" appeared in *Cavalry Journal*. Written by a squadron commander, it offered guiding concepts to assist new commanders in operations and unit training. It included readily comprehensible guidelines for the planning, preparation, and execution of reconnaissance operations, including their logistical underpinning. Published in the midst of the North African campaign, it reflected the dual emphasis on stealthy reconnaissance and the need to fight for information on occasion. It highlighted the importance of not

only establishing but maintaining contact with enemy forces, a concept that became axiomatic in all reconnaissance doctrine. Perhaps the most important advice rendered lay in the importance of command flexibility and the ability to adapt to unforeseen circumstances.[112]

Special training publications supplemented this type of article and served a similar purpose. The Cavalry School, for example, issued a series of short pamphlets detailing the operations of mechanized cavalry in North Africa and Sicily. Each one provided a detailed narrative of combat operations, including task organizations, terrain information, and command guidance. A lessons-learned section concluded each narrative. These pamphlets also included references linking particular actions to a specific doctrinal reference. In this manner, they helped to show how doctrine applied to the battlefield.[113]

Literature intended to support training did not reject combat by reconnaissance elements. Reconnaissance units possessed the means necessary to fight for information and perform a variety of missions other than information collection. At times, battle proved the only manner to break through a hostile security screen or develop an otherwise obscure situation.[114] However, combat was not the preferred means of mission accomplishment. Time loss added to the possibility of casualties threatened to undermine a unit's ability to gather perhaps crucial information necessary to guide command decisions. Therefore, reconnaissance units "avoid contact except when necessary for the success of their mission. A reconnaissance unit should not engage in combat with an enemy reconnaissance unit of similar size if its mobility enables it to sidestep the intervening resistance." Observation and reporting constituted the preferred methods of executing reconnaissance.[115] Such actions required that "reconnaissance forces move by stealth; they fight only in self-defense or to get the required information."[116]

By early 1944, the skill set associated with reconnaissance covered a plethora of subjects. Individual soldiers needed to master mounted and dismounted movement techniques in all weather and terrain conditions, weapons, maintenance, radio operations, and basic tactics. Added to this foundation were combat intelligence, reporting procedures, map skills, terrain analysis, and air-ground communications. All reconnaissance personnel were expected to function as forward observers. Their responsibilities further included minefield identification and clearance, handling prisoners of war, road and bridge classification, demolition, and roadblock creation.[117] This diverse skill set mandated a complex and lengthy program of instruction.

An added difficulty arose through the miscommunication of doctrine in training. Although FM 2-20 clearly discouraged combat by reconnaissance units, it nevertheless acknowledged circumstances in which fighting the enemy became unavoidable. This caveat disappeared in unit training activities that stressed stealth and the complete avoidance of combat. The 113th Cavalry Group responded to this emphasis through adoption of the slogan "Sneak, Peek, and Retreat" to reflect its singular focus on reconnaissance without fighting. Field problems were designed to tempt commanders into firefights with hostile forces that led to severe maneuver penalties and a critique critical of the decision to enter combat.[118]

The combination of restrictive doctrine and training measures aligned doctrine, organization, and training. By 1944, mechanized cavalry organizations were following a standard process of combat readiness. Gone were conflicting references to reconnaissance via stealth simultaneous with highlights of unit versatility and combat power. In pure reconnaissance missions and the avoidance of battle, mounted reconnaissance organizations had found their niche. Unfortunately, this emphasis would prove unrealistic on the battlefields of Europe.

European Theater of Operations, 1944–45

The doctrinal and organizational principles embedded in mounted reconnaissance units found full expression in the European theater of operations. Between June 1944 and May 1945, the Army deployed to this theater 13 division cavalry reconnaissance squadrons, 2 armored reconnaissance battalions, and 42 mechanized cavalry reconnaissance troops with infantry divisions. A further 13 cavalry groups served with corps headquarters and 1 squadron remained unattached.[119] This unprecedented massing of mechanized cavalry made the European theater the focus of mounted reconnaissance analysis.

All of these units began operations optimized for reconnaissance missions. However, their actual employment quickly transcended this narrow role, and pure reconnaissance missions proved exceptional.[120] Mechanized cavalry routinely performed a variety of operations in diverse weather and terrain conditions, including wooded, urban, and fortified. The squadrons of the 6th Cavalry Group, for example, conducted river crossings, exploitation, and deep penetration of German lines in conjunction with armored formations; seized key terrain; provided flank security; and pursued enemy forces. An observer visiting the 102d Cavalry Group found the unit in a defensive posture dispersed over an 8-mile frontage, manning a series of strongpoints with dismounted troopers.[121] The 4th Cavalry

Group squadrons also found themselves holding part of the front line after several months of continuous operations that included amphibious assault, dismounted attacks, seizing and holding ground, patrolling, eliminating pockets of German resistance, screening, covering gaps between formations, and reconnaissance and counterreconnaissance. Mechanized cavalry also conducted delaying actions against German armor but incurred considerable losses, exemplified by the 2d Cavalry Group at Arracourt and the 14th Cavalry Group's defense of the Losheim Gap at the start of the Battle of the Bulge.[122]

These experiences demonstrated the fallacy of a doctrinal focus on information collection. It did not match battlefield reality. Colonel Edward M. Fickett, commanding the 6th Cavalry Group, expressed a common sentiment among mechanized cavalry soldiers:

> Efforts and doctrine directed towards making the Cavalry Squadron exclusively a reconnaissance unit, not participating in combat other than as a necessity of extrication from enemy reaction or in the exceptional case of limited engagement by fire to obtain information desired, is faulty. It is evident that there is no occasion, no opportunity, and justification for the maintenance in large commands of such an extremely costly, highly trained organization simply for the purpose of executing "reconnaissance."[123]

Instead, a clamor arose from the field for the redesignation of mechanized units as cavalry rather than reconnaissance. The name change accorded with a related desire to adopt the much broader mission set of the mounted arm and align doctrine, training, and organization with the operational environment. Mechanized cavalry soldiers who had performed extensive dismounted operations also wanted recognition for their efforts in the form of a combat badge similar to that awarded infantry.[124]

In some cases, dissatisfaction with reconnaissance doctrine led unit commanders to take matters into their own hands and implement training that contradicted established doctrine. The 4th Cavalry Group, for example, trained in England on the premise that it would have to fight for information. Combat reconnaissance dominated its activities, complete with battle drills and aggressive maneuver. Once the group deployed to France, these preparations permitted rapid adjustment to actual battlefield conditions. Its commander noted afterward, "We have had to fight to obtain information in practically every case."[125]

Analysis of group operations from the Normandy invasion to Germany's surrender found that security, defense, and special operations

constituted their primary employment. The special category included rear area security, mobile reserve, and support of the information service in the Third Army. Offensive operations ranked fourth in terms of frequency but still proved more common than pure reconnaissance, which accounted for only 3 percent of missions performed.[126]

Most operations entailed combat and the groups were suitably augmented by their parent corps. Typical attachments included a field artillery battalion, a tank destroyer battalion, and an engineer company, although variation occurred among each corps and army.[127] Each of the four cavalry groups supporting the Third Army included an attached artillery battalion, one or two tank destroyer companies, an engineer company, infantry, and additional wire communications. The 6th Cavalry Group, for example, served as a de facto combat command that controlled its own subordinate task forces. At one point it included two mechanized cavalry squadrons, an engineer battalion, an infantry regiment, three artillery battalions, two tank destroyer companies, and several tank companies.[128]

Augmentation reflected the desire of senior commanders for powerful army and corps reconnaissance assets more akin to traditional cavalry organizations. Strengthening the cavalry groups, however, encouraged their use in nondoctrinal roles. In several instances, the reinforced groups found employment in economy of force roles thereby relieving infantry and armored units for use elsewhere. Indeed, the attachment of tanks, tank

Courtesy Patton Museum of Cavalry and Armor

Figure 30. M8 Armored Car in France, August 1944.

destroyers, engineers, and infantry to mechanized cavalry transformed the reconnaissance organizations into highly versatile, general purpose combat units capable of far more than simply reconnaissance.[129]

A similar departure from doctrinal intent became manifest among the squadrons, reconnaissance battalions, and troops assigned to the armored and infantry divisions. Security, rear area operations, and service as a mobile reserve consumed much of their time in theater. These activities were hardly passive. The rapid drive across France bypassed many German pockets of resistance. Security operations assumed vital importance in ensuring the steady flow of supplies and often resulted in combat with retreating German groups. Mobile reserves found themselves thrust into battle during the German counteroffensives in Alsace, Lorraine, and the Ardennes. Combat became an integral function of most missions, including reconnaissance, and necessitated the reinforcement of division cavalry, often through the attachment of artillery and tanks or tank destroyers.[130]

The prevalence of security and combat-related operations spurred recommendations to restructure the mechanized cavalry squadron and troop. Tactical self-sufficiency, improved command and control, and better communications constituted the primary goal of these proposals. The value of integrated air and ground reconnaissance also emerged through a desire to make observation aircraft organic to the squadron.[131] Efforts to add pioneers and a heavier antitank capability to the squadron simply reflected battlefield reality. Mines slowed the tempo of operations, and German armor posed a threat not easily overcome by the light weapons of the squadron's armored cars and light tanks. Ironically, the early 1943 configuration of the mechanized cavalry squadron included antitank and pioneer platoons, but these units disappeared in the winnowing of cavalry organizations later that year.[132] The most common recommendation, however, lay in the desire for a greater dismounted capability.[133]

Troop level modifications sought enhanced communications and more soldiers for dismounted operations.[134] These changes reflected the frequent employment of the troop on independent operations that required greater self-sufficiency. However, the small size of the infantry division's cavalry component constrained its activities and led to recommendations for an organic cavalry squadron identical to that found in the armored divisions.[135]

The platoon constituted the basic unit of reconnaissance. Its effectiveness in Europe, therefore, received considerable scrutiny. The platoon included three M8 armored cars, three jeeps equipped with pedestal mounted machineguns, and three jeeps carrying 60-mm mortars. Total

strength included 1 officer and 28 enlisted soldiers. The platoon's design envisioned operation either as a single force or as a collection of three reconnaissance teams, each including an armored car, machinegun jeep, and mortar jeep. Other variations were also possible but left to the discretion of the platoon leader.[136]

The platoon leader did not possess a separate headquarters section. He shared the vehicles and equipment of the platoon, and his leadership functions were interwoven with the unit's operation. He could not focus on managing the platoon without impacting its ability to execute missions.[137] Nor could the platoon leader rely on radio communications with every vehicle in his charge. The armored cars possessed two radios, permitting communication within the platoon and with troop headquarters. The machinegun jeeps also carried one radio for platoon communication, but the mortar jeeps had none. Dismounted operations created other problems. The pack radios intended for this purpose proved bulky and heavy, rapidly fatiguing foot patrols and slowing the pace of operations. These problems spurred requests for lighter and more reliable radios and the insertion of a separate headquarters element in the platoon organization.[138]

Fire support proved less than responsive. The 60-mm mortars had their greatest effect when employed together as a battery, but the platoon did not include a noncommissioned officer (NCO) devoted to mortar operations. Poor communications existed between the mortars and the rest of the platoon, while the absence of an observer made rapid accuracy adjustments difficult. These problems led commanders to advocate the replacement of the platoon's mortars with a single 81-mm weapon capable of being fired from a vehicle.[139] Even without a self-propelled mount, the single, larger mortar was still the preferred solution, because it made more soldiers available for other actions.[140]

Most criticism of the platoon concerned its personnel complement. Its 29 soldiers were considered wholly inadequate for the range of tasks required. Dismounted operations of all types constituted a significant part of platoon activities, but vehicle manning and mortar crew requirements left few individuals free to leave their vehicles. Some units facing extended dismounted actions removed their weapons and crews, and left the vehicles untended under cover. These extreme measures did nothing to remedy the lack of personnel qualified for mine detection and removal. Consequently, commanders sought more robust platoons with at least one rifle squad carried in a halftrack.[141]

The combat experience in Europe generated a demand for a reconnaissance platoon with multiple capabilities. It needed the ability to

operate effectively both on roads and cross-country, performing mounted or dismounted operations as required. The platoon required the means to detect mines and clear a path to prevent the delay of friendly forces. The unit remained an important information gathering organization, but it needed the capacity to enter combat when the tactical situation required. In short, the wartime experience generated a desire for "a strong cavalry platoon capable of any cavalry task, but particularly adapted to reconnaissance."[142]

The frequency of combat by reconnaissance units generated casualties who required aid. Organization and doctrine, however, proved deficient.

Courtesy *Armor Magazine*

Figure 31. Dismounted mechanized cavalry patrol in the fall of 1944.

Mechanized cavalry troops did not include organic medical support, relying instead on the attachment of medical teams from the squadron. Doctrine governing battlefield casualties directed units to leave wounded for personnel following to collect. Such a practice not only decreased the chances of survival, it also undermined soldier morale. Hence, it was not followed. Instead, additional medical support was sought from parent or attached units.[143]

Neither of the principal platforms used by the mechanized cavalry platoons proved entirely satisfactory. The wheeled armored car and jeep encountered difficulty in rugged terrain, and they "simply could not cope with difficult terrain."[144] In addition to mobility limitations, the car-jeep team recommended in doctrine was not intended for the routine exposure to combat that characterized its operational experience. According to a postwar analysis, "In the performance of all missions, divisional reconnaissance units almost without exception found that the armored car, M8 equipped with a 37-mm gun and its companion ¼-ton truck, 4x4, were unable to effectively overcome the type of resistance which platoons normally encountered."[145]

The 9-ton, 6x6 M8 armored car possessed limited cross-country mobility and required too large a turning radius for close terrain. Unlike similar vehicles in use by other countries, it did not possess the means to move quickly in reverse and escape dangerous situations.[146] Its mobility was further degraded on soft terrain by a poor power-to-weight ratio and minimal flotation. Its 37-mm main armament made it largely ineffective against most armored targets encountered in 1944–45, but its armor offered little protection against antitank projectiles, including the handheld *panzerfaust* and *panzerschreck* weapons issued to German infantry.[147] Indeed, its light armor and open top made it vulnerable to most threats except small arms fire.[148] Its cramped configuration offered little room for stowage, communications gear, or workspace for the platoon leader. The addition of a fifth crewman was recommended, though this would have necessitated a redesign of the vehicle: "The car commander cannot possibly exercise command of this section, platoon or other unit, act as loader for a major caliber weapon, operate a voice radio set and follow a map all at one and the same time."[149] Dissatisfaction with the M8 led the commander of the 6th Armored Division to replace the wheeled car with the fully tracked assault gun used in the mechanized cavalry squadron.[150]

Despite the armored car's limitations, some commanders preferred it over other alternatives, particularly light tanks. They valued the car's relative quietness of operation as a desirable feature for reconnaissance and

were prepared to accept the vehicle's drawbacks to retain this quality.[151] Compared to the M8, the M5 and M24 light tanks proved noisy and possessed a shorter radius of action. They were not generally recommended for use as reconnaissance platforms.[152]

The jeep suffered its share of criticism. Although more maneuverable than the M8 and easy to conceal, it was not designed as a combat vehicle. The machinegun jeeps carried their armament on pedestals. This mounting facilitated antiaircraft fire, but hindered engagements with ground targets in the vehicle's frontal arc. Consequently, soldiers modified the vehicle in the field often mounting the machinegun on the dashboard where it could easily engage ground targets.[153] This alteration did nothing to alleviate the jeep's extreme vulnerability stemming from its lack of armor protection. Too often reconnaissance personnel proved unable to complete their mission when faced with hostile forces or they had to abandon the vehicle when engaged.[154] In the words of Brigadier General T.B. Thompson, who led a combat command in the 7th Armored Division:

> We lost many vehicles from surprise fire which could have been avoided by light armor. Most losses were due to machinegun fire. . . . In my opinion, no armor on ¼ tons caused great delay and destruction of vehicles and lowering of morale. . . . We didn't get the information we should have had. This, in my opinion, was due to loss of morale because of high losses in men and vehicles.[155]

Major General Holmes E. Dager, who commanded the 11th Armored Division, echoed his views. Referencing the jeep, he noted,

> Only reason we used it [¼-ton] for reconnaissance combat action was because we didn't have enough light tanks or armored cars, but have boys with guts enough to fight in even a "baby carriage." . . . Mobile reconnaissance so essential to Armored Units "paid the rent" in World War II, but lost too many bodies for lack of armament and armor on the jeep.[156]

Reconnaissance losses on the battlefield underscored this viewpoint and found reflection in other theaters. During operations near Manila in the Philippines, the 8th Cavalry Regiment routinely employed its reconnaissance platoon as lead element. When resistance was encountered, the lead jeep was often destroyed and its crew killed or wounded. Combat assets moved forward and destroyed the resistance, but the repetition of such incidents sapped the morale and aggressiveness of the platoon and

discouraged rapid movement. The operational tempo of the regiment slowed as a result.[157]

Jeep survivability concerns also influenced assessments of the reconnaissance platoon employed by tank battalions. In 1944, this platoon included a halftrack, 5 jeeps, and 21 men. The halftrack and one jeep constituted the headquarters element of the platoon, while the remaining four jeeps functioned as two sections, each led by an NCO.[158] The battalion reconnaissance platoon operated in close proximity to its parent organization. Its primary functions included route and area reconnaissance. Bivouac reconnaissance and liaison duties with adjacent units constituted frequent secondary missions.[159] The platoon's weaponry included machineguns and small arms, which together with the absence of armor protection on its jeeps effectively precluded significant combat operations. This minimal combat power led to criticism and recommendations for change by battalion commanders. The most common included its redesign as a cavalry reconnaissance platoon and the replacement of the halftrack with one or two armored cars in addition to improvements in its radio equipment.[160]

Despite the jeep's vulnerability, condemnation of the battalion reconnaissance platoon was not universal. Used carefully in the limited roles for which it was designed, the platoon often performed effective service to its parent battalion. It proved essential for road and bivouac reconnaissance, providing the parent unit a sense of what lay immediately in its path. It could also be augmented with light tanks for missions likely to trigger combat. Hence, several battalion commanders expressed satisfaction with their reconnaissance platoons.[161]

Evaluating the reconnaissance platoon's effectiveness was complicated by the manner in which tank battalions were employed. Doctrine anticipated their use as single entities, providing needed combat power for particular missions. In fact, their subordinate tank companies often supported different organizations. In the armored divisions, this dispersion occurred among different task forces. For the separate tank battalions assigned to infantry divisions, their tanks were detached to different infantry regiments and battalions. The battalion reconnaissance platoon often found employment in operations unrelated to its parent unit, complicating efforts to assess its effectiveness. When the war ended, extensive analysis of mounted reconnaissance operations occurred, but the focus lay on the larger mechanized cavalry troops, squadrons, and groups.

Wartime experience tended to encourage more robust reconnaissance organizations with greater combat power. The doctrinal emphasis on

pure reconnaissance and the avoidance of combat found few advocates among the soldiers and leaders who tried to employ it on the battlefield. Organizational developments early in the war similarly sought organizations with the ability to participate in combat and survive chance encounters. Consequently, security, counterreconnaissance, economy of force, offense, defense, and harassment missions became feasible. General McNair's winnowing of reconnaissance organizations and streamlining of their doctrinal focus eroded these broader capabilities. However, his actions reflected an effort to identify and provide a viable baseline capability. From the perspective of Army Ground Forces, reconnaissance needs constituted only one portion of the entire Army force structure requirements that had to be met. Although McNair's organizational concepts were subsequently discredited, they represented an innovative effort to realize reconnaissance needs within the constraints of available resources. In World War II, shipping, industrial output, and competing demands from all services constituted the principal restraints. In the decades to come, the challenge of balancing requirements and resources would be complicated by similar limitations.

Notes

1. By late 1941, Regular Army cavalry included 2 horse-mechanized regiments and 10 horse regiments, including those in the 1st Cavalry Division and recently activated 2d Cavalry Division. National Guard assets included 4 divisions and 17 regiments. See Shelby L. Stanton, *World War II Order of Battle* (New York, NY: Galahad Books, 1991), 21–23.

2. War Department, Cavalry Field Manual (FM) 2-15, *Employment of Cavalry* (Washington, DC: Government Printing Office, 1941), 1, 5, quotation from page 1.

3. War Department, FM 100-5, *Field Service Regulations: Operations* (Washington, DC: Government Printing Office, 1941), 40–44; FM 2-15 (1941), 87–89.

4. FM 2-15 (1941), 89–90.

5. Ibid., 88, 90.

6. Ibid., 94.

7. Ibid., 97–98, 133, quotation from pages 97–98.

8. War Department, FM 2-10, *Cavalry Field Manual Mechanized Elements* (Washington, DC: Government Printing Office, 1941), 53–54, 60, 64–65, 70–71.

9. Ibid., 21, 62–63, 68.

10. Ibid., 66–67.

11. Major Thomas J. Heavey, "The Horse-Mechanized Regiment," *Cavalry Journal* XLIX, no. 5 (September–October 1940): 424–428; "Fourth Cavalry (H-Mecz) in Fourth Army Maneuvers," *Cavalry Journal* XLIX, no. 5 (September–October 1940): 444; Matthew Darlington Morton, "Horses for 'Iron Ponies': The Interwar Development of Mechanized Ground Reconnaissance" (Masters of Arts Thesis, Florida State University, 2001), 218–219.

12. "The Armored Division 1940–1942," *Tactical Notebook*, May 1993. Monthly publication of the Institute for Tactical Education in Quantico, VA.

13. Major I.D. White, "Reconnaissance Battalion, Armored Division," *Cavalry Journal* L, no. 3 (May–June 1941): 48–49.

14. "The Armored Division 1940–1942," *Tactical Notebook*, May 1993; "M2 Half Track Car," http://en.wikipedia.org/wiki/M2_Half_Track_Car (accessed 3 March 2008).

15. White, "Reconnaissance Battalion, Armored Division," 48–52.

16. Brigadier General Willis D. Crittenberger. Letter to Lieutenant General Daniel Van Voorhis, 16 July 1941, US Army Military History Institute (hereafter referred to as MHI), Willis D. Crittenberger Papers.

17. Major Paul A. Disney, "Reconnaissance Units Training Test, 2d Armored Division," *Cavalry Journal* L, no. 5 (September–October 1941): 68–72.

18. Morton, "Horses for 'Iron Ponies,'" 247.

19. Brigadier General Alvan C. Gillem Jr., Memorandum to Chief of Armored Force, "Report on Reorganization of Armored Division," 3 June 1941, MHI, Alvan C. Gillem Jr. Papers; Major General Bruce Magruder, Memorandum to Colonel Unger, "Reorganization of the Armored Division," 7 June 1941, MHI, Willis D. Crittenberger Papers.

20. For a comprehensive analysis of the maneuvers, see Christopher R. Gabel, *The U.S. Army GHQ Maneuvers of 1941* (Washington, DC: Center of Military History, 1991).

21. Lesley J. McNair, Memorandum to CG, IV Army Corps, "Comments on First Army Versus IV Army Corps Maneuvers, November 16–30, 1941," 7 January 1942, 3, National Archives and Records Administration (hereafter referred to as NARA), Record Group (hereafter noted as RG) 337, HQ AGF, GHQ; Major General Charles L. Scott, Memorandum to Chief of the Armored Force, "Report on GHQ Exercises in Which Armored Forces Participated,"10 December 1941, 1–2, MHI, Henry C. Newton Papers; Gabel, *GHQ Maneuvers*, 128.

22. Lieutenant Colonel John A. Smith Jr., "Comments Concerning Maneuver Operations of 2d Armored Division," 20 September 1941; "Comments by Lt. Gen. L.J. McNair, G.S.C., 1st Phase, GHQ-directed Maneuvers, Camp Polk, La., September 14–19, 1941," 6; Lieutenant Colonel Riley F. Ennis, "Report of Assistant Armored Force and Antitank Director Concerning Armored Operations in First Carolina Maneuver," undated, 1; Lieutenant Colonel Riley F. Ennis, "Report Concerning Armored Operations in Both Phases of Carolina Maneuver," undated, 1, 3; Memorandum, Lieutenant General Lesley J. McNair to CG, Third Army, "Comments on Second Versus Third Army Maneuvers, September 15–30, 1941," 10 October 1941, 5; Brigadier General Kenneth P. Lord, "Training Memorandum No. 2: Analysis of 1941 Training and Maneuvers," 26 January 1942, 6. All sources came from NARA, RG 337, HQ AGF and GHQ files.

23. Gabel, *GHQ Maneuvers*, 82.

24. Smith, "Comments Concerning Maneuver Operations of 2d Armored Division," 20 September 1941; "Comments on First Phase—First Army Versus IV Army Corps Maneuvers, 1941," 22 November 1941, 9; Lieutenant General Lesley J. McNair, Memorandum to CG, First Army, "Comments on First Army Versus IV Army Corps Maneuvers, November 16–30, 1941," 22 December 1941, 6; Lieutenant General Lesley J. McNair, Memorandum to CG, IV Army Corps, "Comments on First Army Versus IV Army Corps Maneuvers, November 16–30, 1941," 7 January 1942, 4; Major F.T. Searcy, "Report Concerning Actions of 13th Armored Regiment During First Phase of Carolina Maneuver," 21 November 1941, 2. All sources from NARA, RG 337, HQ AGF and GHQ files.

25. Colonel M.J. Conway, "Comments on Second and Third Army Maneuver 1941," undated, 4; Lieutenant Colenel Wayland B. Augur, Memorandum to GHQ G3 Director, "Report of Cavalry Operations, First Phase Carolina Maneuvers, November 16–21, 1941," 22 November 1941, 2–5; "Comments on First Phase—First Army Versus IV Army Corps Maneuvers, 1941," 22 November 1941, 8; Lieutenant General Lesley J. McNair, Memorandum to CG, First Army, "Comments on First Army Versus IV Army Corps Maneuvers, November 16–30, 1941," 22 December 1941, 8. All sources from NARA, RG 337, HQ AGF, and GHQ files.

26. Major General Robert C. Richardson Jr., "Report of VII Army Corps Field Exercises and Maneuvers in Southwestern Arkansas—August 17–28 and Participation of VII Army Corps in Second Army and GHQ Maneuvers August 29–September 30, 1941," 29 October 1941, appendix 2, 3, 6; appendix 3, 13, MHI,

World War II US Army, War Game Maneuvers; Augur, Memorandum, "Report of Cavalry Operations, First Phase Carolina Maneuvers, November 16–21, 1941," 22 November 1941, 1–3.

27. Chief of Cavalry Major General John K. Herr, Letter to Brigadier General Adna R. Chaffee, 1 June 1939; Chief of Cavalry Major General John K. Herr, Memorandum to CG, 7th Cav Bde, Subj: Recommendations on Motorcycle Troop, 5 June 1939; Chief of Cavalry Major General John K. Herr, Radiogram to CG, 7th Cav Bde, 18 September 1939; Chief of Cavalry, Memorandum to CG, 7th Cav Bde, 5 June 1939; 1st end of same, 23 June 1939; Chief of Cavalry Major General John K. Herr, Memorandum to CG, 7th Cav Bde, Subj: Utilization of Motorcycles with Mechanized Cavalry for Reconnaissance Purposes, 30 June 1939. All sources from NARA, RG 177, Office of the Chief of Cavalry General Correspondence files.

28. Colonel John Millikin, Memorandum to Chief of Cavalry, "Report on Operations of the 6th Cavalry in Maneuvers of IV Corps at Fort Benning, Georgia," 2 May 1940, NARA, Record Group 177, Office of the Chief of Cavalry General Correspondence; George A. Lynch, "Final Report of Major General George A. Lynch: A Summary of Infantry Developments during His Term of Office," 30 April 1941, 31–32; appendix VI, 9–13, MHI.

29. Doug Stewart, "Hail to the Jeep! Could We Have Won Without It?" *Smithsonian* (November 1992): 61–64; "Jeep," http://www.globalsecurity.org/military/systems/ground/jeep.htm (accessed 28 November 2007).

30. Lieutenant George M. White, "Cavalry's Iron Pony," *Cavalry Journal* L, no. 2 (March–April 1941): 85–86.

31. White, "Cavalry's Iron Pony," 85–88; Captain Bruce Palmer, "The Bantam in the Scout Car Platoon," *Cavalry Journal* L, no. 2 (March–April 1941): 89–92; Morton, "Horses for 'Iron Ponies,'" 251–254.

32. Robert R. Palmer, "Reorganization of Ground Troops for Combat," in Kent Roberts Greenfield, Robert R. Palmer, and Bell I. Wiley, *United States Army in World War II: The Army Ground Forces: The Organization of Ground Combat Troops* (Washington, DC: Department of the Army, Historical Section, 1947), 265, 268–269.

33. Ibid., 272–273.

34. Stanton, *World War II Order of Battle*, 21–24.

35. Palmer, "Reorganization of Ground Troops for Combat," 352, 356–357.

36. Ibid., 308–309.

37. War Department, FM 17-5, *Armored Force Field Manual, Armored Force Drill* (Washington, DC: Government Printing Office, 1942), 132.

38. War Department, FM 17-20, *Employment of Armored Units, Reconnaissance Platoon and Company* (Washington, DC: Government Printing Office, 1942), 6.

39. Ibid., 6.

40. Ibid., 3.

41. Ibid., 79–80.

42. Ibid., 78.

43. Steven J. Zaloga, *Staghound Armored Car 1942–62* (New York, NY: Osprey Publishing Ltd, 2009), 7–14.

44. FM 17-20 (1942), 2.

45. Ibid., 78.

46. Ibid., 2.

47. Ibid., 2–3.

48. Ibid., 3.

49. Ibid., 16–24.

50. War Department, FM 17-33, *Armored Force Field Manual, The Armored Battalion, Light and Medium* (Washington, DC: Government Printing Office, 1942), 1, 3.

51. Ibid., 15–17.

52. Ibid., 15–17, 22, 37–39, 49–51, 81–83, 100, 116.

53. Ibid., 4, 44.

54. Major General Charles L. Scott, "Armored Reconnaissance," *Cavalry Journal* LI, no. 6 (November–December 1942): 20.

55. Ibid., 21.

56. Ibid., 22.

57. Cavalry School, *Cavalry Reconnaissance Number One: Operations of the 81st Armored Reconnaissance Battalion in Tunisia* (Fort Riley, KS: Cavalry School, c. 1943); Cavalry School, *Cavalry Reconnaissance Number Two: Operations of the 81st Armored Reconnaissance Battalion in Tunisia, Part III: Kasserine—El Ma El Abiod* (Fort Riley, KS: Cavalry School, c. 1943); Matthew Darlington Morton, "Men on 'Iron Ponies,': The Death and Rebirth of the Modern U.S. Cavalry" (Ph.D. Diss., Florida State University, 2004), 266–274. Reconnaissance platoons in the 81st Armored Reconnaissance Battalion included four scout cars in lieu of armored cars, four jeeps, and one assault gun.

58. Cavalry School, *Cavalry Reconnaissance Number Three: Operations of the 91st Cavalry Reconnaissance Squadron, Mechanized, From El Abiod to Mateur (Northern Tunisia)* (Fort Riley, KS: Cavalry School, c. 1943); Cavalry School, *Cavalry Reconnaissance Number Four: Operations of the 91st Cavalry Reconnaissance Squadron, Mechanized, From Mateur to Bizerte (Northern Tunisia)* (Fort Riley, KS: Cavalry School, c. 1943); Morton, "Men on 'Iron Ponies,'" 274–281, 283, 290. The 91st Cavalry Reconnaissance Squadron included headquarters and headquarters troop, three reconnaissance troops, and one support troop. Headquarters troops included an antitank platoon and a pioneer and demolitions platoon.

59. Morton, "Men on 'Iron Ponies,'" 285–287.

60. Lieutenant Colonel John K. Waters, commanding 1st Battalion, 1st Armored Regiment, 1st Armored Division, and Lieutenant Colonel Hyman Bruss, commanding 2d Battalion, 13th Armored Regiment, 1st Armored Division, interview, 29 December 1942, 5–6, George C. Marshall Foundation (hereafter referred to as GCM), National Archives Project, Microfilm Reel 375, Item 5611.

61. Ibid., 6.

62. Colonel Stanley J. Grogan, Memorandum to Mr. McCloy, "Report on Matters, Other Than Public Relations, During North African Trip, February 10–March 17, 1943," 20 March 1943, 3, GCM, National Archives Project, Microfilm Reel 375, Item 5612.

63. Major General Alvan C. Gillem Jr., Memorandum to Chief of Staff, "Report of Observations at European Theater of Operations and North African Theater of Operations," 1 August 1943, 4–5, GCM, National Archives Project, Xerox No. 2300. Not until December 1944 would the Army field a light tank, the M-24 (Chaffee) equipped with a 75-mm gun, but this weapon was not intended for antitank use.

64. HQ, Armored Command, "Report of Observations at European Theater of Operations and North African Theater of Observations," 1 August 1943, in US Army Ground Forces (AGF), Observer Board, "Report of Observers: Mediterranean Theater of Operations," Vol. 2, no. 35, MHI; HQ AGF, "Observers Report, Team No. 3," 22 August 1943, in AGF Observer Board, "Report of Observers: Mediterranean Theater of Operations," Vol. 2, no. 37, MHI.

65. HQ AGF, "Observers Report, Team No. 3," 22 August 1943, in AGF Observer Board, "Report of Observers: Mediterranean Theater of Operations," Vol. 2, no. 37, 2, MHI.

66. Lieutenant Colonel Bruce Palmer Jr., "New Battle Lessons on Reconnaissance," *Cavalry Journal* LII, no. 5 (September–October 1943): 37.

67. Lieutenant Colonel Charles J. Hoy, "Reconnaissance Lessons from North Africa," *Cavalry Journal* LII, no. 6 (November–December 1943): 17.

68. Palmer, "New Battle Lessons," 37.

69. Palmer, "New Battle Lessons," 37; Lieutenant Colonel Harry W. Candler, "91st Reconnaissance Squadron in Tunisia," *Cavalry Journal* LIII, no. 2 (March–April 1944): 20.

70. Morton, "Men on 'Iron Ponies,'" 272, 288, 281 footnote 65.

71. Conference with Lieutenant Colonel Louis V. Hightower, 1 March 1943, 2, attached to memorandum from Brigadier General Lowell W. Rooks to War Department Operations Division, 21 March 1943, GCM, National Archives Project, Microfilm Reel 375, Item 5612.

72. Conference with First Lieutenant Herbert F. Hillenmeyer, 1 March 1943, 6, attached to memorandum from Brigadier General Lowell W. Rooks to War Department Operations Division, 21 March 1943, GCM, National Archives Project, Microfilm Reel 375, Item 5612.

73. Observer report of Lieutenant Colonel William S. Myrick Jr., 27 January 1943, 20, MHI, United States Army Ground Forces, Observer Board, Report of Observers, Mediterranean Theater of Operations; George F. Howe, *United States Army in World War II: The Mediterranean Theater of Operations: Northwest Africa: Seizing the Initiative in the West* (Washington, DC: Department of the Army, Office of the Chief of Military History, 1957), 332.

74. Conference with Lieutenant Colonel Louis V. Hightower, 1 March 1943, 4.

75. Lieutenant Colonel William B. Kern, Captain Thomas W. Hoban, and Captain Walter R. Geyer, "Proceedings of a Board of Officers for Recommendations for Changes and Improvements in Organization, Tactics, and Equipment," 21 December 1942, 3, 5, in P.M. Robinett, "CCB, 1st Armored Division: North African Operations," GCM, Paul M. Robinett Collection, Box 12.

76. Cavalry School, *Cavalry Reconnaissance Number Five: Operations of the 3d Cavalry Reconnaissance Troop, Mechanized, Part I: Sicily* (Fort Riley, KS: Cavalry School, c. 1943).

77. HQ AGF, "Lessons Learned in the Battle from the Garigliano to North of Rome," 21 September 1944, in AGF Observer Board, "Report of Observers: Mediterranean Theater of Operations," Vol. 3, 11–12, MHI; Morton, "Men on 'Iron Ponies,'" 313–314.

78. HQ AGF, "Lessons Learned in the Battle from the Garigliano," 10–12; Morton, "Men on 'Iron Ponies,'" 318–322.

79. Palmer, "Reorganization of Ground Troops for Combat," 356–357.

80. Ibid., 326, 331, 333.

81. Major General Robert W. Grow, Letter to Colonel Barrows, 12 September 1945, 2, MHI, Robert W. Grow Papers.

82. Armored Division Organization Charts, T/O 17-26 Headquarters and Headquarters Company, Tank Battalion; T/O 7-26 Headquarters and Headquarters Company, Armored Infantry Battalion, 15 September 1943, 14, US Army Armor School Reprint.

83. War Department, Cavalry Field Manual (FM) 2-30, *Cavalry Mechanized Reconnaissance Squadron* (Washington, DC: Government Printing Office, 1943), 98–100.

84. Ibid., 98–99.

85. Ibid., 13, 96.

86. Hoy, "Reconnaissance Lessons From North Africa," 20; Morton, "Horses for 'Iron Ponies,'" 263–264.

87. Palmer, "New Battle Lessons on Reconnaissance," 37.

88. FM 2-30 (1943), 16–17.

89. Ibid., 18–20, 30.

90. Ibid., 32–33.

91. Ibid., 65–84, quotation from page 65.

92. Ibid., 13.

93. Ibid., 65–66.

94. Armored Division Organization Charts, T/O 2-27 Cavalry Reconnaissance Troop, Mechanized, 15 September 1943, 11, US Army Armor School Reprint.

95. Armored Division Organization Charts, Cavalry Reconnaissance Squadron, Mechanized, 9; T/O 17-17 Light Tank Company, 16; T/O 2-28 Cavalry Assault Gun Troop, Mechanized, 12, 15 September 1943, US Army Armor School Reprint.

96. Armored Division Organization Charts, Cavalry Reconnaissance Squadron, Mechanized, 9; T/O 2-27 Cavalry Reconnaissance Troop, Mechanized, 11; T/O 2-28 Cavalry Assault Gun Troop, Mechanized, 12, 15 September 1943, US Army Armor School Reprint; FM 2-30 (1943), 98.

97. War Department, FM 100–5, *Field Service Regulations: Operations* (Washington, DC: Government Printing Office, 1944), 9–10.

98. US Forces, European Theater, "General Board, Study No. 49: Tactics, Employment, Technique, Organization, and Equipment of Mechanized Cavalry Units" (Washington, DC: US Army Center of Military History, 1945), 5–6 (hereafter cited as Study No. 49); FM 100–5 (1944), 10.

99. War Department, FM 2-20, *Cavalry Reconnaissance Troop Mechanized* (Washington, DC: Government Printing Office, 1944).

100. Ibid., 2.

101. Ibid., 17–18.

102. Ibid., 94.

103. Ibid., 22–25.

104. Ibid., 36, 38, 50, 69, 70–72, 89–94.

105. Ibid., 72–75, 78, 81–82, 94.

106. FM 2-30 (1943), 20, 23, 45, 47.

107. Ibid., 24, 31–33.

108. Ibid., 19–21, 25–26, 37–41, 44, 64–71.

109. FM 2-30 (1943), 4-15. Typical examples of illustrations intended to show correct and incorrect operations can be found on pages 38 to 41.

110. Lieutenant Colonel Brainard S. Cook, "Vehicular Reconnaissance," *Cavalry Journal* LII, no. 1 (January–February 1943): 51–59.

111. FM 2-30 (1943), 4–5; Cook, "Vehicular Reconnaissance," 53; Palmer, "New Battle Lessons on Reconnaissance," 36–37.

112. Cook, "Vehicular Reconnaissance," 51–59.

113. The titles of the first five of these studies are *Operations of the 81st Armored Reconnaissance Battalion in Tunisia; Operations of the 81st Armored Reconnaissance Battalion in Tunisia, Part III: Kasserine—El Ma El Abiod*; *Operations of the 91st Cavalry Reconnaissance Squadron, Mechanized, From El Abiod to Mateur (Northern Tunisia); Operations of the 91st Cavalry Reconnaissance Squadron, Mechanized, From Mateur to Bizerte (Northern Tunisia); Operations of the 3d Cavalry Reconnaissance Troop, Mechanized, Part I: Sicily*. All of these studies were produced and published by the Cavalry School at Fort Riley, KS. They are currently available in the US Army Armor School Library.

114. Lieutenant Colonel Allen D. Hulse, "Principles and Modern Methods of Reconnaissance," *Cavalry Journal* LII, no. 4 (July–August 1943): 69.

115. Cook, "Vehicular Reconnaissance," 53–54.

116. Hulse, "Principles and Modern Methods of Reconnaissance," 67.

117. FM 2-20 (1944), 6–8.

118. Captain Stuart J. Seborer, "Modern Cavalry Organization," *Cavalry Journal* LVI, no. 2 (March–April 1947): 23.

119. US Forces, European Theater, "Study No. 49," 6.

120. Ibid., 9.

121. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, in AGF Observer Board,

European Theater, "Reports of Observers, ETO 1944–1945," Vol. 5, C–1007, 1, MHI; War Department Observers Board, "AGF Report No. 479: Interview with Colonel S.N. Dolph, Commanding 102d Cavalry Group," 31 December 1944, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 3, C–479, 1, MHI; "The General Board, Study No. 49," 9.

122. War Department Observers Board, "AGF Report No. 483: Notes on the Fourth Cavalry Group," 29 December 1944, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 3, C–483, Exhibit A, 1, MHI; Hugh M. Cole, *U.S. Army in World War II: The Lorraine Campaign* (Washington, DC: US Army Center of Military History, 1997), 220–221; Hugh M. Cole, *United States Army in World War II: The European Theater of Operations: The Ardennes: Battle of the Bulge* (Washington, DC: Center of Military History, 1993), 137–140, 144–151, 164; Morton, "Men on Iron Ponies,'" 371–373.

123. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 1.

124. War Department Observers Board, "AGF Report No. 479: Interview with Colonel S.N. Dolph, Commanding 102d Cavalry Group," 31 December 1944, 4; War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 1–2; War Department Observers Board, "AGF Report No. 775: Mechanized Cavalry Notes," 28 March 1945, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 4, C–775, MHI; "General Board, Study No. 49," 13, 20.

125. War Department Observers Board, "AGF Report No. 483: Notes on the Fourth Cavalry Group," 29 December 1944.

126. "Study No. 49," appendix 3, table 3a. The statistical breakdown of missions performed by cavalry groups was defensive (32.8 percent), security (24.9 percent), special operations (28.8 percent), offense (10.2 percent), and reconnaissance (3.3 percent).

127. "Study No. 49," appendix 3, table C.

128. War Department Observers Board, "AGF Report No. 385: Cavalry and Armored Report," 27 November 1944, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 3, C–385, Exhibit A, 9, MHI; War Department Observers Board, "AGF Report No. 483: Notes on the Fourth Cavalry Group," 29 December 1944, Exhibit A, 1–2; War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 2.

129. Captain Stephen H. Smith et. al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units" (student paper 2/46.102, US Army Armor School, Fort Knox, KY, 1952), 25–26, US Army Armor School Library.

130. "Study No. 49," appendix 4, tables A and B; appendix 5, tables A and B. The statistical breakdown of missions performed by cavalry reconnaissance squadrons and armored reconnaissance battalions in the armored divisions was special operations (48 percent), security (24 percent), reconnaissance (13 percent), defensive (11 percent), and offensive (4 percent). For cavalry reconnaissance troops assigned to infantry divisions, the breakdown was security (50 percent) and special operations (39 percent).

131. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 10.

132. War Department Observers Board, "AGF Report No. 6: Organization, Employment, Training, and Equipment of Mechanized Cavalry," February 1944, 2, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 1, C–6, MHI; War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 3–4.

133. "Study No. 49," 15; War Department Observers Board, "AGF Report No. 479: Interview with Colonel S.N. Dolph, Commanding 102d Cavalry Group," 31 December 1944, 3; Smith et al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units," 33–34.

134. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 3–4, 6.

135. "Study No. 49," 15; Smith et al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units," 33–34.

136. FM 2-20 (1944), 25; Smith et al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units," 26; Major Robert F. Cunningham et al., "Ontos in the Reconnaissance Platoon" (student paper 45.4-19, US Army Armor School, Fort Knox, KY, 1953), 9, US Army Armor School Library.

137. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 3.

138. Cunningham et al, "Ontos in the Reconnaissance Platoon," 9; War Department Observers Board, "AGF Report No. 775: Mechanized Cavalry Notes," 28 March 1945, 28th Cavalry Reconnaissance Squadron, 2.

139. War Department Observers Board, "AGF Report No. 6: Organization, Employment, Training, and Equipment of Mechanized Cavalry," February 1944, 6, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 1, C–6, MHI; War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 4.

140. War Department Observers Board, "AGF Report No. 775: Mechanized Cavalry Notes," 28 March 1945, 28th Cavalry Reconnaissance Squadron, 2.

141. War Department Observers Board, "AGF Report No. 6: Organization, Employment, Training, and Equipment of Mechanized Cavalry," February 1944, 2–3; War Department Observers Board, "AGF Report No. 479: Interview with Colonel S.N. Dolph, Commanding 102d Cavalry Group," 31 December 1944, 3; War Department Observers Board, "AGF Report No. 775: Mechanized Cavalry Notes," 28 March 1945, 3d Cavalry Group, 2; War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 3–4; "Study No. 49," 15.

142. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 3, quotation from page 19.

143. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 10–11; "Study No. 49," 8–12, 20–21; Smith et al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units," 33–34.

144. Smith et al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units," 26.

145. Ibid., 6.

146. War Department Observers Board, "AGF Report No. 6: Organization, Employment, Training, and Equipment of Mechanized Cavalry," February 1944, 5; War Department Observers Board, "AGF Report No. 396: Report of Visit with the 6th Armored Division," 23 November 1944, Exhibit A, 1, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 3, C–396, MHI.

147. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 5; Smith et al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units," 26.

148. Cunningham et al, "Ontos in the Reconnaissance Platoon," 9.

149. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, 5.

150. War Department Observers Board, "AGF Report No. 396: Report of Visit with the 6th Armored Division," 23 November 1944, Exhibit A, 1.

151. War Department Observers Board, "AGF Report No. 396: Report of Visit with the 6th Armored Division," 23 November 1944, Exhibit A, 7; War Department Observers Board, "AGF Report No. 479: Interview with Colonel S.N. Dolph, Commanding 102d Cavalry Group," 31 December 1944, 1.

152. War Department Observers Board, "AGF Report No. 6: Organization, Employment, Training, and Equipment of Mechanized Cavalry," February 1944, 6.

153. War Department Observers Board, "AGF Report No. 396: Report of Visit with the 6th Armored Division," 23 November 1944, Exhibit A, 6.

154. Smith et al., "The Need for a Lightly Armored Vehicle in US Reconnaissance Units," 7.

155. Ibid., 7.

156. Ibid., 7.

157. Cunningham et al, "Ontos in the Reconnaissance Platoon," 67.

158. Major Craig S. Harju, "White Paper—A Study of the Maneuver Battalion Reconnaissance or Scout Platoon" (Fort Knox, KY: US Army Armor School, 18 September 1989), 6–8. Available through the Defense Technical Information Center as Report AD-A214 798.

159. War Department Observers Board, "AGF Report No. 385: Cavalry and Armored Report," 27 November 1944, 2, 6, 10.

160. War Department Observers Board, "AGF Report No. 385: Cavalry and Armored Report," 27 November 1944, 6; War Department Observers Board, "AGF Report No. 693: Armored Notes," 1 March 1945, 2, 4, 6, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944–1945," Vol. 4, C-693, MHI.

161. War Department Observers Board, "AGF Report No. 385: Cavalry and Armored Report," 27 November 1944, 6, 10.

Chapter 3

From Postwar to Korean War

The years 1945 and 1955 marked a transition period for the Army. The end of World War II led to demobilization and downsizing that resulted in a much smaller force in the immediate postwar years. Extensive analysis of wartime combat experiences shaped the direction of doctrine, organization, and materiel development. Mounted reconnaissance shifted from a wartime emphasis on reconnaissance only to a broader mission set oriented on security and combat. Organizational developments, particularly the emergence of the armored cavalry regiment and the combined arms reconnaissance platoon, reflected this change. The Korean War marked the first opportunity to employ the new reconnaissance units and doctrine in combat, but the nature of the conflict made it a limited test case. Lessons learned tended to focus on the company and platoon. After the war, the Army's focus shifted to operations on an atomic battlefield.

Analysis of the Wartime Experience

The end of World War II triggered a rapid reduction in the Army's size. From a force of 89 divisions in 1945, only 10 remained by 1948. The number of armored divisions shrank from 16 to 1 with parallel reductions in the numbers of cavalry groups and cavalry reconnaissance squadrons. The Armored Force, redesignated during the war first as the Armored Command and then the Armored Center, inactivated only to reactivate in November 1946. In the interim, its functions migrated to the Armored School, which remained the center of gravity for armored developments. In the late 1940s, the value of armor to the Army was not in question, but rather how to integrate responsibility for its development into the existing force structure on a permanent basis.[1]

In Europe, the Army assumed responsibility for the stability of Occupied Germany. Plans to establish a large garrison presence there evaporated with demobilization. Instead, the Constabulary arose, a special force that relied on mobility rather than mass to ensure a secure environment for Germany's reconstruction. Its components were drawn largely from mechanized cavalry, tank destroyer, and armored units, leveraging the characteristics of mobility and robust communications associated with these mounted units. Established in 1946, the Constabulary's focus lay on stability and security operations rather than combat.[2]

These developments left the Army few resources for other operations or experimentation with new ideas. However, the late 1940s witnessed a

major intellectual effort to capture the lessons learned from World War II and incorporate them into tactical organizations, doctrine, and materiel. This analysis led to significant changes throughout the Army, although the means to implement them were not immediately available. The resultant paper changes established a pattern for future developments that guided activities into the Korean War.

Reconnaissance operations by mounted units received considerable attention. Following Germany's surrender, the Army convened a General Board to gather data on combat operations in Europe. Its report on the experience of mechanized cavalry dominated much of the postwar discussion on reconnaissance. Given the large-scale presence of mechanized cavalry organizations in the European theater of operations, this emphasis made sense.

The General Board's mechanized cavalry report relied on reports and personal input from wartime commanders. From this extensive body of data, the Board crafted a final report that summarized the wartime experience,

Courtesy *Armor Magazine*

Figure 32. Constabulary jeep patrol in Occupied Germany.

identified problems, and included a detailed set of recommendations for postwar developments. The most important conclusion concerned the doctrinal principles that governed the organization and intended employment of mechanized cavalry. The Board rejected as "unsound" the wartime emphasis on reconnaissance as the principal mission of mechanized cavalry, citing the much more varied actual battlefield experiences of cavalry groups and cavalry reconnaissance squadrons. Security and combat operations were considered routine activities for mechanized cavalry and their organization and doctrine required appropriate adjustment. Reconnaissance remained a responsibility, but it was considered integral to other activities.[3]

Acknowledging the broad range of activities performed in Europe, the Board sought to drop the reconnaissance designation from all mechanized cavalry units. Instead, it wanted them renamed as cavalry with the wider mission set traditionally associated with mounted units. Through nomenclature, cavalry organizations would be distanced from the now discredited reconnaissance-only emphasis of the war years. Through increases in personnel and combat power, the Board also sought to add substance to the name change by boosting the manning level and combat power of mechanized cavalry units—at least on paper. Its recommended organizational changes effectively transformed the mechanized cavalry into general-purpose combat units capable of a broad range of activities without reliance on external augmentation. Central to these improvements lay an increased capability for dismounted operations and the provision of survivability and lethality without sacrificing quietness of operation. A clear preference for the better cross-country mobility of tracked vehicles was also manifest, particularly if their noise signature could be reduced.[4]

The General Board's analysis encouraged widespread changes to the structure and mission of all mounted reconnaissance organizations. At the army and corps levels, dissatisfaction with the minimized, flexible cavalry group led to recommendations for its replacement by a cavalry regiment traditionally configured with three battalions and the necessary means to perform its mission without reliance on an external attachment. A consensus similarly emerged to replace the single cavalry reconnaissance troop of the infantry division with a complete squadron.[5] Armored commanders favored retention of a squadron equivalent in the armored division albeit with some modification. They desired a squadron with a headquarters and headquarters service company, four cavalry troops equipped with light tanks rather than armored cars, and an assault gun troop for mobile fire support. In this proposal, each cavalry troop included a headquarters, 3 cavalry platoons, and 160 personnel. The platoons relied on the same

armored car/jeep mix used in the war pending development of an improved light tank, but overall strength increased to 1 officer and 36 men. Although some officers supported inclusion of a rifle squad in each platoon and an armored car rather than a light tank, they constituted a minority view. A survey of junior officers found widespread support for a mix of armored vehicles and jeeps within the platoons, but they divided over whether the armored platform should be an armored car or a light tank.[6]

Although the mechanized cavalry experience overshadowed that of the reconnaissance platoons of the tank battalions, these too received at least some attention from the General Board. The report on the separate tank battalions included opinions and recommended changes from personnel who served in these units. In every case, the respondents recommended increasing the size of the reconnaissance platoon. The extent of this expansion varied wildly from a simple increase in the existing strength to the addition of a second platoon or even an entire reconnaissance troop. Little enthusiasm remained for the halftrack, and recommendations emerged to replace this platform with an armored car.[7]

While the General Board continued its work in Germany, analysis of the wartime experience occurred simultaneously throughout the Army. The activities of the mechanized cavalry received considerable attention at Forts Riley and Knox and within the War Department. The pages of *Armored Cavalry Journal* were filled with articles detailing cavalry operations during the war, providing a wealth of combat accounts, unit activities, assessments by veterans of their activities, and recommendations for improvements. Organizational changes often paralleled the findings of the General Board. In an article titled "Brief for a Cavalry Combat Platoon," the author drew on his wartime activities in a cavalry reconnaissance troop to propose a new platoon. It focused on the inclusion of an organic rifle component within the platoon, increasing its strength by 10 men. By reducing the number of vehicles and changing their type, he sought to minimize the vehicle crew requirement and generate a more compact unit requiring less road space. The resultant platoon could thus field a much greater dismounted capability and could rapidly bring all of its combat power to bear if attacked—particularly on roads.[8]

This emphasis on dismounted capability and increasing the man-to-vehicle ratio to permit more effective dismounted operations resonated throughout the mounted community. Similar concerns led Major General I.D. White in 1945 to conclude,

> The Cavalry mechanized unit must be trained and organized for considerable dismounted action. Our present

> reconnaissance troop . . . does not lend itself to dismounted action and . . . there is little time to train them as riflemen for dismounted combat.[9]

A variety of recommendations resulted, including a proposal to include a troop of dragoons in each cavalry squadron and increase the platoon rifle strength of the desired armored regiment.[10]

The attention given to the platoon reflected its status as the basic building block for cavalry organizations. For the dispersed operations associated with reconnaissance activities, the platoon rather than the troop or squadron constituted the primary maneuver element—much as the platoon had been considered the principal reconnaissance agency in the interwar and early World War II years. Because combat operations demonstrated the fallacy of conceiving reconnaissance as a separate function from other mission types, the trend in platoon design lay toward increased capability. The high level of dismounted operations undertaken in World War II resulted in efforts to strengthen the platoon through the addition of riflemen.

Similarly, the priority of platoon missions changed from an exclusive emphasis on reconnaissance to one that placed security and combat activities before reconnaissance. This change fueled the drive to enhance

Courtesy Patton Museum of Armor and Cavalry

Figure 33. Mobile Constabulary winter patrol.

the combat power of the platoon. Parallel efforts were affecting troop and squadron organizations, which would serve as the principal source of augmentation for subordinate units rather than external attachments.[11]

Concern over combat power also stemmed from the wartime employment of mechanized cavalry in covering force and advance guard assignments. This use made sense when information on the enemy proved minimal. In situations where hostile forces were pinpointed and battle imminent, reconnaissance units had no place forward, since "too often reconnaissance type units suffered severe losses when 'caught' between main opposing elements in heavy meeting engagements."[12] Major General Ernest N. Harmon concurred with this view. Reflecting on his experiences as an armored division commander, he noted,

> If you are in heavy contact, I think it is absurd to attempt to lead your attack with the reconnaissance battalion or elements of the reconnaissance battalion. You should lead with your medium tanks as to do otherwise will simply destroy your lighter reconnaissance vehicles and clog up the battlefield.[13]

In 1946, the Armored School hosted its first armored conference. This event brought together armored and cavalry veterans to discuss a wide range of issues related to organization and doctrine. Reconnaissance constituted one of these subjects, although the focus overall included proposals for a new armored division, changes to the tank battalion structure, and related personnel and materiel items. In preparation, the Armored School sought views on the mechanized cavalry squadron, cavalry group, and reconnaissance battalion of the armored division. In general, respondents found the squadron unsatisfactory and sought to reconfigure it to include combined arms troops equipped with jeeps, light tanks, and full-track armored personnel carriers supported by self-propelled 105-mm guns. Cavalry groups were considered unnecessary and an armored regiment preferred. Within the proposed armored division, the reconnaissance battalion included a headquarters and four companies, each equipped with a mix of jeeps, light tanks, 105-mm guns, and an armored reconnaissance vehicle in lieu of the armored car. Overall strength for each company was listed as 5 officers and 155 men.[14]

Reconnaissance Restructured

By 1948, much of the analysis of wartime experience had been translated into new tables of organization for reconnaissance units and updated doctrine. Overall, the Army retained the tiered reconnaissance

developed and employed in World War II. The reconnaissance platoon constituted the smallest tier and the basic component of the larger units. It underwent significant change from its wartime predecessors. It now included a separate headquarters, a scout section, a tank section, a rifle squad, and a support squad. Total strength rose to 1 officer and 38 enlisted men. Its vehicle mix included the jeep, light tank, and armored personnel carrier. Criticism of the fire support offered by three 60-mm mortars was addressed by acting on the recommendation to replace them with a single 81-mm mortar. This weapon constituted the focal point of the support squad, which included two jeeps and two trailers. The latter carried ammunition for the mortar but at the expense of the jeep's off-road mobility. The new platoon offered a much more robust, combat capable organization with an enhanced ability to conduct dismounted operations—very much in line with postwar recommendations. In effect, the reconnaissance platoon had become the smallest combined arms team within the Army, and it provided the foundation on which other reconnaissance units were crafted.[15]

The new reconnaissance platoon became a standard organization intended for inclusion in the armored reconnaissance battalion of the armored division, the reconnaissance company of the infantry division, and the tank battalion. Its combined arms nature provided tank battalion commanders the ability to conduct aggressive reconnaissance, fight for information, and provide security without the perpetual necessity of augmentation. It brought similar capabilities to the other organizations in which it could be found and generally marked an improvement over the wartime reconnaissance platoons.[16]

A new reconnaissance company included a headquarters and three reconnaissance platoons. The platoons were configured as outlined above, while the headquarters included a headquarters section; a maintenance section; and an administrative, mess, and supply section. Total strength included 5 officers and 157 enlisted soldiers, very close to the size recommended at the armored conference. The reconnaissance company replaced the cavalry reconnaissance troop in the infantry division, marking the demise of cavalry nomenclature in Army functions.[17]

Within the armored division, the reconnaissance battalion now bore responsibility for reconnaissance *and* security. It was also intended to execute light combat missions and operate as an armored task force with suitable augmentation. The new battalion configuration included a headquarters and headquarters and service company, four reconnaissance companies, and a medical detachment. The combined arms nature of the platoons obviated the need for light tank and assault gun units under

battalion control for assignment to company and platoon level. Hence, these assets disappeared from the organization.[18]

At corps and army level, a new organization emerged to replace the wartime cavalry group—the armored cavalry regiment (light). This unit, too, reflected efforts to implement recommendations from wartime operations and found expression in the General Board report on mechanized cavalry. However, the regiment also reflected the tactical needs of the Army in Europe. Stability and security in the occupied zone of Germany had been the responsibility of the Constabulary. As Germany began to rebuild and establish a new government with its own capacity to maintain internal security, the need for the Constabulary diminished.[19]

The Berlin Airlift, the creation of the Warsaw Pact, and the onset of the Cold War shifted the Army's focus in Germany from internal to external security. With a minimal tactical reserve in Central Europe, Army leaders sought to enhance the combat ability of all forces stationed there, including the Constabulary. Consequently, in 1947 Constabulary units began to transition into combat organizations, exchanging their jeeps and armored cars for medium tanks and emphasizing tactical operations in training. The next year, Constabulary units converted into combat units that collectively constituted an armored division equivalent for use in the event of hostilities with the Soviet Union. The 2d, 6th, and 14th Armored Cavalry Regiments resulted, paralleled in the United States by the creation of the 3d Armored Cavalry Regiment.[20]

The armored cavalry regiment (light) was intended for assignment at the corps and army level. The name reflected the uncertainty surrounding the fate of armored organizations within the Army. Although a merger of armored and cavalry units into a single branch was anticipated, its final form and designation had not yet been determined. The term "armored cavalry" found common use throughout the late 1940s. In the case of the armored cavalry regiment (light), the name reflected the unresolved branch status for armor and cavalry organizations.[21]

In a deliberate break from the purpose of the wartime cavalry groups, the prioritized purpose of the armored cavalry regiment (light) included security, light combat, and reconnaissance. Its principal missions included pursuit, exploitation, flank security, screening gaps between units, and reconnaissance. Reflective of its Constabulary origins, the regiment also bore responsibility for establishing security in areas captured but occupied by a hostile population. Secondary missions included defensive actions, offensive combat, urban operations, and securing lines of supply and

communication. The new organization bore the characteristics of speed, lightness, long- and short-range communications, and both offensive and defensive abilities. All of these qualities derived from the General Board report on mechanized cavalry and the wartime experiences of the same. In short, the armored cavalry regiment (light) emerged as a versatile organization capable of performing the full range of activities actually conducted by the wartime cavalry groups.[22]

The regiment possessed a triangular structure to correct the imbalance noted by wartime commanders of cavalry groups that included only two mechanized cavalry squadrons. The new unit comprised a headquarters and headquarters company, three reconnaissance battalions, a service company, and a medical detachment. Each battalion in turn included three companies with three platoons apiece. Administrative, supply, and maintenance functions were concentrated at the regimental level for detachment to the battalions. Personnel strength for the regiment totaled 2,883, with a battalion strength of 37 officers, 1 warrant officer, and 746 enlisted men.[23]

The reconnaissance battalions differed in configuration from those included in the armored divisions. In the armored cavalry regiment, each battalion included a headquarters, three reconnaissance companies, a medium tank company, and an assault gun company. The tank and assault

Courtesy Patton Museum of Cavalry and Armor

Figure 34. The transition of the Constabulary into a tactical force through the inclusion of medium tanks.

gun companies were intended to be used en masse or parceled out among the battalions for specific operations. Overall, the cavalry regiment's battalions possessed greater firepower than their division counterparts, reflecting their greater independence of operations. Reconnaissance companies and platoons, however, bore the same configuration as those found in other organizations, including division reconnaissance elements.[24]

The armored cavalry regiment (light) constituted a powerful combined arms team capable of a broad range of activity. This versatility was deliberate and it marked a return to the type of general-purpose combat organization represented by the 7th Cavalry Brigade (Mechanized) in the 1930s. Considerable care went into addressing the problems encountered by the mechanized cavalry in World War II. Indeed, the new regiment included two light observation aircraft. Integration of ground and aerial reconnaissance, long recommended, now became a routine reality.[25]

The armored cavalry regiment was not without its critics. The intended assignment of one regiment per corps did not facilitate the continuous operations anticipated. This fielding mirrored the assignment of one cavalry group per corps, but it did not permit the periodic removal of the groups from combat operations for rest and reorganization. One alternative proposal advocated the assignment of one regiment to each corps and two to each army. Within the regiment, objections arose over nomenclature. The squadron and troop designations long characteristic of cavalry organizations disappeared in favor of battalions and companies. The use of the term "reconnaissance" to identify these units also triggered concerns lest they become associated with the pure reconnaissance organizations of the wartime mechanized cavalry.[26]

Mechanized cavalry leaders at all echelons in World War II routinely found themselves lacking sufficient soldiers to conduct effective dismounted operations. The new armored cavalry regiment addressed this problem by increasing available dismounted strength. The number of soldiers required to operate vehicles shrank, and the ratio of men-to-vehicles rose, but not to the levels recommended by wartime mechanized cavalry commanders. Within the platoons, a single 81-mm mortar replaced the 60-mm mortars used during the war. While this change reflected recommended actions, the larger weapon, crew, and ammunition were carried in two jeeps that towed cargo trailers. Thus burdened, the support squad possessed inferior mobility to the rest of the platoon and became more vulnerable. The use of M26 medium tanks in the tank company reflected available platforms, but a lighter tank with enhanced antitank capability was desired.[27]

Doctrinal Revision

Doctrinal developments paralleled the changes in mounted reconnaissance organizations in the late 1940s. The experience of the mechanized cavalry in World War II also found reflection in the emerging doctrinal publications. In a change from the pure reconnaissance principles prevalent in wartime training and doctrine, postwar guidance embraced the employment of reconnaissance units in all those missions previously associated with both the horse and mechanized cavalry. In the conduct of these missions, the likelihood of combat, including fighting for information, gained acceptance.[28]

Ground reconnaissance units included the capability to maintain continuous contact, operate under all weather conditions, and determine the details of enemy activity. Armored reconnaissance units were expected to include a balance of combat assets, ensuring their ability to conduct distance reconnaissance and operate over an extensive front beyond the effective support range of other units. They were intended to work through gaps in enemy lines and around flanks to reach their objectives. Encouraged to work closely with air assets, reconnaissance units were not expected to achieve a complete sense of enemy activity in the presence of aggressive hostile screening elements. In such instances, "frequently, essential information can be obtained only through attack. Reconnaissance units attack when their mission requires it."[29]

These ideas governing mounted reconnaissance became embedded in the updated draft version of FM 100-5, *Field Service Regulations: Operations*. It provided the basic mission statement of reconnaissance:

> Reconnaissance is usually performed by light armored cavalry units which employ rapidity and flexibility of movement, communications facilities and firepower. Sustained offensive or defensive combat is avoided. The capabilities of light armored cavalry include both distant and close ground reconnaissance, and counterreconnaissance, seizing and holding critical terrain features for a limited time, march and battlefield security, flank security, combat liaison, and delaying and harassing action. Reconnaissance units fight on a relatively broad front and in slight depth. In performing any of their missions these units customarily contribute to the security of the larger command of its elements by reporting locations and strengths of enemy forces and by providing timely warning of impending ground and air attacks. Information is

> transmitted directly to higher headquarters and to units whose security is threatened.[30]

The May 1950 publication of FM 17-22, *Reconnaissance Platoon and Reconnaissance Company*, provided more detailed guidance for reconnaissance operations. This manual reflected the writers' clarity of thought and determination to provide a useful tool to small unit commanders. It proved easy to understand and benefited from the effective use of diagrams, drawings, and charts. For personnel new to the postwar reconnaissance changes, this manual walked them through the principles and their application in a sensible manner. Its guidance applied to all those organizations that included a reconnaissance company or platoon, including tank battalions, divisions, and the armored cavalry regiment (light). The manual's broad applicability conformed to the universal nature of the reconnaissance platoon and company organizations. These units were expected to:

> Provide security and perform reconnaissance or light combat for units to which they are assigned or attached. For the successful accomplishment of these missions, both the reconnaissance platoon and reconnaissance company are organized, equipped, and trained to attack, to defend, or to delay. Each will engage in whichever type of action its mission and the situation dictate.[31]

The reconnaissance platoon and company possessed the qualities of mobility, balanced firepower, light armor protection, and robust communications. They were considered versatile and capable of a variety of activities, more similar to the interwar mechanized cavalry than the wartime cavalry groups, squadrons, and troops.

> Because of their mobility, balanced firepower, light armor protection, and multiple means of communication, the reconnaissance platoon and company are capable of adapting themselves readily to any type of situation and of engaging in any type of combat. They are capable of regrouping within their own organizations to meet any situation which arises.[32]

Their standard organization and versatility also facilitated their attachment and use in task forces tailored to a specific mission or environment.

Within the reconnaissance company, the platoon constituted the basic tactical unit. It consisted of a small combined arms team intended to operate as a single force rather than a collection of detached teams. In keeping

Courtesy *Armor Magazine*

Figure 35. Communist propaganda poster proclaiming the defeat of the United States in 1950.

with the deliberate break from the pure reconnaissance doctrine of World War II, the chapter on platoon operations opened with coverage of the platoon's employment in security, covering force, rearguard, and counter-reconnaissance missions. The early introduction of these subjects subtly reminded the reader of the platoon's versatility and intended roles. Security missions, in particular, received considerable coverage, because "security is the mission most commonly assigned to the reconnaissance platoon and company."[33] Security encompassed operations conducted to protect flanks, rear areas, and supply lines, and act against airborne assaults in addition to the general purpose of preventing the surprise of the parent unit.[34]

Despite the deliberate upfront attention given to security, reconnaissance operations consumed much of the chapter devoted to platoon

operations. Reconnaissance remained a primary function of this platoon, but it was not intended to be a passive information gatherer: "The reconnaissance platoon frequently will attack in the execution of its mission."[35] Throughout the section on reconnaissance, the reader was repeatedly reminded that time often precluded a deliberate, thorough pace of operations. Consequently, the platoon leader's range of operations shrank and encouraged greater reliance on hasty, aggressive, and mounted operations. Reconnaissance by fire suited these conditions, since it was intended to force a suspected enemy to disclose his presence:

> The platoon moves into position to cover the suspected position. One of the scout ¼-ton trucks then moves out slowly. It suddenly stops, turns, and speeds for cover, firing at the suspected position. This maneuver creates the impression that the enemy has been discovered, and may draw fire.[36]

The greater combat power of the platoon made possible more aggressive tactics. The platoon often moved in a column. The scout section led, covering the main axis of advance and related lateral routes. The tank section followed to provide covering fire or assume the lead in case of resistance. The rifle and support squads trailed at the column's end. When an attack became necessary, the platoon formed a base of fire built around the support squad and at least part of the scout section. The rifle squad joined the tanks to provide a combined arms maneuvering force that assaulted the enemy.[37] In defensive actions, a mobile defense was preferred, and the manual provided detailed guidance for conducting delaying actions.[38] The platoon leader was not restricted to any particular vehicle or location. Instead, he was encouraged to position himself in a manner that provided the best means of seeing and controlling the actions of his forward elements. In a change from earlier doctrine, he was not expected to avoid combat. Whether or not he committed the platoon to battle hinged solely on the likelihood of success.[39]

Like prior manuals, FM 17-22 categorized reconnaissance operations as zone, route, or area. Route focused on an axis of movement either forward or behind friendly lines, depending on whether an advance or retrograde movement was planned. Zone reconnaissance focused on the principal routes and dominant terrain features within an assigned maneuver box. Area reconnaissance targeted a particular locale. In performing these types of operations, the platoon relied on the proven techniques of bounding overwatch and dispersion, particularly on roads. Finding the enemy and reporting his status and disposition remained the primary objective.

On gaining contact, the platoon deployed and sought more detailed information, relying on dismounted patrols where necessary. Special guidance governed bridges, defiles, and urban areas. The last case emphasized the use of dismounted action where time permitted or the use of a staggered vehicle column moving by bounds. Although night operations were not discounted, they were discouraged due to the difficulty of observation and the adverse effect of vehicle noise.[40]

Company operations mirrored those of the platoon on a larger scale. The mission set remained the same, although the greater size of the company provided more flexibility in how such missions were conducted. It included a headquarters and three identical platoons. Although each platoon was considered a single team, the manual acknowledged the periodic grouping of like elements from the platoons for select missions. In this manner, larger concentrations of tanks and infantry might be achieved. Generally, however, the company commander focused on coordinating the separate actions of his subordinate platoons over a broad area. The company was expected to provide a screen that provided time and space for the parent organization to react and maneuver. In general, each platoon covered a single route and its laterals, or three routes at the company level. By splitting the scout section of each platoon into two parts this coverage might be doubled, but at the cost of reduced effectiveness in reporting. Similar guidance governed the number of routes on which the company could perform delaying actions.[41]

Reconnaissance missions assigned to the company also included zone and route. The company commander then subdivided his assignment into platoon areas of responsibility. In coordinating the actions of his platoon, he was expected to move frequently, appearing wherever most needed, borne by the most appropriate vehicle. The headquarters possessed no tactical assets, only administrative, supply, and maintenance support. Therefore, the commander influenced platoon activity through his guidance, personal intervention, and oversight of subordinate units. His headquarters kept the platoons supplied and served as a nexus of information between each platoon and higher headquarters. Combat also was considered a normal part of the company's reconnaissance and security functions. The commander's role lay in determining how many platoons to commit and in what configuration. With the exception of the companies in the armored cavalry regiment, he was expected to conduct combat operations without augmentation.[42]

The manual also introduced unit training. For the platoon and company, it included a listing of tasks to be taught, hours to be devoted to each one,

and a description of principal exercises. In effect, it provided a framework for planning, preparation, and execution of training from the squad through the company. This guidance emphasized the teamwork at all echelons and ensured that the versatility associated with the platoon found reflection in training activities. A special appendix included a detailed description of tactical problems for the platoon, including the situation, actions to be taken drawn from doctrinal principles, and illustrations.[43] Individual training emphasized the specialization required: "Each individual member of the reconnaissance platoon must be a thoroughly trained scout."[44] Skills required included techniques for the detection and removal of mines without special equipment, route and bridge reconnaissance and repair, removal and placement of explosives, ability to perform functions of an artillery forward observer, and the provision of emergency medical treatment and casualty evacuation. Overall the training guidance ensured that the full mission set became part of the training schedule and suited the small unit commander's needs. Drawing from the wartime experience, it acknowledged the linkage between training and action on the battlefield: "From the beginning of any training program, the procedures employed should be the same as those which are employed in combat."[45]

Table 1. Reconnaissance platoon training[46]

Unit	***Training Time***
Squad and section	40 hours
Platoon	62 hours
Company	128 hours

The doctrinal changes for the reconnaissance platoon and company impacted tank battalions assigned to infantry and armored divisions. Each such battalion included an organic reconnaissance platoon identical to that found in the armored cavalry regiment and the division reconnaissance battalions. The combined arms nature of these platoons marked a major increase in versatility and combat power over battalion reconnaissance in World War II. However, the primary function of battalion reconnaissance did not change. It continued to focus on local security, liaison with adjacent units, and reconnaissance near the parent battalion. The platoon scouted those areas and locations into which the battalion intended to move and subsequently guided tank units into their bivouac, assembly area, and attack positions. It remained close to the battalion and did not generally conduct independent operations.[47]

Within the battalion, the reconnaissance platoon constituted part of the headquarters and service company. Coordination of its actions with

Courtesy *Armor Magazine*

Figure 36. The M41 Light Tank (Walker bulldog) fielded to replace the M24 (Chaffee) and cope with more heavily armed and armored Soviet combat vehicles.

those of the battalion occurred through the joint efforts of the S3 and S2. FM 17-22 contained much of the guidance for the tank battalion reconnaissance platoon. Tank battalion doctrine provided some indication of how the platoon might be used, but details proved sparse. The platoon acted as one of several sources of information available to the battalion commander that also included aerial photos, pilot reports, information from adjacent units, and general intelligence passed down through command channels. All battalion assets were expected to conduct reconnaissance in the normal course of their missions—this activity was not the exclusive purview of the reconnaissance platoon. The most oft cited activity related to the facilitation of the battalion's movement. The platoon was expected to play a vital role in locating battle positions and guiding combat assets to them in both offensive and defensive engagements. The platoon also helped determine where and how delaying actions would be fought and sought to retain contact with enemy forces during exploitation operations. However, the employment of the reconnaissance team came with a caution concerning its survivability:

> When enemy contacts have been frequent but intermittent, and combat with units employing tanks or antitank guns can be expected momentarily, it is not advisable to employ the reconnaissance platoon as a part of the advance guard or covering force, because of the light armor of its vehicles. [48]

Despite the reconnaissance platoon's increased combat power, it remained vulnerable on a battlefield dominated by armor and antiarmor systems.

Doctrinal guidance for the reconnaissance battalion followed in March 1951 with the publication of FM 17-35, *Reconnaissance Battalion, Armored Division*. This manual was the first to address this unit in detail since 1944. The revised battalion included a headquarters, four identical reconnaissance companies, and a medical detachment. It, too, was intended for more than pure reconnaissance:

> The reconnaissance battalion, armored division, is a self-contained tactical and administrative unit organized and equipped to engage in offensive or defensive combat, either mounted, dismounted, or a combination of both, primarily in the execution of security and reconnaissance missions. The battalion is the security and reconnaissance unit of the armored division. The division commander will normally use it as an economy force so that he can concentrate the bulk of the division on the most important objectives. As a rule, the battalion operates without attachments of tanks and armored infantry and without direct-support artillery.[49]

The battalion provided a number of capabilities to its parent division. In addition to performing reconnaissance, security, and economy of force missions, it also engaged in offensive and defensive combat. It possessed the ability to operate mounted or dismounted and was considered capable of performing reconnaissance for the division commander in any combat situation. The battalion was expected to deploy over a broad area, maneuvering each of its companies in a coordinated manner. It was considered an ideal covering force for the division, and the nature of its organization permitted it to rapidly change the direction of its advance on short notice. It also carried sufficient supplies to conduct continuous operations for a 72-hour period.[50]

The reconnaissance battalion remained a division asset. However, its employment remained the purview of the formation commander and no prescribed method was provided. The entire battalion might be attached to a combat command, one or more companies might support other division components, the entire battalion could be retained under the formation commander's control, or the unit might be divided between the division and a subordinate command. The battalion constituted an important, flexible asset whose employment suited the division commander's needs. However, the regular operation of the battalion as a collection of

detachments was discouraged because it eroded the tactical integrity of the unit.[51]

In the execution of security and reconnaissance operations, doctrinal guidance built on the principles established for the company and platoon. In many respects, battalion operations resembled those of the company on a larger scale. Both the company and battalion often employed their subordinate elements over a broad area, but they retained the ability to concentrate their efforts when circumstances dictated. When possible, the commander sought to retain a reserve under his direct control. Both the company and battalion commanders also had few assets within their headquarters to influence operations. They channeled medical, supply, and maintenance support to component units, but their principal influence occurred through their personal leadership and guidance.[52]

Despite the firepower, mobility, and general versatility of the reconnaissance battalion, it operated under several limitations. It possessed a limited number of riflemen, which restricted its capacity for sustained, dismounted combat. Its geographic coverage depended on the range of its radios, and the mix of wheeled and tracked vehicles within the companies and platoons gave the battalion a degree of terrain sensitivity. Mines constituted a particularly dangerous mobility threat, necessitating the placement of personnel trained in mine detection and removal in forward scout elements.[53]

The battalion manual followed the pattern established by FM 17-22 for training. Guidance outlined the nature and progression of unit training, indicating principal tasks to be addressed at each level. Soldiers were imbued with the spirit of the offensive in all activities. All commanders were expected to be qualified in calling for and adjusting artillery fire. Combat was not shunned. The description for one reconnaissance training exercise included:

> This exercise should stress the battalion operating as a unit on a reconnaissance mission. The situation should require the companies to deploy their platoons and to fight to obtain information. It should include the proper transmission of information from company to battalion and from battalion to the next higher headquarters.[54]

The reconnaissance battalion was not configured or trained to conduct the sneak and peak tactics once favored by mechanized cavalry doctrine.

The last manual related to the restructured reconnaissance organizations governed the armored cavalry regiment. FM 17-95, *The Armored Cavalry Regiment and the Armored Cavalry Reconnaissance Battalion,*

appeared in September 1951. It addressed only those elements specific to the regiment, although it, too, leveraged the principles established in the reconnaissance company and platoon manual. The regiment performed security, reconnaissance, and economy of force operations—missions that would become staples for future cavalry organizations. Although not intended for combat with enemy armor or strong defenses, it was intended for any light combat that did not require the full strength of a division. The manual noted the regiment's characteristics of high mobility, light armor, heavy firepower, and robust communications. These qualities reflected the concepts behind the regiment's design, making it "organized, equipped, and trained to perform highly mobile operations to seize critical terrain features lightly held by the enemy. The regiment is capable of extensive use as an independent force in pursuit or exploitation."[55]

The regiment included three reconnaissance battalions. These differed from their counterparts in the armored division through the addition of a medium tank company and a self-propelled howitzer company. With the exception of the howitzers and tanks, each battalion was a microcosm of the regiment, possessing the ability for self-sufficiency and independent operations. The mission set for each battalion also embraced security, reconnaissance, and combat operations. Reconnaissance operations included route, zone, and area, and incorporated principles introduced by the horse cavalry and refined in World War II. In a rejection of the wartime emphasis on stealthy reconnaissance, the regiment was expected to fight for information:

> It is frequently necessary for a reconnoitering unit to engage in combat when its patrols are unable to penetrate the hostile defense; only on rare occasions can patrols perform reconnaissance missions by stealth. The commander should avoid becoming seriously engaged with a superior enemy and should be prepared to break off an engagement when continuing it would jeopardize the success of his primary mission.[56]

The manual provided detailed guidance for the operation of the regiment and its battalions. Well illustrated, it clearly depicted a versatile combat organization that had more in common with the interwar 7th Cavalry Brigade (Mechanized) than it did with the mechanized cavalry organizations that fought in World War II. It included 27 combined arms reconnaissance platoons and was described as "the composite of all the desires of armored cavalrymen who fought in the last war."[57] The armored cavalry regiment's mobility and combat power made it suitable for many

Courtesy *Armor Magazine*

Figure 37. The continued danger posed by mines did not trigger the rapid development of more efficient methods of mine detection and clearance.

applications. This versatility was a deliberate objective of its designers and was readily manifest throughout FM 17-95.

Training

The publication of new manuals provided the doctrinal underpinning for the redesigned reconnaissance units. Dissemination of the principles of employment for these units throughout the force occurred through training. However, in the late 1940s, Army training remained in turmoil, adversely affecting the ability to absorb new ideas.

In the fall of 1945, mounted reconnaissance training shifted from the Cavalry School to the Armored Center, consolidating all armor-related instruction. At Fort Knox, the Armored Replacement Training Center provided this training until absorbed into the 3d Armored Division, an umbrella organization that executed all basic and advanced individual training. Further instruction occurred after a soldier received his first unit assignment. However, the quality of unit training suffered from several factors. From 1947 to 1949, most units in the United States experienced large-scale personnel turnover and many were understrength. Training facilities and staffs shrank in the aftermath of World War II.[58]

The 2d Armored Division constituted the only armored division in this period, but its organic reconnaissance battalion had deactivated, eliminating the chance to train this type of unit. The division also became responsible for the sustained training of enlisted reservists, which consumed much of its time and energy. Already understrength, the 2d Armored Division remained low as late as 1950.[59]

In 1949, conditions began to improve. The reactivation of the 2d Armored Division's reconnaissance battalion made possible its participation in training exercises and maneuvers starting in 1950. These activities, however, revealed a number of deficiencies and problems with reconnaissance personnel. In one instance, scout sections manning an outpost line in a wooded area were overrun without notifying higher headquarters of the presence of enemy forces. Umpires emphasized the vulnerability of jeep-mounted scouts by regularly ruling the vehicle destroyed whenever contact with the enemy was made and small arms fire received. Their actions created a belief that the lead scout vehicle would always be destroyed on contact and the crew killed or wounded: "The scouts, protected only by 'God and OD shirt' were 'killed' with regularity during every maneuver."[60] Umpires often accompanied the lead scout and directed the crew to abandon the vehicle on contact with the enemy. Failure to do so resulted in the soldiers being ruled casualties. Those who did abandon the vehicle found themselves unable to report the presence of hostile forces because the radio was in the jeep. These occurrences eroded scout morale and encouraged soldiers to transfer out of scout sections. Some became much more interested in tank units.[61]

Personnel turnovers in units and the transition to the new reconnaissance organizations generated a high demand for reconnaissance crewmen. This demand often resulted in minimally trained soldiers being sent overseas to serve in reconnaissance units. Unit training suffered not only from the green nature of some soldiers, but also from the lack of experienced officers and NCOs. Funding constraints that prevented regular maneuvers only exacerbated this situation. Consequently, unit commanders found few opportunities to test and become familiar with the new reconnaissance organizations. Within the United States, the 3d Armored Cavalry Regiment proved an exception. This unit managed to conduct effective unit training and build on it through regular participation in training exercises and maneuvers. In Europe, reconnaissance units generally faired better. Personnel turnovers proved less frequent and field maneuvers were conducted more frequently. Consequently, the 2d, 6th, and 14th Armored Cavalry Regiments in Germany conducted more training

than new organizations.[62] All units, however, suffered from an Army emphasis on individual career management over unit effectiveness.[63]

The overall impact of these obstructions to training lay in a low readiness rate for many reconnaissance units. This erosion of readiness was not limited to this type of organization. It afflicted the entire Army in the years immediately following World War II and directly contributed to the initial reverses suffered in the Korean War. Soldiers serving in reconnaissance units did gain familiarity with the new organizations and learned to use them effectively, but the learning curve proved steep and required more time than it should have.

Upgrading Reconnaissance Materiel

Analysis of the World War II experience encouraged efforts to improve reconnaissance materiel in addition to doctrine. Before hostilities had ended, the Armored Equipment Board, under the leadership of Brigadier General Paul M. Robinett, convened in the fall of 1944 to review armored equipment and make recommendations. This board reported its findings in December. It recommended a new reconnaissance platform capable of carrying six men, possessing high cross-country mobility, and weighing no more than 6 tons. Other requirements included the ability to protect occupants from small arms fire, mount two machineguns, and sustain speeds of 40 miles per hour. The Board, however, considered only tracked vehicles.[64]

The following year, the Army Ground Forces Equipment Review Board convened under the leadership of Major General Gilbert R. Cook. Its focus lay in studying weapons and transportation requirements for the postwar years. This board recommended development of several new vehicles, including a light tank, an armored car, a lightly armored personnel carrier, and an armored command vehicle. It did not advocate replacement of the ¼-ton truck, but the General Board's findings included suggestions to provide this vehicle with an armored windshield and side wings for protection against small arms fire received through the frontal arc.[65]

In 1946, the War Department Equipment Board refined the conclusions of the General Board. In particular, it rejected the armored car as an effective reconnaissance platform and recommended its replacement by the light tank:

> Whether performed by cavalry or by organic reconnaissance units, a vehicular ground reconnaissance will remain a requirement, and such units should utilize the

> equipment prescribed for mechanized Cavalry. The armored car lacks the mobility necessary for use by the most advanced patrol elements and the firepower for immediate close support of these elements. Development should be terminated. The supporting backbone of reconnaissance units should be the light tank. A lightly armored ¼-ton type vehicle should be provided for use by the most advanced patrol elements.[66]

Related recommendations included development of a full tracked, armored personnel carrier and an armored assault gun with a 105-mm howitzer.[67]

Materiel requirements determination continued throughout the immediate postwar period. By 1949, these requirements had clarified. The doctrinal acknowledgment that reconnaissance units performed a broad range of activities led to the following conclusion: "The frequent engagement in combat by reconnaissance units in the performance of their normally assigned mission necessitates a combat vehicle mounting a gun of considerable power in the reconnaissance company."[68] Less clear was the type of platform for this requirement.

In the new armored cavalry regiments responsible for operations over a broad area, the armored car remained an attractive platform despite a desire for greater firepower. However, the ability to match a heavy armament with a light overall weight proved difficult to achieve, resulting in an increased weight requirement of 20 tons.[69] Despite the desirability of retaining the mobility of the armored car, the challenge of mounting a heavy gun on a light, wheeled chassis resulted in acceptance of the M24 light tank as the principal combat vehicle of the reconnaissance platoon.[70]

This solution was not universally accepted. Officers with combat experience in cavalry groups assigned to corps dissented. They believed, "The requirement for wheeled mobility (or at least a silent full tracked vehicle with the cruising radius of the armored car) was of equal importance with the requirement for a gun at the platoon level—that when guns (tanks) were required at that level they should be dispatched from the tank troop organic to each reconnaissance squadron."[71] Corps reconnaissance entailed operations over a broader distance further from the parent formation. The armored car's ease of maintenance, better fuel economy, and ability to negotiate low capacity bridges suited their preference for mobility over firepower. However, division reconnaissance benefited from the close proximity of the parent formation and its ability to provide supplies, maintenance, and bridging assets on a regular basis. Therefore, the tank's

Armor Branch Archives

Figure 38. The Korean landscape.

smaller radius of action and greater supply needs were less of a hindrance. Combat power rather than mobility dominated division reconnaissance needs.[72]

This difference of opinion between corps and division reconnaissance needs did not augur well for efforts to build robust, standard units. However, it did generate interest in replacing the light tank with a 10-ton armored car carrying a gun of at least 76-mm.[73] Efforts to build such a vehicle proved elusive, largely due to the technical difficulties of matching the requisite mix of firepower, mobility, and protection with a low weight limit. Air transport requirements limited the maximum weight to 16 tons, and no waiver could be obtained to accommodate any increase associated with the mounting of a large caliber gun.[74] An effort to develop a joint design with the United Kingdom failed due to doctrinal differences between the two countries.[75] In the absence of a viable armored car, the light tank continued to equip reconnaissance platoons.

The General Board's earlier recommendations for improving the protection of the ¼-ton truck also found acceptance provided the jeep's agility remained unimpaired.[76] A host of other modifications emerged to improve the vehicle, which was to retain its small size and cross-country performance. It was intended for use by commanders, liaison officers, and "for

limited reconnaissance use." The effect of the proposed changes was to alter the configuration of the jeep into a six-wheeled vehicle that remained in a design stage.[77]

Similarly, work continued on an armored personnel carrier for use by the rifle squad of the reconnaissance platoon. The wartime M3 halftrack had proven adequate but received criticism for its open top and limited off-road mobility. Experimentation with a full-tracked, fully enclosed armored carrier began during the war and resulted in the M44 Armored Utility Vehicle. This vehicle proved too large and unwieldy. Postwar efforts included a modified M44 and a new design, the T18 Armored Utility Vehicle that later became the M75 Armored Infantry Vehicle. These vehicles were intended for multiple roles, including ambulance, command and control, mortar carrier, maintenance support, and personnel transport. Both platforms remained in a developmental state by 1949 and neither seemed ideal for their intended uses.[78] In the interim, rifle squads in the reconnaissance platoons utilized available platforms, including the M39. Based on an M18 tank destroyer chassis, the M39 entered limited service during World War II. Fully tracked and lightweight, its principal drawback was its open top.[79] Other reconnaissance platoons continued to rely on the older M3 halftrack.

New materiel for reconnaissance units proved slow to arrive in units. Despite the extensive analysis of combat experience from World War II and related efforts to improve equipment, most concepts remained in a developmental state. It proved easier to determine needs than to match these requirements with new materiel. Consequently, while new platforms remained in varied states of design, the Army continued to utilize equipment designed for World War II.

Unfortunately, the Army faced a new threat in the Soviet Union. Although a wartime ally, relations between the United States and the Soviets deteriorated in the postwar years. The Berlin Airlift and the creation of the North Atlantic Treaty Organization (NATO) symbolized the rise in tension and augured in the Cold War, characterized by the ever-present danger of a new shooting war that might not be constrained to Central Europe. In Korea, China, and Greece, Communist activities suggested an orchestrated effort to promote communism worldwide.

The balance of conventional forces favored the Soviet Union. Although American forces expected to rely on mobility, firepower, and superior technology to offset Soviet numerical superiority, the means to do so remained limited. American armored formations retained their aging wartime vehicles, while "the USSR has already produced a vast stock of

modern tanks, which according to all information are superior to any we now have."[80] In 1949, the United States implemented a 5-year tank plan intended to keep its tank production lines open. It was not intended to support a large-scale war or major mobilization. A Department of the Army report summarized the situation:

> No modern armored equipment has been available to U.S. forces for field testing or for training since World War II. The Soviets, following a well conceived program, fully supported by national resources, have succeeded in equipping and modernizing a powerful mechanized army backed by a reserve and an industrial production capability of some 4,000 tanks per year.[81]

While the report focused on tanks, it might have applied with equal accuracy to reconnaissance vehicles. American reconnaissance platoons employed the same jeeps and light tanks used in World War II, while new platforms began to appear in Soviet units.

A much more positive development occurred with the creation of the Armor Branch. After World War II ended, the temporary Armored Force deactivated, leaving only the Armored Center and School at Fort Knox to address issues related to armored units. Armored officers were detailed to the Cavalry Branch to provide them with a branch identity. This uncertain state ended with the Army Organization Act of June 1950, which restructured the military. Through this act, Congress provided a legal foundation for the establishment of the Armor Branch that merged the Cavalry Branch with the Armored Center and School.[82] The new branch consolidated development responsibility for armored and cavalry units in a single headquarters. It also ended the dual and sometimes contradictory development of reconnaissance doctrine and organization between the armored cavalry communities. The Armor Branch, headquartered at Fort Knox, offered a unity of direction in reconnaissance that had not always been present. Developments in Asia, however, eclipsed the significance of the Army Organization Act. Just 3 days prior to the passage of this Act on 25 June 1950, North Korean forces attacked across the 38th parallel. The Korean War had begun.

Reconnaissance in Korea

The opening phase of the Korean War began with a series of defeats for the Republic of South Korea and its American ally. North Korean forces achieved surprise and overran key positions using columns spearheaded by tanks. For the United States, the destruction of Task Force *Smith* by

one of these columns later became a reminder of the importance of Army readiness. Within weeks of the initial invasion, the North Koreans had driven South Korean and American forces into the southeastern corner of the Korean peninsula, an area that became known as the Pusan perimeter. United Nations (UN) intervention resulted in the dispatch of military forces from several countries, but the United States retained its military leadership role and poured reinforcements into Korea.

This buildup of military capability provided the means for a counterstroke. The Inchon landings changed the course of the war. By striking far to the rear of the frontlines, the American forces were poised to strike toward the South Korean capital of Seoul and coordinate their efforts with a counteroffensive from the Pusan perimeter. By late 1950, the North Koreans had been driven back into their own country, where they faced defeat. American and UN forces continued to overrun much of North Korea, but chances of a complete victory and a quick end to the war evaporated with Chinese intervention. American columns, dispersed over broad areas to eliminate the last North Korean resistance and seize territory, were unprepared for the avalanche of Chinese forces. Brutal fighting in winter conditions ensued as American and UN troops sought to extricate themselves from Chinese pincer operations.

By early 1951, the fighting had returned to South Korea, where Seoul again changed hands. Throughout the year, a series of major American and UN offensives helped to stabilize the frontline. The military and political objectives also became more limited, focused on simply preserving South Korea's national integrity and frontier along the 38th parallel. The following year, combat was characterized by patrols and small unit combat rather than major offensives intended to achieve a decisive penetration of Chinese and North Korean positions. In 1953, the combatants continued to skirmish until a cease-fire went into effect in July, effectively ending the war.

For mounted reconnaissance, the Korean War provided the first test of the changes in doctrine, organization, and materiel implemented in the aftermath of World War II. However, the scope of this experience remained limited to the division reconnaissance companies and battalion reconnaissance platoons. The poor road net and rugged terrain of the Korean peninsula precluded the employment of larger armored formations, including the armored divisions and the new armored cavalry regiments.[83] One analysis of the use of armor in Korea observed, "To an army whose armored doctrine is based primarily on the last phases of the European campaign in World War II, Korea has been a timely reminder that armor must often operate in terrain which does not approach the desirable, let alone the ideal."[84]

Armor Branch Archives

Figure 39. A North Korean T34/85 and an SU-76 knocked out by UN forces.

"Less than ideal" understated the circumstances surrounding the arrival of the first American tank units in the Pusan perimeter in 1950. The 89th Tank Battalion, for example, included only one company of tanks and its reconnaissance platoon. The latter largely provided service support for the company rather than information collection. The confused and desperate fighting around Pusan often required new tank units to enter combat piecemeal, with subordinate companies assigned to support different infantry formations. This dispersion of the tank battalions paralleled the experience of the separate tank battalions in World War II and resulted in the independent employment of the reconnaissance platoons. The most common tasks performed by the latter included road, path, and defile reconnaissance within the Pusan perimeter and the conduct of related trafficability studies. This work fell to the platoon scout section and support squad. The tank section and rifle squad often performed a separate security action such as the creation and defense of a roadblock. This employment suited battlefield conditions, but it violated the doctrinal emphasis on employment of the platoon as a single team. The chaotic situation characteristic of the Pusan fighting, however, was considered exceptional.[85]

The role of the tank battalion reconnaissance platoons changed when American and allied forces counterattacked from the Pusan perimeter. The collapse of North Korean resistance resulted in rapid gains and transformed the overall operation into one of pursuit and exploitation. The reconnaissance platoons provided route reconnaissance, and helped to maintain contact between friendly units, and the rifle squads performed extensive mine-removal operations. The platoons secured assembly areas and guided their parent battalion and supply trucks to them.[86] During the advance into North Korea, one reconnaissance platoon helped to secure military installations while intelligence teams scoured them for useful information.[87]

During the initial period of Chinese intervention, reconnaissance platoons often found themselves thrust into combat roles. As American and UN columns sought to reestablish coherent lines and escape Chinese encirclements, the platoons performed reconnaissance operations that frequently resulted in enemy engagements. Sometimes they were augmented with medium tanks to provide additional combat power. In these freewheeling battles, at least one battalion reconnaissance platoon abandoned its jeeps, instead preferring to rely on attached tanks and the platoon's armored personnel carrier due to the poor survivability of the jeep in combat.[88]

By early 1951, American and UN forces had returned to South Korea, where they fought to preserve the prewar boundary between the two Koreas. The nature of the conflict changed to one of major offensives and counteroffensives. Tank battalions performed a variety of roles, and their reconnaissance platoons generally supported them. In January 1951, the 70th Tank Battalion participated in a reconnaissance in force operation intended to identify enemy attack preparations and destroy hostile forces. The reconnaissance platoon initially served as the battalion reserve, but later undertook active patrolling, supported by tanks. In this action, the platoon relied on spotter aircraft to identify obstacles, minefields, defiles, enemy forces, and potential ambush locations.[89] Reconnaissance operations that preceded the UN counteroffensive of early 1951 again underscored the need for an armored reconnaissance vehicle. Reconnaissance platoons frequently left their jeeps in the rear when embarking on a mission, because "it was realized that it was folly to advance into the extensive defensive positions of the Chinese in a jeep."[90]

In the last year of the war, peace negotiations constrained operations to limited objective actions. The frontlines tended to stabilize and UN forces remained generally in a defensive posture. One report noted that "patrol actions, raids, mass armor and artillery fires set the trend for the year's period."[91] In these circumstances, tanks generally served as infantry

support weapons and the reconnaissance platoons performed extensive patrols. They also participated in vehicle recovery operations and observed enemy activities. Overall, the use of tank-infantry teams supported by the tank battalion's reconnaissance platoon predominated. The teams moved by bounds and employed extensive reconnaissance by fire. The reconnaissance platoon remained in close proximity to the tanks, whose firepower provided them additional security.[92]

The experience of the division reconnaissance companies bore some parallel to that of the battalion reconnaissance platoons. However, the greater combat power of the companies encouraged their use as maneuver assets, particularly in the opening phases of the war. They often covered gaps between division combat teams or provided flank security.[93] Inside the Pusan perimeter, the 7th Infantry Division's reconnaissance company conducted independent operations. Reinforced with two tank platoons, it received orders to take and hold a critical terrain objective. It did so despite heavy North Korean counterattacks and a freewheeling engagement.[94] Following Chinese intervention, the reconnaissance company of the 25th Infantry Division joined with a tank-infantry team to form Task Force *Dolvin*, charged with limited objective attacks. The reconnaissance company frequently executed economy of force operations to support task force maneuver. When Task Force *Dolvin* disbanded, the reconnaissance company transferred to another team responsible for holding a series of hilltop positions. Later, the same company assisted in the reduction of roadblocks barring the retreat of UN forces from northern Korea. During the UN counteroffensive in January 1951, elements of the reconnaissance company entered combat attached to an infantry regimental combat team.[95]

Similarly, in the 1st Cavalry Division, the 16th Reconnaissance Company also performed a variety of combat operations. During the Pusan perimeter fighting, it received orders to take a key town. The unit did so and held it against North Korean counterattacks and mortar shelling. When if finally withdrew, it had lost its commanding officer and many casualties. Many of its jeeps were destroyed and the survivors had to be evacuated via tanks and armored personnel carriers.[96] More commonly, the company provided security for the 1st Cavalry Division, and in the final phases of the war its subordinate platoons conducted patrolling and observation of hostile positions.[97]

When not performing independent operations, the 25th Infantry Division employed its reconnaissance company in a security role. The company components often moved in columns that remained largely road

bound due to the poor terrain conditions in Korea. In these circumstances, the company commander sometimes consolidated all mortar teams in the leading platoon. The company maneuvered by platoons, each one leapfrogging forward to successive objectives. The scout squads detached themselves to secure key terrain features and observe. Behind the reconnaissance platoons trailed the command group and company trains. After an early engagement with Chinese Communist forces in which the company fought in isolation and lost many soldiers and jeeps, the unit routinely established defensive perimeters before nightfall in preparation for the nocturnal attacks favored by the Chinese.[98]

The division reconnaissance companies proved versatile organizations and adapted reasonably well to the Korean environment. They did so despite a number of shortcomings at the start of the conflict. Although they possessed their full complement of light tanks, many had seen only limited use in maneuvers and had not been properly maintained. They also continued to employ halftracks and M39 personnel carriers, vehicles that dated to World War II.[99]

The reconnaissance companies benefited from leaders who understood small unit combined arms operations. As a result,

Armor Branch Archives

Figure 40. Inspection of a disabled North Korean T34/85, initially considered the bane of American mounted troops.

> They utilized the fire squad, support squad, and the scout section with the tank section organically to the platoon, which in reality was a small task force. Platoon leaders utilized the scout section as a reconnaissance force, the support squad (81-mm mortar) as a base of fire and close-in direct artillery support, and the rifle squad as a maneuver force or with the tanks as a combined maneuvering force.[100]

In fact, the general effectiveness of the companies fueled interest in the enlargement of the company into a battalion for the infantry division.

Criticism of the reconnaissance companies focused on their small size and misuse by commanders unfamiliar with them. The security and reconnaissance missions assigned to them encompassed much larger areas than they were intended to cover. One company assumed responsibility for covering a 24-mile gap between divisions. On more than one occasion, senior leaders:

> Not knowing the organization and limitations of the reconnaissance company, attempted to order the tank platoon (which does not exist in the reconnaissance company) on a tank mission. The result was that the commanders of the reconnaissance companies pulled the two tanks from each of their platoons and with a provisional tank platoon, attempted the tank mission with no infantry support. The results were not satisfactory.[101]

Organizational and Materiel Lessons Learned

Analysis of the reconnaissance company and platoon experience in Korea identified a number of deficiencies. Although these units performed credibly throughout the entire conflict and did not share the same difficulties encountered by the mechanized cavalry in World War II, they still proved less than ideal. The reconnaissance platoon proved a versatile team, but the mix of vehicles utilized eroded its effectiveness. The light tank possessed excellent mobility even amid the mud, rice paddies, and rugged terrain of Korea. The headquarters, support squad, and scout section labored in jeeps that proved too road bound. The support squad included two jeeps towing cargo trailers. Fully laden, these vehicles could not navigate effectively off roads. Hence, the 81-mm mortar and ammunition often had to be dismounted and hand carried into a firing position—a time-consuming and laborious process. The disparity in mobility between the full tracked and wheeled components of the platoon complicated its

employment. It forced the platoon leader to either constrain operations to terrain over which the entire unit could traverse or divert his jeep assets from the primary advance route. The latter option separated the platoon and complicated command and control.[102]

The scout squad faced a unique problem. It included two jeeps—one which carried a machinegun and one which mounted a radio. Using the bounding movement techniques encouraged in doctrine posed a dilemma, since the radio jeep could not provide support fire. If the radio jeep led, however, its loss eliminated communications with the rest of the platoon. While many soldiers favored simply mounting a machinegun on the radio jeep, this solution posed ammunition stowage problems not easily reconciled with the scouts' gear and limited vehicle space.[103]

Survivability issues also plagued jeep use. The vehicle's lack of armor protection made it vulnerable in any contact with enemy forces. Given the aggressive nature of reconnaissance doctrine, the likelihood of such contact increased, even without consideration of the chaos associated with an actual combat environment. As one reconnaissance platoon leader observed, "You very seldom knew when you are going to be hit by the enemy and his first burst can ruin your scout section."[104] For platoon leaders expected to lead from the front, the jeep's vulnerability added another command and control problem. In cases where heavy contact was expected, platoons simply left their jeeps in the rear and placed their soldiers on tanks and armored personnel carriers. During the retreat from North Korea that followed Chinese intervention, many jeeps were simply abandoned.[105]

Jeeps rarely survived their first encounter with enemy fire or mines. In the confusing situations in which reconnaissance units sometimes found themselves, the inability to survive a surprise contact often resulted in loss of life. The 25th Reconnaissance Company discovered this reality during operations near Seoul in January 1951. One of its platoons maneuvering in column with its scouts forward as per doctrine worked its way through urban streets filled with fleeing refugees. The platoon suddenly came under crossfire from automatic weapons and lost nearly every jeep, its cargo trailers, and its mortar in the first blast. The survivors continued to fight dismounted, supported by the close-range fire of the light tanks until directed to withdraw.[106] The 3d Reconnaissance Company also suffered an ambush in which enemy fire knocked out every jeep and forced the crews to seek cover. Tanks and armored personnel carriers had to be used to evacuate the casualties.[107]

The 24th Reconnaissance Company commander noted, "Enemy fire is normally received by the lead vehicle which is usually a scout jeep. There were times when the company had to drive through enemy fire to extricate itself from positions which were untenable—the jeeps were very susceptible to this fire."[108] The jeep's vulnerability led to steady losses and morale erosion that unit commanders could not fail to notice. Improvised armor protection resulted among some units. According to one platoon leader, "My unit placed one sheet of armor in lieu of windshields on the jeep. This saved many lives I'm sure, and also achieved the psychological effect of some protection."[109] With unit effectiveness impacted, several commanders recommended the jeep's replacement with some type of tracked, armored personnel carrier.[110] Major General Hobart R. Gay, commander of the 1st Cavalry Division, summarized the views of many reconnaissance soldiers regarding the jeep: "A very mobile and dependable machine—but affords no protection and in no way can be considered a suitable vehicle from which to fight."[111] To an NCO in the 7th Reconnaissance Company, the issue was simple: "Many of our casualties were in jeep-led columns. . . . The best damned fighting men in the world should have the best equipment his tax money, his family's tax money, and his friends' tax money can buy."[112] Both men wanted an armored vehicle in the scout section.

The jeep's problems tended to overshadow other shortcomings in the reconnaissance platoon. Reconnaissance personnel desired improvements to the M24 light tank's firepower through the relocation of the turret-mounted .50-caliber machinegun to the front of the tank commander's hatch and the addition of a second machinegun forward of the loader's hatch.[113] The M24 did not possess the firepower to combat effectively the T34s used by the North Koreans. Its removal from tank units was sought, although in Korea the vehicle was still considered suitable for reconnaissance purposes.[114] For the Inchon landings in which heavy resistance was anticipated, the 7th Reconnaissance Company substituted medium tanks for its M24s to provide additional firepower and armor protection.[115] Army field forces further intended to replace the light tank in reconnaissance units with the M41 light tank, carrying a 76-mm gun designed for antitank use.[116] This intended action also reflected conditions in Europe. The likelihood of facing a highly mechanized threat there encouraged a greater emphasis on antitank capabilities that the M24 did not possess. It was considered inadequate for use in the armored cavalry regiments that would be among the first in combat in the event of a Soviet attack. Efforts to replace M24s in use by Constabulary units were already underway.[117]

Courtesy *Armor Magazine*

Figure 41. The M39 Armored Personnel Carrier, initially developed at the close of World War II and based on the chassis of the M-18 Gun Motor Carriage.

Other common deficiencies identified in reconnaissance units included the armored utility vehicle and radios. The former transported the rifle squad of the reconnaissance platoons. Pending the fielding of the newer M44 armored utility vehicle, platoons used the less than satisfactory halftrack and the M39. The halftrack retained the same faults identified in World War II, while the M39 possessed a minimal carrying capacity and tended to throw its narrow tracks. Both vehicles had open tops.[118] Radio sets suffered from age, limited maintenance in the years prior to the war, and inexperienced personnel. The mountainous terrain further interfered with signals. The collective impact lay in the periodic breakdown of radio communications. Army field forces sought to provide newer and more capable radios, but also stressed the importance of relying on experienced radio operators who knew how to exploit terrain to their advantage.[119]

The Way Ahead

The Korean War intensified efforts to develop and field new equipment. In 1950, the United States made little distinction among Communist

movements in different countries. It considered all of them linked and working under the direction of the Kremlin in Moscow. Consequently, North Korea's aggression was at first seen as a prelude to larger Soviet military action in Central Europe. Given the disparities in readiness and materiel between American and Soviet forces in Europe, considerable urgency surrounded the rapid development of new materiel. Within the armor community, the M48 tank program became one of the most noticeable examples of this effort. A similar threat-driven environment characterized work on new materiel for reconnaissance organizations.

In October 1951, the US Army Policy Conference on Armor convened at Fort Monroe, Virginia. This conference reviewed materiel development since 1949 and sought to establish objectives for further work. The same month the Tripartite Conference on Armor and Bridging brought representatives from the United States, the United Kingdom, and Canada together to discuss areas of mutual interest and the possibilities for coordinated development. In 1952, tanks constituted the primary focus of the Conference on Medium and Light Gun Tanks. The next year, the Army Tank Panel delivered its final report on armor developments. These meetings marked the highlights of related research and analysis efforts conducted by the Army field forces, the Armor Branch, and the technical services.[120]

These efforts confirmed the need for both a light and a heavy reconnaissance vehicle. For each platform, a set of requirements emerged, shaped by the Korean War experience and the looming threat of Soviet forces in Europe. The need for reconnaissance units to fight underwrote the need for combat power in determining the nature of vehicles desired.[121] Doctrine further embraced the value of combat operations and provided the rationale for increased firepower and protection on platforms intended for reconnaissance organizations.

The light tank constituted the principal heavy reconnaissance vehicle studied. In Korea, the M24 proved unable to cope with the more heavily armed and armored T34/85s utilized by the North Koreans. The Army recommended its use be restricted to reconnaissance units intended for combat against light armor or soft targets. In Europe, however, American forces expected to fight the much more mechanized Soviet Army and desired increased firepower for all tanks, including those in reconnaissance units. The Army preferred a light tank mounting at least a 76-mm gun to cope with the growing threat of Soviet armor. To support operations in Korea, the Army rushed the M41 light tank through development and began production in 1951. Limited numbers entered combat in Korea, but the war

served largely as an operational test for the vehicle. Not until the war's end did the M41 begin to equip combat units in large quantities.[122]

The M41 marked an improvement over the M24, but the Army considered the M41 only marginally acceptable. The 76-mm main gun and sophisticated rangefinder provided the new tank a significant increase in firepower. It also proved noisy, and its poor fuel economy resulted in a short operational radius—qualities undesirable in reconnaissance units.[123] The M41's most redeeming feature lay in its availability. Design work had begun in the 1940s, and it could be fielded quickly. However, it did not possess the mix of armor protection, agility, fuel economy, fire control system, sustainability, cross-country mobility, crew comfort, low noise signature, and low silhouette desired. A sense of what the Army desired is indicated in this excerpt from a study submitted to Army Field Forces in 1952:

> For the present and possibly interim period, a light gun tank is required that is distinguished by its exceptional agility, its outstanding mobility on roads, cross country and over difficult terrain, its quietness of operation, its low production cost, economy of fuel consumption, great mechanical reliability, simplicity maintenance with easily accessible components, long cruising range, and capability for sustained action. The subject tank must be less of a burden on the over-all national economy than that of any light tank built recently. . . . The weight of the tank combat loaded must not exceed 21 tons; however, every effort must be made to lower this weight. The tank must possess armament commensurate to its missions to include main armament capable of defeating the frontal armor of armored vehicles organic to enemy reconnaissance units. Its armor should give the best protection practicable consistent with the more important requirements of weight, mobility, and gun performance; however, maximum practicable protection should be provided against artillery shell fragments and small arms fire.[124]

These requirements proved difficult to realize and continued to encourage alternative approaches. The armored car retained support, particularly due to its light weight, low noise signature, and fuel economy. This vehicle type was also considered easier to maintain and air transport, while its wheels permitted greater mobility on roads. Yet the technology of the day did not offer an effective means of matching a large caliber gun with a wheeled chassis. Research into a more effective armored car continued,

but the Army recognized Canada and the United Kingdom as the leaders in this effort.[125] Some interest emerged in the British FV701 Ferret 4x4 light armored car, but this platform plainly could not replace the light tank.[126] It could not carry the heavier armament considered necessary. Although interest in armored cars continued, the inability to meet Army requirements with a wheeled vehicle, coupled with the latter's inferior cross-country mobility, encouraged a trend toward tracked vehicles, particularly for the light tank and personnel carrier roles. A survey conducted by the Armor School of soldiers in reconnaissance units also found a preference for the light tank over the armored car.[127]

In addition to the light tank, the Army also reviewed its principal reconnaissance vehicle—the jeep. Many of the vehicles used in the Korean War dated from World War II, but in 1952 the M38A1 ¼-ton truck began to enter service. It featured a number of improvements, including a new engine and strengthened frame.[128] These improvements did not eliminate the jeep's primary weaknesses when used for reconnaissance—mobility and survivability. Its inability to keep pace with the tracked components of the reconnaissance platoon and its lack of any armor protection incurred considerable criticism. In scout sections, soldiers found the pedestal-mounted machineguns to possess poor accuracy. Sustained firing required the entire crew to man the weapon. Surveys of reconnaissance soldiers with field experience indicated a general desire for replacing the jeep with a light armored vehicle.[129]

Efforts to provide a more effective scout platform predated the Korean War but had not generated any viable concepts. Work begun to prepare a light armor package for the jeep were found unsatisfactory and terminated. A variety of alternative vehicles received consideration, including the ¾-ton truck, the British FV701, the British Bren carrier, and even a tracked jeep. The last platform stemmed from World War II efforts to provide a light armored, tracked vehicle for use by airborne forces. A more exotic approach lay in the use of an M50 (Ontos) reconfigured as a scout vehicle. Designed as a light antitank vehicle mounting six 106-mm recoilless rifles, even with modification the M50 was considered a worse choice than the jeep. None of these efforts resulted in a viable replacement for the ¼-ton truck.[130]

Part of the problem lay in the clear identification of the requirements for a lightly armored reconnaissance vehicle. No viable standard of comparison or a commonly accepted set of characteristics for such a vehicle existed.

> Probably no subject has received more attention with less unanimity of opinion than the need for lightly armored

> vehicles in reconnaissance units. The subject is confused by the lack of a clear concept as to what is expected of the personnel who are to ride in such vehicles. Are they to fight or observe from the vehicle, or are they to ride to the vicinity and observe on foot?[131]

An effort in 1953 by the Armor School to identify requirements for this vehicle underscored the problem. The requisite vehicle needed to be low cost, easy to maintain, air transportable, small, quiet, possess effective high cross-country mobility, provide protection from small arms, mount a machinegun, and weigh no more than 2½-tons. A further complication arose from the general view of soldiers that the same vehicle should be used for command and control purposes. Meeting these requirements in a single platform proved beyond the technology and production capabilities then available.[132]

Nor was the jeep without its supporters. It met many of the Armor School requirements, and it had its patrons. General Harmon, a well-known and outspoken armor commander with a distinguished combat record, considered the jeep an excellent platform: "Now, you have a very fine vehicle in the jeep and everybody is trying to ruin it by loading it up so it won't be worth a damn. . . . You put a big plate of armor on it and try to fix it up so it will protect you against mines and you have nothing, absolutely nothing."[133] Responding to an Armor School survey concerning the optimal scout vehicle, one general wrote: "Throughout this questionnaire, it is implied that more efficient, aggressive and higher morale unit can be produced by providing an over-weighted, sluggish, armor-protected ¼-ton truck capable of engaging in a fire fight. A

Courtesy *Armor Magazine*

Figure 42. Major General Ernest N. Harmon commanded armored formations in World War II before establishing the Constabulary in postwar Germany. He remained influential within the Armor community afterward.

reconnaissance unit does not depend on a single vehicle. It is composed of a number of different types."[134] Compared with the cost of a new vehicle, the continued reliance on the jeep appeared to make sense. Soldiers fighting in Korea noted that such financial justification for the jeep's retention did not include the cost of life insurance for men entering combat in unarmored vehicles.[135]

The jeep continued to equip scout sections, but the rifle and support squads benefited from vehicle upgrades. After several years of design and development, the Army began fielding the M75 Armored Infantry Vehicle in 1952. Intended as an infantry squad carrier, it resembled an armored box on tracks. It weighed 21 tons and carried a single machinegun, but possessed the limited operational radius of 115 miles on roads. Despite the incorporation of components common with the M41 light tank, it proved expensive and its air-cooling vents were considered vulnerable to small arms. Nevertheless, it marked an improvement over the limited mobility and open topped halftrack and the small capacity and open top of the M39.[136] The M59 Armored Personnel Carrier succeeded the M75. Described as "an armed, watertight, self-propelled, armored box," it improved on the design features of the M75. In particular, it incorporated features to simplify maintenance and offered a fording capability. It proved to be a multipurpose vehicle and remained in service throughout the latter 1950s.[137]

In Korea, dissatisfaction with the jeep-equipped mortar section led to some units being re-equipped with the M21 mortar carrier. Initially developed and fielded in World War II, this vehicle constituted a modified M3 halftrack. It retained the same automotive qualities but added an 81-mm mortar and ammunition in lieu of infantry passengers. Although it shared the drawbacks associated with halftracks, it proved far more effective than the jeep and trailer mix in the reconnaissance platoons. It also partially restored the mobility differential between the support squad and the tracked elements of the platoon.[138]

These changes in materiel reflected the Korean War experience, but once combat operations ceased, the Army leadership's focus shifted to future battlefields. In particular, it began to consider how to conduct operations in a combat arena that included atomic weapons. The destructive power of these weapons discouraged the movement and employment of masses of men and materiel. Such concentrations were highly vulnerable to atomic destruction. Instead, Army concepts of operations focused on highly mobile, dispersed organizations that concentrated only at the moment of battle, quickly spreading out again afterward.

This vision of future operations necessitated changes in the Army's force structure. Therefore, studies and tests began as the first phase in another division redesign that would necessarily impact training, doctrine, and materiel developments. While this work began, training began to reorient toward operations over greater width and depth and anticipated a nonlinear environment. Combined arms teams with high mobility and a great degree of command and organizational flexibility were desired. Exactly how the division redesign would affect reconnaissance organizations remained uncertain, but the more dispersed battlespace suggested a continued emphasis on security and reconnaissance functions. Another Armor luminary, Lieutenant General Bruce C. Clarke, then commanding US Army forces in the Pacific, identified the future need: "Reconnaissance must be emphasized, and a concerted effort made to provide timely information to units below division level. The Corps and Army must have adequate and well-trained reconnaissance units." Adequacy increasingly included the integration of aircraft, including helicopters, and ground reconnaissance.[139]

General Clarke also highlighted the importance of thinking about future needs rather than those of the recent past.[140] Looking ahead encouraged a vision of combat shaped by high mobility, extreme violence, and rapid dispersion. Critical to this conceptualization was the ability to find enemy main force elements—the focal point of temporary concentrations of combat power. A parallel requirement emerged in the need to prevent hostile forces from pinpointing friendly forces. Clearly, reconnaissance and counterreconnaissance would prove central to maneuver and security on the atomic battlefield just as they had in past conflicts.[141]

The most important question, therefore, was not the definition of new reconnaissance principles, but determination of the best tactics, techniques, and procedures that reflected the new realities of conventional force operations in the atomic age. However, old problems remained. Ground reconnaissance units needed the ability to move much faster than the organizations they supported to provide information in a timely fashion to influence maneuver. They also needed the ability to operate in rugged terrain away from roads.[142] Too often reconnaissance units lacked the means to do either. With reconnaissance and main body elements possessing similar mobility, the former was hard pressed to remain out front. The absence of a mobility differential coupled with frequent time constraints resulted in reconnaissance units moving fast with minimal security. These conditions all but precluded the use of the bounding overwatch techniques stressed in doctrine. They also increased the vulnerability of the unarmored scout jeeps that routinely led reconnaissance platoons. The least

Courtesy *Armor Magazine*

Figure 43. Soldiers in the 3d Armored Cavalry Regiment receive instruction on the M75 Armored Infantry Vehicle.

survivable element found itself racing from point to point rather than relying on stealth and deliberate movement as intended.[143]

The dispersion associated with the atomic battlefield and the related reconnaissance needs required units with the ability to operate independently and move rapidly over great distances. Reconnaissance platoons found themselves increasingly incapable of such action. The fielding of the M41 light tank and the M75 Armored Infantry Vehicle boosted survivability and combat power, but at the cost of increased logistical dependency. Both vehicles consumed fuel at a high rate, necessitating frequent resupply and limiting their operational radius. Consequently, reconnaissance platoons became tethered to their parent organization on whom they depended for fuel. Far-ranging missions of the type seemingly required on the atomic battlefield became problematic.[144]

All of these considerations led some officers to seek an answer through air transport. Reliance on aircraft to enhance reconnaissance had been common in World War II and Korea. In the future, helicopters offered the ability to move reconnaissance units quickly over broad tracts and rugged terrain. They could be landed near their objectives, conduct their mission, and airlifted to another position. In this manner, they might regain their mobility superiority and move rapidly without compromising their security. Such an approach suggested the need for lighter vehicles that could be transported by air.[145]

Reliance on aircraft to resolve reconnaissance issues paralleled a much greater Army-wide interest in the use of tactical airlifts, particularly via helicopter. Air movement met the atomic requirements of rapid movement, flexibility, and fast concentrations of men and materiel. Technological and budgetary issues remained to be overcome, but interest in a greater integration of aircraft and reconnaissance units proved persistent. In the latter 1950s, it led to the emergence of a new type of cavalry unit based on the helicopter. The bulk of the Army's mounted reconnaissance assets, however, remained on the ground in vehicles. To them lay the task of how best to adapt to the changing conditions of an increasingly lethal battlefield.

Notes

1. John B. Wilson, *Army Lineage Series: Maneuver and Firepower: The Evolution of Divisions and Separate Brigades* (Washington, DC: Center of Military History, 1998), 208; Mary Lee Stubbs and Stanley Russell Connor, *Army Lineage Series: Armor-Cavalry Part I: Regular Army and Army Reserve* (Washington, DC: Center of Military History, 1984), 74.

2. Michael A. Rauer, "Order Out of Chaos: The United States Constabulary in Postwar Germany," *Army History*, No. 45 (Summer 1998): 22–35; Robert S. Cameron, Briefing, Subj: There and Back Again: Constabulary Training and Organization, 1946–1950, 2000, Armor Branch Archives, electronic, Hist/Hist Ref/Evolution of Armor/Constabulary.

3. United States Forces, European Theater, "The General Board, Study No. 49: Tactics, Employment, Technique, Organization, and Equipment of Mechanized Cavalry Units," 1945, 20–22 (hereafter cited as Study No. 49).

4. Ibid.

5. Ibid., 20–22; Wilson, *Maneuver and Firepower*, 223.

6. United States Forces, European Theater, "The General Board, Study No. 48: Organization, Equipment, and Tactical Employment of the Armored Division," 1945, appendix 5, 2, appendix 6, 1, appendix 8, chart n.

7. United States Forces, European Theater, "The General Board, Study No. 50: Organization, Equipment, and Tactical Employment of Separate Tank Battalions," 1945, appendix 3.

8. Captain Stuart J. Seborer, "Brief for a Cavalry Combat Platoon," *Armor* LV, no. 2 (March–April 1946): 55.

9. Quoted in Seborer, "Brief for a Cavalry Combat Platoon," 24.

10. Captain Stuart J. Seborer, "Modern Cavalry Organization," *Cavalry Journal* LVI, no. 2 (March–April 1947): 23–25.

11. "Report of Army Field Forces Advisory Panel on Armor to Chief of Staff of the Army," Vol. I, 18 February 1949, section V, 5, Armor Branch Archives.

12. "Report of Army Field Forces Advisory Panel on Armor to Chief of Staff of the Army," Vol. II, 18 February 1949, tab 2, annex B (Brief of Testimony of US Army Reconnaissance Policy Witnesses), 3.

13. Letter draft, Major General Ernest N. Harmon to Lieutenant Colonel Hugh M. Exton, 1948, Armor Branch Archives, electronic, Hist/Hist Ref/Evolution of Armor/Post WWII/Personalities.

14. Armored Conference Memorandum No. 2, Headquarters, US Army Armored School, Subj: Organization of and Instructions for Committees of the Armored Conference, 26 April 1946, enclosure 5, Armor Branch Archives, electronic, Hist/Hist Ref/Evolution of Armor/Post WWII/Conferences. This conference was the first such event for armored developments and issues, and it established a precedent that continues to the present day.

15. Department of the Army, Table of Organization and Equipment No. 17-57N: Reconnaissance Company, 23 January 1948, US Army Armor School Library.

16. Department of the Army, Table of Organization and Equipment No. 17-26N: Headquarters, Headquarters and Service Company, Medium Tank Battalion, 5 April 1948, US Army Armor School Library; Table of Organization and Equipment No. 17-57N: Reconnaissance Company, 23 January 1948; Major Craig S. Harju, "White Paper—A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," US Army Armor School, Fort Knox, KY, 18 September 1989, 16–18. Available through the Defense Technical Information Center as Report AD-A214 798.

17. Table of Organization and Equipment No. 17-57N: Reconnaissance Company, 23 January 1948.

18. Lieutenant Colonels James I. King and Melvin A. Goers, "Modern Armored Cavalry Organization," *Armored Cavalry Journal* LVII, no. 4 (July–August 1948): 49.

19. Rauer, "Order Out of Chaos," 22–35.

20. Stubbs and Connor, *Armor-Cavalry Part I*, 76; Rauer, "Order Out of Chaos," 32; Cameron, Briefing, Subj: There and Back Again: Constabulary Training and Organization, 1946–1950.

21. The uncertainty regarding branch status was also evidenced in the naming of the related branch journal, which was renamed during this period *Armored Cavalry Journal*.

22. "Report of Army Field Forces Advisory Panel on Armor to Chief of Staff of the Army," Vol. I, 18 February 1949, section V, 1–2; King and Goers, "Modern Armored Cavalry Organization," 49–50; Colonel C.H. Reed, "Armored Cavalry Light: Its Organization as Derived From Its Missions," *Armored Cavalry Journal* LVIII, no. 1 (January–February 1949): 13–16.

23. King and Goers, "Modern Armored Cavalry Organization," 49–50; Reed, "Armored Cavalry Light: Its Organization as Derived From Its Missions," 17; Department of the Army, "Table of Organization and Equipment 17–55, Reconnaissance Battalion, Armored Cavalry Regiment (Light)," 7 October 1948, US Army Armor School Research Library.

24. King and Goers, "Modern Armored Cavalry Organization," 49–50; Reed, "Armored Cavalry Light: Its Organization as Derived From Its Missions," 17; "Table of Organization and Equipment 17–55, Reconnaissance Battalion, Armored Cavalry Regiment (Light)," 7 October 1948.

25. Lieutenant Colonel Ernest T. Barco Jr., "Light Aviation Joins Armored Cavalry," *Armored Cavalry Journal* LVIII, no. 3 (May–June 1949): 2–5.

26. Reed, "Armored Cavalry Light: Its Organization as Derived From Its Missions," 15, 17, 35.

27. Ibid., 17.

28. "Report of Army Field Forces Advisory Panel on Armor to Chief of Staff of the Army," Vol. I, 18 February 1949, section I, 8, 12.

29. Ibid., section II, 2.

30. Ibid., section V, 1.

31. Department of the Army, FM 17-22, *Reconnaissance Platoon and Reconnaissance Company* (Washington, DC: Government Printing Office, 1950), 2.

32. Ibid., 3.
33. Ibid., 67.
34. Ibid., 65–74.
35. Ibid., 97.
36. Ibid., 87, 90, quotation from page 90.
37. Ibid., 81–83, 100–104.
38. Ibid., 105–106, 115–123.
39. Ibid., 83, 97.
40. Ibid., 76–81, 90–96.
41. Ibid, 6, 8–10, 125, 138.
42. Ibid., 6, 125–126, 138, 144, 148.
43. Ibid., 191–203, 241–256.
44. Ibid., 75.
45. Ibid., 11–12, quotation from pages 190–191.
46. Ibid., 191.
47. Ibid., 123–124; Department of the Army, FM 17-33, *Tank Battalion* (Washington, DC: Government Printing Office, 1949), 9–10.
48. FM 17-33 (1949), 7, 9–10, 22, 31, 139–140, 164, 229–230, 253, 297, quotation from page 187.
49. Department of the Army, FM 17-35, *Reconnaissance Battalion, Armored Division* (Washington, DC: Government Printing Office, 1951), 3, 11, quotation from page 3.
50. Ibid., 5–6, 97.
51. Ibid., 8–10.
52. Ibid., see chapters 3 and 4.
53. Ibid., 7–8.
54. Ibid., 308, 314, quotation from page 317.
55. Department of the Army, FM 17-95, *The Armored Cavalry Regiment and the Armored Cavalry Reconnaissance Battalion* (Washington, DC: Government Printing Office, 1951), 1, 3, 7–8, quotation from page 3.
56. Ibid., 19–20, 163, 166, quotation from page 166.
57. Colonel Samuel L. Myers, "The Cavalry Regiment of Today," *Armor* LIX, no. 2 (March–April 1950): 58.
58. Captain Stephen H. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units" (student paper N-2/46.102, US Army Armor School, Fort Knox, KY, May 1952), 60–63, US Army Armor School Library.
59. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 62–63; Brigadier General Riley F. Ennis, Memorandum, Subj: Liaison Visit to Headquarters Fourth Army and Second Armored Division 16–20 October 1950, 27 October 1950, 1, NARA, RG 337, Entry 55I, Box 169.
60. Major Robert F. Cunningham et al., "Ontos in the Reconnaissance Platoon" (student paper, 45.4-19, US Army Armor School, Fort Knox, KY, May 1953), 17, US Army Armor School Library.

61. Smith et al., "The Need for a Lightly Amored Vehicle in U.S. Reconnaissance Units," 64–66; Cunningham et al., "Ontos in the Reconnaissance Platoon," 17.

62. Cunningham et al., "Ontos in the Reconnaissance Platoon," 16.

63. Army Field Forces Inspecting Team, "Report of Inspection of European Command," September 1950, 2, NARA, RG 337, Entry 55I, Box 180; Myers, "The Cavalry Regiment of Today," 58–60.

64. Smith et al., "The Need for a Lightly Amored Vehicle in U.S. Reconnaissance Units," 8–9.

65. Ibid., 8, 10–11.

66. "Report of Army Field Forces Advisory Panel on Armor to Chief of Staff of the Army," Vol. II, 18 February 1949, annex C, tab 8, enclosure 1, 1.

67. Ibid., 2.

68. "Report of Army Field Forces Advisory Panel on Armor to Chief of Staff of the Army," Vol. I, 18 February 1949, section I, 8.

69. Ibid., section I, 8, 14.

70. Ibid., section V, 5.

71. Ibid., section V, 5.

72. Ibid., section V, 5–6.

73. Ibid., section V, 7.

74. Ibid., Vol. II, annex E, 1–2.

75. Ibid., Vol. I, section IX, 1–2.

76. Ibid., section I, 8.

77. Ibid., Vol. II, annex D, tab 9; annex E, 29.

78. Ibid., Vol. II, 18 February 1949, annex D, tab 10; annex E, 29; R.P. Hunnicutt, *Bradley: A History of American Fighting and Support Vehicles* (Novato, CA: Presidio Press, 1999), 32, 37–39, 43–48; Captains Glenwood W. Flint and Lewis B. Tixier, "The M59," *Armor* LXIII, no. 2 (March–April 1954): 7.

79. War Department Observers Board, "AGF Report No. 1007: Mechanized Cavalry Organization and Tactics," 5 June 1945, in AGF Observer Board, European Theater, "Reports of Observers, ETO 1944-1945," Vol. 5, C-1007, 5, MHI Archives; "M-39 Armored Utility Vehicle (AUV)," http://www.olive-drab.com/idphoto/id_photos_m39auv.php (accessed 17 March 2009).

80. Department of the Army Armored Panel, "The Report of Department of the Army Armored Panel," 1 July 1950, 1, Armor Branch Archives, paper, Armor I.

81. Ibid., 30–31.

82. Stubbs and Connor, *Armor-Cavalry Part I*, 74–75.

83. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 70; Cunningham et al., "Ontos in the Reconnaissance Platoon," 17.

84. Captain Milton R. Thompson et al., "Employment of Armor in Korea, Vol. I: The First Year" (student report 45.3-11, US Army Armor School, Fort Knox, KY, May 1952), 20.

85. Thompson et al., "Employment of Armor in Korea, Vol. I: The First Year," 52–54, 56, 59; Smith et al., "The Need for a Lightly Amored Vehicle in U.S. Reconnaissance Units," 70–71.

86. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 71–72.

87. Thompson et al., "Employment of Armor in Korea, Vol. I: The First Year," 105.

88. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 72–74.

89. Thompson et al., "Employment of Armor in Korea, Vol. I: The First Year," 144, 148, 153, 156.

90. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 74.

91. Captain Harry H. Shields Jr. et al., "Employment of Armor in Korea," Vol. II: The Second Year" (student report No. 45.4-35, US Army Armor School, Fort Knox, KY, 1953), 73.

92. Ibid., 51, 60–62, 65, 130.

93. "Report of First OCAFF [Office of the Chief of Army Field Forces] Observer Team to the Far East Command," 16 August 1950, appendix C-4, 2, NARA, RG 337, Entry 55I, Box 171.

94. Thompson et al., "Employment of Armor in Korea, Vol. I: The First Year," 96–98.

95. Ibid., 125, 129, 131, 134, 138.

96. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 77–78.

97. Shields et al., "Employment of Armor in Korea," Vol. II: The Second Year," 26, 31, 33, 35, 60, 62.

98. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 75–77.

99. "Report of First OCAFF Observer Team to the Far East Command," 16 August 1950, appendix C-4, 1–2.

100. Ibid., appendix C-4, 2.

101. Ibid., appendix C-4, 2, 5, quotation from page 5.

102. Henry S. Marcantionio, "Some Ideas From a Junior Leader," *Armor* LX, no. 6 (November–December 1951): 17; Cunningham et al., "Ontos in the Reconnaissance Platoon," 16–17; Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 29–30, 73, 82.

103. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 51.

104. Ibid., 73.

105. Ibid., 30, 72–74.

106. Ibid., 73, 79–80.

107. Cunningham et al., "Ontos in the Reconnaissance Platoon," 68.

108. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 81.

109. Ibid., 73.

110. Ibid., 30–31, 72–73, 78–81.

111. Ibid., 78.

112. Ibid., 30.

113. "Report of First OCAFF Observer Team to the Far East Command," 16 August 1950, appendix C-4, 6.

114. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 30; "Report of First OCAFF Observer Team to the Far East Command," 16 August 1950, appendix C-4, 6.

115. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 74.

116. "Comments of the Chief of Army Field Forces on Section II, Conclusions, and Section III, Recommendations, of Report of First Office, Chief of Army Field Forces' Observer Team to the Far East Command, 16 August 1950," 1950, 36, NARA, RG 337, Entry 55I, Box 171.

117. "Report of Inspection of European Command," September 1950, 8–9, 13, tab E-2, 6.

118. "Report of First OCAFF Observer Team to the Far East Command," 16 August 1950, appendix C-4, 6.

119. "Report of First OCAFF Observer Team to the Far East Command," 16 August 1950, appendix C-4, 7; "Comments of the Chief of Army Field Forces on Section II, Conclusions, and Section III, Recommendations of Report of First Office, Chief of Army Field Forces' Observer Team to the Far East Command, 16 August 1950," 1950, 10.

120. Major James F. Parkins et al., "The Heavy Reconnaissance Vehicle for the Reconnaissance Platoon" (student report N-2/46.87, US Army Armored School, Fort Knox, KY, April 1953), 3–4, US Army Armor School Library; Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 19–20; Department of the Army, "Tank Panel Final Report," May 1953, Armor Branch Archives, paper, Armor I.

121. Parkins et al., "The Heavy Reconnaissance Vehicle for the Reconnaissance Platoon," 12–14.

122. Parkins et al., "The Heavy Reconnaissance Vehicle for the Reconnaissance Platoon," 28–30, 33, 35; Cunningham et al., "Ontos in the Reconnaissance Platoon," 7; Steven J. Zaloga and Lieutenant Colonel James W. Loop, *Modern American Armor: Combat Vehicles of the United States Army Today* (Harrisburg, PA: Arms and Armour Press, 1982), 29.

123. "Final Report of United States Army Armor Policy Conference, 15–19 November 1954," section V, 11, Falkovich Papers, Box 2, Patton Museum of Cavalry and Armor; Parkins et al., "The Heavy Reconnaissance Vehicle for the Reconnaissance Platoon," 30, 80.

124. Parkins et al., "The Heavy Reconnaissance Vehicle for the Reconnaissance Platoon," 19, 60, quotation from page 60.

125. Ibid., 30, 62–76.

126. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 20.

127. Parkins et al., "The Heavy Reconnaissance Vehicle for the Reconnaissance Platoon," 27, 47.

128. US Army Transportation Museum, "Highway Operations," http://www.transchool.eustis.army.mil/museum/KoreaHighway.htm (accessed 24 January 2008).

129. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 31, 67–68, 81.

130. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 19–20, 86, 89–90, 92, 94, 96, 106; Cunningham et al., "Ontos in the Reconnaissance Platoon," 81–82.

131. Cunningham et al., "Ontos in the Reconnaissance Platoon," 20–21, quotation from page 20.

132. Ibid., 22–29.

133. Ibid., 21.

134. Smith et al., "The Need for a Lightly Armored Vehicle in U.S. Reconnaissance Units," 82.

135. Ibid., 38.

136. Hunnicutt, *Bradley: A History of American Fighting and Support Vehicles*, 48, 50, 423; "M-75 Armored Personnel Carrier," http://www.olive-drab.com/idphoto/id_photos_m75apc.php (accessed 17 March 2009).

137. Flint and Tixier, "The M59," 7–9.

138. Cunningham et al., "Ontos in the Reconnaissance Platoon," 17; R.P. Hunnicutt, *Half-Track: A History of American Semi-Tracked Vehicles* (Novato, CA: Presidio Press, 2001), 90, 215.

139. Lieutenant General Bruce C. Clarke, "The Designing of New Divisions for Our Army," *Armor* LXIV, no. 3 (May–June 1955): 22–25, quotation from page 25.

140. Ibid., 23.

141. Lieutenant Colonel George B. Pickett Jr., "Eyes and Ears for Tomorrow's Commanders," *Armor* LXIV, no. 5 (September–October 1955): 30–31.

142. Captain Howard J. Dager, "A New Deal for Division Reconnaissance," *Armor* LXIII, no. 6 (November–December 1954): 19.

143. First Lieutenant Ken A. Davis, "Better Security—Better Reconnaissance," *Armor* LXIII, no. 4 (July–August 1954): 2.

144. Ibid.

145. Dager, "A New Deal for Division Reconnaissance," 19–20; Davis, "Better Security—Better Reconnaissance," 2.

Chapter 4

Survival on a Nuclear Battlefield

The years following the Korean War witnessed a general decline in Army conventional force capability. Faced with budgetary constraints and a national defense policy based on nuclear weapons, the Army struggled to sustain readiness. Doctrine and tactics assumed the presence of nuclear weapons on the battlefield, triggering major shifts in organization. Against this backdrop, reconnaissance incorporated the lessons from Korea and adjusted to the nonlinear, dispersed, and highly-fluid environment associated with atomic weapons. By 1960, developments abroad undermined the validity of massive retaliation and encouraged the rebuilding of conventional ground forces into more robust, flexible formations. This change triggered another round of restructuring for reconnaissance organizations. The most contentious issues concerned the maneuver battalion reconnaissance platoon. The overall effectiveness of division reconnaissance and the armored cavalry regiment increased, partially through the successful incorporation of aerial reconnaissance and surveillance assets. Deficient areas in reconnaissance development included institutional training and delays in the fielding of new materiel.

Massive Retaliation

In the years following the Korean War, President Dwight D. Eisenhower's defense policy focused on the long-term containment of Soviet aggression. The cornerstone of this policy lay in possession of an arsenal of nuclear weapons coupled with the intent to use them on a large scale to thwart Soviet expansionism. The formation of the North Atlantic Treaty Organization (NATO) and the Southeast Asia Treaty Organization (SEATO) established military alliances to supplement the threat of nuclear weapons use with a conventional military deterrent. Less overt measures included the application of military and economic aid packages abroad to discourage tolerance of a Communist presence and the use of covert activities.[1]

The Eisenhower administration did not have the luxury of wartime budget largesse. It faced the challenge of countering Soviet aggression for an indefinite period while maintaining the nation's fiscal solvency. The United States could not afford to match Soviet military spending without incurring significant economic and political repercussions. Therefore, Eisenhower sought to balance desired military strength with financial constraints through reliance on nuclear weapons and at the expense of conventional forces.[2]

The New Look defense policy resulted. Eisenhower undertook major reductions in military manpower and funding to reduce the defense budget. By shifting the foundation of national defense from conventional forces to nuclear weapons, the New Look eliminated the need for a large and costly military force structure with its equally expensive industrial support base. Nuclear weapons proved cheaper, required less manpower, and provided unprecedented levels of destructive capability. Moreover, continued advances in technology suggested the viability of nuclear weapons with greater precision, which might permit the elimination of select military targets without the complete destruction of entire cities.[3]

Under the New Look, the Army became a junior partner to Strategic Air Command (SAC) and nuclear missile development. Airpower became an integral part of deterrence, since bombers would carry nuclear weapons to the Soviet Union. Concerns about the ability of aircraft to penetrate air defenses did little to erode support for SAC, but did encourage greater attention to missile development. The Army became a low priority and suffered accordingly. Between the end of the Korean War and 1961, the Army shrank from 20 combat divisions to 14, including 3 training formations. In the same timeframe, the Army budget shrank from $16 to $9.3 billion. These cuts paralleled personnel reductions and an overall drop in readiness.[4]

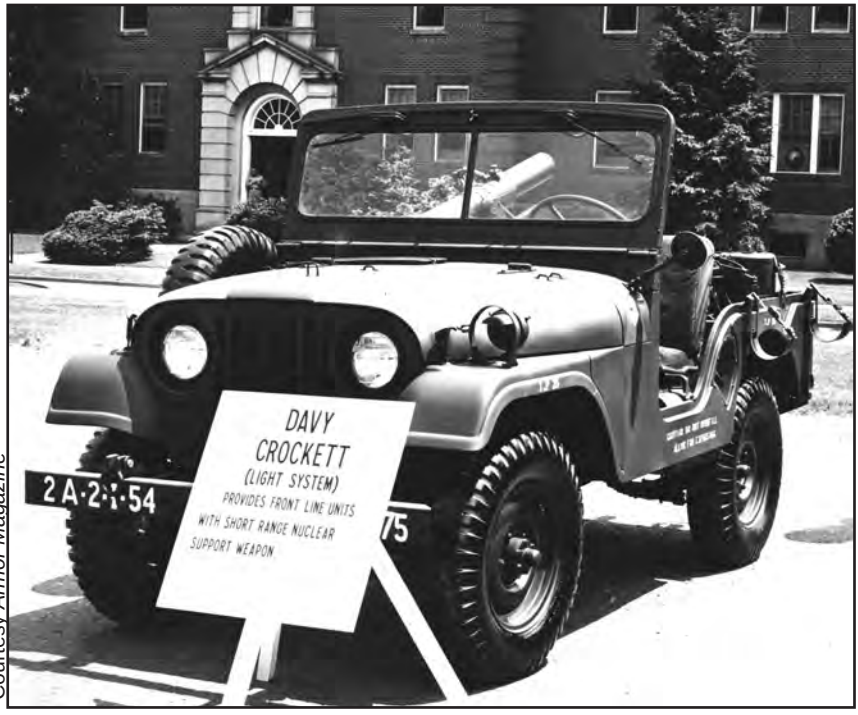
The priority given to nuclear weapons coupled with the rising costs of new weapons obstructed efforts to modernize conventional forces.[5] Armored vehicle procurement lagged and little new materiel reached field units. The M113 armored personnel carrier, for example, remained in development for much of the 1950s. Consequently, units continued to make do with aging equipment.[6] The Army leadership sought to discredit massive retaliation. Small wars and lesser threats that did not warrant a nuclear counterstrike appeared likely in the future, but the emphasis on atomic weapons limited the Army's ability to respond. A series of events in the late 1950s underscored the need for an effective conventional force capability. Russia's brutal suppression of the 1956 Hungarian revolt, disputes over access to Berlin in 1958, unrest in Latin America, and Fidel Castro's 1959 seizure of power in Cuba all served as reminders of the many dangers short of nuclear war that remained.[7]

At the same time, the Army sought to gain some of the public and budgetary support associated with nuclear weapons. It did so by pursuing the development of tactical nuclear missiles and projectiles that could be used on the battlefield. Such weapons supplemented conventional force capabilities, providing a massive boost in firepower otherwise unobtainable

in the budgetary climate of the New Look. The integration of nuclear weapons into ground units resulted. It suited an army that traditionally placed a premium on firepower and technology.[8]

The acceptance of nuclear weapons forced the Army to determine how best to conduct operations on an atomic battlefield. The high level of destruction associated with the new weapons precluded the maneuver of massed formations. Instead, military formations needed the ability to operate as fast-moving, dispersed components that concentrated only temporarily at a decisive point to inflict massive damage on the enemy before again dispersing. The qualities of mobility, dispersion, and organizational flexibility thus became the linchpins of formations intending to fight in a nuclear environment.[9]

Building these qualities into a division structure became the objective of a division redesign effort. The thrust of this effort focused on achieving greater mobility, less vulnerability to nuclear weapons, more organizational flexibility, and a better tooth-to-tail ratio. These objectives were to be achieved through reliance on advanced technologies. The formations



Courtesy *Armor Magazine*

Figure 44. Light mobile Davy Crockett system to provide nuclear capability to forward units.

that resulted became part of Atomic Field Army-1, intended for implementation in 1956. The infantry and armored division designs relied on the proven combat command and task force concepts used in World War II. Maintenance, medical, supply, and transport were concentrated in a special support command for detachment to tactical headquarters.[10]

Field tests conducted in 1955 led to minor adjustments and an increase in the infantry division's reconnaissance from a company to a battalion. The following year a proposed table of organization and equipment (TOE) was issued to the field for comment. Although only minor changes were recommended, no implementation occurred. Throughout the development process, the divisions tended to increase in size and did not serve to reduce overall field strength. Army Chief of Staff General Maxwell D. Taylor halted the work in early 1956.[11]

During the same period, an Army War College study focused on a much smaller division design. Intended to be entirely air transportable, it included only 8,600 men organized into 5 battle groups, each possessing their own artillery support. Honest John rockets provided the division's nuclear capability. Overall, this formation epitomized Army efforts to create an organization capable of great dispersion, high mobility, organizational flexibility, and operations indepth. It influenced subsequent division redesign, which built on its five battle group structure and gave rise to the term "pentomic" division. The pentomic concept largely applied to the airborne and infantry divisions. The armored division never adopted the five battle group structure, because it already possessed a similar configuration in its combat commands. However, the pentomic divisions constituted an effort to adapt formations to the nuclear battlefield and efforts to modernize the armored division shared this goal.[12]

Reorganization of the Current Armored Division (ROCAD)

In 1956, an initiative dubbed Reorganization of the Current Armored Division (ROCAD) began. ROCAD sought to add atomic weapons, increase the formation's target acquisition capability, and reduce the total number of vehicles. On completion, the resultant armored division included many changes. It gained a nuclear capability, consolidated all aircraft in an aviation company, and added a reconnaissance and surveillance platoon to the reconnaissance battalion. ROCAD eliminated the antiaircraft battalion to offset these increases, but no reduction in vehicle strength occurred. The division totaled 14,617 men and 360 tanks. The organization was approved, and the four Regular Army active armor divisions began their conversion in 1957. Subsequent field testing led to small adjustments that did not alter the formation strength, but did move the

reconnaissance and surveillance platoon from the reconnaissance battalion to the division aviation company.[13]

Within the Armor community, ROCAD received considerable praise. In general, it was seen as improving the ability of armor divisions to operate on a nuclear battlefield. It also reflected Army interest in formations suited to multiple roles and possessing great combat power:

> By its tremendous volume of firepower, crushing shock action, wide-ranging armor protected mobility, extensive and flexible signal communication, and responsiveness to the exigencies of battle, this new armored division presents a decisive ground weapon of opportunity and exploitation.[14]

ROCAD built on the modular nature of the World War II formations, while enhancing communications and strategic mobility. Indeed, part of the attraction of ROCAD lay in its retention of those features of the earlier formations considered desirable, particularly the organizational flexibility inherent to the combat commands. ROCAD offered the ability to function on a nuclear or conventional battlefield and possessed its own atomic firepower. It also included a robust aerial component of 50 fixed and rotary wing aircraft concentrated in the division aviation company.[15]

ROCAD anticipated the greater dispersion of forces likely on a nuclear battlefield. Intended to operate as a collection of fast moving, combined arms teams spread over a large area, the new division strengthened its communications. A signal battalion replaced the previous company, and the entire communications framework was redesigned to provide a division-wide system that complemented the existing radio nets. The high density of radio equipment offered flexibility and broader coverage over a wider area. The development of more capable communications equipment facilitated these changes and helped to retain the armored division's responsiveness to rapidly evolving tactical situations.[16]

ROCAD produced changes in the organization of reconnaissance assets. Each combat command headquarters gained a small scout section intended to "furnish valuable assistance in reconnoitering routes and new locations for the displacement of the command post, as well as providing improved local security for the headquarters."[17] This unit represented a new tier of reconnaissance between the division and the battalion, although the small size of the section limited its information-gathering ability. Within the armored infantry and tank battalions, the combined arms reconnaissance platoon disappeared in favor of a scout platoon. This new organization was mounted entirely in jeeps that carried radios and machineguns. Its primary

purpose lay in supporting battalion maneuver through "reconnoitering and locating suitable routes, obstacles, and bypasses." It could provide more traditional reconnaissance and security functions, but it possessed minimal combat power. The scout platoon was intended to operate in direct support of its parent battalion from which it could be augmented as necessary. The scout platoon simplified maintenance and supply requirements through the removal of tracked and armored vehicles. It resembled the World War II era battalion reconnaissance platoons and shared a similar set of qualities, including minimal survivability.[18]

The new scout platoon reflected the growing importance of information gathering on a dispersed battlefield. The battalion constituted the basic building block for the division's task forces. Hence, battalion information requirements shifted from a narrow front to a much broader and deeper area. The scout platoon's organization reflected this change. It included 1 officer and 39 soldiers distributed among a headquarters element and 3 scout sections. Each section possessed 4 jeeps with machineguns and 12 men. It could be maneuvered either as two squads or as a single unit. The entire platoon carried 17 radios, 2 for use by the headquarters, 7 for dismounted operations, and the rest mounted on every other vehicle in the section.[19]

ROCAD also featured a redesigned division reconnaissance unit. The armored cavalry squadron replaced the reconnaissance battalion and

Courtesy Patton Museum of Cavalry and Armor

Figure 45. M41 light tanks on the assembly line.

marked a return to traditional nomenclature. The squadron included a headquarters and four armored cavalry troops. Each troop possessed two light tank platoons, one armored infantry platoon, one scout platoon, and one section of self-propelled mortars. Unlike prior reconnaissance company organizations, the new troop structure shifted the integration of tactical functions from platoon to troop level. Platoons no longer constituted combined arms teams. Instead, the troop commander tailored platoon team configurations from the assets available. This arrangement simplified platoon maintenance, supply, and training, and theoretically increased the flexibility of the troop. The tank strength of each troop rose to 12 and that of the squadron to 52, significantly greater than the 32 tanks of the replaced reconnaissance battalion. This accretion of combat power enhanced the ability to perform reconnaissance, counterreconnaissance, and security missions.[20] It was also unique to the armored division, since the infantry division retained a more traditional organization. Its division squadron included a headquarters and three troops, each one possessing three combined arms platoons.[21]

The inclusion of a special unit within the squadron headquarters further boosted information collection capabilities. The Reconnaissance and Surveillance Platoon provided the means to conduct distant detection of enemy troop movements and dispositions. It possessed a variety of assets that leveraged new technologies for both aerial and ground operations. The platoon's aerial component included photography, radar, infrared devices, and television. It also possessed the ability to conduct the more traditional observation from aircraft. The ground components relied on photography and radar. The division aviation company provided the aircraft and related maintenance support to the platoon.[22]

Doctrine for the cavalry and reconnaissance elements of ROCAD emerged in 1957 with the publication of FM 17-35, *Armored Cavalry Units, Armored and Infantry Divisions*. This manual identified reconnaissance, security, and economy of force missions as the primary role of armored cavalry. Performance of these actions allowed the division commander to concentrate the division's combat power on objectives that are more decisive and provided him the information necessary to do so. Armored cavalry units in the armored division possessed a mix of wheeled and tracked vehicles intended to maximize their mobility on roads and trails. They also possessed an exceptional degree of flexibility in their organizations and communications architectures.[23]

The armored cavalry squadron served as one of the division's primary information gathering means. It was considered a powerful tool, and it

constituted a "closely integrated team of combined arms capable of conducting virtually any type of combat action."[24] The division commander might decide to employ nuclear weapons based on the squadron's request or as a result of information gained through reconnaissance.[25] However, the manual cautioned against sustained battle with strong enemy forces, because "such units are not organized or equipped to engage and defeat heavy armor units, that all personnel do not possess armor protection, and that units thus engaged require additional combat support from nonorganic agencies."[26]

Typical support for the squadron included artillery and related forward observers together with tactical air support for long-distance missions. Aircraft from the division aviation company were also intended for integrated operations with platoon teams. Such aircraft attachments included related maintenance and supply services. Commonly used to support the reconnaissance and support platoon or other reconnaissance missions, aircraft supported command and control actions, served as liaison platforms, provided courier services, transported scout or rifle elements to distant objectives, executed medical evacuations, and conducted resupply operations. This broad range of functions reflected the growing interest in merging ground and air operations, particularly helicopters.[27]

Communications within the squadron occurred primarily via radio, supplemented by wire when conditions permitted. The squadron command post served as a nexus for all communications within the squadron and for information exchanged with other division components. The extensive nature of the varied radio nets paralleled the increased communications capability built into ROCAD. The manual included an extensive description of the communications layout, provided examples of net organization, and identified principal responsibilities associated with sustaining the flow of information. For tactical commanders, the manual stressed command and control from tactical platforms rather than fixed headquarters.[28]

The armored cavalry squadron constituted a flexible organization intended to provide maximum responsiveness to the division commander and changing tactical situations. Platoons within each subordinate troop constituted the basic building blocks for task-organizing reconnaissance teams. The platoons no longer constituted combined arms teams with a mix of embedded functions. Each one possessed a singular focus in organization and function indicated by its name: light tank, armored infantry, or scout. Combined arms integration occurred at troop level through mixing elements from the different platoons into teams oriented on a particular mission or objective. The troop mortar section was also

expected to be employed in a similar manner, and teams thus formed might benefit from the attachment of all or part of the squadron reconnaissance and surveillance platoon.[29]

The creation of platoon teams received considerable attention in the manual. Commanders were reminded, "Each leader must be capable of employing his unit as part of a combined-arms team and must understand the employment of platoons, sections, and squads with which his unit normally will work."[30] Guidance for the platoon task organization did not provide fixed rules. Instead, it emphasized flexibility. Although the mix of tank, armored infantry, and scouts was considered a common platoon team, the manual cautioned, "The habitual formation of the same type platoon teams reduces the flexibility of organization for combat."[31] Sample task organizations showed dissimilar platoon teams. Although the troop commander controlled four subordinate platoon headquarters, he was not obligated to form four platoon teams. Indeed, he was not required to create any and could employ his unit as organized, with separate concentrations of scouts, tanks, and infantry. Mission and terrain considerations constituted the dominant influences on the precise employment of the squadron, troop, and platoon.[32]

The use of platoon teams that lacked permanent substance generated a significant training challenge for platoon, section, and squad leaders. These commanders not only had to understand how their own unit functioned, but also those units with whom they might serve. The pure platoons possessed a smaller variety of different weapons and vehicles, but their integration with other platoons required a degree of expertise and experience difficult to achieve except through continuous practice. Without the attainment of such a skill level, the continuous changes in task organization encouraged by FM 17-35 might result in the erosion of unit cohesion and efficiency. Unfortunately, in the financially strained atmosphere of the 1950s, the ability to provide the level of training necessary for effective integrated troop and platoon teams proved problematic.

One set of employment principles governed the operation of platoon teams. The manual detailed these principles by describing the planning, preparation, and execution of offensive, defensive, delay, reconnaissance, and security missions. Reconnaissance occurred via the same techniques originally developed in the interwar years. Platoon teams sought to gain information through stealth, infiltration, and surveillance. They moved by bounds and relied on a combination of mounted and dismounted activities to perform zone, route, and area reconnaissance missions. On contacting enemy forces, reconnaissance elements were to develop the situation, often

through combat action. The need for rapid, timely information encouraged continuous movement to sustain momentum. Obstacles that threatened to delay or obstruct reconnaissance efforts were to be bypassed. Light tanks moved in support of scouts to help quickly reduce opposition. When time constraints precluded detailed reconnoitering, units relied on reconnaissance by fire to determine the enemy's presence. Mortars were considered particularly valuable in this role, because they could fire into suspect positions without revealing friendly force locations.[33]

Courtesy Patton Museum of Cavalry and Armor

Figure 46. Tank crew trainer at Fort Knox, 1958.

The scout platoon constituted the principal agent for ground reconnaissance within the squadron. Organized into a headquarters element and three scout sections, the entire platoon relied on jeep transport.[34] Section detachments to support task-organized platoon teams was considered normal. However, the chapter on unit operations opened with a cautionary note highlighting the jeep's limited cross-country mobility and vulnerability to artillery, small arms, and atomic weapons. These limitations hampered its interaction with armored tracked vehicles, although the scout sections benefited from the jeep's ease of maintenance and fuel economy.[35]

The limitations and vulnerabilities associated with the jeep-mounted scouts influenced their intended use. They possessed the same mission set as the platoon teams, but the manner in which they conducted operations

differed. They moved by bounds and combined mounted and dismounted movement to "ensure stealth, security, observation, and protection against enemy observation and fire." Dismounted attacks were preferred with the jeeps secured to the rear with sufficient personnel to move them forward when required—a method reminiscent of horse cavalry operations. The manual anticipated that other assets would support scouts, who would not conduct combat alone. Their limited firepower precluded engagements with all but the lightest opposition. Lack of combat power also minimized the ability of the scout platoon to conduct delaying actions, a traditional function of reconnaissance units.[36]

Preferably, scouts relied on other forces assigned to support them to offset their minimal combat capability. Often light tanks overwatched their movements, ready to attack should the scouts become engaged. Another method of engagement relied on mortar support to permit the continued movement of the scouts: "Efficient coordination and control of fires, coupled with movement, allows the scout section and squad to perform security and reconnaissance missions without becoming decisively engaged." In this manner, the scouts retained their freedom of maneuver, while mortars pinned or eliminated hostile opposition. Smoke offered yet another means of covering the scouts while they advanced. Effective use of fires mandated the training of every scout as a forward observer.[37]

Scout survivability often remained linked to the time available for reconnaissance. With sufficient time, the scouts could utilize stealth and dismounted tactics, but the scout commander did not control his timeline:

> When a scout unit is acting as the leading element for the advance guard, speed of movement and aggressive action are of primary importance. The scout section leader's next higher commander normally prescribes a rate of advance, and it is up to the scout section leader to maintain this rate of advance unless the section is stopped by enemy action or impassible terrain."

In those cases requiring speed, the scout unit faced two problems: it lacked the cross-country mobility of other platoon team assets and it could not rely on the more effective but slower techniques of stealth and dismounted operations. Rapidity increased the scout's already highly vulnerable state by increasing the likelihood of sudden, hostile contact.[38]

The manual offered few solutions to the linked issues of time, mobility, and vulnerability, but it did highlight the scout platoon's enhanced ability to observe greater areas. The scout platoon exchanged the firepower of the combined arms reconnaissance platoon for more personnel dedicated

to observing the battlefield. The principal means of security lay in the creation of a string of observation posts (OPs), six to a platoon or one per squad. This number could be increased for short periods. Similarly, the platoon offered much better coverage of directed zones and areas. In addition, its sections could reconnoiter more than one path of advance during route reconnaissance missions. The ability to function as sections and even squads also made the scout platoon an ideal asset for conducting liaison activities with other units, providing quartering parties, guiding the movements of large units, and performing limited pioneer work.[39]

The variety of functions and the specialized nature of the scout platoon directly impacted its training. Like other platoon team elements, the platoon had to be able to function with or without attachments and as part of a combined arms team. Individual soldiers needed the capability of operating as dismounted riflemen or as machinegun squads. The scout platoon's ability to observe broad areas also mandated competency in the establishment of OPs and the execution of patrols, both mounted and dismounted. Finally, scouts needed pioneer skills and familiarity with air transport for those missions requiring their insertion into hostile rear areas. Hence, despite the reduced combat power, the new scout platoon required a growing band of expertise, increasing the specialized nature of its members.[40]

ROCAD Revisited

After implementation of the ROCAD organization in 1957, a period of testing followed. The armored divisions evaluated the effectiveness of the new formation and provided feedback. The Continental Army Command (CONARC) then distilled the results into recommended changes for Department of the Army (DA) action. Evaluation guidance, however, limited the extent to which the division could be modified. It prohibited any increase in personnel strength and sought primarily to increase the formation's overall combat power. The review also served to identify personnel that could be withdrawn from the division without any detrimental impact on its battlefield operation.[41]

Comments from armored division personnel generally supported the ROCAD configuration. It retained the best qualities associated with the World War II-era formations, including mobility, organizational flexibility, and firepower. No fundamental changes emerged, although a number of adjustments were recommended. The DA approved these at the end of 1958, and revised tables of organization and equipment began to reflect the modifications in 1959.[42]

The ROCAD revisions left the basic structure of the formation untouched. It retained its flexible organization based on the combat commands, and its personnel strength remained the same. The most significant changes impacted division reconnaissance, combat surveillance, and target acquisition. The armored cavalry squadron still included a headquarters and four reconnaissance troops, but combined arms integration reverted to the platoon level. Each troop now comprised three combined arms platoons. Gone were the separate tank, armored infantry, and scout platoons and the mortar section. The amorphous nature of the previous troop structure disappeared in favor of a more rigid organization that relied on identically configured platoons. Each of these subordinate units included a headquarters, a light tank section, an armored infantry squad, a support squad, and a scout section.[43]

The change in reconnaissance organization resulted in a uniform troop structure within the armored division, the armored cavalry regiment, and the infantry division. Standardization of equipment and employment followed. Within ROCAD, the change in reconnaissance troop structure eliminated the light tank platoons in favor of light tank sections in each platoon. The overall tank strength of the squadron shrank by 16, generating personnel savings applied to other desired adjustments to the division structure. The removal of the tanks reduced the combat power associated with reconnaissance, but the return to combined arms platoons simplified training and employment. The platoon remained a complex instrument with multiple weapons and vehicles of mixed mobility, but its fixed organization simplified the task of training new commanders how to employ it. Hence the rationale behind the new troop structure: "It has been determined that the training of small units and small unit commanders is most effective if their unit organizational structure is the same as that to be used in combat."[44]

The ROCAD revision also altered the organization of combat surveillance and target acquisition. The reconnaissance and surveillance platoon within the armored cavalry squadron disappeared. Its short- and medium-range ground radars became integral elements of the division's combat units down to company level, while long-range radar became a division asset. The aviation company added an aerial surveillance platoon. It included aerial radar and cameras in addition to a surveillance drone. This change concentrated all aerial assets within the division in one unit, which provided administrative, maintenance, and logistical support. For tactical operations, however, the aerial surveillance platoon was intended for attachment to the armored cavalry squadron. This new configuration

of surveillance and target acquisition capabilities proved more functional than the reconnaissance and surveillance platoon it replaced. The latter's mix of air and ground assets and reliance on the aviation company for support made it an unwieldy organization. The shift of radars to combat elements and the routine attachment of aerial reconnaissance and surveillance to the armored cavalry squadron ensured no loss in reconnaissance capability, but it did streamline the control and use of this asset.[45]

Courtesy Patton Museum of Cavalry and Armor

Figure 47. M41 light tank undergoing fording test.

The changes in aerial reconnaissance and surveillance paralleled other developments intended to improve the integration of ground and air reconnaissance. In 1958, the 2d Armored Division participated in field tests conducted by the Seventh Army in Europe. These tests sought to determine the utility of light aircraft to detect reconnaissance targets in varied weather and ground conditions, identify the vulnerability of such aircraft, and discover how the use of aircraft affected the speed at which reconnaissance missions were completed. The tests offered a side-by-side comparison of two ground reconnaissance units, one with and one without aerial assets.

The results clearly indicated the greater effectiveness of integrated ground and air reconnaissance, but they also suggested some methods to affect this integration. The attachment of one helicopter to each reconnaissance platoon offered the most effective support. More aircraft generated too much information for the platoon to process. The tests utilized both fixed-wing and rotary-wing aircraft, but the helicopter proved more

effective. It provided the platoon with a mobile OP capable of hovering over a given location or moving ahead of the ground unit. It also served as a radio relay station, an important function given the level of dispersion associated with the nuclear battlefield. Helicopters provided early warning of enemy forces not yet visible to friendly ground units, guided units over secure routes to make surprise attacks, directed fire missions, and helped prevent ground troops from becoming surrounded. Although weather sensitivity, antiaircraft measures, and maintenance requirements remained important drawbacks, the helicopters—or sky cavalry as they were becoming known—provided a means to extend reconnaissance into the vertical dimension.[46]

The testing of ROCAD and interest in integrating air and ground reconnaissance reflected the findings of a report compiled for the Army Chief of Staff. In 1957, General Taylor requested a review of American armor developments that a team of Armor Center and CONARC personnel conducted. This study found Armor oriented on Soviet capabilities and the nuclear battlefield. To counter expected deep penetrations by armored and aerial forces supported by atomic weapons, the Army required ground forces characterized by mobility, responsiveness, firepower, protection, reconnaissance, and control. Armor satisfied these qualities and was believed capable of moving through areas swept by radiation to exploit the effects of an atomic weapon before the enemy could reorganize. Similarly, armored formations appeared more likely to survive a nuclear attack and mount a rapid, mobile defense.[47]

The study also noted the importance of reconnaissance to highly dispersed, mobile forces. A need existed for future combat organizations to possess better and more detailed information about enemy forces:

> The increased dimensions of the battlefield and accompanying demands for intensified intelligence effort, target acquisition and surveillance of the enemy—emphasize reconnaissance. To meet this demand we must have reconnaissance, which is improved in penetrating ability, protection, and possesses the facility for fighting for information in all conditions of terrain and weather. This means armored reconnaissance ground elements in close coordination with air-transported reconnaissance and battle surveillance units.[48]

The study also noted heightened Soviet doctrinal attention to reconnaissance measures and the parallel fielding of a light amphibious tank and an amphibious troop carrier.

To match the perceived growth in Soviet capabilities and meet the requirements of the nuclear battlefield, the study recommended more combat power in reconnaissance units. In particular, the report sought a better light tank:

> Neither the main battle tank nor the heavy gun tank, however, is able to perform missions with the speed and versatility demanded of units, which have assumed the cavalry role in modern war. Reconnaissance operations require the ability to fight for positive information, to traverse great distances and to maintain combat integrity in the difficult process of finding the enemy, searching out his soft spots, and developing target suitability. Reconnaissance troops must have firepower so strong that it can enforce the object of their mission against enemy reconnaissance units and can defend themselves against superior enemy forces.[49]

At the time of the study, the M41A1 light tank equipped most reconnaissance units. With enhancement to its operating range, the study considered it adequate until a better platform became available. The Aircraft Armaments Corporation had already begun work on such a design with prototypes undergoing engineering tests. This vehicle was intended to satisfy the need for a new light tank in reconnaissance units and support airborne units. It would evolve into the M551 Armored Reconnaissance Airborne Assault Vehicle, commonly known as the Sheridan. The study, however, cast doubt on the ability of any platform to satisfy both roles: "It is equally doubtful that this reconnaissance vehicle can or will meet the requirement of an airborne assault weapon for airborne or air-transported units."[50]

The review of armored developments provided the macrocontext for revisiting ROCAD, but the scout platoon also elicited comments and concerns from the field. A series of tests and studies preceded implementation of ROCAD to determine if the combined arms reconnaissance platoon constituted the optimum organization for its mission. This analysis led to the earlier integrated troop design and triggered the replacement of the combined arms reconnaissance platoons of the armored infantry and tank battalions with the new scout platoon.[51]

Both incurred criticism. The integrated troop was not based on combat experience. Its ability to provide platoon teams more effective than the combined arms reconnaissance platoon lacked any operational basis. Conversely, the need for reconnaissance units to engage in some level of

Courtesy Patton Museum of Cavalry and Armor

Figure 48. Armed Forces Day display at Fort Knox in 1960 clearly indicative of the New Look policy and its deemphasis of traditional ground combat power in favor of missiles and rockets carrying nuclear warheads.

combat had been one of the principle conclusions to emerge from analysis of reconnaissance in World War II and Korea. They also tended to operate over broad areas that seemed to preclude the availability of friendly support unless organic to the unit. The scout platoon lacked combat power, yet it was expected to perform similar missions to combined arms platoon teams. From a field perspective, the combined arms reconnaissance platoon made sense. The adoption of three different reconnaissance organizations to perform an identical mission did not. While tank and armored infantry battalions adopted the scout platoon, the division reconnaissance squadron of the infantry division retained the combined arms platoon and ROCAD emphasized amorphous platoon teams. Using the combined arms platoon as the standard for all reconnaissance units offered the benefits of uniform equipment, doctrine, and training. In the last case, "Training the platoon as a combined arms team through all training phases enhances its ability to function as a team under any and all combat conditions."[52]

Training scout platoons in the tank and armored infantry battalions proved a very real problem. Detailed training or doctrinal guidance did not accompany fielding of the new reconnaissance unit. The experience of one platoon in Germany underscored the resultant difficulties. The TOE

for the new configuration remained classified until the day of implementation, precluding preparation efforts. No publications for training or scout platoon operations were available, but the parent battalion was scheduled for a major training evaluation within 2 months. Individuals found little time to learn their new responsibilities. While the scout section had little difficulty adjusting, members of the tank section, support squad, and armored infantry section found themselves removed from armored vehicles and thrust into jeeps to perform unrelated functions. Accustomed to more spacious platforms, soldiers re-equipped with jeeps found that "when bedrolls, packs, and ammo were added to the TO&E [TOE] equipment, there was not enough organic transportation to haul it. The platoon was provided one ¼-ton trailer. As a solution, the ¼-ton trailers from the battalion motor officer and S3 were added giving each section a trailer." Trailers reduced mobility, but such improvisation characterized the entire conversion process.[53]

Once created, the scout platoons still suffered from the absence of training guidance and related publications:

> There exist in field manuals and training texts only brief outlines of the capabilities and methods of operation of the scout platoon. Consequently, scout platoons have had to learn almost entirely by experience the best methods of operation in accomplishing a given mission. Platoon leaders have had to develop their own reconnaissance formations and use the trial and error method in determining which ones are suitable for continued use.[54]

In response to this void, one scout platoon leader developed a set of tactics, techniques, and procedures, and published it in *Armor Magazine*, the Armor Branch service journal. The article focused on route reconnaissance, since this mission constituted one of the most commonly assigned tasks. The content provided a level of detail and analysis not found in published doctrine. Nevertheless, it did not address the full range of missions, including counterreconnaissance and security, expected of the scout platoon.[55]

FM 17-35, *Armored Cavalry Platoon, Troop, and Squadron*

In 1960, publication of an updated FM 17-35 addressed the changes in reconnaissance organization and operations related to the revised ROCAD.[56] Clearly written and well illustrated, the new manual marked a major improvement over its predecessor. It consolidated doctrine for the armored cavalry platoon, troop, and squadron organizations found in

armored and infantry divisions. The manual ended the gap in doctrinal guidance for battalion scout platoons and offered employment principles for the scout section included in the armored division combat command. It reflected the decentralization of ground surveillance assets in the revised ROCAD by addressing employment of radar sets by combat battalions and the armored cavalry troop and squadron.

The standardization of reconnaissance organizations found expression in the new manual. The reconfiguration of the armored cavalry troop into a more traditional organization with a headquarters and three identical combined arms platoons led to a streamlining of reconnaissance units. The armored cavalry regiment, the infantry division, and the armored division all incorporated the same armored cavalry platoon and troop organizations. Similarly, armored infantry and tank battalion organizations included identical scout platoons. At the squadron level, the armored division included a four-troop organization rather than the three troops found in the infantry division's cavalry squadron. Both division squadrons differed from those found in the armored cavalry regiment.

Two primary platoon organizations now existed: the scout platoon found in combat battalions and the armored cavalry platoon found in division squadrons. Nomenclature denoted the principal difference between these two units. Although both provided reconnaissance and security, the manner in which they performed these missions differed. The scout platoon possessed limited combat power, but could cover a broader area or multiple routes. The armored cavalry platoon reflected the desire manifest after World War II for greater combat power and versatility. These qualities, however, came at the expense of coverage. The armored cavalry platoon possessed an inherent ability to fight for information, but it operated over a much narrower front.

The scout platoon included a headquarters, three scout sections, and a ground radar section. Each section possessed 4 jeeps, a mix of vehicle-mounted and portable radios, and 12 men subdivided into 2 squads. The platoon provided reconnaissance and security for its parent battalion either alone or as part of a larger force. It was expected to participate in airmobile operations, perform traffic control, provide contact and quartering parties, execute pioneer and demolition activities, and liaise with adjacent units. It also conducted chemical, biological, and radiological monitoring and survey operations, and it might support damage control and assessment activities. This mission set marked an expanding skill set associated with the unit's personnel and underscored the importance of thorough training.[57]

The manual's guidance for scout platoon operations reflected the limited combat ability of the unit. Movement occurred by what had become standard bounding overwatch techniques. Dismounted operations were also emphasized: "Personnel must not become vehicle-bound. They should dismount in order to improve observation, to prevent enemy detection, and to provide security."[58] Observation constituted the principal means of gathering information, whether conducting reconnaissance or security. Security, in particular, relied on OPs, manned by concealed, dismounted soldiers. Normal coverage included six posts, each manned by one squad. However, the platoon could increase this number to 12 for short periods. Mounted patrols assumed responsibility for covering the space between OPs. The ground radar section further boosted the ability to monitor enemy activities, but the doctrinal guidance suggested that the platoon leader did not always control the use of radar, despite its inclusion in the scout platoon. At times it might operate directly under battalion control and locate near a combat unit for security.[59]

Courtesy *Armor Magazine*

Figure 49. Mounted and dismounted elements of the 3d Armored Cavalry Regiment training in Germany in the early 1960s.

The platoon executed screen and guard missions through observation and patrols, integrating its action with aircraft when available. When confronted by a hostile threat, the platoon relied on supporting tank and infantry assets to eliminate the danger. If forced to withdraw, it continued to monitor and report enemy activity. In these types of missions, the platoon generally operated as part of a larger team and avoided combat where possible.[60]

A similar deemphasis on combat applied to zone, route, or area reconnaissance missions. Scouts were expected to eliminate resistance

considered within their capability to do so, but their limited combat power restricted the scope of such action. More often they were expected to report the obstacle and seek to bypass it. With each section reconnoitering different routes or operating across a broad front, scouts were likely to find a detour. If they needed more combat power, it had to be provided from another source.[61] "In executing reconnaissance missions, the scout platoon obtains information by stealth, infiltration, and observation. When employed on a reconnaissance mission as part of a larger force, the scout platoon often executes its assigned missions while being overwatched and supported by other elements of the force."[62]

In the event combat became necessary, the scout platoon formed a base of fire and maneuver force. The vulnerability of the jeeps underscored the emphasis on dismounted combat, using the small arms carried by all personnel and machineguns removed from the jeeps. Organized into fire teams, the scouts essentially functioned as infantry. Nevertheless, the manual did not consider such actions the norm, but to be conducted as part of a defensive engagement or reaction to an ambush.[63]

Similar principles of employment applied to the scout section assigned to the combat command headquarters. This unit included a small command element and two scout squads totaling 5 jeeps and 15 men. The section's primary responsibilities focused on the combat command headquarters. It did not function as an additional reconnaissance unit that could be sent forward to provide information directly to the combat command. Instead, it provided route and area reconnaissance to assist the combat command's movement and location of the command post. It also provided local security and liaison. In effect, it functioned less as a combat reconnaissance unit than as a headquarters police force.[64]

In contrast to the battalion scout platoon, the armored cavalry platoon included a headquarters, light tank section, scout section, rifle squad, and a support squad. These basic elements were identical to the combined arms platoon first adopted after World War II. The headquarters and scout section were equipped with jeeps, while tracked armored vehicles were found in the other components. Unlike the scout platoon, the armored cavalry platoon was expected to fight for information and during security missions "engage the enemy, and within its capability delay or defeat the enemy." It was expected to conduct offensive or defensive actions alone or as part of a larger team, and unlike the scout platoon, it was considered capable of mounting effective delaying actions. For combat, the armored cavalry platoon formed a tank-infantry team accompanied by the platoon leader for the maneuver force, while the rest of the unit served as the base of fire.

This proven ability to subdivide into teams suited the mix of capabilities in the platoon. However, in the execution of reconnaissance missions, its single scout section limited operations to one primary route.[65]

The armored cavalry troop performed similar missions to the platoon but on a larger scale. The troop commander controlled his unit via a command post for tactical operations and the unit trains for combat service support. The troop command post provided an information nexus between the parent squadron and the subordinate platoons. It trailed the platoons, but the troop commander was expected to move forward among his subordinate units to provide direct leadership where necessary. He might also have artillery, engineers, aviation, or tactical air support. Other than these attachments, he had few means with which to influence the action of his platoons other than a ground radar set. He could task organize his platoons, but unlike the original ROCAD troop organization, the potential permutations were limited. He could employ the platoons in their standard combined arms configuration, concentrate the like elements from each platoon, or create three tank-infantry teams and leave the scouts and support squads directly under his control.[66]

The armored cavalry squadron performed reconnaissance, security, and economy of force operations for the parent division. It could be employed directly under division control or subordinated to a combat command. Although FM 17-35 considered the unit most effective when employed in its entirety, it acknowledged the potential value of detaching a troop to support other division components. Intended for use without augmentation, the manual noted that common exceptions included the attachment of aircraft and surveillance devices to extend the depth of reconnaissance missions. The squadron commander exercised control through his personal presence, the squadron command post, and liaison officers. Together with select staff officers, he formed the command group, which moved throughout the squadron area to oversee operations. The command post constituted the central command and communications node for the squadron. Liaison officers served as human conduits of information with higher headquarters and adjacent units. Collectively, these measures provided a greater degree of command flexibility.[67]

On the nuclear battlefield, the armored cavalry squadron played a vital role. It was expected to identify potential targets for division atomic weapons. This ability could be enhanced through attachment of the division's aerial surveillance platoon. Once a nuclear attack had been made, the squadron exploited its disruptive impact on enemy operations. Alternatively, squadron elements conducted reconnaissance of areas

impacted by atomic weapons to assess the damage and assist affected friendly units. Although it was by no means clear that units could operate in areas of high radiation or survive a nuclear attack, the manual's guidance reflected broader Army doctrine.[68]

Flexible Response and ROAD

By 1960, Eisenhower's massive retaliation had lost much of its earlier credibility. The Soviet Union continued to expand its influence through the encouragement of small wars, national liberation movements, and subversion. Against these measures, the American policy of containment through the threat of nuclear attack did not work. In 1961, newly elected President John F. Kennedy opted for a new direction in national defense. He believed the chance of a nuclear war far less likely than the danger of a small war or guerrilla conflict. Containment of the Soviet threat, therefore, required different tools. While retaining a powerful nuclear arsenal, he simultaneously worked to increase conventional force capability to provide a broader range of responses to Soviet provocation.[69]

Kennedy's emphasis on nuclear and conventional forces became known as flexible response. It proved a welcome change for Army leaders who had labored under the constraint of Eisenhower's New Look program in the previous decade. Implementation of Kennedy's flexible response required more robust and capable ground forces.[70] In December 1960, CONARC began work on a division redesign effort to improve the mobility, survivability, and combat power of infantry, armored, and mechanized divisions. Intended for fielding in the 1961–65 timeframe, these formations became known as Reorganization Objective Army Division (ROAD).[71] In actuality the conversion of divisions began in 1962 and continued into 1964.

The new division structure incorporated flexibility and standardization. Each division type included a common base to which combat maneuver battalions were added. The number and ratio of infantry, mechanized infantry, and armor battalions determined the overall type of formation. The division based included command elements together with military police, engineer, signal, aviation, reconnaissance, and artillery assets. Maintenance, medical, transport, and supply components were pooled into a support command, directly subordinate to the division commander. Brigades replaced the combat commands, but this change proved largely one of nomenclature. The brigade headquarters possessed no permanent troop assignments. Like the combat commands, the brigades formed and controlled several task forces from combat assets assigned to them for particular missions.[72]

Courtesy Patton Museum of Cavalry and Armor

Figure 50. Preproduction model of the M151 jeep.

Under ROAD, an armored division included six tank battalions and five mechanized infantry battalions. A mechanized infantry division contained three tank and seven mechanized infantry battalions. The battalion was the principal combat element and its basic structure became standard. Whether armor, infantry, or mechanized infantry, each battalion comprised a headquarters, headquarters and service company, three companies, and a reconnaissance platoon. This baseline facilitated task organization.[73]

The ROAD formations possessed increased combat power that depended on the fielding of new equipment, including the M60 tank and the M113 armored personnel carrier. The expense of this materiel coupled with the time to procure it slowed adoption of the ROAD configuration. Many divisions also suffered from personnel shortfalls that proved difficult to overcome. In the meantime, principles of employment related to ROAD began to guide schoolhouse training.[74]

The Armor community welcomed ROAD. Its standard organization facilitated training and readiness. The formations could easily accommodate materiel as it became available, an important feature given the time and cost associated with equipment fielding. ROAD also incorporated many

features associated with the World War II armored divisions. The self-sufficient battalions and combat command structure of the latter found expression in the flexible brigades and combat maneuver battalions of ROAD. The battalions were expected to cross-attach companies to form combined arms task forces in a manner reminiscent of the armored formations of the 1940s. The organizational flexibility, combat power, and mobility of the ROAD had long been qualities associated with armored formations.[75] Major General (Retired) Robert W. Grow, a well-known armor leader with a distinguished World War II combat record extolled the virtues of the new division design and urged commanders to structure their training to:

> . . . emphasize flexibility, that each company or even each platoon as well as each battalion be able to join any one of the brigades at any moment and carry out its task as if it were an organic element. It is a wonderful feeling to be able to promptly constitute an appropriate command to deal with situation changes. Now, more than ever, we cannot afford rigidity.[76]

Grow's view constituted the field commander's perception of flexible response—more powerful combat formations with the means and capacity to adjust to evolving tactical environments. Division reconnaissance provided the information necessary for the formation to adapt. The ROAD reconnaissance squadron included a headquarters, three ground troops, and one air cavalry troop.[77] The last unit included observation helicopters and extended the reconnaissance coverage possible by the squadron. The integration of air and ground assets also helped to make reconnaissance more mobile than the formation it supported, a desirable characteristic that had become problematic with Army-wide mechanization. The ROAD armored cavalry squadron marked an organizational change from the four ground reconnaissance troops included in armored divisions since World War II.[78]

In the 1950s, the integration of aerial and ground reconnaissance attracted considerable interest that continued to grow in the next decade. This interest was fueled by a number of studies undertaken by the Army, including the Mobility Requirements Board of 1962. Also known as the Howze Board after its director Lieutenant General Hamilton H. Howze, this body reviewed the use of aircraft in land warfare and provided recommendations for further Army development, including the formation of an air assault division, an airmobile division, and air cavalry units. The board also analyzed and proposed the expanded use of aircraft by ground divisions.[79]

In the ROAD, the aviation company grew to a battalion. This unit included one company of airplanes and helicopters for reconnaissance and liaison, and an airmobile company intended to provide aerial transport for division assets.[80] Ground reconnaissance remained the most reliable means of obtaining information about enemy activities, but aerial reconnaissance broadened and deepened the area of coverage. The principal issue surrounding air reconnaissance was one of organization and the precise nature of its working relationship with ground reconnaissance units.[81] Greater integration of ground and air reconnaissance suggested a closer alignment within unit tables of organization. The effective use of aerial assets by armor commanders suffered in part because no habitual relationship existed between aviation and tactical commanders. In the ROCAD, for example, aviation remained pooled in the division aviation company for temporary attachment. Many battalion commanders had little interaction with these air assets. Interest arose to make observation helicopters organic to the maneuver battalions, thereby increasing their self-sufficiency and reconnaissance capability.[82]

This change was not implemented in the combat battalions, but it did occur in the division armored cavalry squadron, which replaced one of its ground troops with an air cavalry troop. This unit included armed helicopters capable of both reconnaissance and troop transport.[83] However, even this organization did not constitute the ideal. In the view of one small unit commander, the dispersed, fluid, and highly lethal battlefields of the future required a multipurpose reconnaissance troop that leveraged advanced technology and fully integrated air and ground platforms, including aerial surveillance drones that hovered and reported on battlefield developments. This futuristic unit possessed both conventional and nuclear capabilities, benefited from armed aircraft, possessed a high level of mobility, and relied on an advanced communications system to "transmit rapidly great volumes of information with maximum resistance to enemy jamming and spoofing."[84] The ultimate troop "incorporated a target acquisition capability into the reconnaissance unit to permit rapid delivery of fires on targets detected during reconnaissance and security operations."[85] Although reconnaissance sought to avoid detection and engagement, they possessed the means to fight for information, fix, and/or destroy hostile forces.[86]

This futuristic unit was not within the bounds of early 1960s technology, but clearly the transition to flexible response was encouraging new ideas for reconnaissance units. Other ideas were not so new. The creation of a multipurpose organization for reconnaissance, security, and other missions certainly dated at least to the 7th Cavalry Brigade (Mechanized) in the 1930s. Similarly, cavalry doctrine had advocated a close relationship

Courtesy *Armor Magazine*

Figure 51. While American scouts continued to utilize the jeep, their Soviet counterparts began fielding the small, armored BRDM series in the late 1950s.

between aircraft and ground reconnaissance since the interwar years, but by the 1960s, fixed and rotary wing aircraft were becoming common appendages to reconnaissance units. Surveillance drones and ground radar offered new methods of monitoring enemy activity and their effectiveness could reasonably be expected to grow in tandem with technological advances.

Battalion Reconnaissance

ROAD transformed the maneuver battalions into triangular configurations with three companies. For armor battalions, this meant the loss of a tank company. At the division level, this loss was more than offset by an increase in the total number of battalions. The smaller maneuver units simplified command and control and facilitated attachment into task forces, but they also resulted in fewer assets available to the battalion commander.

Part of the ROAD reorganization entailed a common combined arms reconnaissance platoon organization for the armored cavalry regiment, division cavalry squadrons, and the maneuver battalions. The impact of this standardization fell largely on the battalions, since the other organizations already included such a platoon. The maneuver battalions exchanged their scout platoons for the combined arms units. The latter resembled the armored cavalry platoon with its headquarters, light tank section, scout

section, rifle squad, and support squad. It did not possess a ground radar section. The new battalion reconnaissance platoon offered greater combat power at the expense of the scout platoon's ability to cover broad areas and multiple routes simultaneously.

The return of the reconnaissance platoon marked the fourth major shift between a pure organization and a combined arms unit within the battalion since World War II.[87] This almost cyclic change reflected a degree of confusion concerning the proper role and use of battalion reconnaissance that wavered between combat power and broad coverage via stealth. The reconnaissance platoon was not universally welcomed. Not only was its information gathering ability limited to a single scout section, but it also posed a training challenge. The reconnaissance platoon's commander was the only platoon leader in the Army responsible for directing the actions of tanks, infantry, and indirect fires. His unit constituted the smallest combined arms team in the Army, but it also contained four different vehicle types, several different radios, and a basic ammunition load that addressed eight different weapons.[88]

An equally intensive training program did not match the complexity of the reconnaissance platoon. Consequently, the new platoon leader learned much of his craft through experience. Mastery often resulted in promotion to troop commander and replacement by a new platoon leader who had to learn from scratch. Reconnaissance soldiers were expected to be highly intelligent and capable, but much of their training was left to units. Units, however, found it difficult to incorporate the variety of weapons and skills associated with the reconnaissance platoon into standard training schedules. The platoon possessed four distinct elements that necessitated a longer overall training time.[89]

The scout section proved critical to the overall success of reconnaissance platoon operations, but institutional training proved minimal. One officer summarized the problem:

> The individual scout is more precisely designated an Armor Intelligence Specialist, MOS 133. To receive this designation the soldier merely completes Advanced Individual Training with the barest essential skill for the job he will be expected to perform. In fact a unit commander is fortunate indeed to receive a scout who is able to find himself on a map. This situation is no more shocking than receiving new platoon leaders from the Armor Officer Basic Course who have been designated Reconnaissance Unit Commanders, MOS 1204. These

> officers have received instruction identical to that presented to lieutenants reporting into tank units.[90]

Other problems afflicted reconnaissance training. Fort Knox possessed only limited maneuver space, making it difficult for new platoon leaders to comprehend the broad areas over which they were expected to operate. No well-established career field existed to grow the expertise associated with reconnaissance organizations. Within the Armor School,

> The Chief of the Reconnaissance Branch, Command and Staff Department, once a billet for a fireball-type lieutenant colonel, was for many months recently a captain. This indicates a frightening subordination of the entire subject which is borne out by recent graduates of both basic and career courses who report that Cavalry and reconnaissance were barely mentioned.[91]

Corrective measures proved slow to emerge. In Germany, the Seventh Army implemented a Reconnaissance Leaders Course in its Combined Arms School at Vilseck. The course aimed at providing new platoon leaders a thorough grounding in reconnaissance operations, particularly those areas cursorily addressed or ignored by the Armor School at Fort

Courtesy *Armor Magazine*

Figure 52. Battalion scouts from the 37th Armored Regiment training in Germany, 1963.

Knox. This action stimulated the Armor School to increase instructional time for armored cavalry, but the change did little for new platoon leaders. Most of the additional training focused on the operations of the new air cavalry troop in the division squadron. Continued dissatisfaction with the training of new reconnaissance leaders led to a recommendation for a special reconnaissance school, patterned on ranger training in the Infantry Branch.[92]

To help new platoon leaders overcome the limited training received, experienced officers wrote articles based on their own experience. They identified common problems and offered suggestions to overcome them. One officer wrote, "I believe that successful reconnaissance operations depend on a variety of field techniques and training procedures not found in any field manual."[93] The same individual provided tips for road marches, assembly areas, and troop leading procedures. He also outlined simple platoon movement procedures, noting, "The proper movement of a reconnaissance platoon is a symphony of mutual support and can be compared to a sort of mechanized accordion."[94]

Given the complexity of this "symphony," battle drills assumed a high degree of importance. The members of the platoon team needed to react to situations reflexively. They could only do so through repetitive training and through the rapid creation of a base of fire and maneuver force. Reporting procedures, terrain analysis, and delay operations also proved complex tasks that could overwhelm the new platoon leader if he did not practice them. Scouts, still equipped with jeeps, received special attention:

> Every scout should be imbued with the idea that his vehicle can be eliminated by a forty-five slug through the radiator. When he understands this he will understand the necessity of rapidly dismounting his machinegun and moving his vehicle into a covered position when he is taken under fire.[95]

This procedure had been standard practice in World War II and Korea. Years later, it remained valid, largely because the wheeled, unarmored jeep continued to equip scouts.

The support squad constituted another area of difficulty for new platoon leaders. The Armor School emphasized the importance of "rapid, accurate mortar fire with the minimum of communication." Unfortunately, achieving this goal was left to the platoon leader. One method developed in the field focused on training platoon personnel to include fire data automatically in every spot report. The support squad monitored these reports and could begin planning a fire solution before receiving a call for fire and

without adding to the radio traffic on the platoon net. For it to be most effective, each platoon member needed to possess the basic skills of a forward observer. More importantly, the technique and related platoon training helped to integrate support squad actions with those of the platoon.[96]

The training difficulties associated with the battalion reconnaissance platoon encouraged officers with platoon leader experience to recommend a simpler organization. The most common involved a pure structure that did away with the combined arms mix. With fewer weapons, vehicles, and tactical functions, platoon leaders could master its employment in less time. Simpler training meant more time executing effective operations instead of learning their craft. Retention of the scout platoon, upgraded with armored vehicles, constituted a common theme among these recommendations.[97] Other suggested organizations included a mix of scouts with either a tank section or a rifle squad.[98] The most exotic proposal combined scouts in armored vehicles with helicopters to leverage the benefits of aviation and ensure it became an organic battalion asset.[99]

Opponents of the combined arms reconnaissance platoon in the battalion focused much of their criticism on this unit's minimal scout capability. Possessing only a single scout section of 4 jeeps and 12 men, it simply could not match the coverage of the scout platoon in route reconnaissance, OPs, or area. Reconnaissance effectively became limited to reconnoitering a single route, although the battalion might require several potential paths of advance. Scouts also performed other roles beyond route reconnaissance. They guided battalion movement; located potential assembly areas; reconnoitered attack positions; and conducted chemical, biological, and radiological surveys. These actions often necessitated continuous employment for which the single scout section of the reconnaissance platoon lacked the manpower. It could not perform multiple functions simultaneously and continuously for the battalion.[100]

The scout section, overwatched by tanks, normally operated by stealth and infiltration. While this employment provided a degree of security to the scouts, it also compromised them. The noise of the tanks warned the enemy of the scout's presence, while the tanks themselves complicated platoon logistics. Therefore, many scouts preferred tanks to remain well back until needed. Proposals to improve scout effectiveness emphasized the need to operate away from roads, exploit the cover of darkness, and ensure sufficient time to employ both mounted and dismounted activity.[101]

The replaced scout platoon, however, incurred its own criticism. Its jeep-mounted scouts lacked the cross-country mobility of the parent battalion, making it difficult for them to remain forward and gather information to

guide the movement of the tank companies. The jeeps remained highly vulnerable, but the platoon itself became the subject of misuse by some battalion commanders. As a result, "The scout platoon failed to fulfill its main purpose because its organization rendered it a ready made taxi cab service and palace guard for the battalion headquarters."[102] The experience of one battalion on maneuvers was not exceptional. While a tank company remained halted at a roadblock during an attack, the reconnaissance unit that should have been finding a bypass route instead found itself guarding the battalion command post. Such misuse could be dangerous, because "there is little doubt that the capabilities of a reconnaissance unit lends itself to top performance in the task of command post security, as column guards, or as substitutes for other organic units. But every assignment that replaces a scouting mission is a hazard to the security of the parent unit."[103]

Courtesy *Armor Magazine*

Figure 53. The amphibious PT-76 light tank also began to equip Soviet reconnaissance units.

The scout platoon had also resurrected longstanding concerns surrounding the need to fight for information. An organization roaming the battlefield in unarmored vehicles seemed incapable of overcoming hostile screens or surviving chance encounters with artillery fire, mines, or an ambush. In a tone reminiscent of the interwar debates on the same issue, the case for robust reconnaissance organizations found expression in an article written by Major Raymond R. Battreall Jr. He believed:

> No enemy is going to divulge the type of information we seek—the location, composition, and disposition of his main force—without a fight. Hence, the word reconnaissance with its misleading connotation of "sneak and peek" needs to be refined-or-better-dropped from our title, for the unit we are talking about is going to have to go out and fight for its information.[104]

Gaining information necessitated the ability to force a reclusive enemy to reveal his presence.

> The characteristics of a unit which can kick up such a brawl without committing suicide are those of Cavalry from the earliest days; mobility superior to anyone else on the battlefield, killing power sufficient to produce shock, and communications adequate to pass the word. Naturally, a unit with these characteristics will be useful, as it has always been, for a wide variety of missions . . . it will never fight without seeking information and it will rarely, if ever, seek information without fighting.[105]

Supporters of the combined arms reconnaissance platoon highlighted its ability to participate in all operations of the parent battalion. It could operate independently and perform offensive, defensive, and retrograde operations with its organic assets. In the type of delay actions likely to occur in the opening phases of a war in Central Europe, the reconnaissance platoon could retain contact with the enemy, relying on the tank section to engage at long range, while the scout section continuously observed enemy activity. Nevertheless, by 1964 the Army had begun to plan another restructuring of the maneuver battalion reconnaissance platoon. Responding to a request for feedback on a platoon proposal, one experienced platoon leader attending the Armor School wrote, "Before making any changes to the reconnaissance platoon, our planners should remember that this platoon needs sufficient firepower to accomplish its mission and must have the capability of independent operations away from its parent unit."[106]

Once again, the reconnaissance platoon organization became caught between two contending views. One favored firepower and combat power to ensure survival and the ability to fight for information as necessary. The other placed a premium on the performance of multiple tasks and maximizing information collection over a broad area. Materiel issues influenced this debate. Jeep use by scouts encouraged emphasis on stealth and the avoidance of combat. By the early 1960s, this platform had equipped

reconnaissance units for 20 years. Its deficiencies were well known and interest in procuring a replacement continuous, but minor automotive improvements constituted the extent of its change. This inauspicious development was characterized as having made the jeep "more expensive, less rugged, hard to fix, somewhat more comfortable, and with the M151, considerably easier to turn over."[107]

Recommendations for a replacement proved common and generally sought to retain the best features of the jeep in a small, tracked armored platform.[108] To junior officers, the new technologies being pursued throughout the Army were not appreciably improving small unit effectiveness. Some thought the attention to futuristic weapons unwarranted, especially since it appeared to come at the cost of current capabilities: "Part of the problem is that in the great hue and cry for technological breakthroughs and organizations to exploit them we have been gazing too long into the crystal ball since our last good hard look at the present."[109]

While the pursuit of new materiel continued, the jeep soldiered on as the scout's workhorse. The need for a change was perhaps best summarized by one officer's observation:

> How often have you observed a scout jeep fully loaded with TA-21, basic load of ammunition, rations for several days, weapons and other gear, its three man crew precariously perched atop this miniature Vesuvius, motoring down a road or train with the springs violently jarring against the frame at each small bump?[110]

By late 1963, scouts could finally look forward to a new platform. The M114 Armored Command and Reconnaissance Vehicle finally provided the reconnaissance platoon headquarters and scout section a full tracked, armored vehicle. With its arrival, the reconnaissance platoon possessed a uniform mobility. The M114 was built to meet specific requirements associated with scouts. It weighed 7.5 tons, carried a three-man crew, and mounted a .50-caliber and an M60 7.62-mm machinegun. Its aluminum armor provided protection from artillery fragmentation and small arms, offering at least a chance of surviving an ambush. Its light weight permitted air transport and air dropping. It possessed an inherent amphibious capability that required no special preparations to use. Its height of over 7 feet compared unfavorably to the jeep, but it proved narrow enough to move through narrow defiles and paths.[111]

In the M114, scouts finally had a vehicle that offered a degree of protection and firepower. It certainly improved stowage for scout personnel and its M60 machinegun was intended for mounted or dismounted

Courtesy *Armor Magazine*

Figure 54. The M60 tank began to equip mounted formations as the Army transitioned to more combat capable formations as part of Flexible Response.

operations. Indeed, the vehicle doubled the firepower available to scouts and increased the value of the section to a base of fire. The armored shell provided a degree of protection during operations in the wake of a nuclear blast. No longer did scouts need to bypass terrain passable to the rest of the platoon.[112]

In many respects, the M114 seemed the ideal scout vehicle and reflected views of reconnaissance personnel at least since the Korean War. The principle disadvantages initially associated with the M114 included track and engine noise noticeably louder than the relative silence of the jeep. The greater complexity of the vehicle increased maintenance requirements, and its tracked nature limited its use in training areas with a fragile infrastructure. These drawbacks seemed slight in comparison to the improved protection and capabilities offered the scout.[113]

News of the pending fielding of the M114 encouraged analysis of its use in scout units. Proponents of the scout platoon saw in the vehicle the means necessary to address the deficiencies of the organization while retaining its strengths. With better survivability, firepower, and mobility than jeep scouts, the M114 added desirable qualities to the platoon.

The greater maintenance associated with the vehicle was not considered excessive, particularly since it was expected to replace jeeps in most roles throughout the battalion.[114]

By the mid-1960s, the reconnaissance platoon was on the verge of another change. Plans to reconfigure the unit back into a scout platoon accompanied the fielding of the M114, effectively ending the notion of a uniform platoon for use in armored cavalry regiments, division cavalry squadrons, and maneuver battalions. In fact, this objective had never entirely been achieved. In the armored cavalry regiment, the platoon's tank section possessed a third light tank. In the battalion reconnaissance platoon, the support squad disappeared following the addition of a mortar platoon to the battalion headquarters.[115] Consequently, three different platoons with three different strengths existed. Moreover, a clear difference of opinion had emerged regarding the role of the maneuver battalion reconnaissance platoon versus that of the armored cavalry regiment and division squadron.

Armored Cavalry Regiment

In the years following the Korean War, the armored cavalry regiment remained a robust, general purpose combat unit charged with providing reconnaissance and security at the corps level. Intended to operate independently, its organic assets provided sufficient strength to permit operations as a light armored task force. With augmentation, it became a highly mobile armored team. In the Federal Republic of Germany, the 3d, 11th, and 14th Armored Cavalry Regiments provided border security and bore responsibility for alerting American and NATO forces in the event of a Soviet invasion. They maintained watch over 500 miles of border, which ran through mountainous and rugged terrain. In some areas, cultivated fields and villages extended to the very border, complicating observation and defense. Each regiment covered a section of the border and maintained continuous patrols between OPs on the frontier.[116]

The dispersed nature of the armored cavalry regiments and their special mission resulted in the adoption of a modified TOE for them. Subordinate battalions were reorganized to enhance their ability for independent operations through the incorporation of administrative, maintenance, medical, and supply services taken from the regimental headquarters. This decentralization of support suited the dispersed nature of the regiments and provided more timely responsiveness to each battalion. In addition, the reconnaissance companies of each battalion replaced their M41 light tanks with M48 medium tanks to provide a longer range and better armor and firepower. The removal of the light tanks standardized tank ammunition

and supply requirements throughout the regiment. Each battalion also benefited from the addition of one helicopter for aerial observation.[117]

The operation of each regiment in Germany varied according to their circumstances. The 14th Armored Cavalry Regiment was stationed very close to the border, resulting in the dispatch of border patrols directly from its garrison quarters. Home station for the 3d and 11th Armored Cavalry Regiments was much more distant to the frontier, requiring the movement of border patrol personnel first to an intermediate staging camp before dispatch to the East German border. Similarly, overall conduct and management of operations varied. In the 3d and 14th Regiments, each battalion handled management of border operations. The 11th Regiment retained management within the regimental headquarters, creating a special staff section for this function alone. These operations and their related coordination demonstrated the command and control flexibility inherent to the armored cavalry regiment.[118]

In 1957, CONARC undertook a review of the armored cavalry regiment to determine changes required by new equipment and emerging concepts. The review occurred with support from the Armor School and comments from field units. In general, this feedback endorsed the basic

Courtesy *Armor Magazine*

Figure 55. Scouts in an M151 jeep practicing stealthy observation.

regimental structure but offered refinements to particular components. The most significant recommendations included provision of the battalions for independent operations—an action implemented by the regiments in Germany, greater surveillance capability, and increased aerial reconnaissance. CONARC and the Armor School consolidated the recommended changes and sought DA approval. This was received in December 1958, followed shortly thereafter by the publication of a new TOE. The DA also imposed a personnel cap on the regiment to prevent any increase in strength.[119] Publication of a new regimental manual followed these changes in 1960.[120]

The revised regimental structure dispensed with the battalion/company nomenclature and replaced it with the more traditional cavalry terms squadron and troop. The reconnaissance battalion, for example, became the armored cavalry squadron. The application of cavalry designations did not fundamentally alter the mission set of the regiment or its components. The regiment was expected to function as a light armor task force in security and light combat missions and generally perform reconnaissance, security, and economy of force operations. It performed screening and counterreconnaissance operations and operated as a mobile armored task force when reinforced. Specific actions also included reconnaissance and surveillance over a broad front; chemical, biological, and radiological monitoring; flank protection and security between formations; and screening the movements of friendly troop concentrations. It served as a covering force for offensive, defensive, and retrograde actions. The regiment also provided rear area security and gathered intelligence for nuclear target acquisition. Its versatility found expression in the guidelines for its use in nuclear, nonnuclear, and Cold War environments.[121]

The regiment included a headquarters and headquarters troop, three armored cavalry squadrons, and one aviation company. The most significant command and control change lay in the decentralization of logistical and medical support to the squadrons. The regimental headquarters strength shrank by a third as personnel and equipment migrated to the squadrons to increase their self-sufficiency. These changes largely institutionalized similar measures already taken by the regiments in Germany.[122]

Another significant modification to the regiment's organization lay in the addition of an aviation company. This unit included both fixed and rotary wing aircraft and increased the regiment's aircraft complement from 8 to 26. The troop was comprised of a general support platoon; three combat support sections; an aerial surveillance platoon; and related

air traffic, maintenance, and ground control. Helicopter and fixed wing aircraft constituted each combat support section that could be detached for operations with a ground squadron or troop. The aerial surveillance platoon included drones, aerial radars, and aerial cameras. It reflected a similar proliferation of surveillance devices found in the ROCAD. Overall, the aviation troop served to boost the regiment's ability to conduct reconnaissance and surveillance.[123]

Among the regiment's ground components, most modifications reflected the changes associated with the ROCAD revision and aimed at an increased level of standardization among armored cavalry organizations. Troop organization included three combined arms platoons and a headquarters. Additional support could be found at the squadron level, which included three armored cavalry troops, a tank troop, and a howitzer battery. The tank troop was configured similarly to the tank company found in armor battalions. Each squadron and troop added a radar section to improve surveillance capabilities.[124]

The new TOE permitted the substitution of light tanks with medium tanks at the theater commander's discretion. Although such a change already applied to Germany, it now became a standard option. Its effect was to greatly increase the regiment's offensive and antitank capability. The reconnaissance troop retained its collection of combined arms platoons, which theoretically were interchangeable with the platoons found in the division cavalry squadrons and the maneuver battalions.[125]

The possibility of incorporating main battle tanks in cavalry organizations down to the platoon did not meet with universal acclaim. The increased combat power was a direct response to the likelihood of encountering Soviet armor, particularly in Europe. Heavier tanks permitted a cavalry screen line to operate in the face of Soviet T54s, but opponents noted that this strength came at a cost. The heavier vehicles had a detrimental impact on the mobility of reconnaissance assets and could not guarantee their ability to traverse lighter bridges, narrow defiles, or forest trails. Soviet tank platoons included five main battle tanks, compared to the two that might be found in an armored cavalry platoon. Hence, the heavier tanks would be outnumbered even if they were able to keep pace with the scout section. These concerns led to the conclusion that the main battle tank "has emphatically no place in the Cavalry Troop itself, for it becomes a millstone about the neck!"[126]

Despite these concerns, the armored cavalry regiment did not excite the controversy associated with reconnaissance in the maneuver battalion or the division cavalry squadron. Its basic structure remained similar to

its inception in the 1940s. The inclusion of organic aviation constituted the most important change and reflected the development of air cavalry in the 1950s and 1960s. The aerial component of the regiment grew in this period and encompassed surveillance devices. It enhanced the versatility of the unit and offered the promise of still more capabilities as helicopter development and employment expanded.

Courtesy *Armor Magazine*

Figure 56. The M114 intended for command and reconnaissance roles and the jeep's replacement.

The regiment was intended to operate with its squadrons dispersed, pursuing separate but coordinated objectives. The commander relied on his command post, liaison officers, and extensive radio communications to keep him informed while he moved forward with his command group. Speed of action and aggressiveness was encouraged in all operations, whether attacking, reconnoitering, or conducting a mobile defense. Unlike the stealth and infiltration expected of scout platoons, "the regiment performs reconnaissance boldly and aggressively, making full use of its mobility and firepower." Although the regiment was not to become decisively engaged and diverted from its primary mission, its components were clearly expected to fight for information whenever necessary.[127] Its combat qualities also suited its role as a covering force responsible for:

> . . . the early development of the situation, the provision of security for the command, and the prevention of unnecessary delay of the main body. The covering force's missions are broad. They may include attacks to destroy

> enemy resistance, seizure and holding of key terrain features, or containment of large enemy units.[128]

By the mid-1960s, the armored cavalry regiment constituted the top of a tiered reconnaissance structure among ground forces. The regiment supported corps formations, while divisions included a cavalry squadron, and each battalion possessed its own reconnaissance platoon. Changes at all levels, however, made the years between the Korean and Vietnam Wars ones of high adventure for officers serving in reconnaissance units. The close of the period finally witnessed the emergence of a replacement to the venerable jeep, greater integration of ground and aerial reconnaissance, and a viable division design with adequate reconnaissance and security assets. Vietnam would provide the testing ground for the reconnaissance doctrine, materiel, and organizations that emerged.

Notes

1. Allan R. Millett and Peter Maslowski, *For the Common Defense: A Military History of the United States of America* (New York, NY: The Free Press, 1984), 508–510.

2. Millett and Maslowski, *For the Common Defense*, 511–512; A.J. Bacevich, *The Pentomic Era: The U.S. Army Between Korea and Vietnam* (Washington, DC: National Defense University Press, 1986), 12–14.

3. Millett and Maslowski, *For the Common Defense*, 511–512.

4. Bacevich, *The Pentomic Era*, 15–16, 19; Millett and Maslowski, *For the Common Defense*, 515–516; John B. Wilson, *Army Lineage Series: Maneuver and Firepower: The Evolution of Divisions and Separate Brigades* (Washington, DC: Center of Military History, 1998), 286.

5. Mary Lee Stubbs and Stanley Russell Connor, *Army Lineage Series: Armor-Cavalry Part I: Regular Army and Army Reserve* (Washington, DC: Center of Military History, 1984), 76–77.

6. Bacevich, *The Pentomic Era*, 100–101.

7. Millett and Maslowski, *For the Common Defense*, 525, 527–528; Bacevich, *The Pentomic Era*, 25–26, 40–44, 60–61.

8. Bacevich, *The Pentomic Era*, 66, 72–74, 94–96; Wilson, *Maneuver and Firepower*, 279.

9. Bacevich, *The Pentomic Era*, 68–70.

10. Wilson, *Maneuver and Firepower*, 264–267.

11. Ibid., 269–270.

12. Ibid., 270–277.

13. Ibid., 277–279, 282, 284.

14. Lieutenant Colonel Duane S. Cason, "Introduction to the New Armored Division," *Armor* LXVI, no. 6 (November–December 1957): 5.

15. Cason, "Introduction to the New Armored Division," 4–5; Major Paul M. Fisher and Captain George C. Hoffmaster Jr., "Armored Division Organization and Doctrine," *Armor* LXVII, no. 5 (September–October 1958): 7, 9, 11.

16. Cason, "Introduction to the New Armored Division," 8–9; Fisher and Hoffmaster, "Armored Division Organization and Doctrine," 9.

17. Cason, "Introduction to the New Armored Division," 5.

18. Ibid., 7.

19. Major (Promotable) Craig S. Harju Sr., "White Paper—A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," Report, US Army Armor School, Fort Knox, KY, 1989, 25–27. Available via the Defense Technical Information Center, ADA 214 798.

20. Cason, "Introduction to the New Armored Division," 7; Fisher and Hoffmaster, "Armored Division Organization and Doctrine," 8.

21. Department of the Army, FM 17-35, *Armored Cavalry Units, Armored and Infantry Divisions* (Washington, DC: Headquarters, Department of the Army, 1957), 14–15.

22. Cason, "Introduction to the New Armored Division," 7; Fisher and Hoffmaster, "Armored Division Organization and Doctrine," 8–9.

23. FM 17-35 (1957), 6–7.
24. Ibid., 18.
25. Ibid., 21.
26. Ibid., 17.
27. Ibid., 19–21.
28. Ibid., 22–30.
29. Ibid., 31–32, 40–41.
30. Ibid., 40.
31. Ibid., 41.
32. Ibid., 40–44.
33. Ibid., 45, 63–72, 79.
34. This organization was the same as the scout platoon organic to armored infantry and tank battalions.
35. FM 17-35 (1957), 85–86.
36. Ibid., 87, 103, and 107, quotation from page 87.
37. Ibid., 93, 96, and 109–112, quotation from page 96.
38. Ibid., 112–113, quotation from same.
39. Ibid., 99–101,112–113.
40. Ibid., 86.
41. Wilson, *Maneuver and Firepower*, 282; Colonel John A. Beall Jr., "Revisions to ROCAD," *Armor* LXVIII, no. 2 (March–April 1959): 48.
42. Beall, "Revisions to ROCAD," 48–49.
43. Ibid., 49–50.
44. Ibid., 50.
45. Ibid., 49–50; Wilson, *Maneuver and Firepower*, 282, 284.
46. Major Harry H. Hiestand, "Rapid Reconnaissance, Now!" *Armor* LXVIII, no. 1 (January–February 1959): 46–49.
47. "Armor—Where Are We Going?" *Armor* LXVI, no. 6 (November–December 1957): 22–23.
48. Ibid., 23–24, quotation from page 23.
49. Ibid., 24.
50. Ibid., 24–25, quotation from page 25.
51. Lieutenant Colonel James T. Burke, "Armored Infantry and Recon Unit Organization," *Armor* LXV, no. 4 (July–August 1956): 15.
52. Ibid., 15–17, quotation from page 16.
53. Captain Thomas A. Tullar, "From Reconnaissance to Scouts" (student paper 45.6-142, Armor Officers Advanced Course, US Army Armor School, Fort Knox, KY, c. 1962), 1–4.
54. First Lieutenant William C. Haponski, "Which Method?" *Armor* LXVIII, no. 3 (May–June 1959): 10.
55. Ibid., 10–13.
56. Department of the Army, FM 17-35, *Armored Cavalry Platoon, Troop, and Squadron* (Washington, DC: Headquarters, Department of the Army, 1960).
57. Ibid., 10–11.
58. Ibid., 16.

59. Ibid., 10, 14–16, 19–22, 25–26.
60. Ibid., 30–34.
61. Ibid., 26–29.
62. Ibid., 26.
63. Ibid., 34–42.
64. Ibid., 46–48.
65. Ibid., 54, 61, 65–67, 73, 81–87, quotation from page 62.
66. Ibid., 93–97.
67. Ibid., 159, 168–177.
68. Ibid., 167–168.
69. Millett and Maslowski, *For the Common Defense*, 530–535, 537–538; Wilson, *Maneuver and Firepower*, 291.
70. Millett and Maslowski, *For the Common Defense*, 536–537.
71. Wilson, *Maneuver and Firepower*, 293, 296–297.
72. Ibid., 296–297.
73. Ibid., 297–298, 308.
74. Ibid., 303–308.
75. Editorial, *Armor* LXX, no. 5 (September–October 1961): 22–23.
76. Major General Robert W. Grow, "ROAD Flexibilty," editorial, *Armor* LXX, no. 6 (November–December 1961): 2.
77. Wilson, *Maneuver and Firepower*, 296.
78. Lieutenant Colonel Richard J. Glilkes and Major Rolland V. Heiser, "Dynamic 3-Dimensional Mobility," *Armor* LXX, no. 1 (January–February 1961): 7–9.
79. Wilson, *Maneuver and Firepower*, 314, 316, 318; Lieutenant General John J. Tolson, *Vietnam Studies: Airmobility 1961–1971* (Washington, DC: Department of the Army, 1973), 20–24.
80. Russell F. Weigley, *History of the United States Army* (Bloomington, IN: Indiana University Press, 1984), 540–541.
81. Captain Burton S. Boudinot, "Armed Reconnaissance—Tactical Integration of Aerial Elements," *Armor* LXX, no. 5 (September–October 1961): 6–10.
82. Glilkes and Heiser, "Dynamic 3-Dimensional Mobility," 7–9.
83. Weigley, *History of the United States Army*, 540–541; Wilson, *Maneuver and Firepower*, 296.
84. Glilkes and Heiser, "Dynamic 3-Dimensional Mobility," 8.
85. Ibid.
86. Captain Peter G. Grasser, "Reconnaissance Future," *Armor* LXX, no. 2 (March–April 1961): 4–8.
87. Harju, "White Paper—A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 34.
88. Lieutenant Colonel Charles S. Johnson Jr., "One of Our Units is Missing," *Armor* LXXI, no. 5 (September–October 1962): 19.
89. Ibid., 19–20; Captain Joseph D. Posz, "To Train a Cavalryman," *Armor* LXXIII, no. 4 (July–August 1964): 41.

90. Posz, "To Train a Cavalryman," 41.

91. Major Raymond R. Battreall Jr., "Is Cavalry Really AWOL?" *Armor* LXII, no. 3 (May–June 1963): 11–12, quotation from page 11.

92. Posz, "To Train a Cavalryman," 41–42.

93. Captain Robert E. Wagner, "Cavalry Platoon Operations," *Armor* LXXII, no. 4 (July–August 1963): 32.

94. Ibid., 34.

95. Ibid., 33–37, quotation from page 35.

96. First Lieutenant James K. McCrorey, "One Technique—Support Squad of the Armored Cavalry Platoon," *Armor* LXXIV, no. 5 (September–October 1965): 58–61.

97. Johnson, "One of Our Units is Missing," 21; Captain William A. Fitzgerald Jr., "Bring Back the Scout Platoon" (student paper 50-72, Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1964), 2–4, US Army Armor School Library.

98. Captain Willard Dixon Jr., "Are the Missions the Same?" (student paper 46-53, Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, c. 1963), 4–5, US Army Armor School Library; Captain Tom L. Lindholm, "What do We Have for Recon?" (student paper 50-113, 5, Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1964), US Army Armor School Library.

99. Captain Gordon L. Stone, "More for Your Money" (student paper 50-178, Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1964), 2–4, US Army Armor School Library.

100. Dixon, "Are the Missions the Same?" 1–4; Captain Gary P. Graves, "Ground Reconnaissance for the Tank Battalion—Now" (student paper 46-73, Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1963), 4, 6–8.

101. Captain Walter H. Nevil, "Scout and Reconnaissance Platoon Tactics," *Armor* LXXII, no. 1 (January–February 1963): 14–16.

102. Fitzgerald, "Bring Back the Scout Platoon," 1.

103. Captain John F. Jeszenszky, "Send Out the Scouts," *Armor* LXXV, no. 2 (March–April 1966): 43–44, quotation from page 43.

104. Battreall, "Is Cavalry Really AWOL?" 8.

105. Ibid., 8.

106. Captain Rafael G. Garcia, "The Reconnaissance Platoon—What Will It Be Like Tomorrow?" *Armor* LXXIV, no. 1 (January–February 1965): 57.

107. Ibid., 9.

108. See, for example, First Lieutenant Raymond E. Bell Jr., "Re-Equip the Scout Section," *Armor* LXX, no. 4 (July–August 1961): 53; Johnson, "One of Our Units is Missing," 21; Nevil, "Scout and Reconnaissance Platoon Tactics," 16; Battreall, "Is Cavalry Really AWOL?" 9.

109. Batreall, "Is Cavalry Really AWOL?" 9.

110. Lindholm, "What Do We Have For Recon?" 9–10.

111. Captain William P. Boyle, "M-114 The Scout's New Vehicle," *Armor* LXXII, no. 6 (November–December 1963): 44.

112. Ibid., 44–45.

113. Ibid., 46.

114. Fitzgerald, "Bring Back the Scout Platoon," 2–4; Stone, "More for Your Money," 2; Lindholm, "What do We Have for Recon?" 8.

115. Fitzgerald, "Bring Back the Scout Platoon," 2–3; Garcia, "The Reconnaissance Platoon—What Will It Be Like Tomorrow?" 55.

116. Lieutenant General Bruce C. Clarke, "Armored Cavalry Regiments Along the Iron Curtain," *Armor* LXVII, no. 3 (May–June 1958): 22–23.

117. Ibid., 25–26.

118. Ibid., 27.

119. Colonel John A. Beall Jr., "Revision of the Armored Cavalry Regiment," *Armor* LXVIII, no. 3 (May–June 1959): 5.

120. Department of the Army, FM 17-95, *The Armored Cavalry Regiment* (Washington, DC: Headquarters, Department of the Army, 1960).

121. Ibid., 3–6, 21.

122. FM 17-95 (1960), 8, 10–11; Beall, "Revision of the Armored Cavalry Regiment," 7.

123. FM 17-95 (1960), 13–15; Beall, "Revision of the Armored Cavalry Regiment," 7.

124. FM 17-95 (1960), 10-13; Beall, "Revision of the Armored Cavalry Regiment," 7.

125. Beall, "Revision of the Armored Cavalry Regiment," 7.

126. Batreall, "Is Cavalry Really AWOL?" 9–10, quotation from page 10.

127. FM 17-95 (1960), 22–24, 28, 53, quotation from page 53.

128. Ibid., 56.

Chapter 5

Vietnam: Reconnaissance in Counterinsurgency Operations

In the early 1960s, mounted reconnaissance remained oriented on conventional battlefields. Limited experimentation and analysis resulted in general principles applicable to counterinsurgency (COIN), but they remained unproven until the commitment of armor and armored cavalry to South Vietnam. Through trial and error, these guiding principles evolved into effective tactics, techniques, and procedures. In enabling this transition, mounted organizations demonstrated the value of organizational flexibility and versatility. By the war's end, they had accumulated considerable experience in COIN, but it remained unclear how or if this experience should shape Army-wide doctrine. Operations in Southeast Asia raised questions about the role of mounted reconnaissance and revealed a gap between doctrinal principles and their application to a COIN environment. All mounted units had been employed as maneuver units, resulting in the use of armored cavalry as general-purpose combat organizations. The need for reconnaissance assets to not only find but also engage and destroy the enemy reinforced this trend.

Prelude to War

Between 1960 and 1964, implementation of the Kennedy administration's policy of flexible response occupied much of the Army's focus. The adoption of the Reorganization Objective Army Division (ROAD) symbolized this policy's emphasis on a more robust conventional war capability. Conversion to the ROAD configuration made combat formations more robust and modular.

New materiel accompanied the change in division structure. The M60 main battle tank, the M113 armored personnel carrier, and the M114 armored command and reconnaissance vehicle constituted the principal changes in combat vehicles. The boxy M113 provided a light, armored carrier for a squad of infantry, and possessed excellent mobility. Armed with a single .50-caliber machinegun, its job lay in transporting infantry into position where they could dismount and attack. Mechanically reliable, it possessed good cross-country mobility and a 200-mile operational radius. The M113 marked a major improvement over the less versatile M59 and M75 platforms it replaced. The M114 offered similar promise as a light, armored scout platform in lieu of the venerable but unarmored jeep.[1]

Materiel and organizational changes drove doctrinal and training updates. The focus of these efforts, however, remained rooted in the threat

posed to Central Europe by the Warsaw Pact. Flexible response anticipated the likelihood of increased small wars outside Europe, but this acknowledgment found little reflection in published doctrine. The tactical implications of unconventional wars found expression largely as a footnote to coverage of more traditional conflicts.

In Southeast Asia, French influence in Indochina ended with the Geneva Accords of 1954, which partitioned Vietnam into the Republic of South Vietnam and the Communist Democratic Republic of Vietnam. The new South Vietnamese government embarked on an effort to consolidate its authority in the face of guerrilla activities encouraged by the Communist North. The latter sought to undermine South Vietnamese authority and establish a unified nation under Communist leadership. America supported the South. In addition to various aid packages and an influx of police and economic advisers, the Kennedy administration deployed military advisers. Between 1961 and 1963, the number of such soldiers rose from 900 to 16,000. Military advisers helped train South Vietnamese units and accompanied them into combat. Control of their operations resided with the Military Assistance Command–Vietnam (MACV).[2]

Such American support did not stop the activities of the Viet Cong guerrillas in South Vietnam. With the death of President Kennedy in 1963, his successor, Lyndon B. Johnson, pondered the viability of increasing the American ground presence in Southeast Asia. The 1964 Tonkin Gulf Resolution gave him the authority to do so, and the following year Johnson authorized the commitment of 200,000 American soldiers to South Vietnam. This act expanded the scope of US military operations.[3]

The Army continued to see the escalating conflict as an infantryman's war. Doctrinal references for the use of armor to counterguerrilla activities remained rare. In the 1960 version of FM 17-35, *Armored Cavalry Platoon, Troop, and Squadron*, for example, the mission set for armored cavalry included securing "friendly rear areas, routes of communications, and installations from enemy airborne, air landed, and guerrilla forces." The coverage amounted to no more than a few pages focused on general concepts.[4] The manual offered no special guidance for COIN operations, nor did guidance for the armored cavalry regiment offer further details. It, too, referenced counterguerrilla actions as part of more conventional operations.[5]

In 1961, the ROAD brigade orientation resulted in FM 17-30, *The Armored Division Brigade,* to govern armored brigade operations. It acknowledged the possibility of counterguerrilla actions and provided basic tips and principles to govern armor employed in this role. These

included the denial of civilian support to the insurgents, the prevention of guerrilla formation, and the importance of secrecy to shroud unit movements and achieve surprise. Passive defense measures included installation security and protecting lines of communication, while active operations entailed seeking enemy guerrillas and attacking them. To enhance the effectiveness of these actions, attacks on hostile insurgents were to be conducted at night or during inclement weather. Commanders were advised to consider brigade administrative and support elements vulnerable and likely to draw attacks.[6]

This manual offered something more than vague generalities concerning COIN operations, but it did not constitute an effective depiction of how to employ the armored brigade to defeat guerrillas. Indeed, much of its special section addressed operations in conjunction with friendly guerrillas. COIN was included as a "situation short of war," but in addressing this circumstance, the manual almost apologetically noted, "No normal employment can be described." It did not address operations in close, complex terrain, despite the tendency of guerrillas to avoid the open areas most suited to armored vehicles. A single paragraph constituted the guidance for an armored brigade faced with fighting in woods, swamps, and lake areas. Armor was expected to bypass these terrain features, neutralize them by fire, and let infantry units clear them.[7]

The coverage of rear area security missions offered still limited but more practical guidance applicable to COIN. Brigades assigned to this mission oriented on key terrain, critical installations, the road net, potential landing/drop zones, and likely assembly areas. The brigade divided its area of operations into battalion task force zones. Integrated use of installation security, observation posts, patrols, and centrally located mobile reserves were to ensure security and prevent hostile incursions. Yet, the three pages devoted to this subject did not detail how to organize and implement these measures.[8]

Nascent Awareness of Counterinsurgency Operations

Applying the general principles outlined in doctrine to an actual field environment became the focus of the 3d Armored Cavalry Regiment (ACR). In October 1961, this unit relocated to the Federal Republic of Germany. The regiment assumed responsibility for rear area security. In preparation, the unit participated in tactical exercises that provided the first opportunities to employ an armored cavalry regiment in this type mission. Within its area of operations, the 3d Armored Cavalry had to protect installations and key routes from possible attack by airborne forces, infiltrators, and guerrillas. It needed to establish continuous surveillance over

potential drop/landing zones and likely insurgent base camps. The regiment was expected to find and destroy conventional or irregular forces.[9]

Courtesy *Armor Magazine*

Figure 57. The M114 Armored Command and Reconnaissance Vehicle (foreground) fielded with great promise as a replacement to the venerable jeep.

These exercises provided several lessons for the use of armored cavalry regiments. The most effective use of the armored cavalry regiment proved to be as part of an integrated area security network. Outposts, installation garrisons, roadblocks, scout patrols, surveillance measures, and helicopter flights all provided a continuous stream of information on activities. Further insights into the area came from military intelligence teams and the civilian populace. An extensive and robust communications net ensured the rapid and steady flow of information. In the event of a hostile act, quick reaction forces comprising tank, rifle, and mortar elements raced to relieve those locations in the greatest danger. At the squadron level, the light tank troop was integrated with an armored cavalry troop to provide two organizations with similar capabilities. The armored cavalry troops generally consolidated their like elements and formed mixed task forces as needed. Whenever these teams encountered the enemy, they sought to maintain contact until the hostile force was destroyed. Against an elusive enemy, it was not enough to simply gain and maintain contact. The hostile force had to be eliminated to ensure their inability to conduct further guerrilla acts.[10]

Decentralized command and rapid action proved critical to the success of reaction forces. Initial reliance on successive troop, squadron, and

regimental authority to dispatch reaction teams to hostile contacts failed. The time lag associated with this process eliminated the chance of actually intercepting the enemy force before it withdrew. Therefore, squadron commanders assumed responsibility for their own areas of operations. They determined how to respond to threats without first seeking regimental approval. The regimental commander monitored events and could intervene, but the actions of subordinate commanders were not hamstrung by mandatory consultation with higher headquarters.[11]

The least effective use included convoy escort duties. The escorts tended to deter only small-scale ambushes, while larger attacks entangled the escorts in a series of disjointed engagements that precluded maneuver. The escort could not prevent the loss of at least part of the convoy, but it incurred significant crew fatigue and vehicle wear regardless of whether a hostile attack occurred. Escort duty also diverted combat forces from more lucrative operations.[12]

Route security proved a more efficient method of protecting traffic. Outposts along a road provided a means of surveillance and early warning of hostile action. Patrols roved at irregular intervals between the outposts to preempt or interrupt ambush attempts. Armored cavalry platoons generally used their scouts to perform these patrols and man outposts. The tank section, rifle squad, and support squad constituted a centrally located strike force to relieve convoys under attack. This technique restored some of the armored cavalry's ability to maneuver and reduced vehicular wear, but it still tethered the unit to a single route. Consequently, route security was recommended only for particularly vital roads.[13]

In 1962, the Armor Combat Developments Agency at Fort Knox, Kentucky, produced a study outlining the role of armored cavalry in COIN operations. This study provided an analytical parallel to the 3d Armored Cavalry Regiment exercise. It drew on lessons learned by several nations with COIN experience since World War II, but it was expressly oriented toward Vietnam. The study identified several missions suited to armored cavalry, including offense, raids, counterattacks, route security, convoy escort, reconnaissance, and surveillance. In security operations, armored cavalry appeared capable of securing areas, routes, and convoys, thereby freeing other friendly forces for combat operations elsewhere. The study authors found the armored cavalry regiment's mix of ground and air mobility, firepower, communications, and shock ideal for action against comparatively lightly armed but elusive insurgents. However, they did acknowledge the primacy of infantry in COIN and the likelihood of terrain constraining mobility.[14]

The study urged doctrinal changes to encourage the use of armored cavalry in combating guerrillas. Armored cavalry doctrine required greater emphasis on flexibility, mobility, and the ability to conduct mounted and dismounted operations with equal skill. Small unit training also needed to provide greater emphasis on the tactics, techniques, and procedures associated with COIN. Specific adjustments included more emphasis on support weapons, operations in varied terrain, dismounted operations, and battle drills for rapid reaction to ambushes.[15]

For COIN operations, the study provided a detailed listing of recommended materiel and organizational changes. The danger of ambushes mandated all-round armor protection for tactical vehicles. They needed to survive the initial attack to maneuver and counterattack. Hence, replacement of the scout's jeep with the M114 was favored due to the latter's better survivability.

The reduced armor threat associated with insurgencies reduced the need for tanks. The study suggested replacement of some with M113 armored personnel carriers. Generally, armored vehicles required:

> . . . a high probability of surviving an ambush that may contain rocket launchers and recoilless rifles. These vehicles must be able to assault enemy positions in the face of a large volume of small arms fire, overcoming this fire with weapons operated from within the vehicles, or give suppressive and supporting fires to assist maneuvering elements to attack the flanks and rear of the enemy ambush.[16]

The publication of FM 17-1, *Armor Operations*, in 1963 reflected the growing awareness of the utility of mounted forces in less conventional roles. The manual served to help mounted organizations adjust to the new ROAD structure, but it included guidance applicable to COIN. Coverage of security operations, for example, included not only screen, guard, and covering force; it also addressed area security against a variety of threats, including irregular forces, espionage, and sabotage. The objective of area security lay in the protection of rear area units, installations, and lines of communication. Through reliance on observation posts, air and ground patrols, interaction of the civilian population, and creation of an early warning system, armored units were expected to establish an intelligence network bolstered by mobile combat forces. The manual reflected the earlier experience of the 3d Armored Cavalry Regiment and the analysis of the Armor Combat Developments Agency.[17]

For the reader, the manual identified the key objectives for area security, and it provided useful concepts for organization and mission execution. However, the manual's overall focus remained on conventional operations anticipated in Central Europe. A section on jungle operations simply highlighted the limitations on mounted forces, while just three pages addressed COIN. It noted the need to first create bases in areas of irregular activity, then establish control over the civilian population, and finally destroy the threat through offensive operations. To this simplistic approach were added some principles to guide the tailoring of forces to execute these measures. Nevertheless, much was left to the reader to figure out. The manual acknowledged the likelihood of mounted forces conducting COIN operations, but it considered them a special rather than normal activity.[18]

Courtesy *Armor Magazine*

Figure 58. South Vietnamese M113s in the field. The South Vietnamese became adept at sustaining this vehicle under difficult conditions and pioneered many of the special techniques later adopted by the US Army to maximize the effectiveness of this vehicle in Vietnam.

Ironically, the Army possessed a potential wealth of information regarding the use of mounted forces in South Vietnam against insurgents. When the Republic of South Vietnam was created, its initial military structure included armored units. To organize and train these forces, the South Vietnamese relied on the United States. The configuration of mounted units followed American patterns of organization. The Armor School at Fort Knox trained South Vietnamese soldiers, while American armor advisers

worked directly with South Vietnamese mounted forces in the field. By 1965, every South Vietnamese armored cavalry regiment and squadron possessed its own American advisory cell.[19]

These activities should have generated a steady flow of insights, lessons learned, and general information concerning the use of mounted forces in COIN operations. Unfortunately, much of the potential value of this information was lost to the Army until 1962. Before that year, American advisers serving in Vietnam were prohibited from disseminating information about their activities. Their role was cloaked in secrecy at a time when the Army began to acknowledge the likelihood of COIN operations. Hence, the American Armor community benefited little from the accumulated South Vietnamese COIN experience. Assumptions about the supposed inability of mounted organizations to operate in Vietnam continued to abound.[20]

South Vietnamese armored units became adept at overcoming mobility challenges and sustaining their vehicles without the massive supply of parts and well-equipped workshops available to American tank and cavalry organizations. They introduced the M113 to Southeast Asia through the fielding of two companies in 1962. They rejected the American practice of using the vehicle as a battlefield taxi and achieved better results by encouraging passengers to fight mounted.[21] In fact, "The ultimate tactical objective of the Vietnamese trooper is to physically overrun the enemy and crush him beneath his tracks. All of his efforts are directed to this end, and the psychological—or 'shock'—effect on the enemy of this armor equivalent to 'the spirit of the Bayonet' is very great indeed."[22]

This early success led to the fielding of additional units equipped with the M113, followed by modifications and new tactics. Additional machineguns and gun shields began to adorn the vehicles after heavy losses among crew members trying to operate the unprotected machinegun. The additional firepower suited the platform's growing use as a combat vehicle rather than a transport, and it marked the M113's transition into an armored cavalry assault vehicle (ACAV). A variety of measures were adopted to improve protection, including the use of extra track blocks and sandbags. The South Vietnamese developed additional equipment that could be carried on the vehicle to assist in crossing waterways, recovery, and movement across soft ground. They also employed flamethrowers on the vehicle. American combat units later adopted all of these measures.[23]

The South Vietnamese had less success with the M114. Considered the answer to longstanding desires for a small, armored reconnaissance vehicle, the M114 entered service in 1961. The South Vietnamese received 80 of

these vehicles for use in their armored cavalry organizations. Vietnamese crews discovered the M114's poor cross-country mobility. It could not negotiate many of the small waterways found throughout Vietnam. Too often, the vehicle simply nosed into ditches and stream banks, unable to extricate itself. American observers carefully tracked those South Vietnamese units equipped with the M114 and came to similar conclusions regarding the vehicle's poor effectiveness. As one adviser noted: "The major problem was that their front slopes protruded beyond the track and dug into dikes and canal banks before the track could get a foothold, thereby preventing the M114's exiting from paddies or canals." These vehicles also proved underpowered, possessed poor reliability, suffered frequent track failures, and lacked adequate interior space. Consequently, the M114 was withdrawn from Vietnam, and it did not serve with American units later deployed there. However, its difficulties did not prevent retention and use by organizations serving in other theaters.[24]

Training the Basics

The operation of South Vietnamese armor units generally failed to attract significant attention among commanders of American mounted units. Instead, their focus lay on training and improving combat readiness. Faced with the turmoil associated with the conversion of divisions to the ROAD configuration, they struggled to build unit effectiveness. Reconnaissance organizations faced some particularly difficult challenges related to the restructuring of battalion scout platoons into combined arms armored cavalry platoons.

Basic reconnaissance principles found expression in FM 17-1, *Armor Operations*. Reconnaissance served to gather combat information about the enemy and the area of operations to generate intelligence and guide planning and command decisions. This basic mission applied to the armored cavalry regiments, division cavalry squadrons, and the reconnaissance platoons of the maneuver battalions. They were to integrate the actions of ground scouts, surveillance radar, and aerial assets whenever available.[25]

Reconnaissance oriented on the objective. Its value hinged on timely and accurate reporting. These fundamentals long predated armored organizations, but the manual clearly rejected the World War II era emphasis on pure reconnaissance: "Reconnaissance and security complement each other and cannot be readily separated."[26] The elevation of security as a parallel and integrated function with reconnaissance did not equate to a wholehearted embracement of combat as the principal means of gathering information. Instead, reconnaissance units were to "obtain information by

stealth whenever possible, but fight when necessary to gain the desired information. The reconnaissance mission must not be jeopardized by combat with the enemy when combat is not essential to obtain the information desired."[27]

The reconnaissance commander on the spot decided whether to engage in combat or not. However, a new requirement infringed on this prerogative. Having gained contact with a hostile force, the reconnaissance commander was prohibited from breaking it without higher headquarters approval. While contact sustainment had become a standard principle of reconnaissance, the requirement to seek permission to break it was not. The latter reduced the options available once contact occurred, and encouraged reconnaissance assets to remain in close proximity to an enemy force, where the likelihood of combat and the risk of decisive engagement rose.[28]

Once contact was established with a hostile force, the reconnaissance commander sought to develop the situation. This would occur through one of several methods. He had to determine the strength and disposition of the enemy, particularly identifying his flanks. He then needed to decide whether to attack or bypass the hostile presence, subject to higher headquarters approval. Unlike prior doctrinal guidance that encouraged dismounted reconnoitering, this manual limited such actions to terrain unsuited to vehicular movement and nighttime patrols. Otherwise mounted reconnaissance became the norm, using appropriate movement techniques to minimize the risk of ambush or loss. When time became short, movement accelerated and relied on reconnaissance by fire to discover the enemy. Standard reconnaissance operations continued to include route, zone, and area.[29]

The effective implementation of these principles rested on the platoon, the basic building block of all ground reconnaissance organizations. Under the ROAD configuration, the armored cavalry regiment, division cavalry squadron, and maneuver battalion reconnaissance platoons shared the same combined arms structure. This uniformity posed significant training challenges not easily overcome by organizations faced with simultaneous changes in materiel, doctrine, and unit structure above the platoon level.

Armor units in general already faced serious training and readiness issues. Unit training activities in the United States were undermined by personnel diversions to perform other activities unrelated to tactical effectiveness. These distractions contributed to the inability of several units to complete annual training cycles. High personnel turnover, insufficiently trained replacement platoon leaders, and too few experienced

noncommissioned officers (NCOs) all contributed to a generally negative assessment of combat readiness. Most commanders expressed dissatisfaction with current training programs, stressing the need for more field training, platoon exercises, and gunnery. For many units, limited maneuver space reduced the value of the few field activities undertaken.[30]

Courtesy *Armor Magazine*

Figure 59. Use of an M113 to recover another—a common activity in South Vietnam and necessitated by the terrain conditions.

Commanders serving in armored cavalry regiments noted that officers and NCOs all needed further instruction in reconnaissance principles. Replacement personnel proved especially deficient. The differences in the employment and materiel of reconnaissance versus tank units underscored the importance of specialized training for the former. However, such training was generally not available and not offered by the Armor School, pushing the responsibility for developing effective reconnaissance leaders to units in the field. In response, the Seventh Army Combined Arms Training Center introduced a basic officers' reconnaissance course.[31]

The most significant problems facing the training of armored cavalry platoons included a high rate of personnel turnover and training effectiveness. Unit training areas proved too small and lacked varied terrain, but access to major training facilities with more maneuver space remained limited and of short duration due to their large training load. Limited maneuver space at home station coupled with frequent administrative details of personnel resulted in few opportunities for the training of complete platoons at full

strength. Some units found themselves with as few as 20 percent of their authorized establishment on hand. Moreover, terrain restrictions often precluded the use of tanks that might damage property. The overall impact of these conditions lay in low combat readiness rates, because the platoons spent little time in the field building their cohesion and practicing their craft.[32]

New armored cavalry platoon leaders often arrived in their units insufficiently trained and lacking in basic knowledge and skills. The Armor Officer Basic Course and Armor Officer Orientation Course offered in the Armor School provided only a few days of cursory instruction in the armored cavalry platoon, despite the unit's unique and complex composition. It constituted the smallest combined arms team in the Army and incorporated a mix of weapons, vehicles, and military occupational specialties (MOS). New platoon leaders proved ill equipped to handle such units:

> The platoon leader 1) commands the smallest combined arms team in the army—and does not know how; 2) is frightened to his "boot-tops" when he first views his command (the platoon) in the motor park; 3) does not know the function of any of the platoon's elements, except perhaps the tank element; and 4) is therefore unprepared to employ three of the elements separately, or the four elements together in coordinated action. In short he is unable to command and operate his platoon.[33]

The unqualified nature of new platoon leaders impacted the entire platoon. Such leaders could not demonstrate the effective employment of a particular section or squad, and they did not know the skills associated with each of their platoon soldiers. As a result, the unit rather than the schoolhouse assumed and bore the primary burden of training platoon leaders. This process required months, after which the platoon leader remained with the unit only a short time before leaving for his next duty assignment. Experienced NCOs assumed a critical role. They helped develop new platoon leaders in addition to training squad and section elements, and sustaining the overall cohesion of the platoon. Unit commanders appreciated the efforts of the Seventh Army to provide special classes to help new platoon leaders, but they wanted commanders rather than students. They expected the Armor School to assume this responsibility.[34]

In response to the problems facing armored cavalry platoon training, Continental Army Command (CONARC) sought through the Human Resources Research Organization (HUMRRO) office at Fort Knox to develop corrective measures. A detailed breakdown of the principal

duties and skills followed that was cross-referenced against current training activities. The results of this work then became the foundation for establishing training standards to measure both individual performance and unit readiness. The final product included a series of formal tests that progressed from the individual through the squad and section to platoon. Each level addressed key tasks identified in the study. At the individual level, the focus lay on basic skills such as weapons use and navigation, while the squad and section evaluation addressed vehicle operation and crew interaction. The platoon review focused on the platoon leader's skill, the platoon's responsiveness, and the unit's ability to perform a variety of actions associated with the armored cavalry platoon. Collectively designated the Armored Cavalry Platoon Combat Readiness Check, by 1966 they were undergoing evaluation in the field and facing a final decision regarding their adoption.[35]

Parallel work addressed the issues of leader training and insufficient maneuver space. The solution emerged in the form of a simulator that included a motion picture screen, partitioned booths to represent vehicles and crews with working radios, and motorized projector units. The screen depicted enlarged map transparencies on which the motorized projectors displayed images of the platoon's vehicles and their movement. Other

Courtesy *Armor Magazine*

Figure 60. Armored cavalry trainer developed to improve the preparation of cavalry leaders through the integrated use of radios and movie projectors—the forerunner of computer-based simulators.

projectors controlled friendly and opposing force elements. Trainees occupied the partitioned booths and communicated with each other via radio, seeking to implement the platoon leader's guidance and track the development of each action. Through the execution of free-play scenarios, this training device permitted platoon members to practice map reading, communications skills, tactics, and command principles under the supervision of instructors who controlled the opposition and artillery. The entire construct was developed in close cooperation with the Armor School, which supported a similar product oriented on tank platoons. After an extensive field evaluation in 1965, CONARC approved the adoption of the armored cavalry trainer and its use to instruct both Active Component and National Guard soldiers.[36]

The new device provided an important tool for enhancing platoon leadership without the expense of acquiring new unit maneuver areas. It further permitted repetitive training where appropriate in much less time than would be necessary for a field exercise. It was optimally effective for training the platoon leader, platoon sergeant, squad leaders, and section leaders to work together as a team. In this sense, it proved important to developing overall platoon cohesion and in the instruction of new platoon leaders. However, lest the new device be considered a replacement to field training, a cautionary note accompanied its description:

> Although training on the ACT [armored cavalry trainer] will improve the field performance of cavalry platoon personnel, by no means should the system be regarded as a substitute for all classroom instruction, or for all field training and realistic combat exercises.[37]

These measures improved armored cavalry platoon training, but they required time to develop and implement. They were unavailable during the years immediately before the United States began its large-scale buildup of forces in Southeast Asia. Only after armor and cavalry units began to deploy to Vietnam, did noticeable training improvements occur.

A Question of Need

In 1965, 200,000 troops deployed to Vietnam. Initially, these forces provided security for American bases. By June, the scope of operations had expanded to include combat operations throughout South Vietnam. The need for armored organizations, nevertheless, remained unclear. Preparations to deploy the 1st Infantry Division with its mechanized infantry, tanks, and division cavalry squadron encountered difficulties that underscored the reluctance of senior leaders to commit armor units to Vietnam.[38]

When the 1st Infantry Division deployed, many of its armored assets were removed. The Army Chief of Staff considered them too vulnerable to mines and too constrained by terrain to be of much use in an infantryman's war. The division lost its mechanized infantry and both tank battalions, effectively transforming it into a dismounted formation. The division cavalry squadron, 1st Squadron, 4th Cavalry, remained, but it exchanged its M114s for ACAVs.[39]

Once in Vietnam, the brigades of the division were employed separately. A ground cavalry troop accompanied each one. This fragmentation left the cavalry squadron commander with essentially only the air cavalry troop under his direct command until that, too, was detached. On the assumption that tanks could not operate in jungle terrain, the squadron's M48s were also removed and employed in a static base security role. These actions effectively emasculated the 1st Squadron, 4th Cavalry Regiment and precluded its employment in accordance with doctrine.[40]

Despite these limitations, the squadron troops soon began to demonstrate their potential value. In November one troop used the mobile firepower of its ACAVs to break up a Viet Cong assault and mounted an effective counterattack. Reports of similar actions by Marine Corps armor further encouraged the deployment of more armor to Vietnam. The 11th Armored Cavalry and the 25th Infantry Division with its mechanized infantry, tank battalion, and division cavalry became the first of several more armored cavalry, tank, and mechanized units to enter the conflict.[41]

These mounted reinforcements generally underwent configuration changes before deployment. The most common included a reduction in tank strength and the replacement of M114s with M113s, frequently modified as ACAVs. Once in Vietnam, armored cavalry, tank, and mechanized units tended to operate as collections of detachments rather than as single maneuver elements. Their fragmented status complicated command and control.[42] The net effect of these actions lay in organizations dissimilar to those indicated in tables of organization and doctrinal manuals. They required new tactics, techniques, and procedures suited to the particular circumstances of Vietnam. American military advisers serving with the South Vietnamese armored force helped to make this transition. They provided threat information, terrain familiarization, recommended vehicle modifications, and suggested tactics. In doing so they sought to transfer to US forces the accumulated lessons learned by South Vietnamese armor during 10 years of active operations.[43]

The advisers also waged a campaign to overcome assumptions about the limited mobility of mounted units. In 1966, the senior American

armor adviser to the South Vietnamese published an article detailing the topography of Vietnam and how it could be overcome by mounted units. The Delta region dominated the southern part of the country. Tidal rivers and steep-banked canals crisscrossed nearly half of this region, which also possessed few roads and many swamps and forested areas. North of Saigon, large forests and rubber plantations predominated. Mountains dominated large sections of the northern part of the country and largely limited vehicle movement to the few roads and trails present. Along the coast lay the heavily populated urban centers linked by a highway and railroad. Trafficability proved generally better, but the presence of major rivers effectively partitioned this region. The Central Plateau along the Cambodian border possessed few urban areas and no significant rivers. Instead, forests and tall grass areas abounded. Although roads proved few, cross-country mobility proved better in the grassy regions. All of these regions posed particular challenges to vehicular movement, but they were not insurmountable.[44]

Courtesy *Armor Magazine*

Figure 61. Modified through the addition of machineguns and the installation of gun shields, the M113 became transformed into the Armored Cavalry Assault Vehicle (ACAV).

The M113 constituted the backbone of armored operations, especially when modified to enhance mobility, self-recovery, and firepower. Based on the South Vietnamese experience, this vehicle was expected to function in a tank-like role rather than a transport. Suitable missions included reconnaissance in conjunction with dismounted scouts, reconnaissance in

force, encirclement, and as a reaction force. The M113 possessed the best cross-country capabilities of any vehicle in a country dotted with rice paddies, marshy bogs, mangrove swamps, forests, canals, irrigation ditches, and streams. Nevertheless, the terrain and climate proved harsh on rubber components, resulting in the rapid deterioration of seals and the need for frequent replacement of track and suspension parts.[45]

Many of the tools and techniques developed by the South Vietnamese to facilitate self-recovery and overcome water obstacles were recommended for use by American units. These measures included pushbars, a capstan and anchor kit, and tow cables and pintles on every vehicle. These tools and the related techniques of employment permitted mounted units to overcome soft ground, canals, and waterways without external support. To enhance protection, dummy antennae were recommended for all vehicles to remove the unique signature associated with command platforms. The use of shields on the sides of vehicles made of plywood with a sheet metal covering provided a degree of protection against shaped charge weapons.[46]

Simple land navigation proved a challenge. Advisers noted the problems faced by newly arrived armor soldiers and recommended common sense solutions. One adviser noted:

> Because of the lack of terrain features, the average American has difficulty navigating when he first arrives in the Delta. This problem is further complicated by the erratic wandering necessary to travel a route suitable for the M113's. By constant reference to his map, frequent use of a compass and binoculars, and by utilizing the major canals as reference points, he will learn to overcome the difficulties of navigation in this flat terrain.[47]

The recommendations of advisers proved an important source of information for newly arrived commanders of mounted units. However, many units found themselves learning by trial and error, rather than according to a deliberate schedule of activities designed to prepare them for operations. Thrust into active missions whether ready or not, the first mounted organizations began to accumulate their own experience and develop their own solutions to problems encountered.

Showing the Way—Initial Operations 1965–67

Mounted operations in Vietnam differed significantly from the conventional environment of Central Europe that shaped unit training. The basic reconnaissance, security, and economy of force mission set associated

with armored cavalry assumed a different meaning in Southeast Asia. Reconnaissance included not only discovering hostile forces, but their immediate engagement in combat to destroy them. More often than not, reconnaissance became a movement to contact with the decision to initiate combat resting with Viet Cong and North Vietnamese soldiers. Security actions included convoy protection, securing lines of communications along select routes, and the static defense of installations and firebases. The distinction between economy of force and security actions became blurred, because mounted forces performing the latter freed infantry and airmobile forces for offensive operations elsewhere.

The period from 1965 to 1967 marked a time of adjustment by mounted forces. Most units found themselves fragmented to support different formations, despite the command and control problems this generated. Initial reluctance to employ tanks in an aggressive manner resulted in their relegation to base defense. Armored cavalry organizations thus functioned as a collection of dispersed detachments, further fragmented through the limitations placed on tank use by higher command. The tendency of division commanders to assume direct control over the air cavalry troop of the division cavalry squadron precluded the doctrinally encouraged practice of integrated air-ground cavalry operations. These developments forced mounted reconnaissance organizations to pioneer new tactics, techniques, and procedures suited to Vietnam.[48]

The first operations by American mounted units in Vietnam were small-scale affairs surrounded by confusion and uncertainty. It took

Courtesy *Armor Magazine*

Figure 62. Heavily sandbagged M48 supports a dismounted patrol.

time to overcome the reluctance of MACV headquarters to permit the unfettered employment of tanks. This reluctance ended only after the arrival of the 25th Infantry Division and its successful employment of mechanized infantry, tank, and cavalry in operations against a Viet Cong stronghold early in 1966. Subsequent operations began to test the boundaries of mounted actions in general, including missions during the rainy season.[49]

Before 1968, only two American tank battalions served in Vietnam—the 2d Battalion, 34th Armor Regiment and the 1st Battalion, 69th Armor Regiment. Both organizations experienced the routine detachment of companies to provide armor support to other units. In the case of the 2d Battalion, 34th Armor, some of its assets served in different regions of South Vietnam with little direct contact with the battalion headquarters. Rarely did the unit commander directly command more than a single company and in some instances he controlled none. Tank companies experienced similar detachments of platoons with corresponding command, control, and supply problems.[50]

Tank battalions performed missions similar to those of armored cavalry units. They escorted convoys and participated in route security operations. They also supported search and destroy actions. The tank's bulk made it more effective than other vehicles to forge its way through jungle terrain. The attachment of battalion scouts improved the ability of tank companies to perform these missions. In the jungle, scouts preceded the tanks, which followed in either column or wedge formation. On discovery of a Viet Cong site, the scouts provided a dismounted capability to conduct a detailed search. At night, when the tanks formed a laager, the scouts carried out dismounted night patrols to disrupt any potential hostile attack on the vehicles. During convoy escort operations, one tank platoon led while another trailed the vehicular column. The company commander hovered overhead in a helicopter, while the scout ACAVs positioned themselves in the convoy center, ready to react to threats from any direction. In the event of contact, the armored vehicles formed a herringbone formation through which the soft-skinned vehicles passed. Planning for the convoy's movement included preplotted fire missions along both sides of the road that could be activated if necessary.[51]

Crews appreciated the firepower and general survivability of the M48A3s that equipped the tank battalions, rejecting suggestions that a light tank would be more effective. Although it could be mired by steep-banked streams, the M48's bulk and power permitted some maneuverability in jungle terrain and high vegetation areas away from roads.[52] The tank's survivability proved its most popular feature. Even after extensive

mine damage, the vehicle usually returned to operations within days. Armor protection and instantly available firepower made it likely to survive sudden encounters with hostile forces. Therefore, crews preferred to "stick with our M48A3 medium tanks having seen exactly how demoralizing the 90 MM canister round is to an infantryman, whether it be a Viet Cong or North Vietnamese soldier."[53]

The tank battalions and tank components of armored cavalry units serving in Vietnam fielded the M48A3 before deployment. The diesel engine of this model provided a longer operational radius than gasoline powered versions. Moreover, it eliminated concerns about the volatility of gasoline. Engines and fuel tanks sustained repeated hits from Viet Cong equipped with the RPG-2, but resultant fires proved rare. One tank received a hit in its fuel tank, but the crew remained unaware of the impact until they discovered diesel fuel leaking onto the ground long after the engagement ended.[54]

The initially limited antitank threat faced enhanced confidence in the M48A3's survivability. At least one tank company commander viewed the RPG-2 with disdain:

> I have found that this particular weapon is poorly designed, highly inaccurate, and even after penetration is achieved the actual damage to the vehicle is slight. I base this conclusion on the fact that within a period of less than thirty days my company had eighteen of these weapons fired at it; a fact confirmed by finding the stabilizing assemblies, and I had three tanks which received hits. From these three hits we had, one penetration that occurred on what could be considered a "belly" shot, in that it struck the tank well down on the front slope of the driver's compartment near the point where it turns into the belly of the vehicle. Damage amounted to a broken brake pedal. To be sure, the driver was wounded, but he has since returned to duty and the tank was fought for another three days with a new driver and a bit of unplanned air-conditioning.[55]

Armored cavalry organizations included tanks, but configuration changes before deployment to Vietnam reduced their number. In the 11th Armored Cavalry, all platoons exchanged their tanks for ACAVs. The 2d Squadron, 1st Cavalry Regiment initially did the same only to have its original combined arms platoons restored shortly before leaving the United States.[56] Generally, division squadrons retained their combined arms platoons, although once in Vietnam, early operations were hampered

by the restriction of tanks to bases. This policy removed a significant portion of each platoon's combat power.[57] The replacement of M114s with ACAVs helped to restore some platoon firepower, but in the case of the 1st Squadron, 4th Cavalry Regiment, the vehicles were initially fitted with an improperly balanced gun shield for the .50-caliber machinegun. It proved exceptionally difficult to turn the turret on any degree of cant. Frustrated crews removed the gun shields and operated the weapon without them.[58]

Modifications in theater to fit the particular circumstances of Vietnam became common. At least one division cavalry squadron created an additional combat troop from its headquarters and headquarters troop assets. It consolidated the armored vehicles intended for the commander's use, the transports for the ground surveillance radar section, and the flamethrower equipped M113s. The resultant 12-vehicle force possessed considerable combat power and performed reconnaissance and economy of force missions. The squadron also benefited from periodic attachments that included a mechanized infantry company, a tank company, and/or an air defense battery. The last organization usually performed base camp security with its M42 Dusters employed in an antipersonnel role.[59]

Division cavalry quickly assumed a pattern of activities that became the norm for the remainder of the conflict. They performed cordon and search missions, search and destroy missions, assisted in opening roads closed by enemy action, defended base camps, and protected convoys and

Courtesy *Armor Magazine*

Figure 63. ACAVs halted in herringbone formation.

supply routes. At least a few platoons in each squadron found themselves designated as reaction forces or guarded key locations, including bridges. At night, armored cavalry relied on Thunder Runs to disrupt enemy ambush preparations and mine laying. In these operations, an armored column moved along a road conducting reconnaissance by fire and seeking hostile contact.[60]

Armored cavalry also began to maneuver more frequently off roads, demonstrating their ability to carry the fight to the enemy. In early 1966, the 3d Squadron, 4th Cavalry demonstrated this capability by effectively escorting an artillery unit through jungle terrain to its new firebase location. Off-road movement permitted more effective search techniques that allowed faster coverage of an area. Some degree of security was also obtained through continuous movement with the vehicles located in a different area each night. In all of these activities, armored cavalry generally served as another maneuver unit rather than one devoted to the more specialized missions of reconnaissance, security, and economy of force.[61]

The initial employment of division cavalry occurred with little guidance. Instead, squadrons simply sought the most effective method of using their assets, resulting in considerable variations in technique. Jungle operations forced attention to clearing paths, often by relying on tanks leading columns and using their bulk to bludgeon their way forward. Once in the jungle, the vehicles assumed blocking positions, conducted sweeps, and assisted village evacuations in an effort to separate civilians from the Viet Cong. The slow pace of such operations had to be factored into planning considerations, but they still proved considerably faster than dismounted infantry.[62]

Route security and convoy escort became the most common operations performed by division cavalry. These actions protected the supply lines that constituted the lifeblood of American military operations in Vietnam.[63] Route security generally required the establishment of strongpoints at key locations between which mounted patrols roved. When terrain, distance, and threat conditions made reliance on strongpoints impossible, the squadrons provided convoy escorts. The Viet Cong responded by increasing mining efforts, particularly targeting likely strongpoint positions. They tracked American troop movements and continually adjusted plans to exploit perceived weaknesses. Route security became a cat and mouse game in which some units excelled. In 1967, the 3d Squadron, 4th Cavalry, for example, escorted an average of 8,000 vehicles per month both day and night over roads in its sector. This success stemmed in part from the squadron's ability to retain its organic air cavalry troop. The helicopters

provided an aerial dimension to route security and provided both an early warning of enemy activity and a quick reaction to it. The 2d Squadron, 1st Cavalry adopted a more aggressive approach, routinely operating mounted patrols several kilometers from a protected roadway to disrupt the Viet Cong before they could mine or attack.[64]

Protection of roadways and traffic necessitated the development of counterambush tactics as indicated by the experience of the 1st Squadron, 4th Cavalry in 1966. Charged with securing a major highway connecting Saigon and the Cambodian border, the squadron found itself frequently under attack from Viet Cong forces. At first squadron personnel simply returned fire. Prolonged firefights and casualties followed without a decisive result. This passive response evolved into a more aggressive one in which some elements returned fire to pin the ambushers, while others used their mobile firepower to counterattack and block the enemy's withdrawal. Growing competence in the use of artillery, air support, and helicopters permitted more sophisticated operations aimed at eliminating the attacking Viet Cong. The culmination of counterambush tactics occurred with deliberate attempts to provoke an ambush that in turn triggered a multidirectional counterattack by ground forces supported by helicopter gunships, close air support, and fires. The ability of armored vehicles to survive initial contact and pin the Viet Cong with return fire proved critical to the success of these operations. The vehicles formed a base of fire, while airmobile infantry became the maneuver force encircling the enemy.[65]

The 11th Armored Cavalry performed similar missions. The regiment constituted the largest mounted unit deployed to Vietnam. However, its configuration differed from similar regiments stationed in Germany and the United States. For service in Vietnam, ACAVs replaced M114s and tanks in each armored cavalry platoon and the jeeps of the headquarters scout section.[66] Regimental tank strength fell from 132 to 52, while the number of M113s rose from 83 to 320. The greater reliance on the M113 mandated increases in personnel to permit both proper manning of the vehicle's weapons and a dismounted capability. Accordingly, the regiment's personnel strength rose from 3,040 to 4,112. At the platoon level, manning requirements were often met by dispersing the infantry squad among the other platoon vehicles. The net effect was to transform the combined arms platoon into an all ACAV organization supported by a single mortar carrier.[67]

Arriving in Vietnam in September 1966, the 11th Armored Cavalry's first few months in country were consumed with establishing and securing a permanent base camp. In conjunction with airborne and infantry formations,

Courtesy *Armor Magazine*

Figure 64. The M113's mobility made it invaluable during the rainy season in Vietnam and in crossing the many small waterways. Here ACAVs traverse a flooded area.

it sought to locate, eliminate, and prevent the return of Viet Cong. Afterward, it worked to provide security throughout its area of operations, necessitating convoy escort and the protection of supply and communications lines.[68]

The Viet Cong contested the armored cavalry's efforts, largely through repeated ambushes of regimental assets. These attacks played to American strengths, permitting the employment of massed firepower and rapid ground maneuver to inflict heavy losses. Viet Cong activity soon dropped, permitting the armored cavalry to focus on road clearance. Potential ambush sites were eliminated and the underbrush along major roadways removed to a distance of 100 meters on both sides. These measures improved civilian access to major roads, interfered with Viet Cong supply routes, and ultimately permitted the regiment to disrupt the ability of the Viet Cong to collect taxes. By year's end, the area became secure enough for local elections to be held.[69]

These operations and their results validated the area security principles previously developed by the 3d Armored Cavalry in Germany.[70] They also stimulated the emergence of standard battle drills for ambush situations within the 11th Armored Cavalry. In November 1966, a convoy escorted by a single armored cavalry platoon came under attack by two Viet Cong battalions. While the convoy struggled to drive through and away from the ambush, the escort remained in a firefight. Its squadron commander

soon arrived overhead in a helicopter, directing airstrikes onto targets and coordinating the arrival of gunships and ground reinforcements. The Viet Cong sought to escape from the increasing American firepower, but they continued to be subjected to attack from the air and ground. This experience demonstrated that:

> Relentless pursuit following an ambush yields the best results because one can often overrun the base areas and communication installations to the rear of the battle site. Superior relative mobility allows the cavalry vehicles to strike the retreating enemy in the flanks and rear. In most cases the VC [Viet Cong] do not blaze trails coming to the ambush site. They use existing trails and footpaths so it is often possible to run them down.[71]

This lesson was confirmed a month later during a similar Viet Cong ambush on a convoy near the village of Suoi Cat. The escort included a helicopter, which began firing into the tree lines along the roadway. The armored vehicles also returned fire. Again, the squadron commander arrived over the scene and coordinated the fight from his helicopter. The rapid escalation of firepower prompted a Viet Cong retreat that was intercepted by the arrival of American reinforcements. The fighting ended with 100 Viet Cong killed, underscoring the importance of preparing for ambushes through routinely practiced battle drills, rapid reaction, and the quick escalation of firepower.[72]

Unfortunately, the frequency and tedium of route security and convoy escort missions created opportunities for the Viet Cong. Complacency sometimes resulted in disaster. In May 1967, an 11th Armored Cavalry platoon became the victim of a sudden and well-planned ambush that made casualties of the entire unit and destroyed most of its vehicles. Lax planning and the failure to initiate battle drills proved principal causes for the defeat.[73] In December, an armored column from the 3d Squadron, 5th Cavalry drove into an ambush corridor that stretched for 2 kilometers. The column came under attack from rocket propelled grenades (RPGs), small arms fire, and command detonated mines that caused heavy loss among crew and passengers. It also destroyed two tanks and blew up a mortar carrier and its ammunition. Amid the confusion, command and control disintegrated and a coordinated response became impossible. American soldiers, attempting to return fire, became the targets of overwhelming firepower.[74]

In 1967, mounted units participated in large-scale operations. Operation CEDAR FALLS began in January, targeting an area northwest of Saigon noted for its insurgent presence. Detailed observation and analysis of

Viet Cong activities identified the probable locations of base camps and headquarters facilities. Armor, mechanized infantry, and armored cavalry helped to seal the area of operations before participating in sweeps of assigned locales. Dismounted patrols then searched camps and tunnels. Hostile contact proved limited to snipers and mines that did not prevent the widespread destruction of Viet Cong supplies and facilities. The most significant result was the capture of 500,000 pages of documents detailing enemy organizations and operations.[75]

Operation JUNCTION CITY followed the conclusion of CEDAR FALLS. Starting in February and completing in April, it targeted a region directly along the Cambodian border. The principal objective lay in the destruction of Viet Cong and North Vietnamese Army (NVA) combat organizations, command cells, and camps. The operation entailed the creation of a cordon around the targeted area that steadily shrank and reduced the enemy's ability to maneuver. Armor and cavalry units supported this concept by establishing blocking positions along the Cambodian border to prevent the escape of hostile forces. Subsequently, they performed reconnaissance to locate and eliminate insurgents. They also helped to secure supply routes, escort convoys, and provide mobile reaction forces.[76]

The Viet Cong responded with attacks by battalion- and regimental-size units, sometimes focused on artillery firebase camps. The ensuing firefights favored American forces. Armor and cavalry units were employed as battalion task forces or squadrons. Their combined arms nature proved capable of delivering large amounts of firepower that shattered enemy formations. Helicopter, air support, and artillery simply amplified the effects and increased the casualties among the Viet Cong. Despite the jungle terrain in which many engagements occurred, these mounted teams retained a degree of mobility that facilitated pursuit of retreating insurgents and enhanced their effectiveness as reaction forces. In the latter role, armored cavalry helped prevent firebase camps from being overrun.[77]

In base camp management and security, the 11th Armored Cavalry faced a challenge shared to a lesser extent by the division cavalry squadrons. The regimental base camp included a population of 6,000 soldiers performing administrative and support functions. It constituted a small town that added a host of additional, noncombatant duties to the regimental staff. These requirements fueled requests for an expansion of the headquarters to include more personnel to handle administrative, historical, public information, intelligence, and civil affairs activities. The preferred solution lay in the transfer of base camp operations responsibility to another organization, but no such resolution occurred.[78]

Courtesy *Armor Magazine*

Figure 65. Replacing the M48's engine in the field.

Combat effectiveness of mounted units depended on the status of their vehicles. Through continuous attention to vehicle operations and the routine practice of commonsense measures to minimize repairs, most units managed to keep their vehicles in running order. They conducted much of their maintenance in the field. Crews changed engines, tracks, and road wheels in primitive conditions, but they required a steady supply of parts that supporting organizations did not always understand.[79] Unit commanders adopted their own measures to overcome shortfalls and guarantee support. One troop commander administratively dead lined one or two vehicles in each platoon on a rotating basis. They were left at the base camp where they received a full maintenance check by the crew and maintenance section. To justify this arbitrary reduction in operational readiness, "we would make some fictitious reason for it." In this manner, the unit received routine maintenance and support otherwise unavailable.[80]

Parts and supplies had to be transported to the unit's location in the field. Deliveries occurred through ground convoys but more often via air-drops. Vehicle parts, including engines and track, were all delivered in this manner, but fuel constituted the most important logistical concern. It was the elixir of life for mounted units, and fuel consumption was closely monitored. Within armored cavalry organizations, the transition from the M113 to the M113A1 eased fuel supply concerns. The M113A1 possessed a diesel engine with better mileage and a longer operational radius. This change largely reduced the fuel requirement to diesel only. Every vehicle in the division cavalry squadrons possessed a diesel engine except the M88 recovery vehicle.[81]

Personnel issues also constituted a source of concern. Losses through combat, illness, and leave were not always immediately filled. Therefore, it was common for units to operate understrength. One tank company routinely operated with reduced tank crews.[82] The 1-year rotation policy for soldiers serving in Vietnam posed a different type of problem. The 11th Armored Cavalry, for example, suffered a mass exodus of experienced personnel when their tours of duty ended at the same time. This event led to recommendations for more frequent but smaller and planned personnel rotations. Although this solution meant the premature loss of some veteran soldiers, "the disorganization resulting from a 50 to 75 percent turnover at one time is considerably more crippling to the entire command." Nor did officers prove immune from a high turnover rate. In less than 2 years, three different commanders led the regiment, while eight different leaders passed through squadron command slots.[83]

Mechanized and Armor Combat Operations in Vietnam (MACOV)

The growing number of mounted units successfully operating in Vietnam encouraged formal analysis of their experience to identify training, doctrinal, and organizational trends. At the Army Chief of Staff's behest, such a study occurred between January and March 1967. It included a comprehensive terrain analysis and the collection of operations data from units and attached observers. The final report bore the title "Mechanized and Armor Combat Operations in Vietnam (MACOV)."[84]

The MACOV study helped to dispel the persistent myths surrounding the supposed inability of mounted units to maneuver in Vietnam. It acknowledged the existence of major mobility obstacles, including mountains, dense mangrove swamps, jungles, thick forests, and steep-banked streams and canals. Large areas became impassable to vehicles during monsoon season, and the country did not possess a highly developed

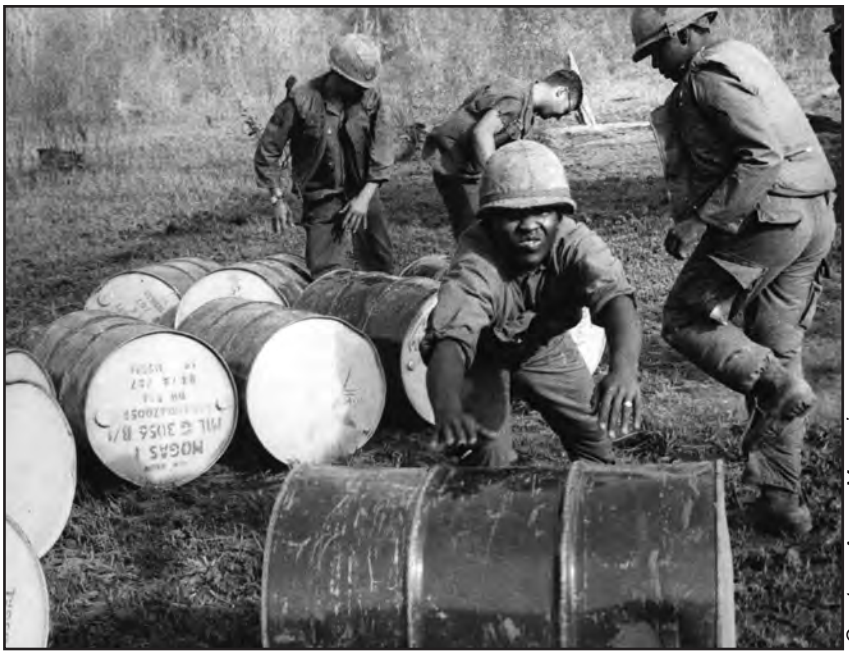
road net. All regions posed particular restrictions and hazards to vehicle operations. Hence, the final report included tips to avoid becoming mired while moving cross-country. For example, the report cautioned soldiers to "Watch the water buffalo. He does not go where he cannot stand on the bottom. If the bottom supports him it will usually support an APC."[85] Wheeled vehicles found themselves largely restricted to roads and trails, but tracked vehicles proved much more agile and able to overcome many terrain features, even during monsoon season. Overall, the M113 possessed the best mobility. Its lower weight and amphibious capability permitted it to cross water obstacles impassable to heavier vehicles. In the coastal lowlands, the M113 remained active and effective during the monsoon season, because it could navigate flooded streams. The table below summarizes the MACOV study mobility assessment.[86]

Table 2. Vehicle trafficability by corps tactical zone/region

	Dry Season		Wet Season	
Corps Tactical Zone	Tanks (M48, M551)	APC (M113)	Tanks (M48, M551)	APC (M113)
I (North)	44%	44%	36%	44%
II (Central Plateau)	55%	55%	54%	55%
III (Piedmont, including Saigon)	92%	93%	73%	93%
IV (Delta)	61%	87%	0%	87%

The MACOV final report summarized the nature of the military problem in South Vietnam. The nation encompassed some 67,000 square miles, including a coastline of 1,500 miles and a 950-mile inland border with Cambodia and Laos. Complex terrain features and underdeveloped infrastructure facilitated guerrilla operations. Infiltration into South Vietnam from Cambodia, Laos, and North Vietnam remained a problem throughout the war. Collectively, these environmental factors made this conflict an area war, characterized as "non-lineal, multi-directional, unconventional."[87]

American forces operated from a network of base camps stretching from the coast to the interior to permit operations throughout the country. The scale of military action varied from platoon to multidivision. In all areas, American forces required the ability to engage conventional and guerrilla forces, secure lines of supply and communication, and establish stability. The inability to distinguish civilians from enemy combatants resulted in restrictive rules of engagement intended to minimize civilian losses. For the individual soldier, area war meant something different: "The elusive nature of the enemy and insufficient friendly intelligence regarding the location and activities of the enemy require that units must expect contact with the enemy at any time and from any direction."[88]



Courtesy *Armor Magazine*

Figure 66. 11th Armored Cavalry Regiment soldiers handling a delivery of fuel.

The MACOV asserted the validity of existing doctrinal principles, but it noted that their application in South Vietnam required considerable changes to tactics, techniques, and procedures. American units generally made this adaptation through improvisation. Like their South Vietnamese counterparts, mounted units employed the M113 in a tank-like role. Scouts and mechanized infantry fought mounted, a role traditionally left to armored units. Dismounted operations generally occurred to conduct detailed searches or when obligated to do so by mines and terrain conditions. In its ACAV configuration, the M113 created new jungle trails for infantry use, flattened undergrowth for helicopter landing zones and clear fields of fire, and transported confiscated food and materiel. It also served as a command platform and a mechanized flamethrower when fitted with a flamethrower and fuel cell. Current doctrine, which focused on the vehicle's infantry transport function, did not address these roles.[89]

Combat operations witnessed a role reversal for infantry and armored organizations. Traditionally, infantry fixed enemy positions and assaulted them, while armored elements constituted a maneuver force to encircle or envelop hostile positions. In Vietnam, tank and armored cavalry units often performed the fixing role, while airmobile infantry became the maneuver force. Armored units relied on their ballistic protection to survive enemy

attacks long enough to counterattack. They moved faster than dismounted infantry in jungle and rice paddies, but they could not match the rapid deployment of airmobile forces. Where possible, tanks led attacks into jungle terrain, relying on their armor to survive mines, booby traps, and ambushes with minimal casualties. Mechanized infantry followed to exploit, while dismounted infantry conducted detailed sweeps.[90]

The Viet Cong avoided engagements with American armor in the open. They used forest and jungle terrain to mount close range attacks and restrict the employment of aircraft and artillery. Although supporting fires were increasingly delivered behind enemy units, the Viet Cong responded by periodically targeting the artillery firebase camps to eliminate this support altogether. This necessitated using maneuver units to protect the firebases, diverting them from offensive operations.[91]

The increased American armored presence led to a growing Viet Cong reliance on mines and booby traps. These devices served to disrupt mounted operations and generate casualties. Antitank mines protected insurgent base camps and became integral elements of ambushes, capable of detonation via vehicle weight, a trip wire, or command from a concealed observer. While these mines tended only to damage the M48, they often destroyed the M113.[92]

Countermine practices were aimed at the disruption of mine-laying activities. Driving tanks along the sides of major roadways helped to disrupt connecting wires. Various mechanical devices were also used to dig up and break wires, and dismounted sweeping teams worked to clear roads protected by armored vehicles, but the pace of such operations proved slow. In Road Runner missions, tanks traveled along a route with the express purpose of discovering or detonating mines before other traffic used the road. Nighttime mounted patrols sought to disrupt Viet Cong mining and ambush preparation. One unit secured its route by sending tanks down the road firing canister and machineguns at every likely ambush point. Ironically, the simple saturation of a route with continuous traffic proved one of the most effective means of preventing mining activity, since it denied the enemy the ability to act without being observed. Over time, soldiers learned to identify mines and booby traps, but countermine capability remained too dependent on detonation discovery.[93]

The MACOV study found that the operational environment directly affected command and control. The slow pace of cross-country movement in South Vietnam impacted operational planning and posed a challenge for leaders accustomed to fast-moving mounted maneuver. Disorientation and navigation problems further undermined the execution of plans,

particularly in jungle terrain. Typical expedients included the employment of fire missions, illumination, or colored smoke on known locations and attempts to mount compasses on vehicles. Many commanders preferred to guide unit movements from a helicopter, avoiding altogether the disorienting effects of some terrain types.[94]

The nature of operations in Vietnam tended to merge reconnaissance and combat operations. Search and destroy missions necessitated intelligence gathering followed by immediate transition into offensive actions on contact. Reconnaissance assets required the ability to engage in combat and were frequently employed as maneuver elements rather than specialized units. Mounted rather than dismounted operations proved the norm and resulted in the emergence of new search techniques to find hostile forces in terrain that favored concealment. The cloverleaf pattern, for example, entailed the movement of vehicles in circular patterns to cover the same area more than once. This technique addressed the tendency of the Viet Cong to remain in hiding on hearing the sound of approaching engines only to break cover once the vehicle had passed. Cloverleaf offered the opportunity to catch them in the open. Less effective was the reliance on supporting fires alone to seal a large area. It is difficult to understand how such a practice achieved any worthwhile result against an elusive enemy.[95]

Night operations by mounted units also became more common in South Vietnam. Tanks equipped with infrared and xenon searchlights

Courtesy *Armor Magazine*

Figure 67. M48 tank and crew of the 2d Squadron, 1st Cavalry Regiment.

proved effective in countering enemy activity and stimulated a program to equip similarly all tanks in-country. Image intensification devices reliant on ambient light and intrusion detectors further improved both mounted and dismounted night capabilities. Road Runner operations after dark provided clear demonstrations of the disruptive nature of armored columns. Image intensification devices also provided an effective complement to ground surveillance radars and improved the latter's effectiveness.[96]

The cross attachment of infantry, mechanized infantry, tank, and armored cavalry proved common and leveraged the organizational flexibility of the ROAD division. All task organizations reflected the mission assigned, enemy forces, terrain, and the troops available. No standard pattern of cross attachment emerged, due to the variegated nature of operations undertaken throughout Vietnam. Task organization strove to ensure sufficient combat power among all maneuver elements due to the uncertainty surrounding when and where hostile contact might occur. In effect, "Units are committed to combat operations with little specific knowledge of the enemy location or activity; present practice is to locate him through contact and then to destroy him by reacting to his efforts."[97] Operations constituted a collection of movements to contact in the hopes of trigging combat that could be concluded on terms favorable to American forces. This approach necessitated the ability of organizations and platforms to survive initial contact.

The MACOV study group considered armored cavalry organizations to be sound. Recommended changes proved minor. In the division cavalry squadron, suggested improvements focused on the headquarters and headquarters troop. Proposed augmentation included a mechanized flamethrower section, an armored ambulance, tracked cargo carriers, and an armored vehicle launch bridge (AVLB). Conversely, air defense assets were considered unnecessary. At the platoon level, the MACOV report supported efforts to replace the 4.2-inch mortar with an 81-mm weapon. The former's minimum range limited its utility in Vietnam and most were consolidated under troop control.[98]

The MACOV study found general satisfaction with the M113 and M48A3. While the former benefited from improvements to its survivability, difficulties operating the tank's .50-caliber machinegun in its cupola led to its remounting just forward of the tank commander's position. The 90-mm canister round devastated enemy infantry, but it was also used to remove foliage and detonate antipersonnel mines. Most tanks carried more canister than any other ammunition type, but these rounds required special handling. They sometimes separated during handling or when carried in the

gun tube. Some M48s also carried a dozer blade mounted across the front of the vehicle to assist in cutting paths through the jungle and to create landing areas for helicopters. A common feature for most combat vehicles was the mounting of dummy antennae to counter Viet Cong targeting of command vehicles made distinctive by their multiple antennae.[99]

The comprehensive nature of the MACOV report did not generate sweeping changes to Army doctrine, organization, materiel, or training. The US Army Combat Developments Command reflected the official reaction in a review of the study. It acknowledged the utility of the MACOV report, but it considered the findings largely a confirmation of published doctrinal principles, especially those found in the October 1966 version of FM 17-1. MACOV conclusions also seemed to confirm the effectiveness of the original ROAD concept: "There do not appear to be any significant voids in current doctrine with regard to employment of mechanized and armor forces." While further analysis of how existing principles applied to Vietnam seemed useful, there seemed little justification to explore whether and how lessons learned from Southeast Asia should influence established doctrine.[100] Air cavalry constituted the only exception to this viewpoint. Its operations in Vietnam greatly exceeded published doctrinal guidance, and the MACOV report served to stimulate development of a new manual for air cavalry.[101]

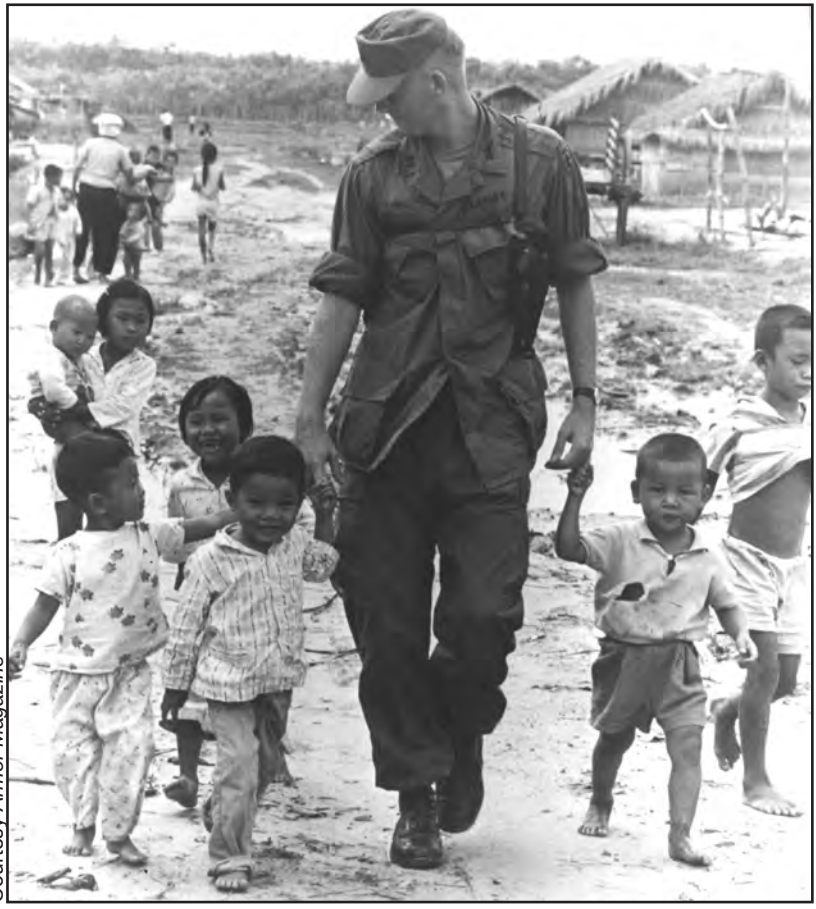
Armor soldiers with experience in Vietnam found the report's conclusion unsurprising. It did, after all, largely chronicle their experience. In 1967, however, much of the Army remained focused on potential conflict in Central Europe. Among this audience, the MACOV findings did not resonate and generated skepticism.[102] Even within the study group, at least one member believed its sole purpose lay in justifying the use of mounted units in Vietnam.[103] Within the Department of the Army, the use of M113s in a tank-like role found little acceptance due to concerns about their vulnerability against an opponent well equipped with antitank weapons. Although the MACOV findings were distributed among the Army, their application was left to unit commanders without senior leadership guidance.[104]

Despite the Army's failure as an institution to embrace the MACOV recommendations, the work constituted an important effort to understand how armor, mechanized infantry, and cavalry functioned in a COIN effort. It provided an understanding of tactics, techniques, and procedures rooted in actual combat experiences. For unit commanders preparing to deploy to South Vietnam, it bridged the gap between doctrinal principles and the realities of their new operational environment. MACOV offered a how-to guide for the employment of mounted forces in a conflict fundamentally

different from the conventional, high-intensity war in Europe that dominated Army readiness throughout the Cold War.[105]

Perhaps most importantly, the MACOV study provided a clear endorsement of the versatility and adaptability of armored organizations:

> The single most striking feature of the entire survey of armor-mechanized operations in this strange war was that our armor-mechanized units and their equipment enjoy a much greater utility in Vietnam than many thought possible at the outset. This reflects most favorably on the versatility and flexibility of our organizational principles and on our equipment. The more so since neither the organizations nor the equipment were designed primarily for the



Courtesy *Armor Magazine*

Figure 68. The meaning of civic action.

> kind of war which we are fighting. Even more striking, however, is that again in this war the prime factor is the imagination, the inventive genius and the persistent determination of the American soldier.[106]

Evolving Doctrine

The next round of field manual updates reflected the expanding role of armor in Vietnam. The October 1966 publication of FM 17-1, *Armor Operations*, provided the latest guidance for the employment of armor and armored cavalry units. It constituted a significant improvement over the 1963 version. Clearly written and well illustrated, it stressed the versatility associated with the organizational flexibility of the ROAD and the armored cavalry regiment. The manual placed particular emphasis on tailored task forces, decentralized command, and rapid adjustment to changing tactical circumstances. Similar characteristics applied to earlier armored organizations, but they had particular validity for Vietnam, where unit experience varied considerably.[107]

In FM 17-1, reconnaissance and security remained interwoven: "Reconnaissance and security complement each other and cannot be readily separated."[108] In the collection of information, reconnaissance units were expected to avoid decisive engagements. They were to "obtain information by stealth whenever possible, but fight when necessary to gain the desired information. The reconnaissance mission must not be jeopardized by combat with the enemy when combat is not essential to obtain the information desired." This time-honored caution left the local commander considerable discretion. Breaking contact required approval from a higher authority, although available aircraft made it possible to monitor the hostile force from the air and permit the continuation of the ground reconnaissance mission.[109] In time-constrained operations, reconnaissance in force became the preferred method of information collection. This technique "normally develops information more rapidly and in more detail than other reconnaissance methods."[110] However, it increased the chance of combat and/or decisive engagement.[111]

The coverage given to integrated air operations and night reconnaissance reflected prevailing views outside Vietnam. Organic air cavalry made the division cavalry squadron and the armored cavalry regiment ideally suited to exploit the benefits of coordinated air-ground reconnaissance. In Vietnam, only the 11th Armored Cavalry could routinely expect to experience the greater effectiveness of such integration.[112] Similarly, the manual's discouragement of nighttime reconnaissance by armored units

did not reflect use of nighttime patrols, ambushes, and Road Runner operations regularly employed in Southeast Asia.[113]

A section on COIN operations offered some of the most detailed tactical guidance yet for mounted forces. It elaborated on the basic principles only outlined in previous publications. The manual provided an overview of insurgent behavior and outlined the basic COIN strategy of clear, hold, and consolidate implemented in South Vietnam. Armed forces first cleared an area of an insurgent presence, secured it, and then assisted friendly government actions to cement its authority over the region.[114]

The manual's description of those counterinsurgent operations best suited to armored units clearly reflected the Vietnam experience. Airmobile infantry and air cavalry used their speed to perform encircling movements to interdict insurgent movement. Ground units, hampered by their slower speed and noise, assisted in the destruction of insurgents once fixed in place. The manual addressed techniques for reducing fortified positions, engaging insurgents in open terrain, conducting ambushes, performing searches, and employing reaction forces. It considered the raid an ideal mission for armored cavalry, since it would likely result in the destruction of supplies and equipment even if surprise proved unattainable—an apt summary of Operation CEDAR FALLS. The inclusion of limited guidance for urban operations reflected the belief that insurgents would ultimately challenge government authority in towns and cities, exactly as they did during the 1968 Tet Offensive.[115]

Armored units were expected to help control borders and hunt insurgents whenever possible. They conducted search and seizure operations, cleared areas of enemy activity, provided mobile reaction forces for friendly troops, protected installations, and escorted convoys. They also played a central role in security, reconnaissance, and surveillance missions along designated lines of communications and supply. The manual considered armored cavalry optimally suited for COIN due to its combined arms nature and organic aviation. Still, all mounted units were expected to benefit from the psychological effect gained through the employment of armored combat vehicles against insurgents ill-prepared to combat them. Nevertheless, mission planning needed to anticipate the impact of restrictive terrain where insurgents preferred to operate and fully utilize aerial reconnaissance.[116]

Insurgencies were described as a collection of small unit actions with the potential to escalate at the insurgent's discretion. Enemy forces were also expected to exploit their ability to blend into the civilian population. Therefore, counterinsurgent organizations needed to secure

Courtesy *Armor Magazine*

Figure 69. Column of M113s moving to contact, 1966.

key installations, establish checkpoints, secure routes of communication, mount regular presence patrols, and interdict the flow of personnel and supplies from nearby borders. Armored units were expected to work closely with local government officials and build support among civilians by minimizing infrastructure damage and noncombatant casualties. However, the manual's tactical emphasis precluded any significant coverage of cultural awareness measures other than the need for extensive use of liaison officers.[117]

Standard COIN security missions included route security, convoy escort, and rear areas. Route security was considered best performed by armored and air cavalry, using a system of strongpoints along the route, connected by irregular air and ground patrol activity. Traffic moved under continuous observation. When an ambush occurred, reaction forces raced from the strongpoints to counterattack. The manual also added a new dimension to route security with its advocacy of herbicides to clear foliage along roadways.[118]

To secure an area, the manual embraced those principles first demonstrated in West Germany in the early 1960s. These included reliance on an extensive information network, continuous surveillance, observation of locations likely to harbor hostile activity, interaction with installation garrisons, and the establishment of quick reaction forces. Collectively, these measures monitored the area, provided early warning of hostile intrusion, and facilitated a rapid response. Despite the need for information, the manual writers did not consider electronic devices a particularly effective source:

> Complex, sophisticated surveillance means are of limited value in counterinsurgency operations. Neither human eye, infrared, nor radar sensors can penetrate the dense forest canopy that conceals many insurgent groups, and no means

> available can differentiate between the armed insurgent and the loyal civilian. Photographic coverage or other electronic devices may reveal an area of unusual activity that can be useful in determining what trails are in constant use. However, insurgents are efficient in the art of camouflage and are rarely discovered by a surveillance means.[119]

A new manual for the armored cavalry regiment also entered publication in 1966. It retained the basic mission set and added surveillance and COIN as normal activities. The regiment remained a self-sufficient tactical and administrative unit, capable of independent operations over a wide area. Characteristics associated with the armored cavalry regiment continued to include organizational flexibility, robust communications, high mobility, and a combined arms nature. The anticipated fielding of the M551 Sheridan led the manual writers to acknowledge the reduced armor protection associated with this platform. So equipped, the unit could operate in the presence of small arms, grenades, artillery, and nuclear weapons, but not modern antitank weapons.[120]

Command and control of the regiment centered on the command group and the command post. The former included the regimental commander and part of his staff that normally operated forward, overseeing squadron activities. The manual accepted as normal the use of helicopters for command purposes down to the troop level. Hence, the commander could coordinate activities from the air or the ground at his discretion. In contrast to the commander's movement around the battlespace, the command post remained comparatively static. It constituted the central node for communications, intelligence, and logistical management. Information was shared throughout the regiment largely by tactical radio nets using FM sets. AM radios with radioteletype capability provided a secure means of transmitting planning, administrative, and logistical reports over long distances. The manual also encouraged the use of wire, messengers, sound, and visual signals, because "no one means of communication is completely reliable by itself; all means must be integrated to insure a reliable system."[121]

The armored cavalry regiment was intended to form teams tailored to fit a particular mission. This organizational flexibility extended down to the troop level, although the combined arms platoons were intended for employment as organized. Team organization included the incorporation of organic air cavalry assets, and the manual provided extensive coverage of the integrated use of aviation and ground maneuver elements, including the aerial transport of riflemen to secure key terrain features. The basic

structure of the regiment remained unchanged, although its robust structure benefited from the inclusion of an armored vehicle launched bridge (AVLB) and a small aviation element within each squadron headquarters.[122]

Reconnaissance and security guidance similarly underwent minimal alteration. The increased coverage of air cavalry operations and an emphasis on aggressive maneuver constituted the most significant changes. Reconnaissance by the regiment was to be executed "boldly and aggressively, making full use of its mobility and firepower."[123] The unit "most frequently engages in offensive action to assist in accomplishing its reconnaissance and security missions."[124] Reconnaissance elements were expected to engage in combat when otherwise unable to penetrate hostile defenses, although they also operated under the caveat of avoiding decisive engagement. Their actions were to be integrated and supplemented by air cavalry to increase speed and scope of action.[125]

Security coverage focused on the employment of the regiment in a covering force role. This function constituted a primary mission for the regiment in a conventional environment. Guidance for rear area security and COIN operations included identical content offered in FM 17-1. The regiment was to rely on its flexibility and mobility to find and destroy

Courtesy *Armor Magazine*

Figure 70. M48 and crew of the 2d Squadron, 1st Cavalry Regiment.

insurgents. It did so through the provision of installation security, establishment of checkpoints, mounted patrols, border control, and route security. Air cavalry expanded the scope of these activities and provided one of the most effective means of finding and attacking insurgents.[126]

The manual writers emphasized differences between conventional and unconventional conflicts by their separate training requirements. COIN operations necessitated greater attention to the use of weapons in mounted and dismounted roles in a variety of topographical environments. They also mandated knowledge of aerial supply, aviation operations, cross-country night movement, airmobile combat techniques, and the execution of deep patrols under primitive conditions. Subjects that clearly reflected the Vietnam experience included police-type search and seizure actions, guard duties, convoy escort, and reaction to ambush drills.[127]

New doctrine for combat maneuver battalions reflected a configuration change. The armored cavalry platoon disappeared to be replaced by a scout platoon. This unit included a headquarters element and 2 scout sections, or 10 armored vehicles and 31 men. With the exception of one M113 in the headquarters, every vehicle was an M114 command and reconnaissance vehicle, despite the latter's poor performance and nonuse in Vietnam. The platoon provided reconnaissance and security for the parent battalion "within its capabilities." It assisted battalion movements, conducted route reconnaissance, and reconnoitered assembly areas and attack positions. Other common operations included liaison with adjacent units, pioneer and demolition work, chemical detection and radiological monitoring, damage control assessments, and roadblocks.[128]

The return of the scout platoon to the maneuver battalions was accompanied by more detailed doctrinal guidance than had been true of similar, previous organizations. The 1966 version of FM 17-15, *Tank Units, Platoon, Company and Battalion,* included an entire appendix devoted to scout platoon operations.[129] The scout platoon lacked the firepower of the armored cavalry platoon, but it possessed armored protection, vehicle mounted machineguns, and several grenade launchers and light antitank weapons (LAW). It was "not organized and equipped to conduct independent offensive, defensive, or retrograde operations. It operates as part of the battalion and should be assigned missions that capitalize on its reconnaissance capabilities." It performed the standard zone, area, and reconnaissance missions. When the parent battalion engaged hostile forces, the platoon screened the flank, performed rear area security, protected the battalion command post, or took charge of handling prisoners of war. It generally provided information and early warning to the battalion commander

and did not deliberately seek combat. Even when employed as part of a defensive or delay action, the platoon's principal role lay in confusing the enemy and monitoring his movements rather than disrupting his activities through direct action.[130]

During reconnaissance missions, each scout "obtains information by infiltration, observation, and, when dismounted, by stealth." Unlike the aggressive nature associated with armored cavalry reconnaissance, the scout platoons operated with caution and sought to avoid contact with enemy forces. In contrast with earlier jeep-based reconnaissance units governed by a similar doctrine, the new scout platoons possessed greater survivability and firepower. They could fight for information, but scouts were still encouraged to dismount to improve observation and avoid detection. They were not to become vehicle-bound despite the prevalence of mounted reconnaissance in Vietnam.[131]

The scout platoon performed security missions as part of a larger force, usually a company. In these missions, the platoon employed patrols and observation points to provide early alert of enemy activity. The platoon normally employed four observation points, one per squad, supplemented with patrols to cover dead space and the battalion ground radar section. When hostile forces threatened the observation line, the platoon withdrew and continued to monitor enemy activity without engaging them in combat.[132]

Special tasks included pioneering and demolition activity, but the minimal equipment carried on the platoon's vehicles limited this capability. These provided an ability to install or clear small minefields, destroy buildings and equipment, and prepare fording sites. However, the unit was not equipped nor trained to function in a true engineer role. In COIN operations, the platoon largely followed the principles established in FM 17-1. It provided reconnaissance and security, escorted convoys, functioned as a quick reaction force, and manned checkpoints to control the movement of materiel and civilians. Information collection and a broad range of interaction with the local populace under the term "civic action" constituted functions expected of all military units associated with battling insurgents, including scouts. Although doctrinal guidance credited insurgent forces with minimal antitank capability, it did not call for the platoon to act offensively in the manner of ACAV use in Vietnam.[133]

Updated doctrine for the division cavalry squadrons did not emerge until 1968 with the publication of FM 17-36, *Divisional Armored and Air Cavalry Units*. It opened with the caveat that its contents were intended as a guide only, noting, "Each situation in combat must be resolved by an intelligent interpretation and application of the doctrine set forth herein."[134]

This cautionary note underscored the problem facing an army with forces deployed in theaters with quite different characteristics. It also acknowledged that the principles presented would vary in application from one operational environment to another—a reality faced every day by cavalry organizations in Vietnam.

Many of the concepts included in the manual proved identical to those outlined in FM 17-1 and FM 17-95, *Armored Cavalry Regiment*. The role of division cavalry remained that of reconnaissance, security, and economy of force, although in unconventional warfare the squadron might function as a maneuver element. The division cavalry squadron included a headquarters element, three armored cavalry troops, and an air cavalry troop. It did not include a tank company, but each troop headquarters controlled a three-tank armor section. The squadron also possessed the staff and communications to accommodate unit attachments from the parent division.[135]

Courtesy *Armor Magazine*

Figure 71. M113 behind chain link RPG screen intended to detonate prematurely incoming projectiles.

The combined arms armored cavalry platoon remained the basic tactical unit, but the nature of its tank section changed. The new manual included a variety of platoon formations and battle drills designed to assist training and its employment by commanders unfamiliar with its combined arms nature.[136] Starting in 1968, cavalry tank sections began fielding the M551 Sheridan. This platform carried a powerful main gun capable of firing the Shillelagh antitank missile or large-caliber conventional rounds, including canister. Mobile and lightweight, the M551 also possessed an

amphibious capability. Within the platoon, it eliminated the mobility differential between the tank section and the faster moving scout vehicles. Greater mobility came at the cost of armor protection, mandating careful use of terrain by Sheridan crews.[137]

Coverage of scout reconnaissance operations provided a wealth of detail concerning movement, observation, reporting, and target engagement techniques. Scouts were expected to fight for information without jeopardizing their primary mission, but for the first time scouts received doctrinal criterion to help them determine when to resort to combat. They were expected to fight in self-defense and when they could destroy targets without risk of an engagement. Reconnaissance by fire remained a viable tool, but scouts were expected to rely on indirect fires to avoid detection. The least desirable circumstance for initiating combat lay in the use of direct fire systems that revealed the scout's location and triggered a firefight.[138]

The value of this guidance was undermined by the manual's simultaneous emphasis on a much more combative stance by scouts. The same section that encouraged detection avoidance included the directive: "Aggressive conduct of reconnaissance and security presents many targets to the scout that he can defeat. These targets are destroyed if possible. For targets beyond his capability to defeat, the scout can request additional direct and indirect fires through the platoon leader."[139] Indeed, the issue of stealth became almost irrelevant with the observation that "scouts moving in tracked, armored vehicles have less capability of moving by stealth than do wheel mounted or dismounted scouts. The advantages of using the inherent armor protection and cross-country capability of these vehicles offset the limitation imposed by loss of stealth." Subsequent passages underscored the rejection of stealth as the primary modus operandi for scouts. Instead, they highlighted the expectation that the scout section would fight for information, relying on the entire platoon as necessary to overcome opposition.[140]

The manual's coverage of COIN operations paralleled the coverage provided in FM 17-1. The new publication outlined missions that armored cavalry might perform, stressing those best suited to the unit's firepower, mobility, and communications. These missions encompassed the activities routinely performed in South Vietnam. Since they all carried the inherent risk of sudden contact, the manual emphasized survivability. Dismounted patrols were acknowledged as periodically necessary, but they were considered highly susceptible to ambush. Similarly, "units performing route security missions must not only have a high probability of surviving

ambushes, but must also be able to destroy or disperse ambushing elements." Reconnaissance, too, required sufficient combat power to fix the enemy once found and prevent his escape.[141]

Doctrinal principles for COIN operations ended with a series of training recommendations. The most important lay in the mastery of basic fire and maneuver concepts while mounted or dismounted. These core competencies proved relevant to both conventional and unconventional conflict. Other skills deemed necessary for COIN operations included ambush drills; integrated operations with helicopters, artillery, and aircraft; aerial supply; and the use of mines, booby traps, and fortifications. To assist in controlling civilian movements, soldiers needed to understand techniques associated with search and seizure, counterintelligence, guard duty, and checkpoint operations. Although not considered an optimum use of armored cavalry, convoy escort techniques also made the list, reflective of mounted operations in South Vietnam. Operations in difficult terrain and far from established base camps underscored the importance of first aid knowledge to sustain casualties until they could be evacuated.[142]

The new doctrinal manuals provided better guidance for COIN, but a gap remained between concept and application. Articles compiled by soldiers with firsthand experience in Vietnam served as a bridge, exemplified by the writing of the senior armor adviser for MACV. In an article written for new armored cavalry platoon leaders headed for Southeast Asia, the adviser noted the inseparability of reconnaissance from other missions and encouraged platoon leaders to be willing to fight for information. He provided practical guidance for reporting information and conducting platoon movements, and did not share the confusion surrounding scout operations manifest in the latest division cavalry squadron doctrine. Scouts were to be aggressive, "employing whichever movement technique the lieutenant prescribes, boldly and aggressively looking for a fight. Overcaution and timidity have no place in Cavalry operations."[143] The author acknowledged the realities of the battlefield: "Of course, occasionally there will be such an overriding demand for speed that you can't even afford alternate bounds. There's nothing to do then but take a deep breath and move steadily until the enemy makes you stop. This is obviously the most dangerous technique, to be reserved for true emergencies."[144]

Operations 1968–70

In January 1968, the Viet Cong and NVA opened the Tet Offensive, targeting urban areas. The offensive achieved tactical surprise, and the initial response by American and South Vietnamese forces proved disjointed.

They struggled to cope with multiple, simultaneous urban battles. The 2d Squadron, 1st Cavalry, for example, had to keep major roadways open to traffic and dispatch reaction forces to different attacks. It proved impossible to achieve success everywhere, and hostile forces managed to close several routes, requiring subsequent clearing operations to reopen them.[145]

Mounted units played a pivotal role during Tet as reaction forces. Their rapid movement from remote locations to the urban areas under attack validated the doctrinal emphasis on organizational flexibility, firepower, mobility, and robust communications. Traveling long distances at high speed over Vietnam's limited road net, they fought through ambushes to arrive at destinations that had become battlefields. Their actions were often movements to contact with little knowledge of enemy dispositions. They relied on armor to survive combat entry and firepower to overcome the opposition. In a 14-hour period, the 11th Armored Cavalry reoriented from an area security mission, consolidated its squadrons, conducted an 80-mile road march, and entered combat in the Saigon vicinity.[146] Similarly, the 3d Squadron, 4th Cavalry proved crucial to the recapture of Saigon's Tan San Nhut Air Base. The unit moved to its objective at night, guided by the squadron commander flying overhead and dropping flares to assist navigation. The squadron attacked and secured the airfield before redeploying against insurgents in Saigon's northern suburbs.[147]

Courtesy *Armor Magazine*

Figure 72. The M551 Sheridan.

Tet proved a major military defeat for the Viet Cong. Its organization lay in ruins, and the high losses incurred prevented cadre replacement. The Viet Cong remnants withdrew to more secure bases within South Vietnam

and to sanctuary areas in Laos and Cambodia. The NVA began to shoulder much of the responsibility for sustaining active operations in South Vietnam. Although better trained and equipped than the Viet Cong, the NVA remained vulnerable to the heavier firepower available to American and South Vietnamese troops.

Similarly, American military strategy changed. General Creighton W. Abrams replaced General William Westmoreland and directed military efforts to the elimination of remaining base camps in South Vietnam and the interdiction of border infiltration.[148] These operations forced the NVA and surviving Viet Cong to either defend their base camps or leave South Vietnam. Significant combat ensued, but by mid-1970 the enemy had largely been driven from the country and border security tightened.

The 11th Armored Cavalry played a key role in these activities. For much of the period, its squadrons controlled relatively unchanging areas of operation. Its organization differed from other armored cavalry regiments through significant augmentation. Additional combat service support included a medical company, a military intelligence detachment, and an aviation maintenance detachment. An armored engineer company ensured the availability of an engineer platoon for each squadron. The regimental and squadron headquarters also received additional staff personnel to administer civic action programs. Although each squadron included an AVLB to assist mobility, its low operational readiness undermined its utility. Combat power increased through the addition of a mechanized flamethrower unit. The squadron tank companies received their own areas of operation and functioned as additional maneuver elements. To facilitate use in this role, each one received an M577 to serve as a command post. Similarly, each howitzer battery included an ACAV for use as a command post or fire direction center. When available, additional infantry was attached to the regiment to permit dismounted operations without leaving vehicle weapons unmanned.[149]

The organization of division cavalry squadrons remained largely unchanged in this period. Most already had added a mechanized flamethrower element, an S5 to assist civic action programs, and reduced the size of the ground-surveillance radar teams.[150] Squadron configuration remained three ground cavalry troops, an air cavalry troop, and a headquarters and headquarters troop. Platoons retained their combined arms nature, but squadron detachments to support other commands remained a commonplace occurrence.[151]

Tank battalions also added an S5 and reduced their ground radar sections. All three of the tank battalions generally cross attached with other

units. The 1st Battalion, 69th Armor Regiment detached a tank company in exchange for an infantry company. Other attachments included engineers, snipers, long-range reconnaissance patrols, and Dusters. The 1st Battalion, 77th Armor Regiment routinely controlled from two to five maneuver companies that included a permanently attached armored cavalry troop. However, it never simultaneously controlled all of its tank companies. The 2d Battalion, 34th Armor Regiment lost two of its tank companies through permanent detachment. The remnant battalion retained one tank company and created another ad hoc maneuver company from its headquarters and combat support assets. Periodic attachments included mechanized infantry and South Vietnamese regional forces.[152]

Mechanized infantry battalions, on paper, possessed a similar basic structure to armor battalions. Their primary combat strength derived from three mechanized infantry companies that possessed considerable mounted and dismounted capabilities. They were the only mounted units that included an organic sniper capability, although armored cavalry units often improvised their own. Mechanized infantry often supported regular infantry units rather than armor as expected in doctrine. Like armor and cavalry organizations, they were also subject to routine attachments and detachments.[153] Mechanized infantry, lacking their own tank support, frequently benefited from the availability of Dusters employed in an antipersonnel mode.[154]

The change in American strategy did not change the mission set performed by mounted units. They continued to execute reconnaissance, area security, and base camp protection. The shift in focus toward the border areas did not eliminate threats to lines of communication, necessitating a continuing need for convoy escort and reaction forces. Often a single unit had to perform several of these missions simultaneously. Cavalry squadrons often operated as a collection of troop detachments that in turn employed their platoons on separate operations.[155]

In these operations, armored cavalry functioned as standard maneuver units. They utilized reconnaissance in force to find the enemy before attacking him. Tank and mechanized units also sought enemy positions of strength to attack directly rather than outmaneuver. While armored cavalry relied on combined arms teams to overwhelm opposition, mechanized infantry used their armored personnel carriers to fix the enemy, and the infantry conducted a dismounted assault. Similarly, when ambushed, mechanized infantry possessed the means to survive the initial attack and counterattack with a combination of off-road maneuver by the personnel carriers and dismounted assault by the infantry. The large number

of infantry, coupled with the combination of foot and vehicular tactics, permitted mechanized infantry to conduct mounted sweeps followed by more detailed dismounted searches. In contrast, the absence of an organic dismount capability made tank units dependent on cross attachments to generate the right mix of combat power.[156]

The dispersed nature of operations constituted a significant challenge to the control of mounted units. Most combat organizations had to maintain at least two primary bases in addition to as many as four firebase camps for supporting fires. These positions all required security, administrative support, and communications capabilities far above the unit's normal requirement. In addition, all of these camps required logistical support and secure lines of supply. Protecting these installations and routes consumed 10 to 20 percent of unit strength and fragmented staff operations among the base camps.[157]

A similar fracturing of assets characterized combat operations. All mounted units routinely provided detachments to other organizations, dividing their remaining assets among several different activities. In the tank battalions, some company commanders found themselves left in charge of only their two headquarters tanks after detachments to support other units. The combined effect of detachments and the need to secure multiple command posts and firebases led to the creation of additional ad hoc combat units formed from vehicles and personnel assigned to headquarters and combat support functions.[158] The 2d Squadron, 1st Cavalry Regiment, for example, established a long-range reconnaissance patrol in this manner. Given Special Forces training, this improvised unit complemented the squadron's information gathering capability.[159]

Dispersion and fragmentation complicated command and control. It necessitated additional radios and long-range communications equipment. Even the robust communications architecture normally found in armored units proved insufficient to meet this requirement. Units therefore acquired far more radios than authorized. Communications requirements also became more complicated by a greater emphasis on signal security, mandated by a growing enemy ability to intercept radio transmissions.[160]

Tactical operations revealed a number of communications issues. Small unit commanders found it difficult to monitor and transmit information over their tactical net while simultaneously communicating with higher headquarters. The cumbersome process of switching between nets proved impractical in combat. While leading his unit, "the commander often had to communicate with helicopter gunships, medevac helicopters, and his higher headquarters. In addition, on occasion the commander personally operated

Courtesy *Armor Magazine*

Figure 73. Sheridan leading column through a rubber plantation.

a machinegun." The fleeting but intense nature of most hostile contacts underscored the importance of simplicity in communications. Therefore, most unit commanders simply acquired a second radio, setting one to the tactical net and the other to the controlling headquarters' frequency.[161]

In the maneuver battalion scout platoons, insufficient radios existed to permit contact between mounted and dismounted elements. A similar communications gap emerged when scout sections operated independent of one another. This artificial restraint was often overcome by unauthorized acquisition of additional radios. It proved more difficult to overcome problems with communications aboard vehicles. Each crewman received a combat vehicle crewman (CVC) helmet that connected to the vehicle intercom and permitted radio monitoring and transmission. Without it, crewmen could not communicate over the intercom or the radio. In many units, however, nearly half were inoperable and could not be fixed in the field due to the unavailability of repair kits.[162] Radios that became unserviceable exacerbated communications problems, and at least one division cavalry squadron found itself struggling to perform operations with only a few operable sets.[163]

These problems plagued but did not stop tactical operations. For mounted units, reconnaissance in force became a common activity in which the enemy was sought and then engaged.[164] One commander of the 11th Armored Cavalry noted that efforts to find the enemy

> . . . were plagued by the old problem of where and how to conduct reconnaissance against an enemy who habitually avoids combat except at times and places of his own choice. Intelligence indicators were generally slim;

> seldom was there hard intelligence on which to base a reconnaissance plan.[165]

Mechanized infantry battalions employed two companies and the scout platoon as a maneuver force, supported by mortars. The remaining company functioned as a reserve and could be airlifted into a contact area minus its vehicles. The combination of vehicular mobility and a strong infantry component made the mechanized infantry among the most versatile organizations on the battlefield. The scout platoon, equipped with ACAVs, operated as a conventional combat unit and did not avoid engagement.[166]

Tank units relied on their firepower and armor to survive initial contact during reconnaissance in force missions. Their mobility permitted them to attack hostile forces once found. Their principal deficiency lay in the absence of any dismount capability, which was overcome whenever possible through infantry attachments. Operations in the spring of 1969 by the 1st Battalion, 77th Armor Regiment demonstrated the effectiveness of armor units in reconnaissance in force missions. The battalion participated in efforts to open a route to Khe Sanh and interdict cross-border infiltration from Laos. The scout platoon ACAVs led and provided security for the engineer teams charged with minesweeping and road repairs. After reaching Khe Sanh, the battalion continued its interdiction efforts, often maneuvering off roads entirely dependent on aerial supply.[167]

Integrated operations by air and ground cavalry often proved the most effective means of finding and eliminating insurgents. Air cavalry helicopters formed an aerial screen, spotting hostile forces and directing friendly ground troops into contact. Air cavalry also interdicted enemy troops and fixed them in place until ground forces arrived to eliminate them. These tactics sometimes generated dramatic successes. In February 1968, the 1st Squadron, 1st Cavalry Regiment used integrated air-ground operations to eliminate 200 Viet Cong and NVA soldiers in a single engagement. Less dramatic results lay in the squadron's enhanced ability to find, track, and engage elusive insurgents even in difficult terrain.[168]

The 11th Armored Cavalry relied on its air cavalry to conduct much of its reconnaissance in difficult terrain. The helicopters rapidly covered large areas and could insert airmobile rifle platoons to conduct dismounted sweeps of select locations or bunker complexes. Air cavalry also helped to identify enemy infiltration trails and track them to base camps, which became the targets for ground attack. Often observation and gunship helicopters were paired to provide a degree of ready firepower against

targets of opportunity. When reconnaissance flights encountered resistance, ground forces quickly responded to engage the enemy before he could escape. The air cavalry also supported command and control functions, assisted jungle navigation, and provided combat support to ground forces in combat.[169]

Efforts to find elusive Viet Cong and NVA soldiers evolved into the technique of "pile-on." It emphasized the creation of information networks "flexible enough to respond to any fresh intelligence input, and aggressive enough to facilitate immediate engagement of the fleeting foe. This build-up from sketchy intelligence, to visual contacts, to engaging the enemy and simultaneous generation of friendly forces, followed by the violent destruction of the enemy unit, whatever its size, was known as "pile-on."[170] Contacts with enemy soldiers were exploited immediately in an effort to trigger an engagement. Air cavalry bore responsibility for verifying reports of enemy activity. Once confirmed, further reconnaissance occurred and the air cavalry sought to force an enemy reaction, sometimes through the insertion of airmobile infantry, while ground forces moved to contact. According to one regimental commander, "Forces were then literally thrown together on a fragmentary basis in order to overpower, encircle and destroy the located enemy. Planning necessarily was minimized. Movement and operations against the enemy had to be paramount."[171] To one junior officer, pile-on meant something different: "The mission was the same every day. Get up in the morning, go find him and if you find him, shoot him up. And the spinoff mission of that was if a buddy gets in trouble be prepared to move rapidly to pile onto the fight that was going on next door."[172]

The shift of operations into remote areas and border regions necessitated reopening roads previously abandoned to the Viet Cong. These routes had become infested with mines, booby traps, and ambush sites. Clearance entailed removing mines, reducing the ambush threat, and preventing further insurgent interference. The 2d Squadron, 1st Cavalry Regiment enjoyed some success through the use of seismic sensors to detect Viet Cong movement, permitting their interdiction before conducting a roadside attack.[173]

The 11th Armored Cavalry performed a similar activity along the roads from Saigon to the Cambodian border. Mined and flanked by soft ground and high vegetation, these routes necessitated a significant engineer presence to clear them. Engineer teams removed mines, repaired culverts and bridges, and cleared vegetation from the roads with Rome Plows. Armored cavalry provided security and reaction forces. Subsequently, Rome Plows

cleared lanes through the surrounding jungle, which became the focus of surveillance and interdiction. Discovered enemy infiltration trails were destroyed or traced to base camps that the regiment then attacked. Clearance operations became a form of offensive action. Often these operations provoked a hostile reaction that simplified locating the enemy and played to the firepower superiority of the armored cavalry.[174]

All mounted units performed security missions. The dispersed nature of American operations mandated the use of combat units to protect convoys, roadways, firebases, and command posts. In addition, routine patrols along South Vietnam's borders sought to interdict NVA infiltration. In these activities, the 11th Armored Cavalry often benefited from the attachment of Cambodian irregulars who provided an additional dismounted capability familiar with the local terrain.[175] Armored cavalry commanders, however, generally did not believe security missions made the best use of the firepower and mobility available: "Whenever possible, reconnaissance was used as a technique to accomplish security objectives."[176]

Surveillance operations supplemented security. Together with target acquisition, it constituted a principal means of intelligence gathering. Surveillance equipment monitored camp perimeters, helped generate ambush points, and pinpointed enemy infiltration routes. Despite these uses, at the battalion and squadron level the employment of surveillance equipment suffered from poor training, inadequate maintenance, and misuse. It did not receive command emphasis. Interference from terrain

Courtesy *Armor Magazine*

Figure 74. Sheridan with added protection for the tank commander against small arms fire and snipers.

and vegetation discouraged field use of ground surveillance radars, which became relegated to fixed locations. Their fragility and tendency to generate false readings eroded user confidence, encouraged underutilization, and led to the diversion of their vehicular transport to other purposes. Improvements generally occurred when surveillance came under centralized control for training, administrative support, and supervision.[177]

Routes once cleared required continuous security to keep them open. The most common method entailed the use of outposts along the length of the roadway connected by mounted patrols and bolstered by reaction forces in the event of an attack. The 2d Squadron, 1st Cavalry garrisoned each outpost with ground surveillance radar, a tank, at least one ACAV, and sometimes a mortar carrier. The collective purpose of these measures lay in keeping the entire route under observation. Some units worked to clear fields of fire along the route, removing concealing vegetation in the process. Periodic patrols in areas adjacent to the road served to create uncertainty among the enemy. At night, radar helped to acquire targets for tanks to engage with infrared and white searchlights. Unit personnel continuously practiced ambush reaction drills to ensure rapid response to an attack.[178]

These practices did not eliminate the need for convoy escort. Armored cavalry squadrons generally bore responsibility for both route security and convoy protection. Convoy duty, however, proved unpopular. It committed combat assets and increased vehicle wear, particularly to tanks. Armored cars were considered better suited to this role, but those in use by the military police lacked firepower and adequate communications. Increased use of air cavalry proved a more effective alternative, because it could fly ahead of the convoy, seeking signs of enemy activity.[179] Armored cavalry officers considered convoy escort "a waste of assets for an armored unit. They were not fun and they were generally expensive in terms of mines."[180]

Jungle operations posed an altogether different set of challenges. Dense vegetation and periodic fog minimized visibility, forcing unit commanders to coordinate exclusively via radio. Even this control became problematic when antennas were shot away during firefights. Jungle operations condensed unit frontages, with armored cavalry platoons covering less than 50 meters. The jungle disoriented crews so navigation proved difficult. Common solutions included the use of white phosphorous marking rounds and reliance on directional assistance from helicopters overhead. Movement through the jungle, nevertheless, remained slow. Narrow columns led by tanks predominated, because the M48A3's bulk and power permitted it to forge new paths. The attachment of a dozer blade

across the vehicle's front hull improved this ability and allowed the tank to cut its way through vegetation. Use of the ACAV in this jungle-busting role tended to overstrain its engine. Lacking organic tanks, mechanized infantry resorted to dismounted operations in jungle terrain, where the infantry proved effective in close range engagements.[181]

Operations in rubber plantations posed problems similar to those of the jungle. Considered vital to South Vietnam's economy, the plantations were off limits to American combat forces in the years before the Tet Offensive. This restriction permitted their unhindered development as fortified Viet Cong and NVA base camps. The shift in American strategy resulted in these plantations becoming battlegrounds, although restrictions still limited the use of artillery and close air support.[182]

The plantations posed less restrictive visibility and mobility problems than those of the jungle. Yet, primitive roads, the presence of civilian workers, vegetation, and mud made the plantations difficult battlefields. For this environment, the 11th Armored Cavalry developed a box formation to provide all-round security. ACAVs and M551 Sheridans formed the front and sides of the box with command and support vehicles in the center. This formation permitted a plantation to be swept from one side to another, while attached infantry conducted detailed dismounted searches.[183]

The presence of insurgent camps and supply bases often resulted in determined efforts to defend them. It was not uncommon for contact to occur within moments of entering the plantation.[184] In this environment, the beehive round used by the M551 Sheridan proved popular and useful. It proved destructive to both vegetation and enemy personnel. It "would just shoot hundreds of holes in those rubber trees, and then you had the dripping problem where you had rubber dripping all over the tanks and really made kind of a mess."[185]

Operations in jungles, among rubber plantations, and in difficult terrain along the border posed mobility challenges for armor units. Flooded rice paddies proved especially difficult for tanks to traverse, and the NVA integrated these obstacles into their defenses. Helicopters proved invaluable as aerial guides, leading armored columns through soft ground without getting mired.[186] Control from the air mandated the use of clear identification panels and markings to facilitate aerial identification. These markers were routinely used, even during the urban fighting of Tet. This practice drew criticism from senior commanders concerned that the panels would attract enemy attention, but as one mechanized infantry battalion commander noted: "I fail to see where a bright red, cerise or other color attracts any more attention than a thundering armored vehicle."[187]

The effectiveness of mounted units depended on operational readiness and regular maintenance. The fragmentation and dispersion characteristic of most combat organizations, however, reduced the availability of direct support maintenance from rear echelons. Vehicle crews assumed the principal responsibility for sustaining their platforms.[188] Maintenance became a unit training priority: "There was no prophylactic maintenance at all. It was entirely a case of drag yourself up by the shorts whenever something broke down."[189]

The M113 in its various configurations generally required only routine maintenance. Titanium plates fitted under the floor and pierced steel planking on the vehicle sides improved survivability against mines and RPGs. The M48A3 provided greater protection against most threats, but it also required more maintenance. Common problems included dirty air filters and suspension damage. Extended use in the jungle resulted in engine damage and burned out transmissions. These items could be fixed in the field, but larger mines could warp the hull, necessitating removal to a proper repair facility. Preventative maintenance checks and services received command emphasis, and some units automatically changed out power packs every 1,000 miles. Others routinely pulled units out of combat operations to perform maintenance.[190] These measures required the availability of parts that could not be guaranteed. Controlled cannibalization of vehicles knocked out in combat resulted. In armored cavalry organizations, the "on-site repair of vehicles was inhibited by continual maintenance problems with the M578—the recovery vehicle assigned to reconnaissance troops."[191]

The fielding of the M551 Sheridan in January 1969 added a new dimension to maintenance operations. It began to equip armored cavalry tank sections. The M551's 152-mm gun offered increased firepower, and its robust suspension and amphibious capability facilitated the crossing of inland waterways. However, it proved less effective in jungle busting than the bulkier M48A3. The M551 Sheridan suffered from engine and transmission problems, and it became prone to overheating. Its electric turret traverse generated troubleshooting headaches, because most maintenance personnel were unfamiliar with it. The devastating firepower of the M551 Sheridan was offset by a slow rate of fire. In several recorded instances, tank crews spotted RPG teams, but they could not engage them fast enough to avoid the destruction of their vehicles. Nor did the M551's armor provide adequate protection against either RPGs or mines.[192]

Mines constituted the greatest threat to armored vehicles. Between November 1967 and March 1970, mines accounted for 73 percent of all

vehicle losses.[193] In the period June 1969 to June 1970, the 11th Armored Cavalry alone encountered 1,000 antitank mines that accounted for 95 percent of all combat vehicle losses. In the same period, the frequency of mine attacks on the unit rose from 20 to 100 per month.[194]

Chinese or North Vietnamese-manufactured mines constituted those most commonly encountered. Encased in a metal container, they carried 20 to 30 pounds of explosive, and became the NVA's principal response to the arrival of American armor in their area. Many types of mines were employed, including plastic devices impossible to detect with available mine detectors. Mines had an immobilizing effect on mounted operations, necessitating time-consuming clearance and sweeping operations in advance of vehicle movement. Persistent heavy mining effectively closed roads, because the manpower to sustain sweeping efforts did not exist.[195]

Courtesy *Armor Magazine*

Figure 75. Dismounted team working with M48.

Mine detection and clearance proved tedious and laborious. Dismounted personnel with handheld detectors moved slowly through an area searching for mines. They also required a security detail. Soldiers, increasingly adept at looking for the right signs, could identify some mines, and the rate of finding them gradually rose to 60 percent. Efforts to employ vehicle-borne mine detection and sweeping devices did not work. Mine rollers generated considerable maintenance with no guarantee of success. Indeed, "The first roller tested was blown apart by a mine and rendered junk. Subsequent models left mines to be detonated by vehicles well back in the column."[196] Vehicle mounted detectors proved only marginally successful. Mine use did not stop armored cavalry operations, but one 11th Armored

Cavalry commander noted, "With an intensified mine program the NVA could have virtually immobilized the Regiment."[197] He further observed, "There is not in the US Army inventory a satisfactory mine detector for clearing extensive road networks in a short period of time, or for sweeping on extended frontages. There is no non-metallic mine detector available for field use."[198]

Mines with their combination of physical danger and psychological threat constituted a challenge never really resolved in Vietnam. Instead, most units simply coped with them as best they could. On a smaller scale, the 11th Armored Cavalry employed the same threat against the NVA. Once supply and infiltration routes were identified, soldiers began to place claymore mines along them. In 1 month alone, these ambushes killed 100 enemy fighters, caused an unknown number of wounded, and generated confusion among the NVA.[199]

End Game 1970–72

Military operations after the Tet Offensive helped to drive the NVA and remnant Viet Cong across the border into Cambodia and Laos. These nations provided sanctuaries for the insurgents, permitting them to reorganize and resupply before infiltrating back into South Vietnam. In the spring of 1970, the United States began to reconsider the political restraints that barred direct American action against targets in Cambodia. President Richard M. Nixon sought to secure "peace with honor." He intended to end the American military presence in Southeast Asia through a combination of diplomacy, expansion of South Vietnamese military capabilities, and the elimination of cross-border infiltration by insurgents.

In May 1970, American mounted units participated in a large-scale incursion into Cambodia along an 80-mile front to destroy NVA supplies and base camps. Initial engagements resulted in heavy casualties to the NVA, who withdrew deeper into Cambodia. The 11th Armored Cavalry continued to advance, driving to the city of Snoul, where it sought to block the retreat of NVA elements. Instead, the regiment became engaged in a street fight to secure the city, which it did at cost to the enemy. After this battle, NVA contacts became rare, and regimental operations shifted to the discovery and destruction of insurgent base camps, supplies, and trails. The experience of other American and South Vietnamese units proved similar—heavy fighting followed by sporadic contacts that permitted wide scale elimination of enemy strongholds and infrastructure.[200]

Unlike most prior operations, the Cambodian incursion was a conventional operation. The 11th Armored Cavalry commander described the

operation as one in which the unit "attacked on an axis, linked up with ARVN airmobile infantry, made a forward passage of lines and continued to attack on an axis, attacked a built up area, then took up an area of operations for reconnaissance operations." Air cavalry provided an aerial umbrella for the attacking columns, assisting navigation and the location of enemy-held positions. Ground units working through the close, jungle terrain relied on ingrained battle drills to respond quickly to sudden contacts and launch counterattacks to preempt enemy withdrawal.[201]

American forces withdrew from Cambodia in June, turning their attention to bolstering the capabilities of South Vietnamese regional and police forces. Mounted units conducted civic action projects and continued to seek insurgents. Hostile contacts shrank to squads and individual soldiers difficult to locate and interdict. Therefore, the 11th Armored Cavalry created a special reconnaissance team. This unit worked to determine enemy base camp locations, movement routes, and likely enemy positions. It routinely entered difficult terrain that could not be effectively reconnoitered from the air. The reconnaissance team possessed the means to either react directly to hostile contact or organize a strike by other combat elements.[202]

The final stages of the war also witnessed an increased use of unattended ground sensors. These devices could be deployed by ground teams or air dropped. Once in place, they monitored enemy activity. Analysis of sensor data provided clues regarding the location of insurgents and suggested likely trails. The devices proved popular and effective. In the 11th Armored Cavalry:

> The maturation of the Regimental sensor program clearly indicated the tremendous possibilities of this system for extending and maximizing the characteristics and potential of armored cavalry units. Whether in reconnaissance, security, or screening operations, the integration of sensors into the scheme of maneuver and plan of supporting fires offers very significant advantages for further exploitation. Furthermore, it is apparent that a great economy of forces deployed may be realized, particularly in the performance of security missions, where air and armored cavalry units may be centrally located and be prepared to respond to sensor-driven intelligence.[203]

The emphasis given to locating small bands of insurgents and reliance on sensors contrasted with the large-scale military actions undertaken earlier in the war. While NVA and Viet Cong activity had fallen sharply, so

too had the American ability to mount major operations. In 1971, the South Vietnamese undertook a large-scale incursion into Laos. In this operation, American ground forces played only a supporting role. Barred from entering Laos, they secured the lines of communications and supply leading to the Laotian border. The South Vietnamese, however, encountered heavy NVA resistance and withdrew.[204]

The Laotian operation marked the last major operation for American ground forces. The first significant troop withdrawals back to the United States had begun in 1969 and accelerated since. By the end of 1971, American troop strength in South Vietnam had fallen to 158,000. Many of the remaining units were armor and armored cavalry, but their activities remained limited to local security and civic action. Preparations for redeployment to the United States overshadowed combat operations and command attention shifted to unit management and administrative actions. By April 1972, even these units had left Vietnam. Only a dwindling number of air cavalry troops remained in the country, the last two leaving in February 1973.[205]

Ironically, the drawdown of American forces coincided with the emergence of more effective training literature. In October 1970, the Armor School released Special Text 17-1-3, *Armor in Vietnam*. The text targeted the small unit leader and vehicle crews, providing well-illustrated and readable descriptions of mounted operations. One chapter focused on the terrain and climate conditions in Vietnam, indicating how to survive and navigate in them. Route security, reconnaissance of force, and other common missions were described in detail amid a Vietnam context. The text addressed mission planning, specific techniques found effective in Vietnam, formations, and counterambush preparations. The weapons and equipment likely to be employed by an armored cavalry platoon leader were summarized, photos included, and general information on their use provided together with detailed organizational data. An entire section described enemy mine techniques and explosive devices.[206]

In 1973, the Armor School published another special text entitled *Vietnam Battle Tricks*. This text documented lessons learned and special techniques used. It addressed mounted, dismounted, air, and artillery operations in addition to offering details related to communications and medical support. It summarized specific methods used to find and eliminate an elusive enemy in jungle terrain. The use of stay-behind patrols and cloverleaf were offered as proven measures to counter an enemy who hid on hearing the noise of approaching combat vehicles. Other subjects included security for mounted mortar teams, dismounted patrols by tank and armored

cavalry units, the use of armored vehicles to create landing zones for helicopters, movement to contact in the jungle, and night ambush. Readers also learned measures to reduce casualties, improve vehicle survivability, conduct trafficability assessments, and perform vehicle recovery. The late date of this publication, however, undermined its training utility.[207]

The year also witnessed the revision of FM 17-36, *Armored Cavalry Platoon, Troop, and Divisional Armored Cavalry Squadron*. This version incorporated improved three-dimensional graphics to better illustrate key ideas, and it reflected the presence of the M551 Sheridan in cavalry tank units.[208] Armored cavalry platoon operations benefited from the inclusion of a clear listing of the pros and cons associated with reliance on direct versus indirect fires. Such information provided a frame of reference to assist

Figure 76. Doctrinal depiction of the combined arms platoon in operation.

decisionmaking in the field. Unlike prior doctrine that discouraged night reconnaissance, this activity now became a required platoon function. The manual provided platoon leaders with guidance for planning and executing night reconnaissance and incorporating ground surveillance radars and unattended ground sensors.[209]

Surveillance operations received expanded coverage, particularly in the use of unattended ground sensors. The latter included remotely monitored devices that tracked seismic, magnetic, acoustic, or physical disturbances associated with the movement of men and materiel. Armored cavalry commanders were expected to use these sensors in conjunction with ground radar, night observation devices, and infrared sights to create a surveillance network that continuously monitored a targeted area. Ironically, an organizational change somewhat nullified this emphasis. Ground radars ceased to be organic assets. Instead, they were issued only when required by the operational environment. Moreover, human analysis took precedence over electronic devices: "The primary surveillance assets of a unit are the eyes and ears of the individual Soldier and his ability to reason—a capability no mechanical or other device can completely duplicate."[210]

A separate chapter addressed COIN operations, incorporating the Vietnam experience. The writers stressed the importance of securing popular support without alienating civilians or destroying their country. All military units were exhorted to support the population through a variety of civic actions intended to build trust and improve quality of life. The overall purpose of COIN lay in the destruction of insurgent bases and forces to provide a secure environment for a wide range of political, social, and economic internal developments to occur. The successful employment of armored cavalry depended on the cultivation of effective intelligence sources, seizing and sustaining the initiative, and rapidly concentrating combat power on hostile contacts.[211]

Despite the lessons learned from Vietnam, armored cavalry organizations continued to experience problems that predated the conflict. Training effective platoon leaders remained as much a challenge at the end of the war as it did in the beginning. Too many new platoon leaders lacked the ability to employ the unit as an integral team:

> The average armored cavalry platoon leader has insufficient basic knowledge of the particular infantry and mortar support capabilities which can and must be furnished by his platoon. The program of instruction for the Armor Officer Basic Course should provide considerably more

> instruction on the basic skills required of the armored cavalry platoon leader to enable him to perform his duties as the leader of a closely integrated combined arms team.[212]

Officer instruction at the Armor School continued to focus on conventional combat operations. Given the persistent threat posed by the Warsaw Pact, some of this reluctance made sense. Unfortunately, it also reflected an unwillingness to embrace the needs and lessons of a conflict many continued to see as a temporary aberration. One tank company commander attending the Armor Officers Advanced Course after serving in Vietnam found the tactical, leadership, and technical instruction to be of marginal use to officers who would soon be fighting in the jungles and rice paddies of Southeast Asia. Reflecting on his experience, he noted:

> I found a real reluctance on the part of the Armor Officer Career Course to discuss Vietnam. To them it was an anomaly. Obviously, in a classical sense, it wasn't the way armor should be used or had been used. Therefore, they wouldn't talk about it and avoided trying to assimilate the experience, or of seeing what could be extrapolated from it, or how it could be incorporated into our doctrine. So, rather than learn how to do it, we just accepted that armor in Vietnam was doing a mission that was unpleasant and was being used improperly. Besides, we had other things to do, which was to fight in Europe, or in the desert, or wherever else. It was a very poor approach. It made us, in the armor community, in many ways ill prepared to go to Vietnam and find ways to employ armor despite the fact that there were many ways to employ armor in combined arms operations, if not alone.[213]

By the mid-1970s, effective principles for the employment of mounted reconnaissance organizations in counterinsurgencies had emerged. Many of these concepts built on the early foundations laid by the 3d Armored Cavalry field experimentation in 1961 and the firsthand experience of the South Vietnamese. Refinement resulted in a wealth of proven tactics, techniques, and procedures whose utility transcended Vietnam. Unfortunately, this achievement proved short-lived. The Army's withdrawal from Vietnam triggered a refocusing of military energy on conventional operations against the Warsaw Pact on the more familiar battlefield of Central Europe. The expertise and knowledge of COIN operations remained as part of the Army's institutional knowledge, but its relevance soon withered through disuse.

Notes

1. "The M113 Armored Personnel Carrier," *Armor* LXVIII, no. 3 (May–June 1959): 8–9.
2. Allan R. Millett and Peter Maslowski, *For the Common Defense: A Military History of the United States of America* (New York, NY: The Free Press, 1984), 546–547.
3. Ibid., 547–550, 552.
4. Department of the Army, FM 17-35, *Armored Cavalry Platoon, Troop, and Squadron* (Washington, DC: Headquarters, Department of the Army, 1960), 7, 65, 120–123, 189–191, quotation from page 7.
5. Department of the Army, FM 17-95, *The Armored Cavalry Regiment* (Washington, DC: Headquarters, Department of the Army, 1960), 4, 67–69.
6. Department of the Army, FM 17-30, *The Armored Division Brigade* (Washington, DC: Headquarters, Department of the Army, 1961), 83, 116–117, 119–120.
7. Ibid., 111–112, 116–117, 119.
8. Ibid., 80–82.
9. Major Raymond R. Battreall Jr., "The Regimental Armored Cavalry Squadron in Area Security," *Armor* LXXIV, no. 1 (January–February 1965): 42–43.
10. Ibid., 44–46.
11. Ibid., 44.
12. Ibid., 43–44.
13. Ibid., 44.
14. US Army Armor Combat Developments Agency, "The Role of Armored Cavalry in Counterinsurgency Operations," agency report, Fort Knox, KY, October 1962, US Army Armor Branch Archives (hereafter referred to as Branch Archives), 4–5, 7, and annex E.
15. Ibid., 6.
16. Ibid., 5, 7, 8, and annex G, quotation from page 7.
17. Department of the Army, FM 17-1, *Armor Operations* (Washington, DC: Headquarters, Department of the Army, 1963).
18. Ibid., 155–156, 196–199.
19. General Donn A. Starry, *Mounted Combat in Vietnam* (Washington, DC: Department of the Army, 1989), 17–19.
20. Ibid., 19–20.
21. Ibid., 21, 24.
22. Lieutenant Colonel Raymond R. Battreall Jr., "Armor in Vietnam," *Armor* LXXV, no. 3 (May–June 1966): 8.
23. Starry, *Mounted Combat in Vietnam*, 24–25, 39–43, 45; Battreall, "Armor in Vietnam," 7–8.
24. Starry, *Mounted Combat in Vietnam*, 37–38; Captain Michael Moore, "Improvement of Armor Employment in Vietnam," *Armor* LXXV, no. 5 (September–October 1966): 6, quotation from Battreall, "Armor in Vietnam," 7–8.

25. FM 17-1 (1963), 39.
26. Ibid., 39.
27. Ibid., 40.
28. Ibid., 40.
29. Ibid., 40, 43.
30. Robert A. Baker, "A Survey of Problems in the Tactical Training of Armor Units," Human Resources Research Organization Report, Fort Knox, KY, December 1961, iii–v, 11, 16–17, 21. Available via Defense Technical Information Center (DTIC), Report no. AD327759.
31. Ibid., vi, 33.
32. John G. Cook, "A Survey of Problems in the Tactical Training of Armored Cavalry Platoons," Human Resources Research Organization Report, Fort Knox, KY, January 1963, 7–9. Available via DTIC, Report no. AD480776.
33. Ibid., 7, 13–14, quotation from page 15.
34. Ibid., 15–17.
35. William L. Warnick and Robert A. Baker, "Determination of Combat Job Requirements for Armored Cavalry Platoon Personnel," Human Resources Research Organization Report, Fort Knox, KY, December 1964. Available via DTIC, Report no. AD455302; Lieutenant Colonel (Retired) John G. Cook and Robert A. Baker, "The Armored Cavalry Platoon Combat Readiness Check," *Armor* LXXVI, no. 1 (January–February 1967): 18–23.
36. Robert A. Baker and Lieutenant Colonel (Retired) John G. Cook, "ACT I, the Armored Cavalry Trainer," *Armor* LXXVI, no. 2 (March–April 1967): 38–43. This system bore many similarities in purpose to the later computer-based Simulations Networking (SIMNET) facilities.
37. Ibid., 43.
38. Starry, *Mounted Combat in Vietnam*, 54–55.
39. Ibid., 54–57.
40. Starry, *Mounted Combat in Vietnam*, 57–58; Major Michael R. Matheny, "Armor in Low Intensity Conflict," *Armor* XCVII, no. 4 (July–August 1988): 11.
41. Starry, *Mounted Combat in Vietnam*, 52–54, 58, 60, 62–63; for a complete listing of armor, armored cavalry, and mechanized infantry units deployed to South Vietnam see Shelby L. Stanton, *Vietnam Order of Battle: A Complete Illustrated Reference to U.S. Army Combat and Support Forces in Vietnam 1961–1973* (Mechanicsburg, PA: Stackpole Books, 1981).
42. Stanton, *Vietnam Order of Battle*, 47; Starry, *Mounted Combat in Vietnam*, 73.
43. Starry, *Mounted Combat in Vietnam*, 63–64.
44. Battreall, "Armor in Vietnam," 4–6.
45. Battreall, "Armor in Vietnam," 6–8; Moore, "Improvement of Armor Employment in Vietnam," 5–6; Major Servetus T. Ashworth III, "Armor can Operate in the Delta," *Armor* LXXVI, no. 2 (March–April 1967): 6–8.
46. Moore, "Improvement of Armor Employment in Vietnam," 4–9; Ashworth, "Armor Can Operate in the Delta," 6–8.

47. Ashworth, "Armor Can Operate in the Delta," 10.

48. Mechanized Operations in Vietnam, Major John B. Hubard, 2–3, US Army Military History Institute, Carlisle, PA (hereafter referred to as MHI); Captain John N. Abrams, Vietnam monograph, unpublished, 37, 2/1 Cavalry File, Branch Archives; Starry, *Mounted Combat in Vietnam*, 57.

49. Starry, *Mounted Combat in Vietnam*, 64.

50. Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Roy D. Kimerling, 2-34 Armor, 15–16, MHI; Stanton, *Vietnam Order of Battle*, 93.

51. Company Command in Vietnam, Kimerling, 51–52, 57, 59–60.

52. First Lieutenant Donald F. Ullman et. al., Letter to the Editor, *Armor* LXXV, no. 5 (September–October 1966): 3; Captain Philip C. Guzman, Letter to the Editor, *Armor* LXXV, no. 5 (September–October 1966): 2–3.

53. Ullman et al., Letter to the Editor, 3.

54. Mechanized Operations in Vietnam, Hubard, 13.

55. Guzman, Letter to the Editor, 2.

56. Lieutenant Colonel Charles P. Graham, 2d Squadron, 1st Cavalry Annual Historical Supplement, Calendar Year 1967, 1 March 1968, 3–4, 2/1 Cavalry File, Branch Archives.

57. Starry, *Mounted Combat in Vietnam*, 57.

58. Mechanized Operations in Vietnam, Hubard, 13.

59. Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Dudley M. Andres, 12–13, 22, MHI; Mechanized Operations in Vietnam, Hubard, 2–3.

60. Abrams, Vietnam monograph, unpublished, 30; Graham, 2d Squadron, 1st Cavalry Annual Historical Supplement, 17; Starry, *Mounted Combat in Vietnam*, 71–72.

61. Mechanized Operations in Vietnam, Hubard, 2–3; Starry, *Mounted Combat in Vietnam*, 64–66; Stanton, *Vietnam Order of Battle*, 125.

62. Mechanized Operations in Vietnam, Hubard, 4–5, 7–9, 10–11.

63. Graham, 2d Squadron, 1st Cavalry Annual Historical Supplement, 2, 15–16; Abrams, Vietnam monograph, unpublished, 16; Starry, *Mounted Combat in Vietnam*, 106–107.

64. Starry, *Mounted Combat in Vietnam*, 106–107, 111.

65. Ibid., 66–71.

66. US Army Concept Team in Vietnam, "Final Report: Optimum Mix of Armored Vehicles for Use in Stability Operations," 3 volumes, 27 January 1971, annex G.

67. Colonel Roy W. Farley, "Blackhorse Report II," *Armor* LXXVII, no. 2 (March–April 1968): 6, 8.

68. Colonel William W. Cobb, "11th Cavalry Report," *Armor* LXXVI, no. 2 (March–April 1967): 30; Farley, "Blackhorse Report II," 8.

69. Farley, "Blackhorse Report II," 9–10; Captain Ronald A. Hofmann, "The Affray at Slope 30," *Armor* LXXVII, no. 1 (January–February 1968): 13–18.

70. Cobb, "11th Cavalry Report," 31.

71. Captain John F. Votaw, "The Blackhorse Kicks Back," *Armor* LXXVI, no. 4 (July–August 1967): 38–41, quotation from page 41.

72. Captain George L. Gunderman, "Ambush!" *Armor* LXXVI, no. 3 (May–June 1967): 16–19; Starry, *Mounted Combat in Vietnam*, 77.

73. K Troop, 11th Armored Cavalry, After Action Report 21 May 1967, http://www.ktroop.com/bandana.htm (accessed July 2008); Starry, *Mounted Combat in Vietnam*, 108

74. Starry, *Mounted Combat in Vietnam*, 109–110.

75. Troop F, 17th Cavalry Regiment, 196th Light Infantry Brigade, Vietnam 1966–72, "Campaign CEDAR FALLS," http://www.ftrp17cav196.com/cfalls.htm (accessed July 2008); Starry, *Mounted Combat in Vietnam*, 91, 95; Matheny, "Armor in Low-Intensity Conflict," 12.

76. Starry, *Mounted Combat in Vietnam*, 95–97, 101–102; Matheny, "Armor in Low-Intensity Conflict," 13; Captain Wilbert R. Mennix, "A First Combat Experience," *Armor* LXXVIII, no. 4 (July–August 1969): 9–10.

77. Starry, *Mounted Combat in Vietnam*, 96; Mennix, "A First Combat Experience," 10.

78. Farley, "Blackhorse Report II," 10–11.

79. Company Command in Vietnam, Andres, 33–35, 39, 40; Company Command in Vietnam, Kimerling, 62–63.

80. Mechanized Operations in Vietnam, Hubard, 11–12.

81. Company Command in Vietnam, Andres, 33–35, 39, 40; Company Command in Vietnam, Kimerling, 16, 62–63.

82. Company Command in Vietnam, Kimerling, 17–18.

83. Farley, "Blackhorse Report II," 5, 10.

84. US Army Vietnam, "Mechanized and Armor Combat Operations in Vietnam," Report, 28 March 1967, I, II, 50, Branch Archives; Lieutenant General Ben Harrell, "Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam (MACOV)," memorandum, 15 May 1967, 2, Branch Archives; US Army Combat Developments Command, "Review and Analysis of the U.S. Army Mechanized and Armor Combat Operations in Vietnam," Report, 15 May 1967, iii, Branch Archives.

85. "Mechanized and Armor Combat Operations in Vietnam," 14.

86. Ibid., 13–14, 19, 22–23, 25, 29–32, 36, 38–39, 43–45, 47–48.

87. Ibid., 10, 50.

88. Ibid., 51–52, quotation from page 51.

89. Ibid., 53–54, 60, 66–67, 106, 108.

90. Ibid., 54, 83.

91. Ibid., 55–56.

92. Ibid., 60, 172–173.

93. Ibid., 109–113, 130.

94. Ibid., 55–56, 84–86.

95. Ibid., 133–134.

96. Ibid., 77–80, 82, 120.

97. Ibid., 68–69, 114–115, quotation from page 115.
98. Ibid., 160–162, 164–165.
99. Ibid., 102–103, 127, 171–172, 177.
100. CDC, "Review and Analysis of the U.S. Army Mechanized and Armor Combat Operations in Vietnam," III-5, III-6, III-7, quotation from page III-7.
101. CDC, "Review and Analysis of the U.S. Army Mechanized and Armor Combat Operations in Vietnam," IV.
102. Starry, *Mounted Combat in Vietnam*, 86.
103. Mechanized Operations in Vietnam, Project No. 239 R-23, Interview of Lieutenant Colonel Richard A. Robinson Jr., March 1974, 6-8, MHI.
104. Starry, *Mounted Combat in Vietnam*, 89–90; For a listing of those MACOV recommendations implemented or rejected, see US Army Concept Team in Vietnam, "Final Report," annex D.
105. The full MACOV report constituted multiple volumes, few of which remain at the time of this publication. One of these is in the holdings of the Armor School Library. A condensed version of some 300 pages was compiled to highlight key findings, and it remains far more accessible than the full version.
106. Major General Arthur L. West Jr. and Colonel Donn A. Starry, "Improved Organization and Equipment for Vietnam," *Armor* LXXVII, no. 3 (May–June 1968): 51.
107. Department of the Army, FM 17-1, *Armor Operations* (Washington, DC: Headquarters, Department of the Army, 1966), 4, 14–16, 18.
108. Ibid., 44.
109. Ibid., 45.
110. Ibid., 47.
111. Ibid., 44, 45, 47.
112. Ibid., 5–7, 47, 49, 82–87, 126–127,173, Appendix XV, Night Combat Techniques.
113. Ibid., 47.
114. Ibid., 218–219.
115. Ibid., 231–233, 235–239.
116. Ibid., 221–223.
117. Ibid., 219–221.
118. Ibid., xxx.
119. Ibid., 240–241, 244–247, quotation from page 241.
120. Department of the Army, FM 17-95, *The Armored Cavalry Regiment* (Washington, DC: Headquarters, Department of the Army, 1966), 3–4, 38, 40.
121. Ibid., 7, 9, 11, 21, 36, 41, quotation from page 21.
122. Ibid., 8, 10–12, 14–15, 38, 40, 45.
123. Ibid., 53.
124. Ibid., 83.
125. Ibid., 53–55, 58, 83.
126. Ibid., 62, 65–75, 125.
127. Ibid., 133–134.

128. Department of the Army, FM 17-15, *Tank Units: Platoon, Company, and Battalion* (Washington, DC: Headquarters Department of the Army, 1966), 8, 175.

129. Ibid., appendix III.

130. Ibid., 175–177, 179, 181, quotation from page 177.

131. Ibid., 179, 180, 183, 184, quotation from page 183.

132. Ibid., 181, 185, 187.

133. Ibid., 188–189.

134. Department of the Army, FM 17-36, *Divisional Armored and Air Cavalry Units* (Washington, DC: Headquarters, Department of the Army, 1968), 1-1.

135. Ibid., 1-1, 1-4 to 1-6, 8-1 to 8-2, 8-5 to 8-6.

136. Ibid., see Chapter 4, Employment of the Armored Cavalry Platoon.

137. Ibid., 4-1.

138. Ibid., 4-3.

139. Ibid., 4-3.

140. Ibid., 4-5.

141. Ibid., 16-2 to 16-4, quotation from page 16-4.

142. Ibid., 16-11 to 16-12.

143. Lieutenant Colonel Raymond R. Battreall Jr., "Cavalry Operations IV—Reconnaissance," *Armor* LXXVIII, no. 2 (March–April 1969): 39, 41, quotation from page 41.

144. Ibid., 39–41, quotation from page 40.

145. Mechanized Operations in Vietnam, Project No. 34 R-4, Sergeant First Class Herman G. Roberts, 22 January 1974, 1–2, 4, MHI.

146. Colonel Wallace H. Nutting, "Senior Officer Debriefing Report," 5 March 1971, I-57 to I-58, Branch Archives.

147. Starry, *Mounted Combat in Vietnam*, 118–119, 122–123.

148. Ibid., 138.

149. Colonel Donn A. Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 48–52, Branch Archives; US Army Concept Team in Vietnam, "Final Report," B-2 to B-3, B-36 to B-37, G-1, G-9, G-21 to G-22.

150. US Army Concept Team in Vietnam, "Final Report," B-3.

151. Lieutenant Colonel Donald W. Moreau, "Operational Report—Lessons Learned for the Period Ending 31 July 1968," 2 August 1968, 1-2, 2/1 Cavalry Files, Branch Archives; Lieutenant Colonel John M. Fairey, "Operational Report—Lessons Learned for the Period Ending 31 July 1969," 31 July 1969, 1-2, 2/1 Cavalry Files, Branch Archives; Captain Snedeker, "Armor in Vietnam Questionnaire," undated, 2/1 Cavalry Files, Branch Archives.

152. US Army Concept Team in Vietnam, "Final Report," B-37 to B-39, J-5.

153. Ibid., III-13 to III-14, K-1.

154. First Lieutenant Arthur B. Cook, "Report of Combat Action," 1 September 1968, http://www.bobcat.ws/cor1.htm (accessed July 2008).

155. US Army Concept Team in Vietnam, "Final Report," G-1, H-1, J-6, J-7, K-1; Cook, "Report of Combat Action"; Moreau, "Operational Report—Lessons Learned for the Period Ending 31 July 1968," 1–2; Fairey, "Operational Report—Lessons Learned for the Period Ending 31 July 1969," 3; Lieutenant Colonel John M. Fairey, "Operational Report—Lessons Learned 2d Squadron, 1st Cavalry, Period Ending 31 October 1969," 31 October 1969, 1, 2/1 Cavalry Files, Branch Archives; Lieutenant Colonel Eric F. Antila, "Mechanized Operations in the Delta," unpublished manuscript, 14 February 1974, 2/1 Cavalry Files, Branch Archives; "Mechanized Operations in Vietnam," Roberts, 2.

156. Antila, "Mechanized Operations in the Delta"; Lieutenant Colonel Eric F. Antila to Lieutenant Colonel George J. Dramis Jr., letter, 2 January 1973, 2/1 Cavalry Files, Branch Archives; Cook, "Report of Combat Action," 1 September 1968; US Army Concept Team in Vietnam, "Final Report," II-14 to II-15, K-6, K-9.

157. US Army Concept Team in Vietnam, "Final Report," III-14 to III-16.

158. Ibid., B-13, B-17, B-18, G-21 to G-22, H-1, H-12.

159. Snedeker, "Armor in Vietnam Questionnaire."

160. US Army Concept Team in Vietnam, "Final Report," III-15, III-18, III-20, III-22.

161. Ibid., III-17.

162. Ibid., III-19, III-21.

163. Fairey, "Operational Report—Lessons Learned for the Period Ending 31 July 1969," 23; "Mechanized Operations in Vietnam," Roberts, 5.

164. US Army Concept Team in Vietnam, "Final Report," II-14, G-1, G-3, G-5, H-1, I-5.

165. Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 17.

166. Antila, "Mechanized Operations in the Delta"; Antila to Dramis, letter, 2 January 1973; Cook, "Report of Combat Action," 1 September 1968.

167. Lieutenant Colonel Carmelo P. Milia, "Armor Task Force to Khe Sanh," *Armor* LXXIX, no. 3 (May–June 1970): 42–46.

168. Captain Charles W. Donaldson, "The Cavalry—Air Cavalry Team," *Armor* LXXVIII, no. 5 (September–October 1969): 25.

169. Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 25, 117; Nutting, "Senior Officer Debriefing Report," 5 March 1971, C-21 to C-24; Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Lemos L. Fulmer Jr., 1983, 61, MHI; "Mechanized Operations in Vietnam," 24 January 1974, 1, MHI; Colonel George S. Patton, "Pile-On—Part II," *Armor* LXXIX, no. 2 (March–April 1970): 27.

170. Colonel George S. Patton, "Pile On," *Armor* LXXIX, no. 1 (January–February 1970): 26.

171. Ibid., 26.

172. Company Command in Vietnam, Fulmer, 48.

173. Moreau, "Operational Report—Lessons Learned for the Period Ending 31 July 1968," 4.

174. Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 20, 115, 117, 118, 120; Nutting, "Senior Officer Debriefing Report," 5 March 1971, I-59. Rome Plows were armored bulldozers used to clear heavy vegetation. They were named for the manufacturer of the plow, the Rome Plow Company in Rome, Georgia.

175. Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Jimmie Quinn, 1985, 9; Patton, "Pile On," 25.

176. US Army Concept Team in Vietnam, "Final Report," G-1, H-6.

177. Ibid., III-1 to III-2, III-6, B-21 to B-22, B-37.

178. Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel John D. Collins, 1982, 3–9, MHI; Captain Franklin Y. Hartline, "Route Security in the Central Highlands," *Armor* LXXVIII, no. 6 (November–December 1969): 21–24.

179. Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Thomas M. Montgomery, 1983, 47–48; Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Richard E. Davis, 23; Company Command in Vietnam, Fulmer, 58; Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 24, 117.

180. Company Command in Vietnam, Fulmer, 58.

181. Brigadier General John C. Bahnsen, Colonel Arthur L. West III, and Lieutenant Colonel Douglas H. Starr, "Attacking Dismounted Infantry with Armored Cavalry," *Armor* XCV, no. 5 (September–October 1986): 8–15; Company Command in Vietnam, Fulmer, 38, 61; Company Command in Vietnam, Davis, 13; Antila, "Mechanized Operations in the Delta"; Antila to Dramis, letter, 2 January 1973; Cook, "Report of Combat Action," 1 September 1968.

182. Company Command in Vietnam, Fulmer, 40; Company Command in Vietnam, Montgomery, 51–52.

183. US Army Concept Team in Vietnam, "Final Report," G-5 to G-8; Bahnsen, "Attacking Dismounted Infantry with Armored Cavalry," 8–15; Company Command in Vietnam, 50–51.

184. Company Command in Vietnam, Fulmer, 40; Bahnsen, "Attacking Dismounted Infantry with Armored Cavalry," 8–15.

185. Company Command in Vietnam, Montgomery, 52.

186. Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Timothy J. Grogan, 1981, 45, MHI; Antila to Dramis, letter, 2 January 1973, 2.

187. Antila to Dramis, letter, 2 January 1973, 2.

188. US Army Concept Team in Vietnam, "Final Report," III-29; Mechanized Operations in Vietnam, Brookshire, 121.

189. Company Command in Vietnam, Grogan, 18–19, quotation from page 18.

190. Senior Officer Oral History Program, Company Command in Vietnam, Interview of Lieutenant Colonel Edgar B. Morrison, 1983, 20–21, MHI; Company Command in Vietnam, Davis, 13, 51; Company Command in Vietnam, Fulmer, 66;

Company Command in Vietnam, Collins, 36; Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 39, 43–44; Lieutenant Colonel Roy F. Sullivan, "The APC in ARVN," *Armor* LXXIX, no. 1 (January–February 1970): 38.

191. Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 39, 43–44, quotation from page 39.

192. Company Command in Vietnam, Fulmer, 66; Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 54; Nutting, "Senior Officer Debriefing Report," 5 March 1971, G-42; Starry, *Mounted Combat in Vietnam*, 143–145.

193. US Army Concept Team in Vietnam, "Final Report," II-1. The total number of combat vehicle losses included 1,342 M113s and 308 M48A3. Total tracked combat and support vehicles equaled 1,856.

194. Company Command in Vietnam, Montgomery, 48. The percentage rate translated into 427 vehicles.

195. US Army Concept Team in Vietnam, "Final Report," II-1; Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 8; Moreau, "Operational Report—Lessons Learned for the Period Ending 31 July 1968," I-1; Fairey, "Operational Report—Lessons Learned for the Period Ending 31 July 1969," 4, 27.

196. Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 9.

197. Ibid.

198. Ibid., 8–9, all quotations from page 9.

199. Ibid., 21.

200. Nutting, "Senior Officer Debriefing Report," 5 March 1971, I-59 to I-60; Major Edward J. Chesney, "The 11th Armored Cavalry Regiment In Vietnam, January 1969 Through June 1970" (master's thesis, Fort Leavenworth, KS, 2002), 78; Starry, *Mounted Combat in Vietnam*, 171–176.

201. Starry, "Senior Officer Debriefing Report—11th ACR, 7 DEC 69 to 7 JUN 70," 12 June 1970, 20.

202. Nutting, "Senior Officer Debriefing Report," 5 March 1971, 1-3, A-9, C-22 to C-23.

203. Ibid., 4, quotation from pages A-8 and A-9.

204. Starry, *Mounted Combat in Vietnam*, 186–187, 190–197. For a description of the US role in this operation, see Keith W. Nolan, *Into Laos: The Story of Dewey Canyon II/Lam Song 719; Vietnam 1971* (Novato, CA: Presidio Press, 1986).

205. Nutting, "Senior Officer Debriefing Report," 5 March 1971, 2–3, 6; Starry, *Mounted Combat in Vietnam*, 199–200.

206. US Army Armor School, Special Text 17-1-3, *Armor in Vietnam* (Fort Knox, KY: US Army Armor School, 1970).

207. US Army Armor School, *Vietnam Battle Tricks* (Fort Knox, KY: US Army Armor School, 1973), 3-1 to 3-7, quotation from page 1-1.

208. Department of the Army, FM 17-36, *Armored Cavalry Platoon, Troop, and Divisional Armored Cavalry Squadron* (Washington, DC: Headquarters, Department of the Army, 1973), 2-2 to 2-4, 3-11. Pages 3-5 through 3-9 provide a good example of the improved graphics used to illustrate integrated action at the platoon level.

209. Ibid., 1-6, 3-15 to 3-17, 3-29.

210. Ibid., 7-2, 7-4, quotation from page 10-1.

211. Ibid., 15-1 to 15-7.

212. Nutting, "Senior Officer Debriefing Report," 5 March 1971, D-28 to D-29, quotation from page D-29.

213. Company Command in Vietnam, Grogan, 20–21.

Chapter 6

Change, Controversy, and a Desert Victory

Between the Vietnam War and Operation DESERT STORM, mounted reconnaissance underwent significant changes in organization, doctrine, and training. These developments reflected the Army's reorientation from counterinsurgency in Southeast Asia to conventional battle in Central Europe. They left mounted reconnaissance in a state of flux for much of the period. Moreover, the slow fielding of new materiel complicated efforts to improve training and eliminated uniformity among reconnaissance assets at the corps, division, and battalion levels. In the 1980s, budgetary realities and experience gained at the National Training Center (NTC) encouraged a shift away from robust, versatile reconnaissance organizations toward ones with reduced capabilities. This transition became particularly evident in the division cavalry squadron and maneuver battalion scout platoon. Both units shed combat power and a broad mission set for lighter configurations intended for information collection. This development paralleled organizational concepts adopted during World War II but found ineffective in combat and discarded after that conflict. Operation DESERT STORM similarly demonstrated problems with the new reconnaissance configurations and encouraged a return to more capable units.

Army 86

The 1973 Paris Peace Accords ended American military involvement in South Vietnam. There Viet Cong and North Vietnamese Army activity increased and led to the unification of Vietnam under Communist rule in 1975. By then the US Army had transitioned to an all-volunteer force, and its strength fell from a wartime high of 1,570,343 soldiers to 775,051. In the aftermath of the Vietnam war, the popularity of military service fell, and the Army soon faced significant personnel shortfalls. It also faced the continuous threat of Warsaw Pact forces poised to invade the Federal Republic of Germany. The Army responded by manning its forces in Europe at full strength and stripping personnel from formations stationed in the United States. The latter received Reserve Component "roundout" elements to offset their losses, but they still faced significant training and readiness problems.[1]

Army reorganization abolished the Continental Army Command (CONARC). This organization oversaw all Army activities in the United States, but it had become too large and unwieldy. In July 1973, Forces Command (FORSCOM) and the Training and Doctrine Command

(TRADOC) replaced it. The former monitored the status of units stationed in the country, while the latter assumed responsibility for the development of training, doctrine, and materiel. TRADOC became the central influence in rebuilding the Army for a conventional war in Central Europe. There, the Warsaw Pact posed a persistent threat. Its capabilities had grown during the period of American involvement in Vietnam, eroding whatever technological superiority the United States and its NATO allies had possessed. Warsaw Pact forces also retained a significant advantage in numbers of combat personnel and major weapons systems.[2]

The October 1973 Arab-Israeli War underscored the very real danger posed by improved Warsaw Pact materiel. In that conflict, Egyptian and Syrian forces, lavishly equipped with Soviet-made vehicles and weapons, inflicted early defeats on the Israeli Defense Force. Reliance on surface-to-air missiles negated Israeli air superiority, while the intelligent and extensive use of antitank guided missiles (ATGM) and rocket propelled grenades (RPGs) dealt tank-heavy Israeli ground units heavy losses. Israel won the war, but it did so at a cost in men and materiel that it could ill afford.

The Middle East conflict introduced a much more lethal battlefield. New antitank weapons eroded the tank's battlefield supremacy and underscored the importance of combined arms teams. Mobile antiaircraft platforms and surface-to-air missiles made air supremacy problematic, while the newer Soviet vehicles fielded by the Arab armies similarly disproved notions of Western technical overmatch. The surprise nature of the Arab attacks called into question the traditional American reliance on a lengthy mobilization process. Strategic planners were forced to acknowledge that a future conflict might occur with little warning and even wars outside Europe carried the likelihood of encounters with a heavy mechanized enemy.[3]

Courtesy *Armor Magazine*

Figure 77. Cavalry platoon in Germany illustrating the mixed composition of M60 tanks and M114s.

The Army responded by overhauling combat organizations, doctrine, materiel, and training. TRADOC and its commander, Lieutenant General William E. DePuy, played a central role in this reorientation from counter-insurgency to conventional operations on battlefields dominated by mechanized and antiarmor systems. DePuy worked to improve Army readiness to permit its commitment to combat without awaiting the completion of national mobilization. He sought a force optimized to employ a variety of weapons in a mobile environment. To achieve this objective, "the U.S. Army would have to be retrained, starting at the lowest levels and working up, to think about combat as a problem of weapons system integration."[4]

A doctrinal update followed. In July 1976, the Army published a new FM 100-5, *Operations*. This manual governed the conduct of battle and related training principles. It embodied ideas nurtured by the TRADOC commander and reflected his emphasis on conventional operations in Europe against the Warsaw Pact. Given the likelihood of fighting outnumbered, the new manual stressed the importance of armored firepower and mobility to achieve success. Armored formations conducted a defense in depth to erode enemy combat power and create the conditions for a decisive counterstrike. In this concept of operations, the tank constituted the principal weapon system. Infantry in armored vehicles maneuvered alongside the tanks to eliminate antitank systems, while helicopters provided aerial antitank support in a marked departure from their role in Vietnam. These ideas formed the essence of Active Defense, a new doctrine intended to blunt and destroy a Warsaw Pact invasion.[5]

Implementing the new doctrine in Europe fell to Lieutenant General Donn A. Starry. While commanding the Armor Center from June 1973 until February 1976, he played a central role in crafting the new FM 100-5. On his promotion and assumption of V Corps command, he worked to apply Active Defense in the Federal Republic of Germany. However, his experience soon convinced him of the need to extend the battle area to include defeat of enemy follow-on echelons rather than just the initial wave of attackers. Otherwise, the defending forces risked winning the first battle only to be overwhelmed by successive attacks.[6]

Courtesy *Armor Magazine*

Figure 78. Major General Donn A. Starry.

Starry's concerns coincided with growing criticism of Active Defense. The new doctrine was considered too tactical in nature and too defense-oriented. It offered little guidance for operational maneuver at the corps level. It also assumed a Warsaw Pact offensive along a single axis on which defending measures could be concentrated. Soviet doctrine changed to embrace multipronged attacks intended to identify vulnerable areas into which follow-on echelons could pour. Active Defense principles seemed much less viable against such a multidimensional threat that kept the defender off balance and unable to concentrate on a decisive point.[7]

Critics also questioned the European focus of Active Defense. The Warsaw Pact constituted a critical danger, but the Army also faced challenges in other regions. American forces remained deployed on the Korean peninsula as a deterrent to possible North Korean aggression. In 1979, the overthrow of the Shah of Iran and the Soviet invasion of Afghanistan represented the emergence of new threats abroad. The Army sought a doctrinal base with global applicability that embraced the entire arsenal of conventional and unconventional weapons to defeat enemy forward and support elements in their entirety.[8]

Growing concern about Active Defense extended to related organizational studies. In 1976, the Division Restructuring Study reviewed division composition in the context of the new FM 100-5. The study aimed at upgrading the Reorganization Objective Army Division (ROAD) configuration and ensuring the effective integration of new weapons into tactical units. The resultant heavy division organization eliminated a maneuver battalion, included smaller battalions, and simplified company command through the removal of weapons systems. The division cavalry squadron also underwent alteration, primarily through the transfer of its air cavalry troop to division control. The proposed formation never evolved from a planning stage, but the related study encouraged further work on division redesign.[9]

In 1977, General Starry began a 4-year tenure as TRADOC commander, succeeding General DePuy. Starry implemented a more comprehensive organizational analysis based on intelligence projections through 1986. The initiative became known as Army 86 and included related studies of army, corps, and division formations. Division reform embraced the need for a powerful, self-sufficient design capable of sustained operations against a mechanized enemy. It included robust combat service support and raised the personnel strength of the division to 20,000 soldiers.[10]

Such a powerful formation made sense in light of the Warsaw Pact threat it was designed to fight. Unfortunately, implementing Army 86

initiatives throughout the force required additional funding and an increase in the Army's end strength. Neither could be secured from a Congress already supporting burgeoning expenses associated with the procurement of an array of new materiel. Therefore, TRADOC struggled to balance its Army 86 personnel requirements with the existing end strength cap by streamlining division organizations and increasing reliance on the Reserve Component. These measures proved expedient, but they did not resolve the discrepancy between the desire for powerful combat formations and a rigid personnel cap.[11]

Amid the organizational redesigns, the acquisition of new materiel occurred at a slow pace. As the 1970s ended, the Army anticipated the fielding of over 40 major equipment items, but cost increases and development problems repeatedly delayed fielding into the future. Hence, units in the field made do with a variety of interim configurations using existing materiel. This lack of synchronization among doctrine development, fielding of new equipment, and organizational changes introduced a degree of confusion into the field forces, including those units charged with reconnaissance.[12]

Reconnaissance Refocused

In the 1970s, mounted reconnaissance development paralleled the emergence of Active Defense and the Army's reorientation toward conventional combat in Europe. General Starry played a central role in this shift and embodied it. Having led the 11th Armored Cavalry in Vietnam, he commanded the Armor Center from 1973 to 1976 and subsequently V Corps and TRADOC. He proved a key influence on the doctrinal developments that led to the 1976 version of FM 100-5 and its later revision. Within the armor community, his views directly influenced reconnaissance doctrine, training, and organization.[13]

Analysis of the 1973 Arab-Israeli War convinced Starry of three central points. Long-range, antiarmor systems appeared to play a dominant role on the battlefield. Air defense systems directly threatened the availability of close air support. Finally, he noted:

> The US Army must learn to fight outnumbered and win. The masses of armor and air defense weaponry employed by Israel's foes not only testify to a Soviet ability to supply her allies with vast amounts of first line materiel, but portend the masses of such systems the Soviets themselves would use. The tank force ratios on the Golan Heights in October 1973 were not at all unlike those to be expected in Central Europe should war occur there.[14]

Starry believed this battlefield environment required fresh tactics and a new understanding of combat operations. Combined arms teams remained valid, effective tools. Tanks sought the destruction of hostile armor and performed reconnaissance as a secondary role. Infantry maneuvered with the tanks to destroy enemy antitank systems and engage hostile armor with sophisticated weaponry. Overhead, helicopters provided aerial antitank platforms. Cavalry sought to identify enemy weaknesses for the combined arms team to attack and screen friendly vulnerabilities. The entire focus of the team lay in offensive action to seize and retain the initiative, even when the overall strategy proved defensive, as in the Federal Republic of Germany.[15]

Starry considered the nullification of hostile antiarmor weapons through active and passive measures vital to tactical success. In addition to direct engagement, he expected units to rely on careful terrain use, suppressive fires, and operations at night and in low visibility conditions to minimize their exposure. To secure reaction time and concentrate friendly forces on a particular threat, hostile forces needed to be detected and observed at the greatest distance possible. This role constituted one central to cavalry organizations, but it raised anew the question of how best to organize and equip them. Starry led this discussion and raised new possibilities to consider, including the potential transfer of traditional cavalry responsibilities to helicopter organizations.[16]

To study the role and organization of cavalry, the Cavalry Scout Ad Hoc Committee convened at Fort Knox. It analyzed issues related to mounted operations in both a Middle Eastern and European environment. The committee's final, classified report affirmed the need for an organization specifically devoted to the conduct of reconnaissance, security to include guard and covering force operations, and economy of force missions. The last role assumed greater significance within an Active Defense context. Cavalry helped to provide the minimal force necessary to secure an area and permit the consolidation of friendly combat assets at the decisive point. In the performance of these missions, cavalry was generally expected to fight, necessitating combined arms organization and tactics.[17]

Starry characterized the study as "the first extensive review and analysis of cavalry doctrine and organization since the Stillwell Board accomplished a similar task in 1948." Through historical analysis, it provided a justification for cavalry organizations in the future and constituted the mounted community's response to any question of the need for cavalry. Its organizational assessment served to improve battlefield effectiveness, but its emphasis on the use of common unit types also suggested how savings

in personnel and funding might be obtained. The study's outline of the role of cavalry provided the conceptual framework necessary to guide further scout vehicle development. More than one armor luminary shared the study's belief that scout functions required special training and a unique organization.[18]

The committee also found cavalry organizations in need of substantial strengthening to permit operations against a heavily mechanized threat. It recommended changes at the squadron and troop levels, but its most important proposals concerned the platoon, which was considered the basic organizational building block for cavalry units.[19] At the time of the study, it included seven M113s for the headquarters, scouts, and rifle squad; a M106 mortar carrier; and three M551 Sheridans in its light armor section. Despite the platoon's size, it lacked the combat power and survivability considered necessary for either European or Middle Eastern battlefields. These concerns encouraged the design of a less complex organization with increased combat effectiveness.[20]

The committee proposed a modified platoon structure. It eliminated the mortar and rifle squads while increasing tank strength. Instead of a combined arms mix, the new platoon included a command vehicle, a tank section with four main battle tanks, and a four-vehicle scout section. Based

Courtesy *Armor Magazine*

Figure 79. Cavalry M114s prepare for operations, 1973.

on M113 platforms, the scout section included two vehicles armed with a tube-launched, optically-tracked, wire-guided (TOW) missile launcher and two equipped with an automatic cannon. Each scout vehicle was also intended to carry a motorcycle for reconnaissance or messenger duties. The scouts collected information, created obstacles, employed mines, conducted limited demolition, and acquired targets for other weapons systems. The tank section provided the platoon backbone of long-range antiarmor firepower. The mortars migrated to troop control, but they could be detached to platoon control as necessary. Similarly, the new platoon structure offset loss of the rifle squad through an increase in scout vehicle crews. In Vietnam, the squad had often been dispersed through the platoon to offset insufficient crew size. The new platoon configuration formalized this field practice.[21]

Support for the proposed organization came from the 3d Armored Cavalry. The regimental commander found it reflective of the views held by his subordinate commanders. They supported increasing the number of soldiers assigned to each scout vehicle and accepted the loss of the rifle squad, since it often became "the replacement center for the rest of the platoon's elements." The proposed platoon also rationalized maintenance support and reduced the number of different military occupational specialties (MOSs) represented. Collectively, these changes reduced the platoon's complexity, which had posed a longstanding challenge to effective training. Moreover, the mix of main battle tanks and armored scouts ensured that the platoon possessed "a high degree of probability of arriving intact at its designated place on the battlefield."[22]

The simplified platoon addressed a number of training concerns. In the new volunteer army, training standards fell. Drug abuse and indiscipline undermined readiness at a time when the Army strove to improve its ability to enter combat on short notice. At the small unit level, noncommissioned officers (NCOs) managed training and sustained combat effectiveness. In armor and cavalry units, they often served as vehicle commanders. However, in the 1970s, the Armor Branch experienced significant trouble acquiring and retaining experienced NCOs. This problem reflected an Army-wide dearth of NCOs and inadequate training for those available. Simpler organizations helped to mitigate the effects of a weakened NCO corps.[23]

In armor and cavalry units, NCOs played a central role in training gunnery skills, which were considered vital to a unit's ability to fight outnumbered and win. The short-range nature of most engagements in Vietnam coupled with declining readiness eroded the ability to perform

long-range gunnery. In the European operational environment, the ability to engage Warsaw Pact combat vehicles from afar could make the difference between life and death. The absence of sufficient numbers of trained and experienced NCOs only undermined efforts to revitalize this core competency. In 1974, FORSCOM responded with a series of actions intended to improve gunnery training, including the assignment of master gunners to tank battalions and cavalry squadrons. The Armor School published a new gunnery manual that standardized procedures and placed them in a more realistic operational context.[24]

Under General Starry's guidance, the Armor School also issued a series of training circulars to help units improve their effectiveness. They further served to encourage the adoption of the doctrinal principles of Active Defense without awaiting publication of a new round of manuals. In this manner, changes considered critical to tactical operations could be implemented rapidly. The circulars proved prescriptive in nature and included greatly simplified tactics and procedures to facilitate rapid improvements in readiness and basic skills.[25] Collectively, they constituted a doctrinal change whose acceptance in the field depended on a clear explanation of their purpose and value. Starry understood that "it will not suffice to simply send our training circulars out and trust that they will be acclaimed on the basis of their eminent logic."[26]

Reaction to the circulars proved less than positive. Despite its support for the proposed platoon, the leadership of the 3d Armored Cavalry, for example, found them too rigid. The circulars introduced a new tactical vocabulary, restrained offensive actions, and prescribed new movement techniques. Their collective impact appeared to contradict the organizational and tactical flexibility traditionally associated with cavalry organizations. The circulars particularly impacted platoon operations and reduced the platoon leader's ability to exercise his initiative. Within the regiment, fears arose that proven doctrine was being replaced by rigid principles. "Again, who, what poll, and what study says that tank or armored cavalry platoon formations and battle drills are too numerous, too complex, or so restrictive as to mentally emasculate a platoon leader in combat?"[27]

In fact, the circulars responded to general concerns about the state of armor and cavalry readiness, which may not have been valid for all units. Nevertheless, serious problems did exist. The cavalry and scout study conducted at Fort Knox suggested that the armored cavalry platoon was too complex and posed a command span problem for the platoon leader.[28] The negative reactions to the training circulars led General Starry to conclude, "It takes a great deal to overcome the rigidity of thinking we've engrained

over the years in our service school dogmas about tactical formations and related matters."[29]

The training circulars and proposed change in platoon organization generated considerable concern among junior leaders charged with their implementation. They did not always understand or agree with either the need for change or the rationale provided. The tank-scout mix proposed coupled with the loss of the mortar and rifle squads fed fears of a reduction in the platoon's effectiveness and versatility.[30] These sentiments found blunt expression in the comment "before we castrate that platoon let us reevaluate all of its functions and proven capabilities."[31]

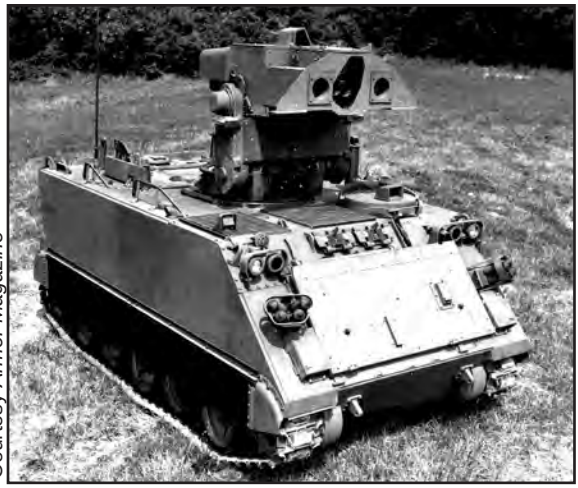
Advocates of stealthy reconnaissance rejected the new platoon's increased combat power. They noted that organizations equipped for battle generally became engaged to the detriment of information gathering. The inclusion of main battle tanks and TOW-equipped scout platforms increased the likelihood of commanders misusing the platoon as another maneuver unit without respect to its unique skills. Already during maneuvers in the Federal Republic of Germany, such a trend had become manifest. Main battle tanks also tended to erode the mobility of the platoon and returned a mobility differential long absent from the unit. The M60A1 tanks intended to replace the Sheridans lacked an amphibious capability, could not maneuver on narrow streets or defiles, and proved more limited in their ability to traverse bridges. They simply did not possess the same mobility as the scout platforms they were intended to support.[32]

An increase in the equipment issued to scouts indicated a clear trend toward more combat power. It fueled concerns that "we may be *unduly* influenced by the events of the October War and the antitank, defense-oriented thinking surrounding organization for combat in Central Europe."[33] To one outspoken critic of the new platoon, "Radar sets, mine detectors, demolition kits, 55-pound IR alarms, NBC alarms, laser rangefinders, laser target designators, and intricate and bulky sights are to be supplied the scout, when most scouts want only a good pair of binoculars, a clear night vision device, and some small, quiet vehicle to get them as close as possible to the enemy."[34]

The initial recommendation for the new platoon included two different configurations of an M113. This platform changed in favor of the more heavily armored Mechanized Infantry Combat Vehicle (MICV). The latter originated from an infantry requirement for an armored combat vehicle that permitted its passengers to fight mounted or dismounted and carry sufficient protection to survive on a battlefield dominated by armored systems. Intended to operate alongside main battle tanks, the MICV

constituted a response to the Soviet BMP series of vehicles, but it remained a work in progress throughout the 1970s.

The trend toward an M60A1/MICV mix in the scout platoon did little to assuage concerns over the organization. With only large armored vehicles, the unit seemed unsuited for effective reconnaissance, sacrificing mobility and agility for armor protection and an array of tank-killing systems. The combination tempted crews to engage targets at the expense of information collection and seemed to promote the platoon's misuse as a conventional maneuver unit.[35] This view found support from Major General George S. Patton, commanding the 2d Armored Division, who considered the scout too heavily armed: "His normal reaction is to become a killer of sorts and the historically important reconnaissance and security role suffers accordingly."[36]



Courtesy *Armor Magazine*

Figure 80. The M901 Improved Tow Vehicle (ITV).

Debate over the scout's role and platform occurred within the broader context of justifying the need for cavalry. Critics outside the armor community suggested that armor and mechanized infantry could perform much of the cavalry mission. Providing an effective response constituted a perpetual duty for cavalry commanders. Hence, the 1977 Armor Conference included a presentation by the 11th Armored Cavalry commander that linked cavalry organizations with the effective implementation of Active Defense. Through information gathering and reporting, cavalry facilitated a commander's ability to see the battlefield and concentrate friendly forces on enemy weakness. Conversely, through security and economy of force operations, cavalry denied this same ability to opposing commanders. These missions required the growing combat power of cavalry organizations and mastery of a much broader skill set than required by conventional maneuver units.[37]

Comparison of a cavalry task force with an equivalent armor or mechanized infantry grouping further underscored cavalry's value. The

cavalry task force possessed far more communications devices, which directly facilitated command, control, and operational flexibility. Indeed, emphasis on a robust communications network had become synonymous with cavalry organizations since the interwar years. In a 1970s context, the communications advantage translated into a superior ability to share information quickly and drive the command decisions necessary to fight and win outnumbered on the Active Defense battlefield.[38]

Yet the very scope of the cavalry mission set necessitated careful attention to training. Each squadron of an armored cavalry regiment included soldiers representing 37 different MOSs and over 300 vehicles and trailers. The complexity of the organization necessitated simultaneous training of different squadron components and decentralized command. The essence of all cavalry organizations, however, lay in the individual scout, whose training assumed special importance. He required the ability to:

> . . . employ all of the firepower available. He must be capable of finding the enemy and knowing what he sees. He should be able to go forward to find the enemy and have the firepower with and behind him to get out of trouble. Most of all he must be capable of semi-independent operations on the battlefield. He must be resourceful—he must be the most clever of all fellows. He takes individual actions that are not dictated by the actions of what other squads or platoons are taking; no one is constantly looking over his shoulder.[39]

The multifaceted nature of cavalry scouts made them different from soldiers assigned to noncavalry organizations. Yet their unique nature did not prevent recommendations to restructure or reassign them. One recommendation included the elimination of maneuver battalion scout platoons and their replacement by a smaller unit at the brigade level. Another proposal called for a transfer of responsibility for mounted scout development to the infantry. More radical still was a call to eliminate ground and air scouts all together.[40]

In defense of scouts and cavalry organizations, the armor leadership again worked to demonstrate the importance of both. It acknowledged the need to improve the air-ground cavalry relationship, but it challenged the wisdom of eliminating cavalry organizations. Such a move would not improve the ability of maneuver units to function on the battlefield. Instead, "commanders would still be required to dedicate elements of their force to perform reconnaissance, security, and economy-of-force missions—which could cause a 1/3 reduction in the size of their combat power." Despite

improvements in electronic and aerial means of gathering intelligence, a persistent need existed for a force capable of continuous, all-weather and all-terrain information collection, even against determined opposition.[41]

Active Defense Reconnaissance Doctrine

In 1977, new field manuals superseded the earlier Armor School training circulars. FM 17-95, *Cavalry,* addressed cavalry operations in general. This manual addressed most cavalry units from the armored cavalry regiment down to the platoon. Platoon actions received the most attention, since they constituted the basic cavalry element and the principal agent for executing many tactical missions. This small unit orientation helped to foster the growth of a new generation of cavalry soldiers immersed in Active Defense. Missing from the manual was guidance for battalion scouts that acknowledged their differences from armored cavalry platoons.[42]

Reconnaissance and security conducted by combined arms teams constituted primary missions. Cavalry embodied economy of force, providing commanders maneuver space and reaction time. It located and engaged enemy forces, relying on its communications architecture to facilitate the actions of movement, observation, suppression, and destruction. Cavalry organizations did not passively watch the battlefield. Instead, the manual considered them active players on it who "must frequently destroy sufficient enemy forces to convince the enemy to break off an attack, to give up a defensive area, or to move toward or away from an area vital to friendly forces. Therefore, more often than not, cavalry will have to fight to accomplish its mission."[43]

The manual's aggressive tone reflected the lethal operational environment in which cavalry would operate and incorporated lessons learned from the 1973 Arab-Israeli War. Dominated by long-range antiarmor systems supplemented by increasingly effective artillery and air defense weapons, the battlefield posed significant challenges to cavalry operations. Mounted units not only had to survive; they also needed to achieve kill ratios as high as five-to-one. They needed to identify and fire on the enemy first, while utilizing mobility, overwatch techniques, terrain, and suppressive fires to offset his numerical superiority. Night operations became a normal activity and constituted a continuation of daytime information gathering. The extensive coverage given to Soviet vehicles, tactics, and doctrine left little doubt as to the manual's European orientation.[44]

Reconnaissance guidance included air and ground cavalry operations. It provided details of platoon actions from preparation to planning through execution. Extensive vignettes walked the reader through a mission from

receipt of a warning order to conclusion. They included common events that might arise during operations and illustrated how to respond to each. These vignettes proved somewhat prescriptive in nature but showed new platoon leaders and NCOs how to survive typical battlefield developments. In a change from earlier manuals, platoon command and control guidance stressed the use of hand, arm, and signal flags rather than radios to avoid enemy jamming and interception.[45]

Basic reconnaissance principles remained unchanged. Information collection occurred through a combination of mounted and dismounted operations. Ground scouts relied on stealth to move and observe undetected, their actions overwatched at a distance by the platoon's vehicles. Basic reconnaissance missions continued to include zone, area, and route. Regardless of the type of reconnaissance performed, scouts sought to reach their objective quickly without ignoring any hostile presence discovered en route. Instead, "enemy forces found in a platoon's zone are destroyed, neutralized, or bypassed. A platoon does not bypass an enemy force without permission."[46]

The inclusion of longstanding guidelines for scout operations did not alter the manual's overall emphasis on aggressive reconnaissance and the related need to fight for information. When contact appeared likely, reconnaissance teams concentrated to ensure sufficient combat power. During route reconnaissance, for example, an entire troop was assigned to a single avenue of advance and platoons were not split to provide broader coverage. In the event of a hostile contact, the manual provided clear criteria to help the reconnaissance commander determine whether to attack, seek permission to bypass, or simply observe the enemy. When a firefight ensued, the reconnaissance unit developed the situation through fire and maneuver. Although stealth techniques served to minimize the frequency of sudden combat, clearly the writers expected combat to occur sooner or later.[47]

Coverage of troop and squadron reconnaissance operations proved much less extensive and largely limited to guiding principles and planning concerns. Squadron guidance included the employment of fire support, air cavalry, and the use of tank companies either organic to regimental squadrons or sometimes attached to division cavalry. Tanks constituted a strike force or a reserve to sustain forward momentum and to prevent subordinate troops and platoons from becoming decisively engaged. Although considered less than ideal for reconnaissance, they provided the antitank capability deemed necessary under Active Defense.[48]

Security operations included employment in screen, guard, and covering force roles in addition to offensive and defensive actions. Cavalry units

participated in combat down to the platoon level, whose tank sections possessed discretionary authority regarding when to engage the enemy. In general, security operations served to "provide reaction time, maneuver space, and information about the enemy to the main body. Security includes all measures taken to prevent observation, annoyance, surprise, espionage, or sabotage." Reconnaissance remained an integral part of security as did rear area protection, but the latter received far less attention than more conventional operations along the forward edge of the battle area.[49]

In the execution of both reconnaissance and security missions, cavalry organizations could expect to benefit from the use of ground surveillance radars and remotely employed sensors. These electronic devices had been used in Vietnam with some success. Found at the cavalry squadron and troop levels, radar helped to monitor select areas, survey distant objectives, provide target locations for fire support, and detect targets in low visibility conditions. Sensors were attached as necessary and served to monitor a particular area. However, specific guidance for the employment of these devices proved minimal. In contrast, the appendix devoted to urban operations offered tips regarding the use of cavalry weapons and personnel in buildings and on streets. It provided tactical guidance for units expected to fight in the industrialized and urbanized Federal Republic of Germany.[50]

The 1978 publication of FM 71-100, *Armored and Mechanized Division Operations,* placed division cavalry squadron actions in the context of operations by its parent formation. Like other cavalry organizations, the squadron sought to locate enemy forces and prevent the parent division from being caught unaware. It served as an economy of force element, providing key information about the enemy with the least application of combat power. Despite access to a variety of information-gathering means, "the division commander will almost always have to make decisions based on incomplete data. Therefore, the more he knows about enemy weapons and supporting systems, tactics, psychology, and the terrain, the better his decision will be." The division cavalry helped to secure this information and helped the commander to understand the battlefield. Reconnaissance in force operations constituted the most common method of securing this information, although the squadron's ability to track enemy follow-on echelons proved limited.[51]

In contrast to cavalry organizations, the maneuver battalion scout platoons received considerably less doctrinal coverage. Their operations were addressed in the 1977 version of FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force*. Scout platoon activities remained focused on direct support of the battalion. Like cavalry organizations, the scouts

Courtesy *Armor Magazine*

Figure 81. M3 Cavalry Fighting Vehicle in Germany during the 1980s

helped the battalion commander understand the battlefield and avoid surprises sprung by the enemy. In doing so, the platoon could expect the attachment of ground surveillance radar teams from the parent battalion. Although the platoons possessed some antitank capability, the manual warned against their misuse as a maneuver unit at the expense of its primary functions.[52]

Scout platoon reconnaissance included the traditional zone, area, and route orientation. Security missions focused on screen and guard operations, and the related establishment of observation points. The latter provided early warning to the battalion. They were to be established and function undetected. In the event of an attack, the scouts withdrew, fighting only in self-defense. The platoon conducted guard missions only as part of a larger force. Overall, the manual considered reconnaissance and security mission inseparable and the platoon's primary roles. However, scouts also supported the battalion through reconnaissance of assembly areas and potential engagement areas, liaison with adjacent units, and the emplacement of limited obstacles and demolitions. They guided the battalion's movement and conducted chemical and radiological surveys. When necessary, the scout platoon eliminated enemy observation posts and executed ambushes.[53]

Scout platoon coverage included clear, proven principles. Even so, details indicating how to apply these principles proved largely absent. The nurturing tone found in FM 17-95 for cavalry organizations found little parallel. Instead, the battalion task force manual left the scout platoon's employment to the battalion commander and the platoon leader to determine. This doctrinal gap impacted training and could not promote a sound understanding of battalion scout operations. Consequently, commanders were left to develop their own techniques for the use of scouts, resulting in a lack of uniformity that paralleled similar variations among reconnaissance organizations and equipment.

Organizational Flux

Army reorientation toward operations in Central Europe against a highly mechanized threat triggered a series of changes in mounted reconnaissance organizations. The most significant changes occurred in the armored cavalry platoon, evidenced by an array of different vehicle mixes. This variation impacted the configuration of division cavalry squadrons and armored cavalry regiments, both subject to periodic adjustments to their organic combat and service support. By the decade's end, three different armored cavalry regiment structures existed with similar variety among the division squadrons. Procurement decisions constituted the principal cause for this organizational hodgepodge. The Army committed to the fielding of a new reconnaissance platform, but delays in its development forced reliance on expedient and interim organizations with available vehicles.

One of the first changes occurred in January 1973, when the platoons of armored cavalry regiments in Europe began to exchange the M114s of their headquarters and scout sections for M551 Sheridans. The altered configuration included a headquarters section and two scout sections, each equipped with two Sheridans. The mortar squad and rifle squad remained, mounted in M113 platforms, giving a total strength of 38 soldiers and 8 vehicles. The revised platoon constituted a major increase in firepower, while elimination of the gas-powered M114 simplified supply. All platoon vehicles now consumed diesel fuel.[54]

Training issues soon arose, because many scouts were unfamiliar with the Sheridan and replacement personnel received no institutional instruction on this vehicle. The platoon now resembled a tank unit, but the first regiment to convert opted to retain the scout-orientation of its crews. The Sheridan served as a platform to support scout operations, albeit with greater mobility and firepower than the M114. Scout squads were trained to operate independently and focus on information gathering rather than on

becoming tankers. The Sheridan's weapon system, optics, and smoke laying improved their ability to see and survive on the battlefield. Conversely, its larger size and noise signature required special attention to terrain use and careful management of the engine to prevent excessive noise or highly visible exhaust plumes. These drawbacks encouraged greater reliance on dismounted patrols by the rifle squad or individual crewmembers.[55]

The "Y" formation became the most common formation for the platoon. In this arrangement, the headquarters section, mortar carrier, and rifle squad remained in the center of the platoon area, with each scout section forward on the left and right. The platoon leader retained the position and means with which to reinforce either scout section. During security missions, the platoon expanded its ability to perform screens by employing its headquarters and scout sections to man observation points that they could also defend. The Sheridan's mix of firepower and mobility similarly enhanced the platoon's ability to perform delay missions, but the tendency of Sheridan crews to engage targets whenever possible clashed with their observation and reporting roles.[56]

In 1977, regimental cavalry platoons in Europe underwent modification. The headquarters section and rifle squad disappeared, leaving the platoon with three reconnaissance sections, a scout section, and a mortar squad. Each reconnaissance section included two Sheridans, while two M113s comprised the scout section. Total strength for the platoon rose slightly to 9 vehicles and 40 soldiers. The reconfiguration rationalized the organization. It made all personnel except the mortar team cavalry scouts, and the renaming of the headquarters section reflected its routine employment in reconnaissance and security operations.[57]

Outside Europe, armored cavalry regiments and division cavalry squadrons retained the combined arms platoon. It contained a headquarters element, a scout section, a rifle squad, a light armor section, and a mortar squad. Total strength equaled 42 men carried in 10 vehicles that included a mix of Sheridans and M113s, which gradually replaced M114s. This organization retained the advantages of versatility and combat power and the drawbacks associated with complexity and reduced coverage.[58]

A third cavalry platoon configuration emerged in 1977. This one included the main battle tank/scout vehicle mix first proposed by the Cavalry Scout Ad Hoc Committee. The new platoon included a headquarters vehicle, a scout section, and a tank section. A single M113 constituted the command element, while the scout section comprised two M113s and two M901 ITVs. Fielding plans also called for the scout section to carry motorcycles for administrative and scouting work. The

tank section included four M60A1 main battle tanks, giving the platoon a combined strength of 40 men and 9 vehicles. It possessed considerable antiarmor capability. Even those scout vehicles not equipped with the TOW missile launcher carried hand-held Dragon antitank guided missiles. The tanks provided an offensive and defensive capability, but this accretion of combat power sacrificed stealth and dismounted operations.[59]

The ITV was a TOW missile launcher mounted on a M113, but its antiarmor capability came at a cost. Its distinctive appearance made it stand out on the battlefield, while its cramped interior and inability to keep pace with other scout platforms posed employment challenges. The ITV was not suited to sudden, mobile engagements, because it lacked the ability to engage targets while moving. Designed for long-range standoff firing, its utility diminished when thrust forward in a traditional scout role. Use in an overwatch capacity better suited its defensive nature, but also precluded its ability to gather information. The vehicle also proved noisy, difficult to hide, and lost whatever concealed status it possessed on firing. It also suffered from low operational readiness rates due to the complexity of the missile launcher, which elevated into a firing position.[60]

Variation at the platoon level occurred simultaneous with several changes in the structure of the armored cavalry regiment in the latter 1970s. By 1979, the Army had dropped the special European configuration in favor of a single regiment organization. It retained a headquarters and headquarters troop (HHT), an air cavalry troop, and three armored cavalry squadrons. An engineer company, an attack helicopter company, and a Combat Electronic Warfare Intelligence (CEWI) company were added to this foundation. The last consolidated the functions of combat intelligence, electronic warfare, and operations security, but it remained a test organization. It marked the rising importance of both protecting friendly communications and interfering with those of the enemy. The CEWI company also centralized control over the ground surveillance radars and remotely employed sensors in lieu of previous regiment and squadron assignment. Only the troop retained its organic ground surveillance devices. In the organizational shuffling, the regimental headquarters retained its small organic scout section, which directly supported command post operations.[61]

The regimental squadron included a HHT, three armored cavalry troops, a tank company, and an artillery battery. The squadron lost its organic ground surveillance capability, but it gained an air defense component of Redeye handheld air defense missiles and an armored vehicle launched bridge (AVLB) section. The missiles reflected the growing threat from air attack. Additional teams might be attached

from the regimental HHT. The AVLB section constituted a belated implementation of a Vietnam War recommendation.[62]

Regimental troop organization included a headquarters and three armored cavalry platoons. However, some variance existed based on the platoon configuration in place. Where the combined arms structure remained, mortar support lay at the platoon level. In the other arrangements, mortars migrated to troop control. All troop organizations continued to include a small ground surveillance radar section to support platoon operations.[63]

Division cavalry squadron changes tended to mirror those implemented in the armored cavalry regiments. The squadrons included an HHT, an air cavalry troop, and three armored cavalry troops. Unlike their regimental counterparts, they possessed no organic tanks or fire support. By 1979, they no longer controlled their own ground surveillance radars. The squadron relied on its parent formation for these and related assets. Troop composition varied, dependent on whether the platoon was configured with main battle tanks or as combined arms team. In the former case, the troop controlled mortar support. In both instances, air defense support came from squadron attachments of Redeye missile teams.[64]

Those division cavalry squadrons that included main battle tanks in their platoons possessed a powerful antitank capability. This increase in firepower led some commanders to question whether it was too much.

Courtesy *Armor Magazine*

Figure 82. Group of ITVs in Germany, 1982.

With 36 tanks, 18 ITVs, and 18 M113s with Dragons, the squadron constituted one of the most powerful reconnaissance units fielded, rivaling even an armor battalion. Consequently, it risked employment as another maneuver unit rather than in its intended roles. The squadron's firepower seemed to make it more suited to function as the division's "Enforcer" at the expense of information acquisition.[65]

The scout platoon of the maneuver battalions similarly experienced change throughout the decade. By 1973 control of the platoon had shifted from the battalion headquarters to the newly created combat support company. This organization controlled all battalion combat support units, including the scouts. Freed from the administrative and service responsibilities of the headquarters, the new company provided support directly to the battalion's combat elements. This arrangement simplified battalion command and control, and restructured the battalion headquarters along functional lines.[66]

On paper, the scout platoon's composition marked a progressive change toward greater firepower. Still, planned changes often occurred slowly and unevenly throughout the Army, sometimes influenced by theater considerations. A variety of configurations thus resulted, resembling the same state of flux associated with the armored cavalry platoon. Doctrine acknowledged the diversity, noting that "a modified table of organization and equipment (MTOE) is in effect for various units and these changes may reflect differences in capabilities."[67]

In Korea, the scout platoon included a headquarters, a light armor section, a scout section, and a rifle squad. Its armor element comprised just two Sheridans, while its platoon leader and scouts rode in machinegun-equipped jeeps. Only the rifle squad rode in an armored personnel carrier.[68] However, in the immediate post-Vietnam years, the most common scout platoon configuration included a headquarters and two scout sections. The headquarters operated two M113s, while the scouts rode in M114s. Typical attachments from the combat support company included mortars and ground surveillance radar teams. Compared to its Vietnam-era predecessor, this platoon also included 10 vehicles, but its personnel strength fell from 50 to 30. This reduction encouraged reliance on mounted operations, since insufficient manpower remained to both man the vehicles and conduct dismounted reconnaissance.[69]

The M114's poor cross-country mobility precluded its use in Vietnam, but it proved no more effective elsewhere. Even before it began to equip combat units, its disappointing performance led the Armor and Engineer Board, responsible for evaluating new armor materiel, to oppose its

fielding. The M114's service record was summarized by one officer as "a disaster from day one." A later variant added a 20-mm cannon, but the added firepower did not improve the vehicle's effectiveness as a reconnaissance platform.[70]

These deficiencies led to the removal of the M114 from service in 1973. In the absence of a satisfactory alternative, scout platoons underwent reequipment with M113s. This process took time to accomplish throughout the force, resulting in the continued use of the M114 long after its official retirement. The change in platform did not otherwise alter the scout platoon. Its mission and subordination to the combat support company remained unchanged. Unfortunately, it also retained its minimal dismounted capability. Despite the switch to the larger M113, a vehicle capable of easily accommodating more soldiers, platoon strength did not increase.[71]

In 1979, the composition of the scout platoon again changed. Pending fielding of a new cavalry vehicle for scouts and armored cavalry organizations, the Army adopted an interim organization. The new platoon featured improved antitank firepower but fewer vehicles. The headquarters include a single M113 from which the platoon leader controlled three identical scout sections. Each one included an M113, an ITV, and nine soldiers.[72]

The Search for a New Reconnaissance Vehicle

Some of the organizational confusion in mounted reconnaissance organizations stemmed from the changing nature of the battlefield and related doctrinal adjustments. However, acquisition decisions in the mid-1970s also tied the Army to materiel programs that would not generate new vehicles and equipment until the 1980s. In the interim, ad hoc and temporary organizations became the norm. Differences among theater requirements and materiel availability also encouraged the diversity. For example, the incorporation of heavier combat power into cavalry platoons became most evident in Europe, where the mechanized threat proved highest. Scout platoons in Korea continued to employ ¼-ton trucks as did similar units in the stateside-based 2d Armor Division as late as 1977.[73]

The variety of reconnaissance organizations also reflected the lack of consensus concerning their proper purpose and composition. At the start of the 1970s, a general desire for a new scout vehicle reignited an old debate over tactical employment. Should the scout focus on information collection to the exclusion of combat and rely on stealth, or should he possess the ability to act aggressively, fight for information, and carry sufficient protection to survive sudden contact situations? The question raised important issues for vehicle design, scout doctrine, and unit organization.

No simple solution existed and both schools of thought could marshal historical operational experience in their support. It became further complicated by differences in the mission of armored cavalry versus maneuver battalion scout platoons. Hence, a variety of contradictory reconnaissance vehicle recommendations emerged.

Concepts for new scout vehicles ranged considerably from an armored dune buggy to a more robust, armed vehicle. The former sought to exploit emerging off-road, wheeled mobility capabilities emerging in the private sector for sport and recreational activities. Approximating the size of the jeep, the militarized dune buggy leveraged state-of-the-art automotive technology to provide much better cross-country mobility while carrying limited armor and weapons. A test bed vehicle underwent testing at Fort Knox in 1971, but it was not adopted.[74] Another concept espoused a scaled-down Armored Cavalry Assault Vehicle (ACAV) on wheels.[75] Other recommendations sought to maximize mobility and provide protection against small arms fire for a crew of three on a wheeled chassis.[76] Still another approach embraced the need for a "track laying, tank defeating, armored reconnaissance vehicle," particularly for the armored cavalry squadron.[77]

Most proposals for a new platform sought a balance among the competing qualities of mobility, survivability, and lethality. Vehicle size and weight needed to be small to facilitate undetected movement and air transportation. Yet any armor protection boosted weight and the decision to rely on wheels or tracks directly impacted the height of the vehicle. Crew size and weapons further required space and added weight, complicating efforts to achieve balance.[78] All of these considerations proved complex in their own right and the subject of controversy. They could not be resolved without a clear statement of the vehicle's role, itself derived from an understanding of the scout's mission. However, such clear guidance did not exist, partly because the answer varied with the unit type.

In this confused state of affairs, many different solutions were explored, including the use of motorcycles. Although utilized prior to World War II, cyclists did not remain a permanent fixture of reconnaissance organizations. In 1972, an Army review and evaluation of potential scout vehicles included motorcycles. Test organizations equipped with cycles conducted operations against more traditional scout organizations and found some utility. Carried in helicopters or armored personnel carriers, the cyclists provided a new dimension to ground reconnaissance, but they were not without drawbacks. Their distinctive noise, battlefield vulnerability, lack of adequate communications, and the difficulty of carrying a weapon offset

their potential value to a reconnaissance unit. Test and evaluation continued for several years, and organizational charts anticipated their fielding by including cycles in scout units.[79]

In 1971, development work began on a successor to the M114, designated the XM800 Armored Reconnaissance Scout Vehicle. This platform was intended to be a "small, lightly armored, ground combat vehicle with a three-man crew and an inherent swimming capability."[80] In effect, it was to possess those characteristics for which the M114 had been designed but proved unable to meet. Manufacturers proposed numerous vehicle concepts, and two were developed for testing: one a six-wheel, all-wheel drive articulated chassis, and the other a smaller version of a M113 with a turret. Neither platform proved sufficiently capable to justify further development. In 1974, the Cavalry Scout Ad Hoc Committee concluded that a new scout vehicle was not warranted, and General Starry recommended an end to work on the XM800. Program termination followed.[81]

Courtesy *Armor Magazine*

Figure 83. M3 Cavalry Fighting Vehicle of the 11th Armored Cavalry Regiment moving at speed, 1985.

The Armored Reconnaissance Scout Vehicle Task Force constituted one of the principal organizations responsible for assessing scout materiel, including vehicles, weapons, communications, and optics. Established at Fort Knox in 1974, it assisted in efforts to select a new scout vehicle and related equipment. It worked closely with the Cavalry Scout Ad Hoc Committee, whose analytical work it helped to validate. The task force

evaluated scout vehicles, ranging from motorcycles and dune buggies to more robust armored platforms.[82] This assessment did not identify an existing vehicle to fit emerging scout requirements under Active Defense. This conclusion, coupled with the cancellation of the XM800 program and the findings of the Cavalry Scout Ad Hoc Committee led to the decision to develop a cavalry variant of the MICV.[83]

The focus of the Armored Reconnaissance Scout Vehicle Task Force accordingly shifted. Instead of seeking a new vehicle, it now sought an interim platform with which to equip scout platoons until the fielding of the MICV sometime in the 1980s. Once again, the task force evaluated an array of vehicles already in production that might suffice with little or no modification. Task force members recommended two M113 derivatives: one armed with a TOW missile launcher and an armored cavalry cannon vehicle equipped with a 20-mm cannon. Development of the former concept resulted in the M901 ITV, but the latter never progressed to production and fielding. The task force further encouraged the inclusion of both weapons in an enlarged turret on the final version of the MICV. All of these recommendations embraced large vehicles with combat power at the expense of the ability to conduct stealthy reconnaissance.[84]

The MICV offered scouts better protection and the ability to keep pace with tanks on the battlefield. Between 1975 and 1977, the program underwent considerable scrutiny, restructuring, management change, and major design alterations. The resultant vehicle featured a two-man turret, 25-mm cannon, a TOW missile launcher, and a redesigned hull. It was built to operate in conjunction with the XM1 main battle tank then also in development and counter the Soviet BMP-series of vehicles. The emerging infantry/cavalry fighting vehicle experienced technical problems and rising costs that intensified congressional scrutiny. Skeptics questioned its survivability and funding for the program was canceled in fiscal year 1979. Program supporters reversed the latter decision but only on condition that production began in 1981.[85]

Between 1979 and 1981, the infantry and cavalry fighting vehicle program overcame numerous technical difficulties. Major concerns continued to emerge over the program's cost, and the testing process also proved controversial and prolonged.[86] Nevertheless, the Army received its first production vehicle in early May 1981. The same year led to the designation of the new platform as the Bradley Fighting Vehicle (BVF), in honor of General Omar N. Bradley. The infantry version became the M2, while the cavalry platform became the M3. Further testing and survivability improvements followed, including appliqué armor, internal spall liners,

redistribution of the ammunition, and the ability to carry reactive armor. This enhanced version became the M2A2/M3A2 and began to equip units later in the 1980s.[87]

Related doctrine development built on previous analysis. Between 1976 and 1978, the Armor Center studied the potential employment of a cavalry fighting vehicle in battalion scout platoons. It leveraged wargaming data and the work of the Cavalry Scout Ad Hoc Committee. Scout platoon configurations were assessed for their ability to maintain contact and conduct screen, reconnaissance, and defensive operations. The study concluded that a platoon equipped with 6 cavalry fighting vehicles constituted the optimal organization and was superior to the 10-vehicle M113 platoons then in service.[88]

Pending fielding of the cavalry fighting vehicle, the study also recommended an interim organization of three ITVs and four armored cavalry cannon vehicles. The failure to develop and field the latter resulted in an adopted interim configuration of 3 ITVs, 4 M113s, and 30 men. This platoon offered more antitank firepower and a lower cost, but it provided less coverage and a reduced dismounted capability in comparison with the 10-vehicle structure it replaced.[89]

This analytical work provided a case for a smaller scout platoon and helped justify the infantry and cavalry fighting vehicle. Critics challenged the methodology and data used. The wargames modeled a mechanized battlefield on which antiarmor systems predominated. The resultant data focused on combat and kill ratios rather than the ability to gather information and provide adequate reconnaissance coverage. Given these parameters, the M113-equipped scout platoons could not compete with ITVs and cavalry fighting vehicles.[90]

Other criticism of the cavalry fighting vehicle echoed previous concerns about excessive armament. Too much firepower constituted a potentially dangerous distraction, because "the scout who has the capability to kill a tank at 3,000 meters is going to be tempted to shoot instead of report enemy tanks. The addition of the TOW system also places another training burden on the commander who has little enough time to train his people to scout."[91] This view complemented concerns over potential misuse of scout platoons as regular maneuver units. An alternate approach lay in the adoption of a smaller, light scout vehicle capable of support by a heavier platform as necessary.[92]

In spite of these views, the M3 suited the nature of Active Defense and its orientation on combating the highly mechanized Warsaw Pact in Europe. It possessed good mobility and a vast improvement in armor and

armament over the M113. Unlike the latter, the M3 did not struggle to keep pace with the tanks it was designed to support. Its combination of TOW missile launcher, stabilized 25-mm cannon, and coaxial machinegun permitted it to engage an array of target types, including the BMP. The M3 provided an aggressive reconnaissance capability in the face of an armored threat. Yet, its 23.5-ton weight made it one of the heaviest cavalry vehicles, and its overall size made it difficult to conceal.[93]

Support for the M3 came from those scouts who wanted a vehicle able to survive and engage target types typically encountered. One NCO noted, "A scout must be able to defeat *all* types of targets he can expect to encounter. If he can not, then other forces must be brought in to do the job and that detracts from the overall picture." He did not believe scouts would always see the enemy first and preferred the ability to fight effectively without relying on external support. To him, the problem with selecting a scout vehicle lay in the confusion that soldiers sensed with the scout mission. It did not appear well defined, thereby complicating efforts to field the right platform.[94]

Supporters of the program acknowledged the veracity of at least some of the criticism. The M3 *was* a large vehicle, but the size was driven by the requirement to accommodate a five-man crew, their gear, and ammunition for the TOW and 25-mm cannon. The greater survivability of the M3 was achieved through the use of laminate, spaced armor that increased weight and necessitated a larger, more powerful engine. The vehicle lacked the ability to sneak about the battlefield, but the proliferation of sensor use made such movement problematic for most platforms. No simple solution existed to counter the real risk of scouts opting for firefights over information collection. This issue had to be addressed routinely through training. Those individuals who participated in the M3's development were only too aware of a larger threat: "The cavalry is under attack in many places. If we don't clean up our act and start talking with a unified voice, the only cavalry we'll know is what we read about in history books." This sentiment was clearly understood by the senior Armor leadership, who pushed the M3 through development to fielding.[95]

AirLand Battle and the Army of Excellence

By the early 1980s, the transition to Army 86 was underway. Meeting the manning requirements of the more robust division design without increasing the Army's end strength, however, remained an insurmountable problem. Worse, dissatisfaction with Active Defense triggered renewed debate and analysis over doctrine amid a growing desire for a force capable of operations outside Europe. This belief was fueled by ongoing Soviet

military operations in Afghanistan, the United Kingdom's brief war with Argentina over the Falkland Islands, and America's own 1983 intervention in Grenada. All of these developments encouraged change in how the Army expected to fight.[96]

In Europe, the danger of Warsaw Pact forces remained, but winning the first battle no longer seemed a complete solution. Soviet doctrine called for the employment of large-scale second echelon forces to exploit initial success and target areas of NATO weakness. Defeating these follow-on forces thus became just as important as repelling the initial invasion, but Active Defense offered few answers. A new approach was needed that showed how to defeat simultaneously the first and follow-on echelons. To do so required operations over a much broader and deeper area, relying on maneuver, offensive action, and a high level of integration between air and land assets. The enemy needed to be presented with multiple threats at once that created a dilemma and disrupted his response. The resultant confusion generated new opportunities to exploit, thereby furthering undermining effective resistance. These concepts constituted the essence of AirLand Battle doctrine.[97]

They found expression in an updated FM 100-5 published in 1982. Compared to its predecessor, this new manual emphasized the operational level of war rather than the tactical. No longer did achieving favorable kill ratios in attrition-style battles predominate. Instead, the integrated maneuver and employment of a wide range of assets over a broad area became the principal focus. Campaign operations received much greater emphasis than the first battle. The emphasis given to seizing the initiative resonated with critics of Active Defense, who sought a more aggressive and offensive-oriented doctrine. The new manual also encouraged subordinate commanders to act on their own judgment without awaiting instructions. It encouraged flexibility, since AirLand Battle anticipated a faster tempo of operations throughout a nonlinear battle area.[98]

Refinement of the manual occurred with the publication of an updated version in 1986. It resolved issues that arose with the 1982 manual and provided a clearer representation of the operational level of war, particularly the planning and execution of entire campaigns. The new version also helped to resolve problems encountered by forces in Europe attempting to apply AirLand Battle in a NATO context. It provided the clearest expression of AirLand Battle concepts yet and guided the Army through the remainder of the decade. As a capstone document, the manual became "the Army primer on combat operations."[99]

Courtesy *Armor Magazine*

Figure 84. Training scouts in dismounted observation and movement techniques.

The new doctrine coincided with the fielding of major weapons systems, many of which had been under development since the previous decade. The M1 Abrams tank, the M2/M3 Bradley Fighting Vehicle, and the AH-64 Attack Helicopter, for example, provided the tools necessary to implement AirLand Battle. However, fielding occurred slowly and triggered force structure changes. These focused on improving combat power at the expense of service and support elements. Division structures were pared again, and assets removed transferred to more robust corps organizations better suited to the operational nature of AirLand Battle.[100]

Transition to the new formations occurred at a slow, uneven pace, driven by the availability of new materiel. The change created confusion, since many formations had already begun conversion to Army 86 configurations. Units struggled to adapt. While those divisions stationed in Europe and Korea were maintained close to full strength and numbered among the first to receive new equipment, FORSCOM and reserve elements proved deficient in personnel and overall effectiveness. This trend reflected a willingness to accept risk in stateside organizations to maintain high readiness overseas. Despite the turbulence that resulted, by the end of the decade the Army had become a more effective tool better able to meet national defense requirements. The field force emerging from this transitional phase to implement AirLand Battle became known as the Army of Excellence.[101]

Cavalry at the Crossroads

The transition from Army 86 to the Army of Excellence resulted in significant alteration to cavalry units. The division cavalry squadron underwent the greatest change with the emergence of a new design. Its basic composition included an HHT, two cavalry troops, and two air cavalry troops. Each troop consisted of a headquarters, a maintenance section, a mortar section, and three platoons. Each platoon had 6 M3s and 30 men.[102] Compared to its predecessor, the squadron shrank in size. Personnel strength dropped from 862 to 613 soldiers, the number of scout vehicles fell from 45 to 36, and tanks disappeared completely.[103] Plans to include a motorcycle platoon, an NBC reconnaissance platoon, and an electronic surveillance platoon within the squadron HHT never materialized. Instead, a long-range surveillance detachment replaced them before fielding began. Within the division, the squadron became part of the aviation brigade, losing its separate identity and status.[104]

The squadron's mission similarly narrowed from the full range of reconnaissance, security, and economy-of-force to primarily information gathering. Secondary responsibilities included screen, command and control facilitation, line of communications surveillance, assistance of troop movements, operation of remote sensors, and internal surveillance. Other activities such as delay, guard, covering force, and offensive and defensive operations were no longer part of the squadron's responsibility, despite the importance previously attached to such tasks under Active Defense.[105]

The reduced scope paralleled the employment of the Soviet division reconnaissance battalion, designed principally for information acquisition rather than combat.[106] The new focus of the American division cavalry squadron helped to reverse a trend noted by one analyst, who concluded, "The *information gathering* capability of US reconnaissance units may be less than that of their counterparts, and the commander may have little or no reconnaissance force left on the 'second day of the war.'"[107]

Nevertheless, the American squadron's reconnaissance orientation came at the loss of combat power and versatility—traditional characteristics of armored cavalry organizations. Within the Army of Excellence framework, other organizations were expected to assume some of the traditional functions of the division cavalry squadron. The armored cavalry regiment assigned at corps level assumed responsibility for economy of force missions. The planned inclusion of brigade scout platoons and an array of sensors within the division provided significant enhancements to reconnaissance and security activities. However, budget constraints soon

eliminated the brigade scouts and additional sensors, leaving the division with a reduced reconnaissance capability and the brigade with none.[108]

The planned reliance on corps reconnaissance assets to assume division security and economy of force responsibilities made sense only on paper. Corps commanders faced significant reconnaissance and security challenges of their own that precluded the routine detachment of all or part of their armored cavalry regiment to subordinate formations. Without this augmentation, the division commander faced little choice other than to reinforce the cavalry squadron from his own assets to permit it to perform the broader range of missions he required. This internal restructuring only underscored the need for a more robust and permanent reconnaissance organization. Similar problems afflicted the World War II mechanized cavalry, and veterans of that conflict would have agreed with a junior officer writing in 1982 that "the division reconnaissance squadrons are not operationally independent or fully organized for their true mission."[109]

The new squadron was not designed to fight its way through heavily defended sectors nor perform sustained defensive actions against an aggressive, armored force. Instead, its configuration anticipated a future nonlinear battlefield. In this setting, air and ground reconnaissance sought enemy vulnerabilities over a broad area. As in Vietnam, air scouts used their superior speed to cover long distances and warn of imminent threats. Ground scouts maneuvered in their wake to develop situations and provide more detailed information. In general, the squadron was expected to maneuver quickly around a cluttered battle area and provide a continuous stream of information to the division commander. In this environment, supporters of the squadron design considered the M3-equipped platoons sufficient to perform their roles and in self-defense defeat enemy armor.[110]

The absence of heavier combat vehicles reflected the Army's inability to afford sufficient numbers of M1 tanks to equip both armor and cavalry organizations. Moreover, analysis of tanks employed by cavalry organizations indicated their principal use in an overwatch role rather than actual combat. Concentrating tanks in armor units seemed the most effective and efficient means of assigning them, particularly given the limited numbers of the new M1 Abrams. The squadron designers considered the attachment of tanks from division assets sufficient to meet the unit's infrequent need for armor. They discounted the likelihood of blind encounters with hostile armor, given the increased access to corps, army, and national intelligence data.[111]

The new division cavalry squadron design reflected a cluttered, nonlinear battlefield significantly different from the linear, attrition-oriented one

of Active Defense. In the confused atmosphere likely to surround combat operations, the squadron assisted command and control by relaying command guidance and information requests directly to subordinate units, bypassing pockets of resistance, and avoiding the effects of electronic countermeasures on communications. In general, the squadron gathered information and facilitated the maneuver of combat, support, and service elements as the division alternatively massed and dispersed for battle and movement. This employment did not constitute an abdication of all combat activity, but it did mark a significant deviation from the fighting reconnaissance symptomatic of cavalry organizations since World War II.[112]

This rationale proved unconvincing to many officers who considered the removal of tanks from the squadron a flawed decision. In their eyes, tanks played a fundamental role: "To protect the reconnaissance elements and ensure they are allowed to do the job for which they are trained and organized." Regardless of the intended use of the squadron, these critics fully expected it to be assigned missions other than reconnaissance that required the combat power of tanks.[113]

Real concern existed regarding the ability of the squadron to cope with Soviet security elements and those reconnaissance units not limited to information gathering. Many of these organizations included a mix of armor, mechanized, and dismounted capabilities. The M3's TOW missile launcher, while powerful, was not suited to the type of sudden, short-range encounters that characterized engagements during reconnaissance operations. Air cavalry support considerably increased the squadron's lethality, but its availability depended on favorable weather, terrain, and tactical conditions. Operations via stealth offered a means of penetrating hostile

Courtesy *Armor Magazine*

Figure 85. Scout section on the move—an M113 and an ITV working together.

security, but the time necessary for such deliberate reconnaissance could not always be guaranteed. Moreover, the size and noise signature of the M3 undermined its ability to move about the battlefield undetected.[114]

As division cavalry squadrons began to transition to the new configuration, opposition increased among senior leaders within the TRADOC, FORSCOM, and armor communities. Heavy division commanders questioned the ability of the squadron to perform necessary missions in accordance with AirLand Battle doctrine. The Armor Center and Combined Arms Center (CAC) responded with an assessment of the squadron's operational effectiveness in a European environment. This study found significant deficiencies with the organization. To correct them, it recommended the addition of a third ground cavalry troop, reconfiguring platoons to include an Abrams tank/M3 mix, and expanding the squadron's mission set to include guard operations. Within the division structure, the study recommended the realignment of the squadron from the aviation brigade to the formation commander's direct control and the transfer of the long-range surveillance detachment to the military intelligence battalion. The TRADOC commander supported these actions and sought the Army Chief of Staff's approval, noting, "Your approval would show to the heavy force that you are aware of a design deficiency and care enough to correct it."[115]

These proposals became the principal objectives of division cavalry redesign for the rest of the decade.[116] Major General Thomas H. Tait, commanding the Armor Center from 1986 to 1988, considered it a priority "to provide the squadron commander with a third ground cavalry troop. Without the third troop, adequate coverage of the division sector, especially during periods of limited visibility, is virtually impossible. . . . Our second priority will be to put the tanks back in the divisional cavalry." These additions made possible the ability to perform guard missions and fight for information.[117] The experiences and insights from senior retired cavalry officers tended to support these objectives.[118]

Concerns within FORSCOM regarding reconnaissance effectiveness led its commander, General Joseph T. Palastra Jr., to request an internal assessment of reconnaissance organizations. He considered it time to restore the division cavalry "to a mission capable wartime organization."[119] Colonel J.J. Robertson, commanding the 3d Armored Cavalry Regiment, provided the evaluation. With respect to the division cavalry squadron, he concluded:

> With two ground troops of scouts and two rather small air cav troops, the squadron is a hybrid organization that

> really doesn't fit any normal scenarios for employment. Given its structure, the squadron is only capable of performing reconnaissance missions either on the ground or in the air and on limited axis or with limited staying power in a division area of operation. One of the inherent requirements for reconnaissance is, if necessary, to fight to complete the mission. Probe the enemy's position, eliminate enemy reconnaissance and security forces, etc. Our current divisional cavalry squadron really can't do that. On the other hand, the other mission of security can only be partially met. The squadron can screen for its parent unit both offensively and defensively but it cannot *guard* anything. It cannot function as an advance guard nor can the squadron guard a division flank. . . . The division cannot use the squadron to occupy a sector or a battle position to free maneuver battalions for other things.[120]

Robertson supported the reintegration of tanks into squadrons, noting the cohesion problems experienced in World War II when augmentation was relied on for armor support. He recommended the addition of a third ground cavalry troop, with each troop including three combined arms platoons.

The experience of the first division cavalry squadron to complete a training rotation at the National Training Center (NTC) only underscored concerns about the unit's effectiveness. The NTC opened in 1981 and provided a realistic training environment for units up to brigade size. The facility included a resident opposing force that employed Soviet-style units, weapons, and tactics. Against this threat, the tankless scout platoons of the 2d Squadron, 1st Cavalry Regiment moved with great caution, seeking to avoid detection and combat. Excessive reliance on dismounted operations soon reduced the pace of operations to the speed of the foot scout. When time constraints necessitated less deliberate movement, losses quickly accumulated. Inadequate maintenance made air cavalry support problematic and incapable of sustaining continuous operations.[121]

The inclusion of the division cavalry squadron in the aviation brigade generated fears that it no longer offered the division commander an effective reconnaissance tool. Immersed in brigade operations, its training and maintenance requirements suffered, and it risked becoming "lost in the shuffle." To soldiers in the field, the squadron's removal from direct division control disrupted a proven command arrangement without justification.[122]

Efforts to restore the squadron to its independent status directly responsive to the division commander failed.[123] The creation of the Aviation

Branch in 1983 eliminated the Armor Center's proponency for air cavalry. Not surprisingly, the new branch supported the existing configuration. In 1986, after reviewing the case of altering the cavalry squadron's alignment, the Army Chief of Staff directed its retention within the aviation brigade.[124] In the face of this opposition, critics could do little other than restate their case.[125]

Nevertheless, the Armor Center developed a master plan at the direction of CAC to address a broad range of cavalry issues. Completed in August 1988, it identified deficiencies, posed prioritized solutions, and attempted to provide clear mission statements for each type of cavalry organization. Its opening pages outlined the need for cavalry in an AirLand Battle context. The higher pace, nonlinear nature, and greater breadth and width of the battle area mandated a greater reconnaissance presence to facilitate information flow and decisionmaking. The evolving capabilities of Warsaw Pact forces further necessitated not only additional reconnaissance assets but an enhanced counterreconnaissance capability as well. Finally, in a clear reference to the Army 86 and Army of Excellence studies, the plan sought to establish cavalry requirements based on operations rather than on an "arbitrary reduction of reconnaissance assets."[126]

The Armor Center considered the armored cavalry regiment a sound and lethal organization capable of performing its mission set. The master plan confirmed the conclusions from an earlier 1985 assessment: "The ground and air cavalry troops form the necessary blend to provide the commander with a highly mobile reconnaissance capability essential to the corps." Recommended changes proved minor and limited to strengthening the aviation component, increasing the number of mortars, adding vehicles for select command personnel, and incorporating motorcycles.[127]

The regiment suffered the least from the organizational paring that accompanied the transition from Army 86 to the Army of Excellence. It included an HHT; three armored cavalry squadrons; a combat aviation squadron; a support squadron; and air defense, artillery, engineer, NBC, and military intelligence elements.[128] Regimental squadrons retained their traditional configuration with a headquarters, three armored cavalry troops, and a tank company. The most significant change occurred at the troop level. The various combined arms mixes of the 1970s gave way to purified platoons. This restructuring reflected concerns about the ability of second lieutenants to control a combined arms platoon that include the Abrams tank and the M3. The adoption of a "2x2" troop configuration simplified command and increased the leader-to-led ratio. Each cavalry troop included a headquarters, mortar element, two tank platoons, and two

M3-equipped scout platoons. Responsibility for task organization and fire support shifted from the platoon leader to the troop commander.[129]

The master plan for other cavalry organizations largely paralleled concerns and proposals advocated throughout the decade. The heavy division cavalry squadron required another ground cavalry troop, tanks, and a more robust aviation section. Indeed, the addition of another ground troop was included among the top three priority actions, together with improving the battalion scout platoon and reorganizing all air cavalry troops. Second tier priorities included the return of tanks to the division cavalry squadron and the creation of brigade scout units.[130]

Identifying deficiencies proved much easier than correcting them. Funding and personnel limitations constituted the primary obstacles. The high cost of fielding the Abrams tank and M3, for example, contributed to the former's removal from the division cavalry squadron. Restoring the tanks required more than an operational justification. Therefore, implementation of this action necessitated a parallel resource strategy. Recommendations included inactivating select units and transferring those soldiers and funds to division cavalry. However, achieving the senior leader consensus necessary to confirm these "bill payers" proved impossible.[131] In 1988, for example, the Armor School reacted to problems associated with the employment of long-range surveillance units with a proposal to eliminate them and use the personnel saved to strengthen the division cavalry squadron.[132] This suggestion met with a stiff rebuke from the Infantry Center, since Armor appeared to be fixing "a cavalry guard problem at the expense of infantry combat power."[133]

In the field, division commanders supported the concept in principal, but proved unwilling to trade a maneuver battalion to achieve it. In effect, efforts to strengthen the division cavalry squadron reached a dead end. As one Armor School officer noted, "The Div Cav Sqdn needs 3 ground troops w/tks. That will not be 'fixed' until the 'bill payers' are decided and the senior leadership directs the change."[134]

Whither the Scout?

The debate surrounding the division cavalry squadron coincided with growing dissatisfaction with the scout platoon. Fielding of the M3-equipped platoon and its performance during NTC rotations raised anew the issue of how best to organize, equip, and use the scout. At the NTC, a pattern emerged of reconnaissance failure and heavy losses. Scouts regularly found themselves engaged in combat and destroyed. The direct correlation between reconnaissance effectiveness and maneuver battalion

success underscored the importance of these results. Scouts unable to provide information on the enemy or provide a clear picture of battlefield developments left their parent battalion to operate blind.[135]

Heavy maneuver battalion reconnaissance quickly became the focus of attention. Several studies sought to determine the nature of the problem and suggest corrective measures. In 1985, the Army Training Board conducted a survey of scout operations at the NTC. In the execution of reconnaissance and counterreconnaissance, the study found:

> A lack of operational knowledge on the part of TF [task force] commanders, which leads to inadequate unit training and improper employment. It also concluded both doctrine and training deficiencies exist that are contributing factors. Doctrine was developed for cavalry platoons and has been overlaid on the TF Scout Platoon.[136]

Equipment and organizational issues simply compounded those of training and doctrine, since several different types of scout platoons existed, including the transitional M113/ITV mix.[137] Recommended improvements included an increase in platoon size to permit greater coverage, the provision of more robust communications, and training.[138]

Courtesy *Armor Magazine*

Figure 86. A Bradley Fighting Vehicle and an M113 occupy battle positions at the NTC.

At the Army's behest the RAND Corporation undertook a more detailed analysis of task force reconnaissance. A study team reviewed heavy maneuver battalion reconnaissance operations during 17 training rotations between 1985 and 1986. The team observed battles, collected data from units after their rotation, and met directly with NTC observer/controller personnel. Not surprisingly, the team found a direct correlation between successful reconnaissance and effective offensive action, but reconnaissance successes proved rare. The team considered this poor showing the result of insufficient command emphasis on reconnaissance, inadequate doctrinal and training support, and poor planning. Despite stringent time constraints on operations, poor planning resulted in misuse of the time available. Furthermore, the small size of the scout platoons left them struggling to complete mission sets within their assigned sectors. The RAND team recommended a larger platoon equipped with radio relay equipment, positional location devices, and more binoculars and night vision goggles.[139]

In 1987, the CAC completed its own assessment of reconnaissance at the NTC. A team of subject matter experts drawn from several Army schools observed a brigade training rotation. They supplemented their observations through interaction with the RAND study team, interviews of observer/controller personnel, and analysis of the results of prior unit rotations.[140]

The CAC study found reconnaissance failures at the brigade and battalion levels attributable to a variety of doctrinal, training, organizational, and materiel causes in addition to artificial constraints imposed by the NTC environment. At the brigade level, the most obvious cause stemmed from the lack of organic reconnaissance assets. Since neither division nor corps assets that might have been available on an actual battlefield were represented during the rotation, the brigade commander could offer little additional support to the battalion reconnaissance effort on which he relied to understand the tactical situation.[141]

Battalion scout platoons did not seek enemy vulnerabilities for the main body to exploit. Nor did they "pull the main body towards and along the path of least resistance." Instead, task forces found themselves committed to an avenue of advance before operations began and rarely deviated: "Commanders typically push however many forces are needed down the axis to make the attack successful. This usually results in the TF pitting its strength against the enemy's strength and sustaining a devastating number of casualties and materiel losses." This inflexibility stemmed in part from NTC scenario constraints that generally mandated a direction of attack and forced an assault on a prepared defensive position.[142]

Scouts received a set time limit to accomplish their tasks. Generally, it proved too short and forced the abandonment of overwatch movement techniques and dismounted operations. As a result, "Scouts have no option but to abandon secure movement and reconnaissance techniques and press forward as rapidly as possible, sacrificing stealth and survivability." Continuous reconnaissance of the task force area proved impossible under these conditions, resulting in mounted movements to contact by the scouts. In contrast, opposing force (OPFOR) reconnaissance units appeared to have much more flexibility to maneuver and observe throughout the battle area. The CAC study believed the artificial time and maneuver constraints to have contributed to an exaggeration of reconnaissance problems.[143] However true, at the platoon level, scouts failed "to accomplish their reconnaissance tasks because they seldom survive initial contact with enemy forces."[144]

The CAC study also found a lack of command emphasis on reconnaissance operations. They were not integral to the battalion's overall scheme of maneuver and often left for the S2 to manage rather than the S3 and executive officer, who helped craft and execute battalion operations. Frequent loss of communications between the battalion and the scout platoon as the latter advanced beyond effective radio range symbolized this neglect. In the absence of previously planned relay stations or alternate communications means, the battalion commander could not benefit from the platoon's observations nor redirect it to fit his own needs. In supply and maintenance, the scout platoon leader lacked the influence to secure his needs without command and staff support. Fire support for the scouts proved generally absent, limiting the scout's ability to develop situations. Not only did the scout rely on such fires, his platoon constituted a collection of potential forward observers capable of enhancing the overall effectiveness of battalion fire support.[145]

Scout platoons needed to employ proper movement techniques for survival. The combination of dismounted scanning of suspect areas followed by the use of overwatch to advance proved effective. Navigation at night or in poor visibility conditions, however, posed a problem for many scouts and compounded the difficulties associated with locating and surveying minefields and obstacles. Some individuals purchased their own magnetic compasses and mounted them on their vehicles—much as crews had done in Vietnam. A better solution lay in the development of a simple position location device.[146]

Mounted reconnaissance by scouts proved the least effective but most common method employed at the NTC. The CAC report encouraged the

use of one or two-man observation posts that remained hidden and continuously observed enemy activity. Indeed, the OPFOR was considered to gain the bulk of its information by this method. Hence, the report noted, "The most successful scout platoons obtain the majority of detailed combat information through stealthy *dismounted* patrolling and stationary observation. However, most scouts habitually remain mounted and blunder into obstacles and fire sacks."[147]

During security operations, scout platoons experienced difficulty maintaining a screen line. They proved too small to provide sufficient cover, although the attachment of ground surveillance radars improved their effectiveness. Operations conducted as part of the task force's defense against the OPFOR suffered from circumstances endemic to the NTC. According to the CAC assessment:

> The OPFOR reconnaissance elements have the "home court advantage." They know the area where the TF will be defending in each scenario. They are intimately familiar with the most covered and concealed routes through the TF sector. Their OPs [observation posts] in the hillsides overlooking TF defensive sectors are prepared positions they return to time after time.[148]

The M3 also received its share of criticism. Its noise and size precluded stealthy operations. General Tait quipped: "Reconnaissance in a Bradley is like doing reconnaissance in a Winnebago." His reference to a popular recreation vehicle underscored his support for a smaller, quieter platform. The M3's thermal viewer provided the ability to observe and scan areas in low visibility, but its use generated other problems. Silent watch, the technique of remaining in place with the engine off while the crew observed the surrounding area with the vehicle's optics, proved impossible. The thermal viewer generated noise and masked the ability of the crew to hear other sounds in their immediate area. Worse, it drained the vehicle batteries after 30 to 45 minutes of operation, necessitating starting the engine to recharge them and thereby disclosing the M3's presence.[149]

Platoons equipped with this vehicle found their ability to conduct dismounted operations limited. At full strength, each vehicle carried a two-man scout team and a three-man vehicle crew. Personnel shortfalls often reduced available dismounts to one or none. Some platoons sought to mitigate this problem by concentrating their dismounts on one vehicle, but more often than not scouts simply avoided dismounted operations.[150]

Given these problems, the report recommended platoons with more vehicles. It also suggested a different scout vehicle than the M3, preferably

one smaller, quieter, and faster. Its main armament was to include a weapon capable of suppressive fire, while the scouts relied on hand-held weapons for protection from armor. More important than the armament, however, was the requirement for a thermal viewer that could be used by dismounted or mounted scouts. In short, "TF scouts envy the OPFOR scouts who operate in HMMWVs [high-mobility multipurpose wheeled vehicles]. They move quietly, quickly, with equal or better mobility than the M3. In large measure, the HMMWV's characteristics contribute to the renowned success of the OPFOR reconnaissance elements."[151]

By the mid-1980s, combat units were receiving HMMWVs in addition to the Abrams tank and the M3. This general-purpose platform replaced the jeep and the light truck. It featured a powerful engine, robust chassis, four-wheel-drive, and a powerful load and pull capacity. Its 25-gallon tank gave it an operational radius of 300 miles without refueling. Air-droppable and available in a variety of configurations, the HMMWV began to find employment in many roles. It proved rugged, reliable, and possessed better mobility than the jeep. At just under 3 tons, the HMMWV outweighed the ¼-ton truck, but it offered greater capability.[152]

At the NTC, the OPFOR employed the HMMWV as a scout vehicle. It was the exact opposite of the M3 Cavalry Fighting Vehicle (CFV). Where the latter proved large, noisy, and heavily armed, the HMMWV proved quiet, fast, and more difficult to locate. It carried a weapon for self-defense and required minimal maintenance and logistical support. As concern over reconnaissance failures mounted, the HMMWV's attractiveness as a scout platform rose. The RAND study, for example, noted the stealthy operation of OPFOR scouts in HMMWVs and recommended mounting scouts in HMMWVs.[153]

The Center for Army Lessons Learned (CALL) continued to collect data on reconnaissance operations at the NTC after the completion of the CAC study. It found a 50-percent loss rate among scouts and persistently low rates of successful reconnaissance missions. CALL attributed these findings largely to training and the absence of stealth in scout platoon operations. With the success of battalion task force operations resting on reconnaissance activity, these results were worrisome.[154] CALL analysis further underscored the importance of sufficient time for effective reconnaissance, which often resulted from the successful establishment of dismounted observation posts. Conversely, "recon elements which remain mounted usually die to enemy fire." Significantly, scout success seemed to correlate with the degree of augmentation provided by the task force.[155] Yet an organization in need of continuous augmentation was not properly

Courtesy *Armor Magazine*

Figure 87. Training scouts equipped with HMMWV to operate vehicle weapon.

configured in the first place and simply drained combat power from its parent organization—a view held by earlier advocates of more robust reconnaissance units.

The NTC for all its realism and value to training, nevertheless, constituted an artificial battlefield with constraints not necessarily present in a combat theater. In weighting decisions about reconnaissance on NTC rotations, the Army risked giving too much credence to simulated combat operations rather than real combat operations. The OPFOR, for example, used visually modified HMMWVs to represent the Soviet BRDM-2. This vehicle carried armor protection and an armament of one 14.5-mm and one 7.62-mm machinegun, supplemented with an RPG for the crew. The laser system used to simulate combat engagements represented the weapons and armor protection. Hence, the OPFOR scout employed a platform with the mobility and silhouette of the HMMWV and the lethality and survivability of the armored BRDM-2. One OPFOR NCO noted, "This is *not* a HMMWV doing the mission: rather, *it is an armored recon vehicle*."[156] This dual nature was often overlooked amid the growing interest in equipping scout platoons with HMMWVs.

Other aspects of NTC operations encouraged a more cautious analysis of trends emerging during training rotations. Lieutenant General Crosby E. Saint, commanding the III Corps, found the employment of unsupported battalion task forces against the OPFOR unrealistic.

> Battalions are not resourced to accomplish the total reconnaissance/counter-reconnaissance mission, though

> it is essential. I believe this is an Army-wide structure problem and must be fixed. When we originally structured battalion scout platoons, we also structured a brigade scout platoon. The Army of Excellence took the scouts from the brigade, but left the battalion structure as it is. At the NTC we are seeing the results of this decision. We see non-standard scout teams, (much like an Armored Cav Troop) that are taken from within the TF, thus reducing the combat power of the TF for the main effort, or we see scout organizations that are too under-resourced to accomplish the mission. Further, the meager other recon and intel assets of the division are not present, though the OPFOR has both divisional and regimental recon available. At the NTC we essentially have battalions on their own with no higher level eyes or assets to kill the OPFOR before it reaches the FEBA [forward edge of battle area]. The OPFOR then shows up generally intact, with no command and control problems, etc. This is counter to the concept of ALB [AirLand Battle] and why we invented Deep Battle.[157]

The NTC results were drawing attention to reconnaissance issues and bolstering the case for a light, stealthy scout organization. Further support came from the use of HMMWVs to equip the reconnaissance squadron of the light division.[158] Experimentation with alternate scout platoon organizations followed. In 1988, the NTC hosted a demonstration of a 10-vehicle platoon that offered greater coverage and the separation of the platoon headquarters from the scout sections for better command and control. The unit included a two-HMMWV command element; a heavy section of four M3s and four motorcycles; and a light section of four HMMWVs. In this manner, the platoon benefited from the stealth capability of the HMMWV and the combat power of the M3. The mixed vehicle set permitted a degree of tailoring to fit varied tactical situations, and found support in an Armor School white paper.[159]

The same year, the 1st Battalion, 64th Armor Regiment tested a pure HMMWV scout platoon organization at the NTC. The unit achieved several successes through reliance on the HMMWV's quietness and small size. Observation teams reached critical observation points undetected and reported on OPFOR activity. The scouts often evaded contact through stealth and completed their mission—a refreshing change from the steady failure reports that previously characterized NTC reconnaissance. This event encouraged further interest in a HMMWV scout platoon.

When encounters with the OPFOR did occur, they tended to result in the HMMWV's destruction—an unpleasant fact lost amid the general enthusiasm generated by the platoon's apparent success.[160]

Formal study of alternate scout platoon organizations followed. In 1989, three platoon configurations underwent testing and comparison. They included a baseline organization of 6 M3s, a mixed platoon with 4 M3s and 6 HMMWVs, and 1 platoon with 10 HMMWVs and 4 motorcycles. All were evaluated in combat training center environments and via JANUS modeling. Analysis found the HMMWV platoon to be the most effective, least costly, and most sustainable organization. It outperformed the other two configurations in the execution of zone, area, and route reconnaissance; screen; and passage of lines. Moreover, the report found the HMMWV platoon "to be the most survivable and most successful in providing the TF commander with information on second echelon threat activity." In terms of providing the battalion task force with advance warning of pending enemy action, these qualities were critical.[161]

The larger size of the mixed and HMMWV platoons permitted them to absorb losses and continue their missions. However, the M3 proved more survivable, and the final report noted, "The vulnerability of the HMMWV and MILMO [military motorcycle] vice the M3 CFV as a scout vehicle was a concern to be resolved." Nevertheless, this caution received less attention than the apparent superiority of the HMMWV platoon over its competitors. The HMMWV platoon proved cheaper, more sustainable, easier to deploy, and required minimal adjustments to training and doctrine. Therefore, in 1990 the Army opted to reequip its heavy maneuver battalion scout platoons with 10 HMMWVs, organized into a headquarters section with 2 HMMWVs and 4 scout sections with 2 HMMWVs each.[162]

This decision marked a return to the wheeled, unarmored scout vehicle, which had dominated scout units in the 1940s and 1950s. At that time, combat experience raised the importance of survivability and led to recurring demands for at least a lightly armored platform. In the changed environment of the 1980s, survivability lagged behind a desire for stealth and mission accomplishment to reverse the negative trends identified at the NTC. Stealth itself became equated with survivability. The testing and analysis done to support the scout decision did not include cluttered battlefields populated with bypassed enemy forces, unexploded ordnance, urban environments, civilian crowds of uncertain disposition, or varied terrain considerations. All of these factors had been part of the scout's experience in World War II and every conflict since. In the event of a chance encounter with hostile forces, could the HMMWV scout survive?

For the 82d Airborne Division, the answer to this question was a resounding "no." At the same time the mounted maneuver community began to embrace a HMMWV-equipped scout platoon, this formation sought a more robust organization. The subordinate 3d Battalion, 73d Armor Regiment included a large (14-vehicle) HMMWV scout platoon, but it was considered unable to perform "the more aggressive and traditional scout missions inherent to armored battalions." The division, therefore, reequipped the battalion scouts with LAV-25s from the US Marine Corps. This wheeled, armored vehicle carried a turret-mounted 25-mm cannon.[163] In justifying this replacement, the division outlined many of the same issues once associated with the use of the jeep in a reconnaissance role:

> The scout platoon is presently structured with 14 HMMWVs, manned by 42 troopers. While adequate for conducting limited reconnaissance and security missions, the lack of a mobile, survivable and lethal weapons platform precludes the platoon from engaging in more traditional and aggressive reconnaissance and security operations. These include, but are not limited to, convoy security, guard missions, deep raids, noncombatant evacuation, and rear area security operations. Missions that involve establishing and maintaining contact with mobile enemy forces are virtually impossible to accomplish with scouts mounted in HMMWVs. Lacking adequate armor protection, cross-country mobility across the spectrum of terrain, and a gun of sufficient caliber to defeat other light armored vehicles, scouts can only accomplish limited reconnaissance.[164]

Reconnaissance Training and Doctrine in the 1980s

The fielding of the M3 and the reconnaissance difficulties encountered at the NTC encouraged another round of doctrinal updates. In November 1985, the Army published FM 17-98, *The Army 86 Scout Platoon.* This manual applied to M3-equipped platoons whether assigned to cavalry organizations or maneuver battalions. The primary functions of this platoon included reconnaissance and security for the parent unit. Acknowledging the temptation for crews and commanders to misuse this unit's firepower, the first page of the manual cautioned against employing the platoon as an antitank unit. Other acceptable roles for the platoon included liaison with adjacent units, service as a quartering party, traffic control, limited pioneer and demolition work, and chemical detection and radiological

survey work. It supported area damage control operations, established roadblocks, and provided command post security.[165]

The manual writers sought to instruct and inform their readers. Hence, the manual offered a wealth of descriptive detail, diagrams, and annotated illustrations intended to enhance its training value. It provided a "how to" guide for scout platoon operations and targeted new NCOs, platoon leaders, and more senior commanders and staff officers to offset what NTC analysis had identified as ignorance of scout platoon employment. An entire chapter focused on command and control issues, including basic troop leading procedures and the responsibilities of command personnel.[166]

The same chapter highlighted those aspects of scout platoon operations considered essential. These included movement, communications, and fire control. Movement was considered "the essence of all scout platoon operations," and the manual addressed movement techniques and formations in some detail. Platoon personnel were expected to employ a variety of communications means in addition to radio to avoid the effect of hostile jamming or interception. The M3's varied armament found expression in a section similar to that found in tank platoon manuals. It detailed fire control measures, fire discipline, engagement priorities, and the creation of engagement areas. The emphasis and level of detail given to weapons employment made it difficult to envision the platoon not engaging in combat.[167]

Reconnaissance coverage included basic principles found in earlier manuals, including an emphasis on dismounted operations. The two-man scout team used stealth to secure detailed information and check potential ambush sites for enemy activity, while their transport provided overwatch from a distance. In the absence of sufficient time or when less information was required, the platoon operated mounted, sometimes relying on reconnaissance by fire. The platoon's size restricted route reconnaissance to a single route. Integrated action with aerial assets was encouraged, but in all reconnaissance missions, the scouts sought information on their objective and related terrain, trafficabiliity, and road conditions.[168]

Screen operations constituted the principal security function addressed by the manual. The platoon possessed sufficient strength to maintain three observation posts, but this number could surge to six for short periods. The platoon retained responsibility for eliminating hostile patrols seeking to penetrate the screen line. Other security missions received minimal coverage, but information collection remained integral to all such operations.

For new platoon leaders one of the most useful chapters detailed a variety of common but difficult activities. These included execution of a relief in place, passage of lines, withdrawal, making contact with other friendly

forces, and assessing water crossings. To help new personnel understand how the M3-equipped scout platoon differed from other reconnaissance organizations, an appendix compared it with the transitional M113/ITV configuration.

Courtesy *Armor Magazine*

Figure 88. M3 Cavalry Fighting Vehicle at the NTC.

Overall, the scout platoon manual offered a wealth of useful, constructive information to orient personnel to the unit's capabilities. However, critics considered it too reflective of cavalry operations and of less use to maneuver battalion scout platoons. The latter could not assume the presence of those assets found in divisional or regimental cavalry units, particularly air cavalry. Reconnaissance, the primary function of the battalion scout platoons, received roughly the same amount of coverage as fire control. While the manual constituted a significant tool to comprehend how best to employ the M3-equipped platoon, it still possessed significant gaps.[169]

This criticism, coupled with continued reconnaissance problems at the NTC and the needs of maneuver battalion scout platoons led to the publication of a revised manual in 1987. It clearly applied to cavalry and battalion scout platoons. Like its predecessor, it targeted platoon leaders and their controlling commanders to educate them on proper scout employment. The publication of standard operating procedures, a unit training plan, and a leader's handbook focused on scout platoon operations complemented the guidance provided by the updated manual.

The mission set for the scout platoon shrank. While reconnaissance remained a primary function, screening replaced the broader range of security operations. Other activities assigned to the scout platoon similarly diminished with the removal of command post security, area damage control, and roadblock establishment. The manual opened with a chapter detailing the limitations of the platoon, clearly reflective of NTC results. In general, the scout unit constituted a reconnaissance force that operated as part of a larger combined arms team. It focused on a single route during route reconnaissance and a 3 to 5 kilometer-wide frontage during zone reconnaissance. Combat capability was described as limited to the destruction of hostile reconnaissance elements. The platoon required augmentation for other combat actions, including counterreconnaissance. To ensure access to such support, the platoon was expected to remain within communications range of its parent unit.[170]

The chapter addressing command and control now provided a clear orientation toward the maneuver battalion scout platoon. The extensive coverage of fire control and gunnery disappeared, replaced by a description of the differences in cavalry organizations versus battalion task forces. Similarly, reconnaissance received expanded coverage that included details of Warsaw Pact organizations and tactics likely to be encountered. More detail appeared in the guidance offered for the execution of zone, area, and route reconnaissance. The same chapter also provided additional information for locating and identifying the extent and nature of obstacles. The human dimension found more expression through depiction of the scout's senses as the most important sensor available.[171]

The primary security mission for the scout platoon remained the screen. Guard and covering force operations were addressed, but the scout performed these as part of a larger team. In the screen mission, the scout platoon's objective lay in gathering information on enemy activity and observing the battlefield. It sought the destruction of hostile reconnaissance only in conjunction with other combat units. Scouts generally sought to avoid direct fire engagements while performing a screen, instead relying on available indirect fires. Counterreconnaissance, another activity routinely criticized at the NTC, received special attention. Previous suggestions to rely on the use of dismounted teams received added emphasis in a section devoted to dismounted patrols, supplemented by a more detailed appendix. Similarly, a chapter provided expanded coverage of common activities, including the selection and preparation of assembly areas, road marches, passage of lines, and relief in place.[172]

The 1987 scout platoon manual proved applicable to both cavalry and battalion units. It shifted the focus of scout operations toward

reconnaissance and information collection. It also clarified the limitations of the platoon, particularly in the execution of combat or security missions. In short, the updated manual provided a valid doctrinal fix to many of the problems experienced at the NTC while offering comprehensive coverage of key tasks associated with both cavalry and battalion scouts. Nevertheless, by itself it could not resolve the range of challenges facing reconnaissance. Even after its publication, scouts continued to receive criticism for being too vehicle-bound, lacking sufficient understanding of the threat, and in need of more effective guidance to sustain vehicles and crews. Scouts also needed to develop expertise in the employment of indirect fires.[173]

Maneuver battalion scouts required similar skills to those of cavalry personnel, but important differences existed in the function and organization of the former. The Army 86 studies affected control of the battalion scout platoon. The combat support company disappeared, and its component elements, including the scout platoon, migrated back to the battalion headquarters and headquarters company (HHC). This consolidation increased the complexity and workload of the HHC commander, who now found himself responsible for managing both combat support and service elements. In the words of one officer, "The problems encountered in command and control, maintenance, and supply accountability make taking command of a HHC about as desirable as contracting Herpes Simplex II."[174]

The problem stemmed from the dispersion of assets that occurred during operations, with administrative, service support, staff sections, and combat support all moving separately. The same officer recommended dividing the HHC into two smaller companies with one responsible for staff sections, mortars, and scouts. This proposal effectively reconstituted the combat support company. It was not implemented, leaving scout platoons under an HHC commander struggling to manage a collection of assets with different functions.[175]

The 1988 publication of FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force,* offered only limited guidance for the operation of the battalion's primary reconnaissance tool. The scout platoon served as the battalion's eyes before combat and continued to monitor events once battle was joined. Its other major roles included assisting the movement of its parent battalion and maintaining contact with adjacent units. Screening operations comprised its primary security function. The platoon was not expected to operate independently, and its actions were always described in the context of battalion operations. It could expect support from maneuver companies during screening operations and possibly the attachment

of ground surveillance radars and/or remotely employed sensors from its parent division. Yet the manual provided only a general sense of how best to integrate scouts into battalion operations.[176]

The publication of FM 17-97, *Regimental Armored Cavalry Troop,* that same year offered a sharp contrast. It provided a much better sense of how subordinate platoons fit into the cavalry troop scheme of maneuver in both armored cavalry regiments and division cavalry squadrons. Further elucidation of the principles found in the manual came with the related publication of a mission training plan and standard operating procedures for the armored cavalry troop. This unit constituted a versatile organization intended for reconnaissance, security, and economy of force operations. It included a headquarters section, two scout platoons, two tank platoons, a mortar section, and a maintenance section. It could operate anywhere terrain permitted heavy forces and, once employed, the primary constraint on its activity lay in the strength and size of the enemy.[177]

Reconnaissance concepts included "recon-pull." The troop sought to locate hostile weaknesses and a path for friendly forces to access or penetrate these vulnerable areas. In this manner, the information gathering of the troop pulled friendly combat assets forward, guiding them to enemy weak points. Zone, area, and route remained the principal types of reconnaissance, but the manual's coverage of each increased the attention given to reporting on terrain, infrastructure, and obstacles as well as the enemy. The reconnaissance principles included in the manual reflected lessons learned since the 1930s. Yet, their presentation through clear language, effective illustrations, and the use of detailed examples incorporating unplanned tactical developments simplified comprehension. Like the 1987 scout platoon manual, this one included a chapter devoted to common activities such as road marches, assembly areas, relief in place, passage of lines, and water crossings.[178]

Table 3.Reconnaissance principles and fundamentals[179]

Principles	Fundamentals
See but don't be seen; use stealth	Maximum reconnaissance forward
Report exactly what you see	Orient on the objective
Report as quickly as you can	Rapid and accurate reporting
	Retain freedom of maneuver
	Gain and maintain enemy contact
	Develop the situation rapidly

The new manuals helped to improve comprehension of reconnaissance operations. A parallel effort addressed training to ensure the related principles became inherent to the operation of all mounted reconnaissance

units. NTC reconnaissance studies showed the need for improvements in the quality of home station training and the effectiveness of cavalry leaders and soldiers. In 1987, the Armor School Assistant Commandant acknowledged, "Right now, we don't have the capability to function effectively in the reconnaissance arena with our cavalry organizations. Part of that is equipment, part of that is training, and part of that is probably doctrine."[180]

The Armor School sought to correct these deficiencies through implementation of new training initiatives. In 1987, it introduced the Cavalry Leaders Course (CLC) as an add-on module to the Armor Officer Advanced Course, which trained company commanders. Graduates of the advanced course slated for cavalry organizations attended the 3-week CLC before going to their next assignments. The course familiarized students with cavalry vehicles and organizations. Related instruction addressed cavalry operations in an AirLand Battle context with emphasis on reconnaissance, screen, and defense missions.[181]

The following year witnessed implementation of the Scout Platoon Leaders Course (SPLC). This course targeted graduates of the Armor Officer Basic Course (AOBC) assigned to scout platoon command. SPLC also spanned 3 weeks and immersed students in classroom instruction, computer simulations, and field exercises to foster in them a clear

Courtesy *Armor Magazine*

Figure 89. HMMWV scouts prepare for their next mission.

understanding of how a scout platoon operated. Training subjects included combat intelligence, Warsaw Pact forces and tactics, reconnaissance, night operations, security, bridge classification, and demolition. The course challenged junior leaders and benefited from recommendations from units that received SPLC graduates. The range of attendees quickly expanded to include leaders already serving in cavalry units. The course received high praise and requests for attendance soon outstripped available spaces. By 1989, the Armor School was running 10 iterations per year but still lagged behind demand.[182]

SPLC provided an additional benefit to reconnaissance personnel. During field exercises, students used HMMWVs as representative scout vehicles, because they cost less to operate than the Bradley Fighting Vehicles equipping many platoons in the field. This cost-saving measure familiarized students with a vehicle gaining popularity as a reconnaissance platform and ultimately selected to replace the M3 in the battalion scout platoons.[183]

NCO training benefited from the creation of the Advanced Noncommissioned Officers Course (ANCOC) in 1988. This course focused on platoon operations and included computer simulations and field exercises. The effectiveness of the instruction benefited from the Armor School's transition from large group to small group instruction. In addition, a slightly longer scout version was implemented to boost the effectiveness of NCOs in scout and cavalry organizations. Skills trained during the course included reconnaissance, screen operations, indirect fire use, mounted patrolling, smoke use, and directing close air support.[184]

Other training improvements reflected the influence of the NTC. By the late 1980s, the Armor School possessed its own OPFOR, which supported armor and cavalry training exercises at Fort Knox. This unit participated in NTC exercises, where it helped to train cavalry units. It increased awareness of threat tactics, improved field leadership at the junior command level, and promoted the use of stealthy reconnaissance over combat operations for scouts. By 1989, the Armor School also ran an observer/controller certification course. This course familiarized NTC observer/controllers with armor and cavalry operations.[185]

By the end of the decade, the influence of these doctrine and training improvements were being felt in the field. The establishment of CLC, SPLC, and the scout version of ANCOC constituted a solid institutional foundation for the development of junior leadership in reconnaissance units that had been absent. Coupled with updated field manuals and related training support publications, these initiatives migrated some of

the responsibility for training scout platoon leadership skills from field units back to the Armor School where it belonged.

Operation DESERT STORM

The collapse of the Berlin Wall in 1989 signaled the end of the Cold War. Within 2 years, the Soviet Union ceased to exist and the threat of a Soviet-led invasion of Central Europe disappeared. These developments triggered a new round of downsizing, force structure studies, and plans to begin withdrawing at least some American combat organizations from the Federal Republic of Germany. However, while the Cold War's end largely eliminated the prospect of a major NATO–Warsaw Pact conflict, it did not augur in an era of peace. Instead, regional crises and the potential for localized conflicts replaced the danger of a war between superpowers. American military planning began to focus less on hostilities in Europe and more on preparing to respond to potential regional trouble in different parts of the globe.

Even before the collapse of the Soviet Union, an international crisis arose over Iraq's invasion and occupation of Kuwait in 1990. This action posed a direct threat to Saudi Arabia and underscored the danger of Iraq, already a regional power, increasing its influence through control of a significant part of the world's oil supply. The United Nations mandated Iraq's withdrawal from Kuwait, while the United States began to build a military coalition to force compliance. While the coalition formed, the United States deployed aircraft and the 82d Airborne Division to Saudi Arabia to deter further Iraqi aggression.

The summer and fall of 1990 marked a steady buildup of US and coalition forces in Saudi Arabia. The Cold War's end permitted the large-scale movement of combat formations from Central Europe to spearhead military operations in Southwest Asia. The American divisions that deployed to the Persian Gulf included some of the best equipped and trained available, honed as they were to employ AirLand Battle against a Warsaw Pact invasion.

In January 1991, the coalition began military operations to expel Iraqi forces from Kuwait. An air campaign targeted Iraq's ability to fight and steadily eroded its combat power. In late February, ground operations commenced to envelop and isolate Iraqi forces in Kuwait. A successful deception campaign focused Iraq's attention on the Persian Gulf while the main thrust of coalition forces came from the desert, sweeping into and through southern Iraq. After 5 days of major combat operations that soundly defeated the Iraqi Army and destroyed much of its equipment,

Kuwait was liberated and the war ended. The short ground campaign proved a test of AirLand Battle doctrine and the related organizational and materiel changes implemented in the 1980s. It also provided an opportunity to evaluate mounted reconnaissance organizations in the context of real world operations rather than the realistic but still artificial environment of the NTC.

The fighting during Operation DESERT STORM involved a high percentage of the Army's heavy force. Armor and cavalry organizations played a prominent role in the defeat of the Iraqi Army and the more capable and better-equipped Republican Guard formations. Against this opposition, the 2d and 3d Armored Cavalry Regiments proved highly effective. They served as corps reconnaissance assets, performing the full range of reconnaissance, security, and economy of force missions for their parent formations. In these operations, they proved robust and versatile, and after action analysis found few problems, confirming a longstanding belief in the general utility and effectiveness of the armored cavalry regiment.[186]

The 2d Armored Cavalry garnered considerable publicity for its role in leading the VII Corps advance. The regiment gathered intelligence, guided the corps' movement, screened operations, and served as a covering force. In the last capacity, it routinely engaged Iraqi forces encountered and prevented their observation of VII Corps movement. The regiment's combat effectiveness became obvious during the battle of 73 Easting in which it moved through a sandstorm and attacked Iraqi forces in prepared positions. Despite some initial confusion, elements of the regiment drove into and through the Iraqi positions, engaging mechanized and dismounted forces without pause. Regimental air cavalry eliminated Iraqi artillery supporting the defenders. When the engagement ended, the armored cavalry had left a path of destruction in its wake and set the stage for further attacks by the VII Corps.[187]

During the course of the campaign, the 2d Armored Cavalry moved nearly 200 kilometers during combat operations. It engaged elements from five different Iraqi formations and received credit for the destruction of over 300 armored vehicles and the capture of 2,000 prisoners. It benefited from the integrated employment of air cavalry and close air support. However, limited visibility and no-fly weather interfered with air operations, including support during the battle of 73 Easting. This reality underscored concerns expressed about overreliance on aerial support that could never be guaranteed. In contrast, the Abrams tank and M3 teams proved their ability to operate continuously against enemy forces and in poor weather conditions.[188]

The experience of division cavalry squadrons proved less satisfactory and generated numerous recommendations for changes. Among those heavy divisions that transitioned to the Army of Excellence design, a general desire emerged to add tanks to the squadron. Several division commanders attached tanks to the squadron to protect their scouts and provide additional firepower. Most felt that their cavalry required the ability to destroy any targets encountered and survive hostile contact. In those formations in which tanks were attached to the cavalry, the combination of Abrams tanks and M3s proved a winning one. This integration tended to occur at the platoon rather than the troop level. In general, the attachment of tanks to division cavalry proved "fundamental to the success of the squadrons' execution of its demanding mission profile." The increased combat power permitted a faster tempo of operations and greater depth in security actions.[189]

The experience of the 2d Squadron, 4th Cavalry Regiment highlighted the extent to which division cavalry squadrons underwent wholesale redesign in the combat theater. Assigned to the 24th Infantry Division (Mechanized), the squadron deployed to Saudi Arabia in 1990 with a brigade from that formation. Initially, the squadron provided a forward screen to help cover the buildup of coalition forces in Saudi Arabia. Due to its forward and semi-independent role, the squadron received significant augmentation to its combat power, including another ground cavalry troop and a multiple launch rocket system (MLRS) battery. The squadron also temporarily controlled various mechanized and armor teams.[190]

In preparation for ground operations, the division commander augmented the squadron to permit it to function as another maneuver unit. This practice proved common among formations stationed in the Federal Republic of Germany, from where the 24th Infantry Division deployed. The squadron retained its MLRS battery while gaining an Abrams tank company and detachments of engineers, military intelligence, and air defense artillery. Chemical personnel provided smoke generation and NBC reconnaissance capabilities. Additional supply and maintenance assets coupled with the attachment of ground-surveillance radar teams to each troop completed the reinforcement. Reminiscent of the Vietnam war, the division commander removed the squadron's air cavalry, consolidating it with the rest of the formation's aerial assets in the aviation brigade.[191]

These changes made the 2d Squadron, 4th Cavalry a ground cavalry task force with little internal uniformity. Its principal combat elements included a tank company and two cavalry troops. One cavalry troop conformed to the Army of Excellence configuration with pure M3 platoons, but the other

was organized as a regimental cavalry troop with two tank platoons and two scout platoons. The tank platoons converted to Abrams tanks before combat operations began, but the scout platoons retained their ITV/M113 mix throughout the conflict. Mortar support remained consolidated at the troop level.[192]

Control of the cavalry task force varied between the division command and subordinate brigades. At the start of operations, its two ground cavalry troops supported different brigades. Similarly, the missions assigned to the squadron frequently changed, ranging from zone and route reconnaissance to screen and guard functions. There was no attempt to focus the squadron predominantly on information collection. The division commander expected it to operate forward of the main body and conduct independent security operations. During the course of the ground campaign, the mission set performed exceeded the doctrinal emphasis on information collection, but it reflected the division commander's desire for a robust and versatile cavalry organization.[193]

The increase in the squadron's combat power came at the cost of additional planning challenges related to logistical support. The high fuel consumption rate of the Abrams tanks necessitated frequent refueling stops that threatened to either slow the squadron's momentum or leave forward elements without armor support. Therefore, an impromptu reorganization occurred that gave each cavalry troop a mix of tank and scout platoons. Each tank platoon refueled according to a staggered rotation schedule to

Courtesy *Armor Magazine*

Figure 90. Two Bradley Fighting Vehicles during Operation DESERT STORM.

avoid compromising squadron momentum or temporarily denuding either troop of armor support.[194]

The reinforcement given to the 2d Squadron, 4th Cavalry made it an effective combat force. Such augmentation did not alter the commonly held view that squadrons with only two ground cavalry troops lacked sufficient force to accomplish the range of missions actually assigned. Most division commanders preferred a more traditional squadron configuration with three ground and one air cavalry troop, and they were willing to lose an air cavalry troop to affect this change. These findings led the Army Chief of Staff in June 1991 to approve in concept the addition of tanks and a third ground troop to the division cavalry. Pending implementation, division cavalry squadrons in Europe began to replace their pure M3 scout platoons with a mix of three Abrams tanks and five M3s. Elsewhere, the Army considered a smaller interim platoon of two tanks and three M3s. All platoons were to transition to the European model by the mid-1990s prior to reconfiguration of the squadron with three ground cavalry troops. These decisions marked an abandonment of the underlining rationale for the Army of Excellence division squadron structure and a return to a more robust organization. However, until funded and enacted, they remained objectives rather than accomplished facts.[195]

While division commanders possessed the flexibility to reconfigure their cavalry squadrons through the realignment of assets, brigade commanders did not. According to one analysis of DESERT STORM combat operations, "It is clear that, had the assets been available, a number of commanders would have experimented with brigade scouts." The brigade represented the only command echelon between battalion and corps that did not possess a reconnaissance unit. Most commanders felt that combat operations justified such an organization.[196] The Armor Center leadership agreed and sought to secure a scout platoon for the brigade commander, but this remained a work in progress.[197]

Heavy maneuver battalions employed a variety of scout platoons, reflecting the limited progress made toward conversion to pure HMMWV units. The following table shows the mix of different configurations assigned to battalion task forces.

Platoons equipped with the M3 found it effective in combat. It kept pace with the Abrams tank, and it possessed a desirable mix of firepower, mobility, and protection.[198] Crews appreciated the weaponry available and engaged all types of targets encountered. The M3 benefited from modifications made during the 1980s, including the addition of NBC protection, the insertion of periscopes to permit better visibility from

Table.4. Operation DESERT STORM scout platoon configurations

Vehicle Equipment	Number of Platoons
M3 CFV	33
HMMWV	6
M113 & ITV	5
M3 CFV & HMMWV	2
LAV 25	1

inside the vehicle, and an improved TOW missile launcher. The fielding of the M3A2 in 1988 increased survivability through the addition of more armor, a Kevlar spall liner, and related improvements to the engine and suspension. The A2 version proved much less vulnerable in combat than earlier versions.[199] Global positioning systems (GPS) on at least some of the vehicles in each platoon ensured few navigational errors as US forces swept across the desert.[200]

The vehicle did experience problems. Its engine periodically clogged with sand, but the effect proved less disruptive than that experienced by Abrams tank crews. Optics proved less than ideal for scouting, engaging targets at longer ranges, and identifying friend from foe. On the M3A2, exhaust fumes blew into the vehicle commander's face obscuring his visibility and causing sickness. The cramped conditions inside the vehicle resulted in a variety of different load plans to accommodate both crew and

Courtesy Patton Museum of Cavalry and Armor

Figure 91. Operation DESERT STORM—a Bradley from the 1st Squadron, 4th Cavalry Regiment during a pause in the action.

personal gear. Observers noted, "Present load plan on BFVs doesn't take into account that crews live in the vehicle as well as fight from it. There is not enough internal space for either a nine-man infantry squad or a five-man Scout squad's gear."[201] The coaxial machinegun also proved prone to malfunction. One cavalry troop engaged in a firefight found that every single vehicle experienced coaxial jamming.[202]

The experience of M3-equipped battalion scout platoons reflected doctrinal and training emphasis on avoiding unnecessary combat. One platoon in the 1st Infantry Division, for example, facilitated the operations of its parent organization without significant combat. When ground combat operations began, the platoon screened its parent task force and maintained contact with supporting artillery. Subsequently, it guided the task force through a forward passage of lines and kept its parent unit aligned with adjacent friendly units. During these operations, hostile engagements by the platoon proved rare and could not be initiated without the task force commander's approval. In recounting his unit's experience, the platoon leader noted, "Although it is unusual for scouts to engage the enemy with direct fire, it was necessary to minimize the possibility of fratricide." Clearly, the results of the reconnaissance controversy of the preceding decade were influencing combat operations overseas.[203]

In addition to the pure M3 platoons, two units deployed to Southwest Asia in an experimental configuration. It addressed concerns over the lack of tanks in division cavalry squadrons by again integrating them at the platoon level. The resultant "3x5" structure included three Abrams tanks and five M3s. A headquarters section of one tank and one M3 directed two scout sections, each possessing one tank and two M3s. This platoon structure provided considerable firepower and after the war was adopted by division cavalry squadrons in Europe. Its principal drawbacks included a limited dismount capability and a narrow breadth of coverage.[204]

The M113/ITV scout platoon possessed the drawbacks of limited mobility and inability to keep pace with the Abrams/M3 team. Readiness issues associated with the ITV were well documented by 1990–91, but the platoon retained a strong antitank capability adequate to defeating Iraqi armor. The scout platoon of the 3d Battalion, 73d Armor Regiment entered combat equipped with the LAV-25. This unit was part of the 82d Airborne Division, which previously exchanged its HMMWVs for LAV-25s. In the desert, the LAV-25 proved quiet and mobile, able to traverse much of the same ground as a tracked vehicle. Its off-road movement surpassed that of the HMMWV, while its 25-mm cannon permitted it to engage enemy reconnaissance and light armor platforms. Its large size constituted its

principal drawback, which crews were expected to mitigate through careful terrain usage.[205]

The HMMWV scout platoons garnered considerable interest due to the controversy surrounding reconnaissance operations in the 1980s. None of the HMMWV platoons that participated in Operation DESERT STORM represented an ideal organization. They lacked the optics, motorcycles, and Stinger antiaircraft missiles supposed to be organic to the unit.[206] Nevertheless, at least one platoon leader favored the HMMWV scout unit. He appreciated the mobility, quietness, and small size associated with the HMMWV, and relied on these qualities to move to and on the battlefield. While operating as a forward screen, his unit routinely identified targets for the parent battalion task force to eliminate. In periods of frequent contact, however, the HMMWV scouts had little option other than to hide due to their lack of armor protection. In their stead, the battalion employed heavier assets to clear a path, making it safe for the HMMWVs to proceed.[207]

Armor battalion and brigade commanders in the theater proved much less sanguine about HMMWV scout platoons. They considered these units far too vulnerable, making their active employment on the battlefield too risky. Therefore, employed close to their parent battalions, HMMWV platoons were generally used to assist command and control functions and facilitate traffic movement. Mechanized infantry or tank platoons temporarily thrust into the role of scouts assumed their role of forward reconnaissance.[208] Survivability concerns led some commanders to create ad hoc organizations with increased combat power. In one instance, an improvised company team was created through the concentration of a scout platoon, a tank platoon, a mechanized infantry platoon, and an engineer section.[209]

The HMMWV shared the difficulty of the M113 and ITV in keeping ahead of the Abrams tanks and Bradley Fighting Vehicles that equipped parent battalions. These scout platforms advanced less to detect and identify enemy forces than to simply stay in the lead. Of the scout platforms employed, however, the HMMWV proved the least likely to survive chance encounters with hostile forces or mines. The M3's firepower and superior survivability inspired recommendations to create a mixed M3/HMMWV scout platoon with increased numbers of dismounts. This combination provided the means to conduct either stealthy operations or a more aggressive reconnaissance likely to trigger hostile contact.[210]

The war's end led to further analysis of the proper structure and equipment of the scout platoon. The survivability of the M3 in combat against Iraqi armor encouraged advocates of better protected scouts

who possessed the capability to fight. Indeed, the rationale behind the HMMWV seemed in question. Therefore, the Armor Center requested the cessation of HMMWV scout platoon fielding, pending further analysis of scout operations in Operation DESERT STORM. A formal study began, but HMMWV platoon fielding continued.[211]

The successful conclusion of hostilities in Southwest Asia helped to validate the requirement for a more powerful division cavalry squadron, establish a brigade scout platoon, and renew concerns over the proper scout platoon configuration. It also found reconnaissance organizations of all types temporarily immersed in managing prisoners of war and helping refugees. It was these postwar activities rather than the desert battles that foreshadowed the challenges facing the Army abroad in the next decade.

Notes

1. Russell F. Weigley, *History of the United States Army* (Bloomington, IN: Indiana University Press, 1984), 568–569, 571, 573.

2. Major Paul H. Herbert, *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations* (Fort Leavenworth, KS: Combat Studies Institute, 1988), 7–8, 31.

3. Ibid., 31, 33.

4. Ibid., 33–36, quotation from page 35.

5. Department of the Army, FM 100-5, *Operations* (Washington, DC: Headquarters, Department of the Army, 1976); Herbert, *Deciding What Has to Be Done*, 41, 46–47, 77–80, 82; Weigley, *History of the United States Army*, 578–579.

6. Herbert, *Deciding What Has to Be Done*, 95–96; John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine 1973–1982* (Fort Monroe, VA: US Army Training and Doctrine Command, 1984), 23–25; E-mail message, Anne W. Chapman to Robert S. Cameron, 25 July 2005, Armor Branch Archives, electronic files, Evolution of Armor/Donn Starry.

7. Herbert, *Deciding What Has to Be Done*, 96–98; Romjue, *From Active Defense to AirLand Battle*, 14–17, 19–20.

8. Romjue, *From Active Defense to AirLand Battle*, 30, 33–36, 45.

9. John L. Romjue, *The Army of Excellence: The Development of the 1980s Army* (Fort Monroe, VA: US Army Training and Doctrine Command, 1997), 8; John B. Wilson, *Army Lineage Series: Maneuver and Firepower: The Evolution of Divisions and Separate Brigades* (Washington, DC: Center of Military History, 1998), 379–382.

10. Romjue, *Army of Excellence*, 9–10; Wilson, *Maneuver and Firepower*, 383–386; Weigley, *History of the United States Army*, 575.

11. Romjue, *Army of Excellence*, 13–14.

12. Wilson, *Maneuver and Firepower*, 388–389.

13. Richard M. Swain, "AirLand Battle," in *Camp Colt to Desert Storm: The History of U.S. Armored Forces,* eds. George F. Hofmann and Donn A. Starry (Lexington, KY: University Press of Kentucky, 1999), 368, 370, 373.

14. Letter, Major General Donn A. Starry to Deputy Under Secretary of the Army for Operations Research Wilbur B. Payne, 15 July 1974, 3 (US Army Military History Institute, Carlisle, PA) (hereafter referred to as MHI), Donn A. Starry Papers.

15. Major General Donn A. Starry, "The Commander's Hatch," *Armor* LXXXIII, no. 1 (January–February 1974): 4–6.

16. Letter, Starry to Payne, 15 July 1974, 4–5; Starry, "The Commander's Hatch," 6.

17. Major General Donn A. Starry, "The Commander's Hatch," *Armor* LXXXIV, no. 2 (March–April 1975): 5.

18. Letter, General Bruce Palmer Jr. to Major General Donn A. Starry, 26 August 1974, MHI, Donn A. Starry Papers; Message, Major General Donn A. Starry to Mr. Hunter Woodall, 15 November 1974, MHI, Donn A. Starry Papers;

Letter, Major General Donn A. Starry to Brigadier General William B. Burdeshaw, c. 1975, MHI, Donn A. Starry Papers.

19. Letter, Starry to Burdeshaw, c. 1975.

20. US Army Training and Doctrine Command, "The Cavalry/Scout Study," Vol. I, 4 July 1974, 54, 57, 58, US Army Armor Branch Archives (hereafter referred to as Branch Archives). (SECRET—Info used is UNCLASSIFIED.) At this time, the H-series table of organization and equipment was in effect.

21. Starry, "The Commander's Hatch," (March–April 1975): 6–8.

22. Letter, Colonel David K. Doyle to Major General Donn A. Starry, c. 1974, MHI, Donn A. Starry Papers.

23. Letter, Major General Donn A. Starry to Brigadier General Paul F. Gorman, 28 January 1974, MHI, Donn A. Starry Papers.

24. Starry to Gorman, 28 January 1974; Memorandum, General William E. DePuy to General Creighton Abrams, 15 March 1974, MHI, Donn A. Starry Papers; Letter, Major General Marvin D. Fuller to Major General Donn A. Starry, 13 December 1974, MHI, Donn A. Starry Papers; Letter, Colonel Grail L. Brookshire to Major General Donn A. Starry, 12 November 1975, MHI, Donn A. Starry Papers.

25. Letter, Major General Donn A. Starry to Lieutenant General Orwin C. Talbott, 18 March 1974, MHI, Donn A. Starry Papers.

26. Memorandum, Major General Donn A. Starry to Major General Thomas M. Tarpley, 14 May 1974, MHI, Donn A. Starry Papers.

27. Letter, Colonel David K. Doyle to Colonel Jack W. Nielsen, 16 April 1974, MHI, Donn A. Starry Papers.

28. "The Cavalry/Scout Study," Vol. I, 4 July 1974, 58. (SECRET—Information used is UNCLASSIFIED.)

29. Starry to Tarpley, 14 May 1974.

30. Staff Sergeant Peter L. Bunce, "Cavalry Platoon Organization," *Armor* LXXXIV, no. 4 (July–August 1975): 2; Lieutenant Colonel James L. Dozier, "Comments on Commander's Hatch," *Armor* LXXXIV, no. 6 (November–December 1975): 2.

31. Captain James H. Boschma, "The Case for Ground Scouts," *Armor* LXXXIII, no. 3 (May–June 1974): 4.

32. Bunce, "Cavalry Platoon Organization," 2.

33. Dozier, "Comments on Commander's Hatch," 2.

34. Staff Sergeant Peter L. Bunce, "The Reconnaissance Dilemma," *Armor* LXXXV, no. 2 (March–April 1976): 18.

35. Ibid., 18–20.

36. Major General George S. Patton, "In Support of the Scout," *Armor* LXXXVI, no. 2 (March–April 1977): 5.

37. Colonel Crosbie E. Saint, "Cavalry Today," *Armor* LXXXVI, no. 4 (July–August 1977): 60–61.

38. Memorandum, Major General Glenn K. Otis to Lieutenant General Ott, Subj: Cavalry—Economy of Force Role, 6 July 1978, MHI, Donn A. Starry Papers.

39. Saint, "Cavalry Today," 62.

40. Brigadier General David K. Doyle, "The Indispensable Scout," *Armor* LXXXVI, no. 5 (September–October 1977): 10–12.

41. Ibid, 10–12, quotation from page 10.

42. Department of the Army, FM 17-95, *Cavalry* (Washington, DC: Headquarters, Department of the Army, 1977).

43. Ibid., i–ii, quotation from page i.

44. Ibid, chapters 1, 2, 5, and 6.

45. Ibid., 5-58.

46. Ibid., 5-2 to 5-3, 5-5, 5-58, quotation from page 5-33.

47. Ibid., 5-3 to 5-4, 5-18 to 5-19, 5-21.

48. Ibid., 3-13, 5-54.

49. Ibid., chapter 6, quotation from page 6-1.

50. Ibid., 7-14 to 7-16, appendix E.

51. Department of the Army, FM 71-100, *Armored and Mechanized Division Operations* (Washington, DC: Headquarters, Department of the Army, 1978), 1-3, 3-6, 3-10, 4-38, 5-3, quotation from page 5-3.

52. Department of the Army, FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force* (Washington, DC: Headquarters, Department of the Army, 1977), 6-2 to 6-3, 6-5, 6-10.

53. Ibid., 6-6, 6-8 to 6-9.

54. US Army Armor School, *Armor Reference Data* (Fort Knox, KY: US Army Armor School, 1974) Vol. II: 424, 427.

55. Captain Paul F. Nagengast Jr. and First Lieutenant Mack B. Gardner, "3 For 5," *Armor* LXXXIII, no. 1 (January–February 1974): 35–39.

56. Ibid.

57. US Army Armor School, *Armor Reference Data* (Fort Knox, KY: US Army Armor School, 1977), Vol. II: 428, 430; US Army Armor School, *Armor Reference Data* (Fort Knox, KY: US Army Armor School, 1978–1979), Vol. II: 492, 495.

58. *Armor Reference Data* (1974), Vol. I: 64, 67, Vol. II: 272, 275; US Army Armor School, *Armor Reference Data* (Fort Knox, KY: US Army Armor School, 1976), Vol. I: 47–48, Vol. II: 208, 210; *Armor Reference Data* (1978–1979), Vol. I: 64, 67, Vol. II: 358, 361; US Army Armor School, *Armor Reference Data* (Fort Knox, KY: US Army Armor School, 1979), Vol. II: 366, 369.

59. *Armor Reference Data* (1977), Vol. I: 51, 54, Vol. II change 2: 312, 315; *Armor Reference Data* (1978–1979), Vol. I: 68, 71, Vol. II: 362, 365; *Armor Reference Data* (1979), Vol. I: 254, 257, Vol II: 370, 373.

60. Corporal Gary Cheney, "Keeping the Scout Alive," *Armor* LXXXVI, no. 1 (January–February 1977): 4; Seward Smith, Thomas J. Thompson, and Alexander Nicolini, "Human Factors and Training Evaluation of the Improved TOW Vehicle (ITV) during OT/DT III," Report, August 1980, 2–5, Defense Technical Information Center (hereafter referred to as DTIC), Report no. ADA 101917; Staff Sergeant Craig C. Mosher, "The CFV as a Scout Vehicle is Questioned," *Armor*

XCI, no. 1 (January–February 1982): 3; Major (Promotable) Craig S. Harju Sr., "White Paper—A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," Report, US Army Armor School, Fort Knox, KY, 18 September 1989, 80, DTIC, Report no. AD-A214 798.

61. *Armor Reference Data* (1974), Vol. II: 250; *Armor Reference Data* (1976), Vol. II: 191; *Armor Reference Data* (1977), Vol. II: change 1: 288, 306; *Armor Reference Data* (1978–1979), Vol. II: 326, 334; *Armor Reference Data* (1979), Vol. II: 330, 360.

62. *Armor Reference Data* (1974), Vol. II: 264, 266; *Armor Reference Data* (1976), Vol. II: 202–203, 257–258; *Armor Reference Data* (1977), Vol. II: 304, 306, 420, 422; *Armor Reference Data* (1978–1979), Vol. II: 350, 484; *Armor Reference Data* (1979), Vol. II: 358, 360.

63. *Armor Reference Data* (1974), Vol. II: 272; *Armor Reference Data* (1976), Vol. II: 208, 263; *Armor Reference Data* (1977), Vol. II: change 2: 312, 428; *Armor Reference Data* (1978–1979), Vol. II: 358, 362, 492; *Armor Reference Data* (1979), Vol. II: 366.

64. *Armor Reference Data* (1974), Vol. I: 56, 58, 64; *Armor Reference Data* (1976), Vol. I: 39, 41, 47; *Armor Reference Data* (1977), Vol. I: change 2: 43, 45, 51; *Armor Reference Data* (1978–1979), Vol. I: 56, 58, 64, 68; *Armor Reference Data* (1979), Vol. I: 244, 250, 253–254, 257; FM 17-95 (1977), 3-9.

65. Captain Randy D. Tatum, "Cavalry's Traditional Role Endangered," *Armor* XC, no. 1 (January–February 1981): 3.

66. Department of the Army, FM 17-15: *Tank Units, Platoon, Company and Battalion* (Washington, DC: Headquarters, Department of the Army, 1966), change 2, 15 December 1972, 8, 10, 11.

67. FM 71-2 (1977), 6-2.

68. US Army Armor School, TC 17-36-2, *Armored Cavalry Platoon: Organization and Techniques of Movement* (Fort Knox, KY: US Army Armor School, 1975), 17

69. *Armor Reference Data* (1974), Vol. I: 188, 192, 195, 208; *Armor Reference Data* (1976), Vol. I: 119, 127, 129.

70. R.P. Hunnicutt, *Bradley: A History of American Fighting and Support Vehicles* (Novato, CA: Presidio Press, 1999), 232–233; Burton S. Boudinot, "Stealth in Scouting Requires Small, Quiet Vehicles, Not Guns," *Armor* CVIII, no. 6 (November–December 1999): 3.

71. *Armor Reference Data* (1977), Vol. I: 191, 207; *Armor Reference Data* (1978–1979), Vol. I: 226, 229, 274, 277; *Armor Reference Data* (1979), Vol. I: 214, 226, 230, 242.

72. *Armor Reference Data* (1979), Vol. I: 278, 281.

73. TC 17-36-2, 17; Patton, "In Support of the Scout," 5.

74. Lieutenant Colonel Burton S. Boudinot, "The Case for an Armored Dune Buggy," *Armor* LXXX, no. 3 (May–June 1971): 22–24.

75. Lieutenant Colonel Burton S. Boudinot, "An Approach to the Scout Dilemma," *Armor* LXXIX, no. 5 (September–October 1970): 44–45.

76. Captain Harold R. Wager et. al., "Reconnaissance/Scout Vehicle" (student report no. 58-25, US Army Armor School, Fort Knox, KY, 11 December 1967), US Army Armor School Library.

77. Captain Roland J. Bratisax, "Reconnaissance Vehicle" (student report no. 50-26, US Army Armor School, Fort Knox, KY, undated), quotation from page 1, US Army Armor School Library.

78. Captain Robert N. White, "A Reconnaissance Vehicle" (student report no. 45.60-150, US Army Armor School, Fort Knox, KY), US Army Armor School Library.

79. Captain Cecil A. Green, "Motorcycle Scouts," *Armor* LXXXIV, no. 2 (March–April 1975): 22–26.

80. US General Accounting Office, "Staff Study of the Armored Reconnaissance Scout Vehicle," Report, February 1975, 1, Armor Branch Archives, electronic files, Cavalry Development/1970s.

81. "Staff Study of the Armored Reconnaissance Scout Vehicle," 1; Diane L. Urbina, "'Lethal Beyond All Expectations': The Bradley Fighting Vehicle," in *Camp Colt to Desert Storm: The History of U.S. Armored Forces,* eds. George F. Hofmann and Donn A. Starry (Lexington, KY: University Press of Kentucky, 1999), 411; W. Blair Haworth Jr., *The Bradley and How It Got That Way: Technology, Institutions, and the Problem of Mechanized Infantry in the United States Army* (Westport, CT: Greenwood Press, 1999), 69–71.

82. Lieutenant Colonel David L. Funk and Captain Donald C. Snedeker, "Armored Reconnaissance Scout Vehicle Test," *Armor* LXXXIV, no. 5 (September–October 1975): 37–42.

83. Message, Major General Donn A. Starry to Major General Thomas M. Tarpley, Subj: MICV, ARSV, TOW, Cannon, 10 January 1975, MHI, Donn A. Starry Papers; Lieutenant Colonel David L. Funk, "ARSV Task Force Briefing," *Armor* LXXXIV, no. 6 (November–December 1975): 26–27.

84. Funk and Snedeker, "Armored Reconnaissance Vehicle Test," 37–42; Funk, "ARSV Task Force Briefing," 26–28; Starry to Tarpley, 10 January 1975; Message, Major General Donn A. Starry to General William E. DePuy, Subj: Armored Cavalry Vehicle Development, 8 September 1975, MHI, Donn A. Starry Papers.

85. Urbina, "Lethal Beyond All Expectations," 411–412, 417–421; Haworth, *The Bradley and How It Got That Way*, 78–83.

86. See James G. Burton's *The Pentagon Wars: Reformers Challenge the Old Guard* (Annapolis, MD: Naval Institute Press, 1993).

87. Urbina, "Lethal Beyond All Expectations," 424–427; Haworth, *The Bradley and How It Got That Way*, 88–90.

88. Captain Marc A. King, "The Battalion Scout Platoon is Alive and Well," *Armor* LXXXVII, no. 5 (September–October 1978): 35–37; Harju, "A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 72, 75.

89. King, "The Battalion Scout Platoon is Alive and Well," 35–37; Harju, "A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 75.

90. Harju, "A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 75.

91. Staff Sergeant Peter L. Bunce, "Appalled," *Armor* LXXXVIII, no. 6 (November–December 1979): 3.

92. Staff Sergeant Thomas P. Currie, "CFV Not For Scouts," *Armor* LXXXIX, no. 2 (March–April 1980): 2; Mosher, "The CFV as a Scout Vehicle is Questioned," 3.

93. "XM2 and 3," *Armor* LXXXVIII, no. 3 (May–June 1979): 30–34.

94. Sergeant Christopher F. Schneider, "Define the Scout's Mission," *Armor* LXXXIX, no. 2 (March–April 1980): 2.

95. Major Marc A. King, "Time to Get on Board," *Armor* LXXXIX, no. 2 (March–April 1980): 3.

96. Romjue, *Army of Excellence*, 26–28.

97. Swain, "AirLand Battle," 382–385.

98. Department of the Army, FM 100-5, *Operations* (Washington, DC: Headquarters, Department of the Army, 1982); Swain, "AirLand Battle," 384–390; Romjue, *From Active Defense to AirLand Battle*, 66–73.

99. Department of the Army, FM 100-5, *Operations* (Washington, DC: Headquarters, Department of the Army, 1986); Swain, "AirLand Battle," 390–392, quotation from page 392.

100. Romjue, *Army of Excellence*, 24–26, 85–87, 111.

101. Ibid., 55, 89–90,108, 126.

102. US Army Armor School, *Armor Reference Data* (Fort Knox, KY: US Army Armor School, 1981), Vol. III: 492, 494, 506, 509.

103. *Armor Reference Data* (1981), Vol. III: 492, 506, 509; Major Peter S. Kindsvatter, "The Army-of-Excellence Divisional Cavalry Squadron—A Doctrinal Step Backward?" (master's thesis, School of Advanced Military Studies (hereafter referred to as SAMS), Fort Leavenworth, KS, 2 December 1985), 24–25, Cavalry Branch Archives.

104. Kindsvatter, "The Army-of-Excellence Divisional Cavalry Squadron," 48.

105. Kindsvatter, "The Army-of-Excellence Divisional Cavalry Squadron," 23–25; Harju, "A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 76–77; Major Robert P. Bush, "The Division Commander's Eyes and Ears," *Armor* XCII, no. 4 (September–October 1983): 16–17.

106. Colonel William W. Crouch, "Soviet Reconnaissance Operations," *Armor* XC, no. 6 (November–December 1981): 28–29.

107. Captain Rodney B. Mitchell, "Reconnaissance Revisited," *Armor* XC, no. 6 (November–December 1981): 25–27.

108. Harju, "A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 76–77; Romjue, *Army of Excellence*, 95–96; Kindsvatter, "The Army-of-Excellence Divisional Cavalry Squadron," 25–26.

109. Kindsvatter, "The Army-of-Excellence Divisional Cavalry Squadron," 25–26, 33–36; Major Thomas A. Dials, "Economy of Force—the Cavalry

Connection," *Armor* XCII, no. 4 (July–August 1983): 45–46; First Lieutenant Geoffrey C. Davis, "The Three D's of Reconnaissance," *Armor* XCI, no. 1 (January–February 1982): 24.

110. Bush, "The Division Commander's Eyes and Ears," 15–16.

111. Ibid., 16–17.

112. Ibid., 17.

113. Lieutenant Colonel Bob E. Shambarger, "Eyes and Ears Defended," *Armor* XCIII, no. 1 (January–February 1984): 3.

114. Kindsvatter, "The Army-of-Excellence Divisional Cavalry Squadron," 33–36.

115. Memorandum, General William R. Richardson to General John A. Wickham Jr., Subj: Heavy Division Cavalry Squadron Design, 2 June 1986, Branch Archives; Memorandum, General William R. Richardson to General John A. Wickham Jr., Subj: Division Cavalry Study, 2 June 1986, quotation from same, Branch Archives.

116. John Cranston, "Assessment by Major General Thomas H. Tait of his Tenure as Commanding General, US Army Armor Center and Fort Knox, June 1986–August 1988, end of tour interview, 18 August 1989, 10–11, Branch Archives; John Cranston, "Final Interview, BG Dennis V. Crumley," end of tour interview, 20 June 1989, 12, Branch Archives; US Army Armor School, "Cavalry/Reconnaissance Net Assessment-Master Plan," 31 August 1988, 1–9, Branch Archives; Major General Robert E. Wagner, "Division Cavalry: The Broken Sabre," *Armor* XCVIII, no. 5 (September–October 1989): 39–40.

117. Major General Thomas H. Tait, "Commander's Hatch: Reconnaissance," *Armor* XCVI, no. 2 (March–April 1987): 5.

118. Major General Thomas H. Tait, "Commander's Hatch: Remembering Some Lessons Learned," *Armor* XCVI, no. 4 (July–August 1987): 6–7.

119. Message, General Joseph T. Palastra Jr. to General Maxwell R. Thurman, Subj: Cavalry Missions and Structure, 4 April 1988, Branch Archives.

120. Memorandum, Colonel Jarrett J. Robertson to CG, FORSCOM, Subj: Cavalry Missions and Structure, 26 February 1988, 3–4, quotation from page 3.

121. "Cavalry/Reconnaissance Net Assessment-Master Plan," 2-40 to 2-41. The 2d Squadron, 1st Cavalry Regiment was the division cavalry squadron for the 2d Armored Division.

122. Robertson to CG, FORSCOM, 26 February 1988, 3; Staff Sergeant Junius B. Hammer III, "Ground Cav 'Lost in the Shuffle'?" *Armor* SCIV, no. 6 (November–December 1985): 3; Phillip J. Zeller Jr., "Leave the Cav Where It Is," *Armor* XCIV, no. 4 (July–August 1985): 2.

123. Richardson to Wickham, Subj: Heavy Division Cavalry Squadron Design, 2 June 1986.

124. Memorandum, Major General William A. Roosma to Commanding General, Subj: Cavalry Missions and Structure, c. 1988, Branch Archives.

125. Message, Major General E. Parker to Major General Thomas H. Tait, Subj: Reconnaissance/Counter Reconnaisance/Surveillance Forces, 23 August 1988, Branch Archives.

126. "Cavalry/Reconnaissance Net Assessment-Master Plan," quotation from page 1-4.

127. Ibid., 2-68 to 2-70, 2-71 to 2-73, quotation from page 2-68.

128. US Army Armor Center, FKSM 71-8, *Close Combat Heavy (CCH) Maneuver Organizations* (Fort Knox, KY: US Army Armor Center, 1989), Q-1.

129. Major Marc A. King, "2X2: The Regimental Cavalry Troop," *Armor* XC, no. 2 (March–April 1981): 12–13.

130. "Cavalry/Reconnaissance Net Assessment-Master Plan," 1-9 to 1-10.

131. Richardson to Wickham, Subj: Heavy Division Cavalry Squadron Design, 2 June 1986.

132. Message, Commander, US Army Armor Center (USAARMC) to Commander, US Army Training and Doctrine Command (TRADOC), 31 May 1988, see attached discussion sheet outlining problems associated with the long-range surveillance detachment, Branch Archives.

133. Message, Brigadier General William W. Hartzog to Brigadier General Dennis V. Crumley, Subj: Reconnaissance/Counter Reconnaissance/Surveillance Forces Study In-Process Review (IPR), 12 July 1988, Branch Archives.

134. Memorandum, Lieutenant Colonel Gordon E. Sayre Jr. to Commandant, US Army Armor School (USAARMS), Subj: Cavalry Missions and Structure, 25 April 1988, Branch Archives.

135. Anne W. Chapman, *The Origins and Development of the National Training Center 1976–1984* (Washington, DC: Center of Military History, 1997), 107.

136. Major Terry A. Wolff, "Tactical Reconnaissance and Security for the Armor Battalion Commander: Is the Scout Platoon Combat Capable or Combat Ineffective?" (student report, SAMS, Fort Leavenworth, KS, 27 December 1990), 14, DTIC Report no. ADA233108.

137. Wolff, "Tactical Reconnaissance and Security for the Armor Battalion Commander," 14; National Training Center, "National Training Center Commander's Memorandum: Lessons Learned," Report, 20 November 1985, cover page, Branch Archives.

138. Major Christopher M. Hickey, "Heavy Brigade Offensive Reconnaissance Operations: A Systems Perspective" (student report, SAMS, Fort Leavenworth, KS, 18 December 1997), 16, 48 #39.

139. Hickey, "Heavy Brigade Offensive Reconnaissance Operations," 18–19; Wolff, "Tactical Reconnaissance and Security for the Armor Battalion Commander," 16–17.

140. Major John D. Rosenberger, "An Assessment of Reconnaissance and Counterreconnaissance Operations at the National Training Center," Report, February 1987, 1–2, Branch Archives.

141. Ibid., 3.

142. Ibid.

143. Ibid., 4.

144. Ibid., 8.

145. Ibid., 4–8.

146. Ibid., 8–9.

147. Ibid., 8–9, quotation from page 8.

148. Ibid., 10.

149. Ibid., 16; Cranston, "Assessment by Major General Thomas H. Tait of his Tenure as Commanding General," 12, quotation from page 12.

150. Rosenberger, "An Assessment of Reconnaissance and Counterreconnaissance Operations," 16.

151. Ibid.

152. "HMMWV History," *Olive Drab*, http://www.olive-drab.com/od_mvy_hmmwv_history.php (accessed 19 September 2008); "High Mobility Multipurpose Wheeled Vehicle (HMMWV)," http://www.globalsecurity.org/military/systems/ground/hmmwv.htm (accessed 19 September 2008).

153. Hickey, "Heavy Brigade Offensive Reconnaissance Operations," 19.

154. Lieutenant Colonel Thomas C. McCarthy, "U.S. Army Heavy Brigade Reconnaissance During Offensive Operations" (student report, SAMS, Fort Leavenworth, KS, 1994), 18–19.

155. US Army Center for Army Lessons Learned, *Compendium* (Fort Leavenworth, KS: Center for Army Lessons Learned, 1988), Vol. I: Heavy Forces, 4–6, quotation from page 5.

156. Sergeant Richard G. Johnston, "Flaws Seen in Light Scout Concept," *Armor* XCVIII, no. 5 (September–October 1989): 3.

157. Message, Lieutenant General Crosby E. Saint to General Joseph T. Palastra Jr., Subj: Training at the NTC, c. 1988, 3–4, Branch Archives.

158. Captain Mark B. Chakwin, "Cavalry and the Light Division," *Armor* XCVI, no. 1 (January–February 1987): 36–37.

159. "Cavalry/Reconnaissance Net Assessment—Master Plan," 2-10 to 2-11; Harju, "A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 109–113.

160. Major Barry Scribner, "HMMWVs and Scouts: Do They Mix?" *Armor* XCVIII, no. 4 (July–August 1989): 33–38.

161. US Army Armor School, "Proponent Evaluation Report for the Concept Evaluation of the Maneuver Battalion Scout Platoon," Fort Knox, KY, 12 March 1990, 1–3, 13, quotation from page 13, DTIC Report no. ADA224363.

162. Ibid., 16, 32–34, quotation from page 16.

163. Memorandum for record, Subj: LAV-25 in the XVIII ABN Corps, undated, Branch Archives.

164. Memorandum, Colonel F. McFarren to Headquarters, Department of the Army, Subj: Operational Needs Statement for Light Armored Vehicle (LAV), 13 August 1989, 1, Branch Archives.

165. Department of the Army, FM 17-98, *The Army 86 Scout Platoon* (Washington, DC: Headquarters, Department of the Army, 1985), 1-1, 1-4.

166. Ibid., chapter 2.

167. Ibid., chapter 2, quotation from page 2-13.

168. Ibid., chapter 3.

169. Wolff, "Tactical Reconnaissance and Security for the Armor Battalion Commander," 14; Harju, "A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," 80–82.

170. Department of the Army, FM 17-98, *Scout Platoon* (Washington, DC: Headquarters, Department of the Army, 1987), 1-4 to 1-5.

171. Ibid., chapters 2 and 3.

172. Ibid., chapters 4 and 5.

173. Captain Bart Howard, "The HMMWV Scout Platoon," *Armor* XCVIII, no. 4 (July–August 1989): 3, 53.

174. Captain Dale E. Wilson, "Improving the J-Series HHC," *Armor* XCIV, no. 6 (November–December 1985): 2–3, quotation from page 2.

175. Ibid., 2.

176. Department of the Army, FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force* (Washington, DC: Headquarters, Department of the Army, 1988), iv, 1-8 to 1-10, 3-20, 3-29, 3-46, 3-51, 4-25.

177. Department of the Army, FM 17-97, *Regimental Armored Cavalry Troop* (Washington, DC: Headquarters, Department of the Army, 1988), iii, 1-2, 1-6 to 1-7.

178. Ibid., chapter 3.

179. Ibid., 3-3 to 3-4.

180. John Cranston, "Final Taped Interview With Brigadier General Paul E. Funk," end of tour interview, 15 October 1987, 31, Branch Archives.

181. John Cranston, "US Army Armor Center and Fort Knox Annual Command History CY87," Fort Knox, KY, 64–65, Branch Archives.

182. Major General Thomas H. Tait, "Evolution of Armor," Armor Conference Report to Force, 10 May 1989, Branch Archives; "Officer Training in Reconnaissance," *Armor* XCVII, no. 5 (September–October 1988): 51.

183. John Cranston, "US Army Armor Center and Fort Knox Annual Command History CY88," Fort Knox, KY, 38–39, Branch Archives.

184. Cranston, "US Army Armor Center and Fort Knox Annual Command History CY87," 66–67; Cranston, "US Army Armor Center and Fort Knox Annual Command History CY88," 34–35.

185. Cranston, "US Army Armor Center and Fort Knox Annual Command History CY88," 47, 62–63; John Cranston, "US Army Armor Center and Fort Knox Annual Command History CY89," Fort Knox, KY, 27–29, Branch Archives.

186. US Army Armor Center, "Desert Shield and Desert Storm Emerging Observations," Report, 7 October 1991, 4–14, Branch Archives.

187. Colonel Michael D. Krause, "The Battle of 73 Easting, 26 February 1991: A Historical Introduction to a Simulation," Report, 2 May 1991, Branch Archives; First Lieutenant John Hillen, "2d Armored Cavalry: The Campaign to Liberate Kuwait," *Armor* C, no. 4 (July–August 1991): 8–12.

188. Krause, "The Battle of 73 Easting."

189. "Desert Shield and Desert Storm Emerging Observations," 4–5.

190. Major Joseph C. Barto III, *Task Force 2-4 Cav—"First In, Last Out": The History of the 2d Squadron, 4th Cavalry Regiment, During Operation Desert Storm* (Fort Leavenworth, KS: US Army Command and General Staff College, 1993), 3, 5–7.

191. Ibid., 5, 11–12.

192. Ibid., 5–6, 9, 12, 44.

193. Ibid., 11, 23, 33, 44, 47, 62, 66–67, 72.

194. Ibid., 62, 70, 83.

195. "Desert Shield and Desert Storm Emerging Observations," 4–5; John Cranston, Interview with Major General Thomas C. Foley, 20 July 1991, 2, Branch Archives.

196. "Desert Shield and Desert Storm Emerging Observations," 4–7.

197. Cranston, Interview with Major General Foley, 20 July 1991, 2.

198. "Desert Shield and Desert Storm Emerging Observations," 1-12 to 1-13.

199. Haworth, *The Bradley and How It Got That Way*, 103, 137–138, 142, 143.

200. Captain Douglas C. Robbins, "Operation Desert Storm: Battle of Norfolk—Scout Platoon, Task Force 5-16, 1ID," personal experience monograph, April 1991, 1, Branch Archives.

201. "Desert Shield and Desert Storm Emerging Observations," 1-13, 6-27, quotation from page 6-28.

202. Haworth, *The Bradley and How It Got That Way*, 143.

203. Robbins, "Operation Desert Storm: Battle of Norfolk," entire, quotation from page 3.

204. Haworth, *The Bradley and How It Got That Way*, 141.

205. First Lieutenant John Alan Hyatt, "The LAV-25 in the Scout Role," *Armor* C, no. 5 (September–October 1991): 32–33.

206. "Desert Shield and Desert Storm Emerging Observations," 4–7.

207. "Desert Shield and Desert Storm Emerging Observations," 1–4; First Lieutenant (Promotable) Charles W. Gameros Jr., "Scout HMMWVs and Bradley CFVs: Gulf War Provides a Comparison of Scout Vehicles and MTOEs," *Armor* C, no. 5 (September–October 1991): 21–25.

208. "Desert Shield and Desert Storm Emerging Observations," 4–7.

209. McCarthy, "U.S. Army Heavy Brigade Reconnaissance During Offensive Operations," 24–25.

210. Ibid., 31.

211. "Desert Shield and Desert Storm Emerging Observations," 4–7, 4–8.

Chapter 7

Force XXI and the Winds of Change

The 1990s opened with the Cold War's end, the Gulf War victory, and an explosion of new information technology. Harnessing this new technology to combat organizations constituted the essence of Force XXI, which occupied much of the Army's focus and funding. For much of the decade, however, most combat organizations struggled to sustain readiness with existing equipment while supporting deployments in response to regional crises. Operations other than war became a significant influence, necessitating a broadening of doctrine and training measures. Mounted reconnaissance organizations reflected these broad changes through greater emphasis on lighter and more deployable units. Doctrine began to reflect a greater emphasis on stealth, anticipating the fielding of new materiel to facilitate undetected operations. Conversely, a growing willingness to experiment with combined arms reconnaissance teams, the return of tanks to the heavy division cavalry squadrons, and recurring platform survivability concerns reflected a persistent interest in versatile, combat capable units. The coexistence of these two trends mirrored the Army's transitional state between the heavier Army of Excellence organizations and the lighter, high-tech Force XXI formations.

The Post-Cold War Army

Operation DESERT STORM showcased the Army of Excellence and the related effects of improved doctrine, training, and materiel. The Gulf War also constituted the largest massing of American armor and cavalry organizations since World War II. Yet shortly after the victory over Iraq, the force responsible for it began to evaporate. The Gulf War became a footnote to the broader changes triggered by the Cold War's end and the Soviet Union's collapse. The need for a large standing army disappeared, and deactivation and downsizing followed. Within a few years, the number of Active Component divisions fell from 18 to 10, accompanied by installation closings and the removal of some American forces from Germany.[1]

Without a persistent Warsaw Pact threat, the Army began to reassess the changed operational environment. Regional crises replaced the danger of superpower conflict, and Army policy envisioned the need for a force capable of coping with two such crises simultaneously. This policy encouraged the development of a more flexible force, capable of global deployment and performing missions ranging from conventional battle to humanitarian

assistance. The Army's posture changed from one of forward deployment to facilitate early entrance into battle to force projection, necessitating the deployment of combat organizations from the United States.

Despite the end of the Cold War, overseas deployments of Army personnel rose to unprecedented levels throughout the 1990s. Major operations such as those mounted in Somalia, Haiti, Bosnia, and Kosovo captured headlines, but soldiers found themselves serving in many other regions as well. Between the eve of Operation DESERT STORM and 1995, for example, 42 separate military operations occurred, not including the Gulf War. These operations included security and evacuation missions in Liberia, humanitarian relief in Rwanda, observer teams along the Ecuador-Peru border, evacuation of noncombatants from Sierra Leone, participation in multinational observation of the 1976 Israeli-Egyptian peace treaty, and supporting the California National Guard to suppress rioting in Los Angeles.[2] American ground forces also remained as a deterrent along the demilitarized zone on the Korean peninsula and remained in Saudi Arabia and Kuwait to protect both countries from further Iraqi aggression.[3]

These activities increased the visibility given to a broad range of actions other than conventional battle. They triggered changes in doctrine to ensure that soldiers deploying on humanitarian, stability, peace enforcement, or operations other than war possessed the guidance and training necessary to complete their missions. The frequency of these missions increased the visibility and importance attached to light forces, including light cavalry and armor. They could deploy on short notice and required fewer transportation assets to do so.

In addition to rapid deployability, lessons learned from Operation DESERT STORM underscored the importance of accelerating the pace of information sharing on the battlefield. Disseminating maps and graphics electronically, for example, obviated the need for manually marking maps, developing overlays, and distributing them. Eliminating this time-consuming process would hasten planning and decisionmaking. Moreover, rapid information sharing might prevent a recurrence of the Gulf War's high fratricide rates.[4]

An explosion of new information technology in the 1990s made the realization of these goals possible. In addition to rapidly sharing a broad range of information, situational awareness could be boosted through comprehensive and partly automated tracking of battlefield activity. Commanders able to see the battlefield in detail as it developed, track enemy and friendly forces, develop a computer-driven plan of action, and instantly transmit it to subordinate leaders could maneuver with a degree of unprecedented

precision and speed. Such a style of battle command held revolutionary implications that affected nearly every facet of military activity.

Realizing this vision and determining how best to exploit information technologies became the essence of a new Army initiative known as Force XXI. It served as the Army's vehicle for modernization throughout the decade. The ability to employ combat assets at a precise moment and location to achieve a decisive superiority made it possible for a smaller force to achieve a greater effect against an enemy. The AirLand objective of defeating the enemy throughout his breadth and depth remained, but the manner in which this occurred began to evolve and accelerate.

At the start of the decade, these concepts constituted little more than untested theory. In the wake of the Gulf War, they received widespread attention among the senior Army leadership and became the focus of a sustained analysis and experimentation effort. In 1992, the Training and Doctrine Command (TRADOC) established battle labs to link the analysis and experimentation work of each branch with the research and development capabilities of industry. The battle labs combined computer simulations with live training to provide research in support of Force XXI activities.[5]

Courtesy *Armor Magazine*

Figure 92. Scouts of the 1st Squadron, 1st Cavalry Regiment.

The complexity of implementing Force XXI concepts resulted in the creation of a mechanism to identify key issues, explore them, and determine which to pursue. The name given to this process was the Louisiana Maneuvers, a reference to the pre-World War II maneuvers conducted to assess readiness issues in 1940 and 1941. In 1993, the designation applied to the collective efforts of senior leaders, branch schools, and battle labs who worked together to plan how the process of changing the Army should occur. General officers from across the Army recommended subjects to be considered for development. These were then

assessed and assigned to particular schools and battle labs for analysis and recommendations. Finally, a senior officer board of directors decided on which items should be forwarded to the Chief of Staff for final approval and funding authority.[6]

The Louisiana Maneuvers helped to outline the basic course of Force XXI development, but determination of specific equipment, tactics, organization, and training measures required more detailed work. In 1993–94, the Army established in succession two Digitization Special Task Forces, which began the process of matching real soldiers with test organizations and materiel in field conditions. These efforts evolved into a series of Army Warfighting Experiments conducted at the combat training centers. These experiments helped determine how to integrate new technology into combat units and how to restructure their organization, doctrine, and training. They served as large-scale concept explorations, offering indicators as to which concepts and systems seemed most promising and fed Army modernization plans.[7]

The first such experiment involved a heavy battalion task force conducting a rotation at the National Training Center (NTC) in 1994. Known as Desert Hammer VI, this event illustrated the fallacy of forming a new organization, issuing it new and even prototype equipment, and sending it into battle with little training. The task force fared poorly, but the experience provided important lessons for the further development of an armored task force equipped with digital computers and communications systems. It also demonstrated that shared situational awareness throughout the task force improved how it fought. Moreover, the digital communications systems and information sharing permitted the task force to see and operate over a much greater area.[8]

The same year witnessed the publication of TRADOC Pamphlet 525-5, *Military Operations: Force XXI Operations, A Concept for the Evolution of Full-Dimension Operations for the Strategic Army of the Early Twenty-First Century*. The TRADOC publication offered a concept and vision of future conflict together with guidance to shape future Army development. In effect, it became the blueprint for the redesigned Army of the 21st century. The expected operational environment constituted the central influence on future development. TRADOC expected the acceleration of information acquisition, analysis, and sharing to alter fundamentally the conduct and pace of battle. It envisioned a period of about 15 years during which the Army would reorient itself from 20th century threats to the Information Age of the 21st century through the innovative application and employment of emerging technologies.[9]

A primary theme throughout the TRADOC publication lay in the emphasis given to the flow of information, which would occur faster and simultaneously both vertically in the command chain and horizontally among tactical components. It permitted a faster decisionmaking process over a broader battlespace. A related change lay in a shift from sequential to simultaneous tactical operations. In the conduct of battle, the physical massing of men and materiel gave way to an emphasis on managing the effects of weapons systems via digital communications and computers without necessarily concentrating them. The integration of all systems and their combat power provided the means to execute multiple strikes on the enemy throughout his depth to create "massive systemic shock." In this environment, the Army required doctrinal flexibility, strategic mobility, and the ability to tailor organizations to meet specific operational conditions.[10]

In 1995, the Army created the Force XXI Experimental Force (EXFOR) to help determine what systems to develop and how to integrate them into a tactical framework. The EXFOR served to "experiment with and test new organization designs, warfighting/operational concepts, training, and equipment that produces enhancements in the lethality, survivability, tempo, sustainability, deployability, joint/combined linkages, and versatility of the force." EXFOR became a test bed for Force XXI. It replaced the ad hoc organization employed during Desert Hammer VI with a permanent force built on a brigade combat team (BCT) from the 4th Infantry Division (Mechanized), stationed at Fort Hood, Texas.[11]

By 1997, Force XXI developments were evolving from concept to reality. New materiel, especially in computers and digital communications, made possible the goal of building a combat unit whose components shared a common, automatically updated view of the battlefield. Advanced Warfighting Experiment Task Force (TF) XXI in March 1997 clearly demonstrated this status. Unlike the earlier Desert Hammer VI, TF XXI employed an entire brigade trained on more reliable digital equipment at the NTC. It proved capable of conducting continuous operations over a much broader area and securing a steady stream of information on friendly and enemy actions throughout.[12]

The TF XXI experience demonstrated that digitization significantly increased situational awareness by providing a "Napoleonic view of the battlefield."[13] It assisted tactical maneuver and permitted unit tactical operations centers to track battlefield events better than previously possible. Therefore, they could direct more attention to analyzing events and responding to them. Commanders proved better able to concentrate

their forces against objectives by exploiting the situational awareness provided. Joint Surveillance and Target Attack Radar System (JSTARS) and Unmanned Aerial Vehicles (UAVs) permitted tracking opposing force (OPFOR) elements and providing early warning of their actions. JSTARS linked Army command and control nodes with Air Force platforms and remote military analysis, while the UAV constituted a pilotless drone remotely controlled to fly over the battlefield and collect real-time imagery and data on activities and locations.[14]

TF XXI validated the principles inherent to Force XXI. Digital forces were able to practice a degree of precision maneuver through reliance on a wide array of intelligence sources that provided a continuous stream of information to commanders. The potential for much faster and more focused operations clearly existed. It also demonstrated the embryonic state of truly digitized combat units. More work was required before a digital unit would be ready for an operational deployment.

In November 1997, the Division Advanced Warfighting Experiment helped to guide ongoing division redesign efforts by indicating how a digital division might operate. In the largely computer-based experiment, units maneuvered over greatly extended distances, and brigades operated almost independently of division control. The improvement in situational awareness that accompanied expanded use of digital equipment permitted a faster operational tempo. The combination of attack helicopters, UAVs, and JSTARS also provided the division commander an unprecedented ability to destroy hostile combat power long before it could begin tactical engagements. In this sense, the Division Advanced Warfighting Experiment marked an evolution in AirLand Battle, with its emphasis on destroying enemy initial and follow-on echelons at once. Digital systems seemed to increase considerably the ability to do so at a faster rate.[15]

Transforming these promising concepts into battlefield reality required time. Too much of the materiel in use remained in a developmental or prototype stage. Improvements continued throughout the decade, but their effects on field units remained marginal. Instead, the EXFOR remained the principal beneficiary of new equipment and improvements. For the rest of the force, improvements occurred largely through upgrades to existing materiel or the fielding of new equipment whose development predated the onset of Force XXI. Cavalry units benefited from the fielding of advanced versions of the Bradley Fighting Vehicle, the digital M1A2 Abrams tank, and the Apache Longbow helicopter.[16]

Force XXI development also influenced training, doctrine, and organization. While the EXFOR matured tactical concepts and requirements for

a heavy combat force, simultaneous work proceeded on these other areas to assist the Army's future transition to a digital force. The process was a slow one that occurred in the midst of routine training activities and overseas deployments. A degree of confusion surrounded the shift toward digital systems and units, leaving soldiers struggling to understand the new Force XXI tactical concepts while retaining more traditional skill sets. TRADOC worked to balance digital and nondigital training and doctrine development, believing firmly that traditional skills would retain their importance and utility. In the words of one TRADOC commander, "You are not going to rip out a computer and throw it at the enemy."[17]

Armor 2000

Despite the growing influence of Force XXI developments in the 1990s, the most tangible effects would not be seen until the decade's end. Against the backdrop of a shrinking national defense budget and downsizing, Armor planned its own development path that anticipated changing needs and emerging technologies. Armor 2000 provided the objectives necessary to guide branch modernization, including mounted reconnaissance. Developed in 1990, this plan incorporated evolving AirLand Battle concepts, new technologies, and the nature of the threat facing the nation. It identified capability deficiencies, recommended solutions, evaluated new technologies, and offered an updated force structure ready for implementation by 2000.[18]

The collapse of the Soviet Union and the successful conclusion of Operation DESERT STORM did not trigger fundamental changes to the plan. If anything, the subsequent downsizing and drop in military expenditures underscored the importance of clear developmental objectives. By late 1991, Armor faced the loss of 15 tank battalions, 2 division cavalry squadrons, and an armored cavalry regiment, coupled with the expected loss of 9,000 soldiers. However, the future battlefield was expected to be nonlinear, characterized by more dispersion and the availability of weapons and sensors better suited to the location and destruction of enemy forces. Such an environment increased the need and value of mounted reconnaissance and security organizations.[19]

Armor 2000 anticipated the 1990's trend toward combat organizations capable of both traditional combat and operations other than war, including humanitarian relief, stability, peacekeeping, and peace enforcement. Yet the plan considered armored organizations "woefully unprepared to support Light Forces operating in context with the emerging National Military Strategy emphasizing rapid projection of CONUS based combat power."[20] Recommendations to overcome this problem centered on

cavalry organizations. Platoons in the division cavalry squadron and armored cavalry regiment would return to the combined arms grouping of scouts, tanks, and mortars. The division cavalry squadron would gain a third ground cavalry troop while its air cavalry component transferred to division control. This action formalized the tendency of division commanders to transfer control of the air cavalry away from the squadron and acknowledged a longstanding desire to increase ground cavalry strength. The study also called for the creation of a light armored cavalry regiment to support the XVIII Airborne Corps, whose rapid deployability made it ideal for responding to sudden contingencies.[21]

Armor 2000 made no changes to the basic reconnaissance, security, and economy of force roles of cavalry organizations. Their ability to acquire information by a variety of means and develop tactical situations remained central to a commander's understanding of the battlefield. Symptomatic of the growing size of the battle area, cavalry organizations could expect to perform continuous operations day and night, leveraging their "unique organizational structure, equipment, training and interface with military satellites and electronic data links for position location and monitoring of enemy activities over wide and deep areas." In doing so, cavalry organizations expected combat whenever necessary for mission accomplishment.[22]

The Armor 2000 plan also called for the addition of a brigade scout unit similar in structure and purpose to the maneuver battalion scout platoon.

Armor Branch Archives

Figure 93. The M8 Armored Gun System, ready to enter production before its cancellation in 1996.

At both brigade and battalion, however, these scouts were optimized for reconnaissance by stealth. Unlike their cavalry counterparts, these units retained a pure rather than combined arms configuration. Their focus lay in gathering information and providing early warning of hostile action for their respective parent organization. Through their own scouts, brigade commanders would possess the means to focus attention on a particular area or activity on the battlefield, complementing the work of battalion reconnaissance.[23]

Armor 2000 constituted a master plan for the mounted branch and many of its salient features remained valid within a Force XXI context.[24] Responsibility for this continuity lay with Major General Thomas C. Foley, who commanded the Armor Center from 1989 until 1992. He both directed the initial study and observed the changes in the Army and the world that followed Operation DESERT STORM. Hence, both Armor 2000 and Force XXI objectives included improving the versatility and agility of cavalry organizations through expanded use of sensors, improved communications, and a new reconnaissance platform featuring the latest technology. General Foley stressed those developments that improved deployability, reduced fratricide, and contributed to advanced fire control systems with automated features. He also sought to replace the obsolescent M551 Sheridan with a light, air deployable platform that did not compromise lethality and required no extensive sustainment efforts. To reduce the workload associated with continuous operations in a nonlinear environment and expedite mission planning, Foley supported efforts to automate staffing procedures, reporting, and information dissemination, and to rapidly share digital imagery and overlays. Robotic organizations, automated staff and reporting functions, unmanned aerial vehicles, and non-line-of-sight weapons further underscored the futuristic tilt to the Armor 2000 study.[25]

Light Cavalry Emphasis

The Armor 2000 study recommended a light armored cavalry regiment suited to the Army's global focus and force projection nature. Interest in such an organization emerged in the 1980s, but a formal proposal failed to secure the Army Chief of Staff's approval.[26] Nevertheless, the Armor Center continued to list the light armored cavalry regiment among branch needs, considering it ideally suited for assignment to the XVIII Airborne Corps, which lacked a corps reconnaissance asset.[27] Similar recommendations also emerged from officers in the field.[28]

In 1990, at the behest of the Combined Arms Center (CAC) at Fort Leavenworth, Kansas, the Armor Center participated in a light cavalry regiment design effort together with the Aviation and Infantry Centers.

Study and analysis continued to September 1991. Senior Army leadership guidance then finalized the light armored cavalry regiment's design parameters.[29] The emerging mission set included contingency operations, training support for the Joint Readiness Training Center (JRTC), and provision of a standby component for immediate deployment.[30] TRADOC also studied regimental designs using different mixes of currently available equipment, seeking a balance between lethality and deployability. The favored equipment set included materiel in an early development stage, necessitating reliance on an interim solution. The high-mobility, multipurpose, wheeled vehicle (HMMWV); M3; LAV-25; M113; M1 Abrams tank; and M551 Sheridan all found incorporation in the varied proposals advanced. Each recommended vehicle set underwent evaluation on the basis of deployability, fuel consumption, mobility, survivability, lethality, and overall effectiveness.[31]

Further momentum came with the Army Chief of Staff's approval of the light armored cavalry regiment concept in December 1991. He further directed the redesignation of the 199th Separate Infantry Brigade (Motorized) as the 2d Armored Cavalry Regiment, Light, and its relocation from Fort Lewis, Washington, to Fort Polk, Louisiana. There it would support JRTC operations and maintain one squadron in readiness for immediate deployment.[32] This decision resolved two force structure issues. The first concerned the 199th Separate Infantry Brigade (Motorized). Throughout the 1980s, this unit comprised part of the 9th Infantry Division (Motorized), a high technology light division that served as a test bed for a new type of infantry formation. Despite a decade of experimentation, the formation underwent inactivation on the eve of the 1991 Gulf War. The 199th Brigade was retained as a separate unit, but its future remained uncertain. Similarly, after the Gulf War the 2d Armored Cavalry Regiment faced inactivation as part of Army downsizing. The motorized infantry brigade provided the initial equipment set to establish a light cavalry unit.[33]

The reconfigured 2d Armored Cavalry Regiment provided a reconnaissance and security capability for a low intensity environment. Intended for service with the XVIII Airborne Corps, the regimental headquarters would control that formation's division light cavalry squadrons and light armor battalion. It had to accommodate the separate deployment of at least one squadron. At Fort Polk, the 2d Armored Cavalry served as the JRTC OPFOR. Further design work continued, however, to maximize effectiveness within a 4,100-man personnel cap and air deployment into theater via a total of 400 C-141 sorties.[34]

Within these parameters, planners sought the most deployable, versatile, and lethal organization possible. They developed a transition plan

to realize gradually these qualities. Initially, the regiment would utilize equipment immediately available from the 199th Separate Infantry Brigade (Motorized). In this phase, the HMMWV constituted the primary platform, configured with either a machinegun, grenade launcher, or tube-launched, optically-tracked, wire-guided (TOW) missile launcher. The last weapon provided the unit's principal antiarmor protection. The transition from motorized infantry to cavalry was to be completed by 1995 with the incorporation of the 4th Squadron, 17th Air Cavalry Regiment. The next phase upgraded the vehicle set to include the Armored Gun System (AGS) and the M113A3. The final platform mix intended for fielding by 2004 included the AGS, the Future Scout Vehicle, the wheeled High Mobility Artillery Rocket System (HIMARS), and the RAH-66 Comanche armed reconnaissance helicopter. This objective state also included UAVs and non-line-of-sight (NLOS) weapons.[35]

These plans marked a steady evolution toward a robust organization, but the transition from motorized infantry to armored cavalry regiment raised questions. The I Corps leadership, for example, questioned the viability of an organization with dual responsibility for supporting the JRTC and developing as a rapid deployment force. The latter necessitated sustained training by the entire regiment likely to conflict with the needs of the JRTC. They also questioned the realism of regimental deployment with 400 aircraft sorties, when the 199th Brigade proved unable to deploy with fewer than 500. Some concern also emerged regarding the unit's ability to recover and repair vehicles with a minimal support capability.[36] Field artillery personnel disagreed with the intent to rely on towed howitzers, pending development and fielding of the HIMARS. They considered towed weapons unable to keep pace with the regiment and provide timely fire support. Their counterproposal to meet fire support needs with the tracked and armored M109A6 Paladin were rejected by the Armor Center due to the detrimental impact of the vehicle's weight on deployability.[37]

These concerns did not constitute opposition to the concept of a light cavalry regiment, which continued to receive support within TRADOC, Forces Command (FORSCOM), and Department of the Army.[38] The III Corps leadership, for example, proved supportive of the light cavalry regiment in any of its planned configurations, including its original HMMWV mix. The latter suited its need for a force oriented on reconnaissance with a limited security capability. Moreover, the corps leadership considered the ability of a lighter force to arrive in theater faster worth the cost of less combat power.[39]

In July 1992, the 199th Infantry Brigade (Motorized) became the 2d Armored Cavalry Regiment (Light).[40] The following year, it relocated to

Fort Polk. By then the baseline organization of the new light regiment had been determined. It included a headquarters and headquarters troop (HHT), three ground cavalry squadrons, a regimental aviation squadron, and a support squadron. Organic military intelligence, engineer, air defense artillery, and chemical reconnaissance companies provided combat support. Overall, the regiment numbered 4,017 soldiers and included 402 HMMWVs, 108 HMMWVs with TOW missile launchers, 33 helicopters, 18 mortars, and 24 towed howitzers. The general organization paralleled the proven configuration of the heavy armored cavalry regiment. The headquarters also retained the capacity to control a variety of attachments, while the support squadron could detach assets to sustain a squadron independently employed. Combat support assets proved more austere than those of the heavier regiments. Air defense focus lay on helicopters while the chemical reconnaissance and engineer assets represented the minimum necessary. The military intelligence company, however, included the means to access intelligence and data from higher headquarters and national intelligence sources prior to and during deployments.[41]

The Armor Center coordinated training and doctrinal development directly with the regiment. It prepared to train cavalry troopers for assignment to the light cavalry regiment, and it compiled the field manuals, gunnery training, and tactics appropriate to light cavalry operations.[42] Despite this energy, expectation inherent to most doctrinal and organizational actions remained on a unit built around an AGS/M113 mix. So equipped, the regiment possessed credible lethality, mobility, and survivability. Its missions included those of screen, guard, and covering force operations for a light corps, and it possessed the ability to fight for information.[43]

Realizing these capabilities sooner rather than later became more important in the wake of American experiences in Somalia. There, US forces deployed to ensure the safe delivery of humanitarian aid found themselves confronting armed factions, culminating in a major firefight in Mogadishu in October 1993. The fighting demonstrated the vulnerability of the unarmored HMMWV in a hostile city. The Somalian experience encouraged consideration of a better-protected platform and an accelerated transition of the 2d Armored Cavalry from HMMWVs to the M113A3. The latter vehicle began fielding in 1987, and it featured improvements to the engine and transmission in addition to the inclusion of spall liners. Relocating the fuel tanks to an external position freed internal space, and the ability to accommodate additional armor improved the platform's overall effectiveness and survivability.[44] Nevertheless, no immediate fielding of the M113A3 to the light cavalry regiment occurred. Its vehicle upgrade remained tied to the availability of the AGS.

The focus of soldiers assigned to the 2d Armored Cavalry Regiment (Light) lay in actually standing up the unit and training. Much of the transition to a HMMWV-based organization occurred in the 1993–94 timeframe, simultaneous with the shift in personnel from infantry to armor and cavalry backgrounds. At Fort Polk, two troops of the regiment served as the OPFOR during the first peace enforcement rotation conducted at the JRTC in November 1993. This activity gave the regiment experience in security patrols, checkpoint operations, and force protection measures. Sustainable, versatile, and encompassing many of the qualities traditionally associated with armored cavalry, the emerging light armored cavalry regiment offered a potential solution to the need for forces suited to operations other than war.[45]

Courtesy *Armor Magazine*

Figure 94. Elements of the 2d Cavalry Regiment in Haiti.

The first test of these qualities occurred in 1995. The United Nations (UN) intervened in Haiti to prevent that country's decline into chaos and civil war following political upheaval and persistent economic problems. The 2d Armored Cavalry participated in the UN action, supporting other elements from the XVIII Airborne Corps. The volatile situation in Haiti necessitated the use of the cavalry to deter violence through continuous patrols in and around the capital city of Port-au-Prince. These patrols operated continuously throughout the day and night, combining both mounted and dismounted operations. They always included at least two scout HMMWVs commanded by a noncommissioned officer (NCO) or lieutenant. When necessary, an infantry squad augmented the patrols and

narrowed the focus of their efforts on a particular neighborhood or city area. The patrols could be manipulated to saturate a locale or disperse over a broader area. Regimental soldiers also provided security for key installations considered central to government authority, and ensured the absence of violence during political elections. In this manner, they deviated from past practices dating from the Vietnam era in which the security of fixed sites was left to other forces to permit the cavalry to exploit its mobility. The 2d Armored Cavalry also performed more familiar missions, including convoy escort, traffic control, cordon and search, and quick reaction. The regimental staff formed the cadre for a joint task force command cell.[46]

The ground cavalry squadrons served tours in Haiti in succession and effectively tested the regiment's ability to deploy subordinate units independently. During its operations in Haiti, however, the regiment's squadrons benefited from the attachment of rifle companies and military policemen, which provided additional combat power and the means to cope with a difficult and confusing environment.[47]

Haiti provided a testing ground for the new light cavalry regiment and served to build unit cohesion. The last element did not return to the United States until 1997. By then, the rest of the regiment had completed training and deployed to Bosnia. There, US forces intervened to support UN peacekeeping operations, following several years of violence among ethnic factions that followed the collapse of central authority in Yugoslavia. As part of its preparation, the 2d Armored Cavalry completed an NTC rotation in 1996. There it was augmented with two artillery battalions, an engineer battalion, a signal company, and elements of a corps support battalion from the XVIII Airborne Corps. These accretions transformed the regiment into a more powerful combat team that proved effective against the OPFOR.[48]

In June 1997, the regiment also completed training at the JRTC before deploying to Europe. This training included interaction with civilian refugees, apprehension of suspected war criminals, and operations with a broad range of organizations not routinely experienced during more conventional, combat-oriented rotations. The regiment then moved to Germany, crossing the Sava River into Bosnia in August. In any event, the unit did not initially function as a single force. The regimental headquarters returned to Germany to conduct a training rotation at the Combat Maneuver Training Center (CMTC) with the 1st Armored Division. This exercise made the 2d Armored Cavalry the first unit to complete training at all three combat training centers in a single 12-month period. However, while the headquarters trained in Germany, the regiment temporarily remained scattered among five countries and two continents.[49]

This dispersal ended in the fall with the concentration of most of the unit in Bosnia. There it seized Serbian-held radio towers to prevent the broadcast of propaganda. It helped to create a local police force, provided security for public business related to implementation of peace measures, and helped to restore the Bosnian rail system. Through the execution of over 12,000 patrols, the regiment made its presence felt and served to deter potential violence. It also inspected weapons storage sites and oversaw the removal of over 12,000 mines. All of these activities necessitated direct and regular interaction with the indigenous population to gather intelligence and calm fears of renewed violence.[50]

The nature of operations in Bosnia required a different set of skills than more traditional military actions. The provision of election security, protection of faction leaders trying to resolve differences, and inspections of weapons storage sites became crucial operations. Reconnaissance remained a primary function of the ground and air cavalry squadrons, oriented less on a clear military threat and more on the actions of the civilian populace. Video documentation became a significant tool that assisted negotiations with local leaders and proved/disproved allegations of misconduct. The regimental aviation squadron performed missions similar to a wartime environment. These included route, area, and zone reconnaissance; area security; hasty attack; convoy escort; and, on occasion, air assault. Generally, the squadron employed two-aircraft teams that included a scout and a security platform. The OH-58D Kiowa helicopter proved an ideal reconnaissance vehicle in Bosnia and received considerable praise. In the event of a crisis, they were generally the first on the scene. Indeed, the efficacy of aviation generated concerns that the employment of overly aggressive tactics and weapons use undermined the political process of reconciliation.[51]

Ground cavalry found itself working with foreign soldiers and a variety of personnel not frequently included in scout teams. Among the latter were psychological operations teams, civil affairs personnel, and counterintelligence specialists. These individuals proved vital in understanding the cultural and political environment in which the regiment functioned, but coordination of their efforts with those of the regiment proved difficult.[52] Movement in the mountainous country suffered from the erosion of infrequently used skills, including route and bridge classification.[53] A host of other issues surrounded communications and administrative actions. In part, they stemmed from the growing use of computers and related hardware and software. Some soldiers proved unfamiliar with these systems, while other configurations did not permit interoperability among different

programs or computers. Coping with these problems amid the mountainous environment highlighted the pros and cons of the Army's increasing use of information technology in the field. The promise of more efficient data management had to be balanced against training and compatibility issues even as Force XXI pushed the boundaries of what could be realistically achieved.[54]

The 2d Cavalry's Bosnia experience stimulated interest in other light cavalry organizations, including those assigned to the light infantry division. These formations emerged in the 1980s to provide the Army a force to deploy rapidly outside Europe. The division cavalry squadron included a HHT, one ground cavalry troop, and two air cavalry troops. The ground troop included platoons equipped with HMMWVs carrying a TOW missile launcher, a 40-mm grenade launcher, or a .50-caliber machinegun.[55]

In 1993, the 3d Squadron, 17th Cavalry Regiment deployed to Somalia with its parent 10th Mountain Division to support humanitarian and peacekeeping operations. This operation marked the first employment of light cavalry in these roles. The operational area for the mounted unit included much of southwest Somalia and incorporated largely rural terrain. The single ground troop generally operated on or near the main supply routes, while the air cavalry troops roamed throughout the operational area. Squadron missions performed included area reconnaissance, convoy escort, raids, show of force patrols, quick reaction force, force protection, road checkpoints, and village assessments intended to gather intelligence.[56]

To perform these missions, the ground cavalry troop possessed less than its full strength. It deployed with only 42 of 66 soldiers. To provide all HMMWVs with a 3-man crew, it used only 13 of its available 22 vehicles. It operated as three platoons with a small headquarters element. Each platoon included two HMMWVs equipped with a TOW missile launcher and one or two HMMWVs with either a grenade launcher or a .50-caliber machinegun. The TOW HMMWVs also mounted an M-60 machinegun. The troop possessed no organic mortar support, although it benefited from the attachment of medical and maintenance contact teams. Further augmentation included interpreters and a counterintelligence team. Nevertheless, the ground cavalry troop remained a small force responsible for operations over a broad area, necessitating continuous long-distance movement. Vehicle load plans reduced the amount of ammunition and equipment carried in favor of more fuel and water.[57]

Whenever possible, the squadron sought to coordinate the actions of its ground and air components. The air cavalry helped to locate routes for the HMMWVs to move over and identified villages not labeled on any

map. Helicopters also permitted access to remote areas and difficult terrain. The ground scouts generally operated mounted, leaving their vehicles only to reconnoiter positions that could not be reached by HMMWV. They remained in close proximity to their mounts, however, and sometimes were overwatched by air cavalry. Global positioning systems (GPSs) greatly enhanced navigation and permitted a high degree of precision in coordinating actions of HMMWVs and helicopters.[58]

The squadron faced a number of challenges even though hostile resistance proved scarce. The squadron became a task force headquarters responsible for control of additional forces. The air cavalry also assumed the role of aviation headquarters for all Army forces, following the departure of the 10th Mountain Division's aviation brigade headquarters. This change provided some additional assets while increasing command responsibilities. The size of the operational area underscored the importance of reliable, long-range communications and vehicle/aircraft sustainment. It also necessitated the squadron establishing up to three different command posts in a manner reminiscent of cavalry units in Vietnam. The dispersion of squadron assets further increased the importance of effective leadership at the platoon and section level, since junior leaders in charge of checkpoints and patrols often could not rely on immediate access to senior commanders for guidance.[59]

One of the most common operations performed by light cavalry in Somali included checkpoints intended to interdict the movement of rogue personnel. Established at random locations and intervals, they also served to monitor civilian movement. The rural nature of the operational area and the general dearth of obstacle materials posed challenges. Poor road conditions encouraged traffic to utilize camel paths that paralleled the roadway and effectively extended the area each checkpoint needed to control. The absence of obstacle materials other than concertina wire also forced each checkpoint to be located where it could be linked to natural obstructions. Although the ground cavalry developed standard operating procedures for checkpoints prior to deployment, it did not anticipate routinely operating them at night. Lacking sufficient night vision devices, scouts relied on vehicle headlights and the thermal sight of the TOW missile launchers to track vehicles approaching checkpoints. Each checkpoint also required an entire platoon, constituting a significant commitment of the troop's already diminished strength. The unit overcame these difficulties, but its ability to do so was considerably improved by the absence of any organized resistance and the generally friendly disposition of the populace in the area—in sharp contrast to the violent reaction to the American presence in Mogadishu.[60]

Courtesy *Armor Magazine*

Figure 95. Enforcing the peace—Bosnia

The operations of the 2d Armored Cavalry and the 3d Squadron, 17th Cavalry sustained interest in light cavalry. They offered an answer to the problem identified when the United States first deployed forces to Saudi Arabia in response to Iraq's invasion of Kuwait. Initially, the 82d Airborne Division represented the only American force in theater ready to defend the Saudis against further Iraqi aggression. The division, however, lacked sufficient combat power to cope with a powerful mechanized threat. Until the arrival of heavier forces, the formation remained vulnerable. The problem remained unresolved and a persistent concern to formation commanders, exemplified by the observation of the III Corps commander in 1992:

> The build up of a credible military force during Desert Shield showed that there is, in fact, a window of vulnerability between the arrival of light and armored forces in an operational theater. The existing force structure currently provides to a corps headquarters an armored cavalry regiment that has similar deployability requirements as a heavy division. In effect, the initial entry light forces are left without a corps level reconnaissance and security force in the operational theater until the arrival of the armored cavalry regiment.[61]

As the Army leadership developed the military force structure in the 1990s, they sought a rapidly deployable combat force with the means to protect initial entry forces until the arrival of heavier units. Light cavalry seemed ideal for this role, but first its capabilities required improvement. A 1993 Armor Center analysis of light division cavalry organizations found them lacking in uniformity and unable to meet their parent formation's needs.[62] The light infantry division cavalry included a headquarters, a single ground troop equipped with HMMWVs, and two OH-58D Kiowa Warrior aviation troops. The HMMWV-equipped ground component

possessed just 66 officers and men organized into a headquarters section and 4 scout platoons.[63] The 82d Airborne Division included an additional aviation troop, but the 101st Air Assault Division possessed four aviation troops without any ground cavalry.[64]

The Armor Center sought a single cavalry squadron configuration for all three division types. The proposed organization included a headquarters, two light ground cavalry troops, three aviation troops, and organic service support. The last element eliminated the squadron's dependency on the division aviation brigade for maintenance and supply, facilitating the squadron's use directly under division control. The increased ground strength improved the squadron's ability to operate under all weather, climate, and terrain conditions. It also made possible the establishment of observation posts and checkpoints for long periods, permitted detailed terrain reconnaissance, and offered more stealthy reconnaissance capability. The ground cavalry troops retained the existing mix of scout and TOW HMMWVs, but added a mortar section.[65]

Field commanders proved generally positive, although concerns emerged about the deployability impact of the expanded ground cavalry component. These concerns were most pronounced among the leadership of the 101st Air Assault and 82d Airborne Divisions, whose formations depended on available helicopters for transportation. In the 10th Mountain Division, the proposal found acceptance without reservation. The formation leadership desired a cavalry squadron capable of more than just reconnaissance, and their views found support among the Aviation Center and the JRTC.[66] Nevertheless, the standard light cavalry design never progressed beyond a conceptual state in the 1990s. It failed to attract the resources and authorization necessary for implementation.[67]

Heavy Cavalry

Among the Army's heavy forces, cavalry organizations underwent significant change. By mid-decade, the Active Component retained only one armored cavalry regiment. The 2d Armored Cavalry Regiment transitioned into a light regiment in 1993, and the 11th Armored Cavalry reconfigured and assumed the role of the NTC's permanent opposition force in 1994.[68] These changes, coupled with Army downsizing, left the 3d Armored Cavalry Regiment a unique organization. It constituted a powerful, combined arms force organized as a HHT, three ground cavalry squadrons, an aviation squadron, and a support squadron. It possessed its own chemical, air defense, military intelligence, and engineer assets. Similarly, each ground squadron remained a combined arms team with

a headquarters, a tank company, an artillery battery, and three troops. Each troop included two tank platoons, two scout platoons, a maintenance section, a mortar section, and a headquarters.[69]

Throughout the decade, training and readiness activities constituted much of the regiment's activity. In 1998, it participated in an NTC rotation, where an aggressive use of combined arms tactics at all command echelons permitted it to seize the initiative from the OPFOR, win tactical engagements, and exploit each success. This result reflected the regiment's continuous emphasis on maneuver training and its permanent combined arms nature.[70] The unit did not deploy overseas, but individual soldiers were tasked to support operations in Bosnia, Kuwait, Honduras, and Haiti. Linguists and aviation personnel bore the brunt of these actions.[71]

The Army's emphasis on rapid deployment found reflection in the regiment's experimentation with a lighter and smaller tactical command post. Air transportable and retaining robust communications, it permitted the regimental commander to establish control quickly over his unit once in theater without the elaborate and time-consuming process normally required. The new command post emulated a similar organization established by the 11th Armored Cavalry Regiment before its conversion into a training force.[72]

Heavy division cavalry squadrons regained tanks. In December 1990, the 3d Squadron, 4th Cavalry Regiment, assigned to the 3d Infantry Division in Germany, became the first unit to regain its tanks. Each scout platoon replaced one M3 Bradley Fighting Vehicle with three M1A1 Abrams tanks, giving a squadron total of 27 tanks and 47 M3s. The resultant mixed platoons possessed greater combat power and restored the ability of the squadron to execute traditional cavalry missions, including guard and economy of force without extensive augmentation. Within the platoon, "scouts find the enemy, and the tanks remove them." In 1992, the 3d Infantry Division also realigned its cavalry from control of the aviation brigade to the division commander, but this change proved local. The official organization for heavy divisions retained the cavalry under the aviation brigade, and this alignment characterized the Force XXI division.[73]

Further changes to the 3d Infantry Division's reorganized cavalry occurred prior to exercises intended to evaluate the squadron's effectiveness. Platoons operated as mixed tank/M3 sections. Troop organization remained unchanged with a headquarters, three platoons, and a mortar section. The squadron gained a ground cavalry troop at the expense of one air cavalry troop. It also gained a reconnaissance platoon with 10 HMMWVs, intended to perform a mission set similar to that of battalion

scouts. However, "the addition of this platoon defied logic when having three troops' worth of scouts." The most common use included command post and supply route security, although it could provide a flank screen, manage traffic control points, or serve as an additional command and control element.[74]

The new squadron configuration proved less than ideal. The addition of tanks improved combat power, but not the capacity for dismounted operations. It lacked ground surveillance radars and its two heavy recovery vehicles proved inadequate to meet squadron needs.[75] Conversion to the new configuration also required a reshuffling of personnel that resulted in scouts filling positions for which they lacked experience and training. Knowledge of cavalry operations proved greatest among executive officers and platoon leaders. The experience of the squadron and troop commanders lay in tank units, and was only partially offset by their attendance at the Cavalry Leaders Course. Platoon leaders arrived at the unit straight from the Scout Platoon Leaders Course and then further benefited from the tutelage of NCOs within the squadron.[76]

The organization of the 3d Squadron, 4th Cavalry Regiment served as a model only for those division cavalry units stationed in Europe. In the United States, squadrons either retained their tankless Army of Excellence structure or received enough tanks to create mixed platoons of two tanks and three M3s. These platoons possessed fewer vehicles than the organization they replaced and could not provide the same breadth of coverage. The greater combat power came at the cost of reconnaissance capability.[77]

By 1995, a standard squadron organization existed on paper. It included a HHT, three ground cavalry troops, two air reconnaissance troops, and an aviation service troop. This structure reflected the final success of advocates who had pushed for a more powerful cavalry squadron since the mid-1980s. The squadron possessed no air defense assets, dropped the reconnaissance platoon, and abandoned the mixed platoon configuration. Each ground cavalry troop now possessed an organization identical to that of the armored cavalry regiment. However, a variety of configurations existed among division cavalry squadrons, reflecting the availability of funding and materiel for conversion to the new organization.[78]

Regardless of their composition, heavy division cavalry squadrons in Bosnia performed similar missions. In general, they enforced peace by occupying battle positions once occupied by feuding ethnic factions; clearing minefields; and maintaining a continuous, visible presence throughout their assigned sectors. When necessary, the cavalry engaged in crowd control operations and interacted with the local populace to ease tensions.

Extensive use of video and camera footage from air and ground cavalry proved especially effective in deterring disruptive actions and documenting peace treaty violations. In many of these actions, the M3 proved easier to maneuver over narrow roads than the Abrams tank. Its size, armor, and highly visible array of weapons also made it more effective than the HMMWV in deterring violence by crowds or individuals.[79]

Continuous operations in the Balkans posed command and maintenance challenges. High vehicle wear necessitated a sustained command emphasis on preventive maintenance by crews. Decentralized operations also necessitated the creation of a tactical operations center by each troop, resulting in a series of improvised solutions reminiscent of the Vietnam war. The mountainous terrain added another complication, since radio communications proved difficult to maintain without an extensive network of retransmission and relay stations. Nor did the peace enforcement mission obviate the need to maintain more traditional skills, including gunnery, forcing unit commanders to balance training requirements and their mission.[80]

Battalion Scouts—Observers, Killers, or Victims?

The 1990s witnessed the steady transition of armor and mechanized battalion scout platoons from M3s to HMMWVs. The attributes of small

Courtesy *Armor Magazine*

Figure 96. Mounted patrol moves through Bosnian village.

size, quietness, ease of sustainment, and adequate mobility provided the momentum behind this shift, despite nagging survivability concerns. The platoon included a headquarters section and four scout sections. Each section included six soldiers and two HMMWVs, one mounting a grenade launcher, the other a machinegun. For self-defense against armored threats, each section also carried a hand-held Javelin antitank missile launcher.[81] Optimized for reconnaissance and limited security, the scout platoon became the subject of increased scrutiny and suggested modifications as it became more commonplace throughout the Army.

Scout effectiveness improved throughout the decade, but at the NTC they continued to suffer destruction before mission completion. In most cases, the scouts became engaged in firefights, blundered into minefields, or compromised their location through faulty concealment. Such fates awaited scouts whether equipped with the HMMWV or the more powerful M3.[82] Reconnaissance failures did not characterize every NTC rotation, but they proved sufficiently frequent to sustain concerns about the overall effectiveness of battalion scouts. They also led Armor Center commander Major General Paul Funk to request a second RAND Corporation review of battalion reconnaissance at the NTC to evaluate the effects of training, doctrine, and materiel improvements implemented since the 1980s. The final report found scouts more often completing tasks and less prone to engaging in combat. Nevertheless, survivability remained a critical issue, because scout platoons suffered an average 50-percent loss rate during each mission. The study concluded, "The issue of scout survivability remains unresolved. Either a new vehicle, or mix of vehicles, plus changes in the doctrine of employment are indicated."[83]

These findings encouraged experimentation with alternate reconnaissance configurations, including the hunter-killer teams utilized by armored cavalry units. In 1989, a 3d Armored Cavalry troop reorganized to form composite groupings of tank and scout platforms. The tanks overwatched scout operations and remained concealed until enemy contact occurred. The scouts then pinpointed the hostile force that the tanks destroyed. The success of this technique in Operation DESERT STORM led to its refinement and broader application. During a 1991 NTC rotation, use of these hunter-killer teams resulted in the repeated destruction of OPFOR reconnaissance assets and facilitated successful mission completion by friendly scouts.[84]

The hunter-killer teams resulted from the reorganization of the troop into one pure tank platoon and two mixed platoons each with two tanks and five or six M3s. The latter operated in sections of a tank and two M3s,

while the pure tank platoon constituted a troop reserve capable of attacking enemy opposition while the mixed platoons continued to reconnoiter. The tank-scout team also permitted faster breaching operations, particularly when the tanks carried mine plows. The hunter-killer approach provided versatility through its combination of combat power, reconnaissance capability, and survivability. Well suited to acquire information aggressively, perform security, and conduct counterreconnaissance, the team could be further enhanced through the attachment of fire support, forward observers, and ground surveillance radar.[85] Other suggestions for alternate hunter-killer arrangements soon emerged. One recommendation featured a troop reorganized into just two platoons and a headquarters element. Each platoon possessed four tanks and six M3s organized into three sections. Thus configured, the troop contained six hunter-killer sections operating semi-independently of one another.[86]

Similar practices emerged among light cavalry units. The 2d Armored Cavalry Regiment abandoned its pure platoon organization in favor of a scout/antitank mix. Reorganized, each platoon included five scout HMMWVS and two equipped with a TOW missile launcher. The TOW sights improved the platoon's observation capability and provided it the means to conduct an antiarmor ambush. Moreover, the TOW HMMWV provided the firepower necessary to cope with armored threats, particularly when employed in conjunction with Claymore mines and handheld AT-4 antitank missile launchers. For the light cavalry, the TOW HMMWV provided a degree of security for the scouts somewhat similar to the role of tanks in the hunter-killer configuration of the heavier cavalry.[87]

In the cavalry squadrons of the light infantry divisions, the single ground cavalry troop initially included two scout platoons equipped with HMMWVs and two platoons of HMMWVs mounting TOW missile launchers.[88] These platoons could be task organized into mixed scout/TOW platoons to:

> . . . enhance acquisition and destruction of the enemy under reduced visibility conditions and in restrictive terrain, where massed TOW fires are not possible. This task organization can also be used to respond to multiple but separate taskings of a troop usually associated with operations other than war, for example, manning checkpoints and area security missions.[89]

In this mixed configuration, the troop functioned as 4 platoons each of 3 scout HMMWVs, 2 TOW HMMWVs, and 15 soldiers. The TOW missile launchers provided not only an antitank capability, but their sites enhanced observation by scouts otherwise dependent on binoculars alone.[90]

Many veterans noted similarities between the hunter-killer concept and previous cavalry organizations, particularly the combined arms platoon. With its mix of scouts, tanks, dismounts, and mortar, this unit possessed a versatility that the newer hunter-killer configuration seemed to be seeking. The hunter-killer configuration restored the versatility once associated with cavalry organizations but partially lost during reorganizations in the 1970s and 1980s. Dissatisfaction with simplified organizations encouraged small unit commanders to return to a mix of capabilities.[91] One officer observed that it was "too bad that our young leaders must experiment through trial and error to find an efficient organization for combat operations when all they have to do is read some 20- to 30-year-old MTOEs and doctrine."[92]

However organized, the use of hunter-killer teams necessitated a high degree of training and junior leadership competence to ensure the necessary cohesion between tanks and scouts.[93] In fact, training constituted the principal concern expressed over the hunter-killer team. Platoon leadership became more complicated, necessitating effective control over several mixed groupings of tanks, M3s, and dismounted scout teams. The ability of new second lieutenants to command such a team seemed problematic, especially when simultaneously required to coordinate aviation and fire support. Older veterans proved more sanguine, noting the ability of junior officers to lead far more diverse organizations in the past.[94]

Maneuver battalion scout platoons also sought to expand their capabilities. In South Korea, HMMWV scout platoons included a sniper section of two snipers and two spotters. This section enhanced screen operations and provided additional observation posts and the ability to eliminate select hostile individuals. The mountainous terrain of South Korea provided numerous locations on high ground for snipers to become ensconced and observe. In reconnaissance, the snipers could be employed to infiltrate a particular locale, although their slow speed and dismounted nature required special attention in planning. In security operations, the snipers provided small arms cover and targeted key enemy personnel. Overall, the sniper section gave depth and breadth to screen lines and possessed the ability to harass enemy positions.[95]

For most maneuver battalions, efforts to overcome reconnaissance deficiencies and improve scout survivability centered on organizational changes. The 1996 RAND Corporation study recommended replacing the HMMWV with a different scout vehicle or using a mix of platforms in the platoon.[96] Consideration of a different vehicle included upgraded versions of the M3 and the M113.[97] Another recommendation included a mixed platoon of HMMWVs and M3s, thereby capturing in one unit the best capabilities of each vehicle. The stealth and small size of the HMMWV

overwatched by the M3 seemed to offer a more robust solution and could be implemented immediately with existing vehicles.[98] Ironically, this platoon structure had previously been rejected in favor of the pure HMMWV unit. By the mid-1990s, however, survivability concerns encouraged a more favorable reception for the mixed scout platoon.[99]

In the absence of a new platform or related equipment, most units worked with existing organic assets to enhance their reconnaissance capability. In 1999, the 1st Battalion, 33d Armor Regiment, developed a solution that transcended simple platoon adjustments. This battalion sought a much more robust and versatile force for a broad range of reconnaissance and security missions. Through augmentation, the battalion command transformed its scout platoon into a company-size force dubbed Team Recon. It included the scout platoon, a tank platoon, a mortar section, an engineer section, and two infantry squads together with maintenance and medical assets. The battalion headquarters and headquarters company (HHC) also provided a small command cell to control Team Recon.[100]

Team Recon remained an information gathering organization, but combat power now supported the scouts in all missions. During security and counterreconnaissance, they now belonged to a force capable of eliminating hostile probes rather than just reporting their presence. Team Recon trained together and remained an integral part of the battalion, simplifying its inclusion in task force planning. Cohesion and effectiveness further improved, since those scout missions that generally necessitated temporary battalion attachments could now be performed by organic team assets.[101]

The creation of Team Recon encouraged further discussion regarding the optimum organization for battalion reconnaissance. The common theme among various proposals reflected a desire for a more powerful and versatile battalion reconnaissance and security force. Adding a scout troop to the battalion composed of scouts, tanks, infantry, and mortars, for example, provided a significant firepower enhancement together with a greater dismount capability.[102] Proposals such as this one constituted a partial rejection of the rationale used to justify adoption of the pure HMMWV scout platoon.

Scout Modernization Strategy

The 1990s witnessed the emergence of a comprehensive scout modernization plan to address a wide range of issues, including survivability and emerging reconnaissance requirements for the Force XXI battlefield. At its core, this plan reflected the continued emphasis of the Armor Center

on purpose-built, manned platforms crewed by specially trained soldiers. Organizations so equipped were not dependent on favorable weather or terrain conditions, and they possessed the ability to assess evolving tactical situations in the context of the commander's intent. This emphasis constituted a reaction to growing Army-wide interest in the use of unmanned systems and aerial platforms to acquire information. The Armor Branch leadership wanted scouts to benefit from the capabilities of emerging technologies without being supplanted by them.[103]

Courtesy *Armor Magazine*

Figure 97. Scout patrol prepares for next move.

Through materiel upgrades, the scout modernization strategy sought to provide more capable reconnaissance organizations suited to future operational environments. It included a phased transition in scout platforms. The first step lay in the shift from the existing mix of M3A2, M3A2 ODS (Operation DESERT STORM), and HMMWV to a combination of M3A3 and long-range advanced scout surveillance system (LRAS3)-equipped HMMWV. The latter vehicle set featured much improved optics, including second generation forward looking infrared (FLIR), a laser rangefinder, and high resolution day television. Combined with digital communications, these vehicles possessed the means to transmit rapidly detailed battlefield information, including imagery.[104]

Intended for completion by 2000, this first step marked an interim state, pending the fielding of a new scout platform for use by both cavalry and maneuver battalion scout platoons. By the mid-1990s, this new vehicle was the Future Scout and Cavalry System (FSCS). It replaced the earlier

Future Scout Vehicle program, whose design work dated to the previous decade. The FSCS was intended to—

> Navigate, communicate, reduce signatures, be more mobile and survivable, acquire threat information (to include detection of nuclear, biological, and chemical (NBC) hazards), locate targets, synchronize fires, and integrate information for battlefield decisionmaking without delay. This ability must extend itself unabated across all types of terrain, during periods of limited/obscured vision, while receiving indirect fire from mortar and artillery, under NBC conditions, and beyond visual range for both air and ground targets. These critical capabilities allow the commander to achieve freedom of action, focus combat power, and decisively defeat the enemy on any battlefield.[105]

To achieve these capabilities, the FSCS design included a sophisticated sensor and sight array to detect targets well beyond the latter's ability to see or engage the scout. Survivability of the FSCS depended on a combination of armor, an active protection system, signature management, smoke, and chaff. Sensors were expected to detect minefields, obstacles, and hostile laser targeting. It also featured a mast mounted sight that permitted the vehicle to hide behind terrain features while observing the battlefield. Combined with a 60-mile per hour speed, these features were expected to permit the FSCS to move about the battlefield swiftly and largely unseen. Yet plans included a medium caliber weapon to permit the FSCS to engage threats equivalent in capability to the BMP-3.[106]

Scout needs drove the FSCS design. Expected to operate primarily off roads, the vehicle required a robust suspension. Its initial swim capability, however, gave way to a 1-meter fording ability and reliance on a special swim kit for deeper bodies of water.[107] Weighing no more than 17 tons, the FSCS would be air deployable and possess an operational radius of 400 miles. Once deployed, the vehicle was expected to function for 3 days without resupply.[108]

The ability of the FSCS to gather battlefield information was to be linked to other platforms throughout the combined arms and/or joint team. By incorporating Force XXI communications technologies, the FSCS could quickly share its information and operate on multiple nets simultaneously. Moreover, it could designate targets for other direct or indirect fire assets to engage without revealing its location. Indeed, employment concepts

envisioned an FSCS screen line well in advance of friendly forces, using its long-range detection capability to orchestrate the destruction of hostile units without being seen.[109]

The complexity of the FSCS necessitated major funding, but the unexpected support of the United Kingdom helped overcome this challenge. The British also sought a new reconnaissance vehicle with similar requirements to those of the FSCS. In 1996, both nations began to explore the viability of a joint program, which became reality 2 years later. Neither nation could afford a new platform alone, but together they could share the cost and leverage the technological developments of both countries. In this cooperative atmosphere, development progressed and a joint acquisition strategy began to emerge.[110]

The Armor leadership made the FSCS a priority and lobbied to build support within the Army and Congress. The expected capabilities of the vehicle constituted a major selling point, since the "FSCS uses technology to reduce force structure and optimize Army ground reconnaissance force."[111] Smaller units were expected to be more effective than current, larger organizations. Therefore, fielding plans stressed the smaller numbers of platforms and personnel required by FSCS units. In 1997, Active Component cavalry and scout organizations included some 520 HMMWVs and 381 M3s manned by 3,325 soldiers. If replaced by platoons equipped with 6 FSCS, the number of personnel fell to 2,781. The total number of vehicles changed little due to the anticipated addition of brigade reconnaissance troops. Among battalion scouts, however, the number of platforms fell from 520 to 312, reflecting the change from 10- to 6-vehicle units.[112]

Critics of FSCS questioned the wisdom of fielding smaller units with fewer scouts. Emerging doctrine envisioned a broader battlespace and greater dispersion among forces, which suggested a need for more scouts. For years, scout organizations struggled with an insufficient dismounted capability. The 3-man crew of the FSCS and the smaller size of FSCS-equipped units did not resolve this problem. FSCS platoons would possess fewer dismounts than either the current HMMWV or M3 organizations, undermining effective operations in urban or wooded terrain. With its small crew and array of sensors and displays, some commanders wondered whether the scouts could be pried loose from their screens to conduct an actual ground reconnaissance at all. For others, the FSCS embodied fears that technology was driving doctrinal requirements rather than the reverse. These concerns were not allayed during briefing sessions in which these and other concerns met with the response "tough decisions have been made."[113]

Individuals concerned with the modernization and fielding of existing equipment found the FSCS concept somewhat chimerical. They advocated a greater focus on maximizing the capabilities of existing and near-term materiel rather than overemphasizing programs that might never come to fruition. In the words of one retired armor officer with program management expertise, "While it's nice to have a group working on the international FSCS program that may give some future generation of scouts a new system, we had better expend more energy on optimizing the new systems we are getting now."[114] Yet, the FSCS program evolved from dissatisfaction with the M3 and HMMWV as reconnaissance platforms, a desire for significant capability improvement, and the inability to achieve the desired performance by modifying existing scout vehicles. By pursuing a new vehicle, the Armor leadership sought to provide for the first time a purpose-built platform optimized for reconnaissance and surveillance and leveraging the benefits of Force XXI developments.[115]

Reconnaissance Platforms

Fielding of the FSCS was not anticipated for several years, but in the 1990s the Army expected to equip select light units with the AGS. Work on this vehicle began in the 1970s, but development proved sporadic, subject to problematic funding and design change. In the aftermath of Operation DESERT STORM, AGS development continued at a steady pace, and it was ready for fielding by mid-decade. Intended as a replacement for the aging M551 Sheridan in the XVIII Airborne Corps and to equip the 2d Armored Cavalry (Light), the AGS was a light, tracked vehicle. It carried a turret-mounted 105-mm gun with optics and a fire control system similar to that of the Abrams tank. A coaxial and external machinegun constituted its secondary armament. The AGS lacked the protection of a main battle tank, but its armor could be tailored to meet different levels of threat. It borrowed features from the Abrams tank to enhance survivability, including an automatic fire suppression system and the compartmentalization of fuel and ammunition stowage. It utilized many parts already in use by American vehicles, and with good cross-country mobility, an autoloader, and an easily accessed engine, the AGS offered a much more reliable and robust alternative to the M551. Moreover, the new vehicle could be air transported or delivered into the battle area via low velocity air drop.[116]

In its primary role, the AGS would "deploy as an integral part of a combined arms team to any contingency area and provide direct support to airborne, air assault, and light infantry as a mobile reaction force."[117] Indeed, it offered an ideal weapon for contingency operations, due to its combination of deployability, combat power, ease of sustainment, and

relative survivability. These qualities also made it attractive for broader use in cavalry and scout organizations, ensuring considerable interest in its testing and development. By 1996, with the development of related doctrine and training programs complete, the AGS was ready to enter production. Instead, the program was canceled for fiscal reasons, leaving the XVIII Airborne Corps and the 2d Armored Cavalry without effective armor support and quashing any thoughts of wider AGS use in reconnaissance organizations.[118]

The HMMWV and the M3 remained the principal platforms for mounted reconnaissance units. The HMMWV, however, became the target of growing criticism. In armor and mechanized infantry battalions, it could not keep pace with either the Abrams tank or the Bradley Fighting Vehicle when moving cross-country. The HMMWV lacked a swim capability and possessed only a limited fording ability. Reconnaissance and surveillance operations suffered from the vehicle's lack of a long-range or thermal sight. Binoculars constituted the primary means of seeing the battlefield, although night vision goggles assisted short-range observation during hours of darkness.[119]

Vulnerability constituted the greatest cause for concern, generating criticism similar to that once applied to the jeep. More than one soldier shared the following view: "The HMMWV is an excellent, comfortable field vehicle; it is fun to train with, but I don't want to face the real thing in it."[120] Despite its small size and quietness, most weapons, including small arms, could readily disable the HMMWV. Nor did it possess an NBC system to protect the crew in a contaminated environment. Limited firepower only compounded the vehicle's poor survivability. Against a mechanized threat, the scout's antipersonnel weaponry did not facilitate disengagement. In the words of one NCO, "Scouts, unfortunately, by the nature of their business, will frequently get into trouble in combat. They must be provided the capability to defend themselves and survive on potential battlefields." Stealth alone did not ensure survivability.[121]

Urban operations in Mogadishu highlighted the vulnerability of the HMMWV and led to the accelerated development of an up-armored variant for use by military police. This vehicle benefited from additional underbody protection, light armor to protect the crew from small arms fire, and overhead protection against the effects of indirect fire.[122] The Army also developed another armored HMMWV model, the M1114, for broader employment. It offered improved protection against small arms fire, artillery, and mines. It also featured more powerful brakes, improved suspension, and air conditioning. The tires remained vulnerable, although

their run-flat nature permitted the vehicle to be driven several miles before complete failure to allow the crew to escape danger.[123]

In 1996, the 1st Squadron, 1st Cavalry Regiment employed early production models of the up-armored HMMWV in Bosnia. There it patrolled in lieu of heavier vehicles. In this role, it proved an effective platform, able to traverse roads and trails with ease. More fuel efficient than Abrams tanks and M3s, the M1114 did not damage roads or buildings in the war-torn province, thereby avoiding the civilian complaints that accompanied the movement of heavier vehicles. For administrative actions and patrols amid a populace more concerned with survival than combat, the up-armored HMMWV was in fact an effective platform, particularly when it remained on established roadways.[124]

Armor Branch Archives

Figure 98. The LRAS3 mounted on a HMMWV.

Conversely, the M1114 lacked the deterrence effect of the Abrams and M3, and its utility diminished in the face of hostile crowds. Hence, the 1st Brigade, 1st Infantry Division in Bosnia maintained two sets of vehicles. HMMWVs performed those missions associated with a minimal threat, while tanks and M3s were used in more dangerous environments where their combat power and deterrence capability were deemed necessary.[125] Even with its added protection, the simple presence of the M1114 did not intimidate would-be aggressors or influence crowd behavior. In 1997, a HMMWV column in the town of Brcko found itself confronted by angry

crowds that surrounded the vehicles, blocked the exit of the crews, and climbed atop them. In another incident:

> The crowd actually attempted to overturn a HMMWV with crew inside. To escape the rock-throwing crowd, the XM1114 crew had to back out down a long street. Mirrors gone, the driver could not navigate the maze of rubble behind them—only the selfless courage of a young trooper climbing into the open hatch, exposed to the crowd's wrath, guided the vehicle backwards. Had there been bullets rather than stones flying in Brcko, the outcome would have had much more serious consequences.[126]

Operations in Bosnia provided an opportunity to assess the M1114's reliability and mobility. There the vehicle sustained reasonable operational readiness rates, despite less than ideal maintenance.[127] Fielding plans anticipated its employment by cavalry, scout, and military police organizations, but the slow procurement pace resulted in few vehicles actually reaching combat organizations. More ominously for reconnaissance operations, the M1114 demonstrated "significant reliability problems when tested to Scout mission profile." It performed adequately on roads, but its mobility dropped during cross-country movement and raised questions about its effectiveness as a scout platform.[128]

Other developments unrelated to survivability improved the effectiveness of the HMMWV as a reconnaissance platform. The development of an extended stowage rack for the HMMWV helped to overcome the perpetual problem facing scouts of where to stow personal gear, rations, and equipment.[129] HMMWV scouts benefited from the fielding of a modification kit that included improved cargo capacity and stowage, a GPS, an additional radio, and an intercom system. It also provided a mounting and power system for a TOW sight. These items addressed key deficiencies in the HMMWV scout's ability to see, navigate, and communicate, but the kit was not universal.[130]

Persistent survivability concerns prompted consideration of alternative scout vehicles. One such vehicle was the German Wiesel, a small, 3-ton tracked weapons carrier. This armored platform was designed for airlift by a helicopter, and it could be equipped with a variety of weapons.[131] The combination of mountains and snow in Bosnia also triggered interest in the M973 Small Unit Support Vehicle (SUSV). Swedish-built, it included two track driven units coupled. With both sections moving at once, the SUSV possessed both traction and very low ground pressure, which made it ideal for moving in snow and/or mountainous conditions. A

prior study addressing the shortfalls of HMMWV operations in the mountains of Korea and difficulties encountered by the same platform in Bosnia contrasted sharply with the successful employment by American forces of limited numbers of SUSVs in the Balkans. Therefore, recommendations emerged to replace the HMMWV with the SUSV.[132]

The most commonly advocated HMMWV alternatives included the light armor vehicle (LAV) and the M113.[133] The Marine Corps employed several LAV variants, providing a body of American experience with the platform. The wheeled, armored platform seemed to offer many of the qualities desired in a scout platform and a significant advantage over the HMMWV, particularly in survivability and lethality. Moreover, it suited the need for a lighter platform with greater strategic deployability.[134] Yet, the LAV's armor protection proved marginal, offering protection against little more than small arms. Its eight-wheel suspension posed a vulnerability for which no simple solution existed. As one observer noted, "Until we make the wheels of the HMMWV and 8-wheeled LAV combat-hardened, **neither will be mission-mobile in the face of enemy small arms**, obstacles, broken glass, and wire." Too large for an effective reconnaissance vehicle, it possessed insufficient protection for use in other roles.[135]

Adoption of the LAV also faced the hurdle of insufficient funds for its purchase and use in Army organizations—a point noted by advocates of the M113. This latter platform already existed in the Army inventory, obviating the need for any new vehicle purchase. It was a proven vehicle, which in the A3 variant included improvements to its protection, engine, and transmission. The tracked M113 offered greater cross-country mobility than the HMMWV and could negotiate obstacles. It possessed an amphibious capability that did not require time-consuming special preparations. Able to carry up to 11 soldiers or a variety of different weapons, it also benefited from mechanical reliability. Supporters noted that the M113 did not risk immobilization from shredded tires.[136]

Yet most units continued to employ either HMMWVs or M3s. The HMMWV remained a vulnerable platform with limited lethality, while the M3 lost none of its noise, bulkiness, or readily identifiable exhaust plumes.[137] The M3 benefited from a series of improvements throughout the decade. In 1997, fielding of the M3A2 ODS began. This version incorporated upgrades to the platform based on operational experience gained during the 1991 Gulf War. The most significant included the addition of a laser rangefinder, a global positioning system, a driver's thermal viewer, and a reconfiguration of the internal layout to increase space. The ODS version also accommodated add-on digital communications to share information

with units equipped solely with digital systems. For protection against antitank guided missiles, a missile countermeasure device interfered with the missile operator's ability to guide the projectile to its target. These improvements enhanced overall vehicle effectiveness, but they came at the cost of weight, which increased to over 35 tons. The 3d Infantry Division became the first formation to receive the improved platforms.[138]

Further enhancements were included in the M3A3. It included a digital data bus to permit networking with other digital systems in the combined arms team. This linkage permitted the automatic sharing of information, particularly friendly force locations, and its depiction on a graphic display that all recipients could see. Digital communications further permitted some crew functions to be automated and streamlined the reporting and sharing of information, including maps and images. The M3A3 version included second-generation FLIR sights and a commander's independent thermal viewer that permitted scanning independently of the gunner. To reduce heat signature, the vehicle's exhaust was funneled to the rear.[139] Inside the vehicle, dismount teams could view the battlefield on a computer display, which enhanced their situational awareness and orientation when they disembarked. Embedded diagnostics assisted the crew to identify problems and speed maintenance. Additional survivability enhancements were also included, but the electronically complex nature of this vehicle slowed its development. The Army received its first M3A3 in 1998, but it was not scheduled for unit assignment until 2000, pending completion of testing.[140]

Despite recurring interest in the use of motorcycles for scout operations, none were fielded. Testing and periodic development occurred since World War II, and the ability to field a durable bike that could be carried on a HMMWV or M3 existed. However, funding restraints and the low priority given to the effort in comparison with other programs led to its abandonment. In the early 1990s, several cavalry units purchased motorcycles on their own, while a proposal remained for the addition of four motorcycles to the maneuver battalion scout platoons for patrolling and liaison.[141] Nevertheless, the decade would not witness any formal action to field motorcycles with mounted reconnaissance units.

For the HMMWV, the LRAS3 constituted the most important development in the 1990s. This device included second-generation FLIR capability, a GPS, and a laser rangefinder. Together in one system, they permitted an operator to detect, identify, and locate a target with a 10-digit grid coordinate within seconds of scanning. Furthermore, LRAS3 permitted scouts to see out to 10 kilometers and provide a coordinate accurate

to within 60 meters. It also possessed zoom and wide-angle capabilities that provided unprecedented target details to be seen at ranges under 10 kilometers. System development occurred as part of Force XXI to permit an interface between the LRAS3 and emerging digital systems. EXFOR scouts used the device to identify targets and direct aircraft or artillery strikes against it while remaining outside the enemy's direct-fire range. Testing and development continued throughout the 1990s with plans to begin fielding the new device in 2001.[142]

Armor Branch Archives

Figure 99. Close-up view of the LRAS3, which greatly increased the scout's ability to see the battlefield.

Yet LRAS3 possessed several disadvantages. Early use by soldiers found the system prone to errors while pinpointing distant targets, particularly when the vehicle was in motion. Its precision target location ability depended on receiving accurate information from satellites. This requirement imparted a delay between initial target detection and the receipt of accurate location data. When mounted on a HMMWV, the device interfered with operation of the vehicle's weapon. Weighing over 100 pounds, it proved difficult to dismount and employ away from the vehicle, particularly in rugged terrain. Once set up, its batteries permitted only 6 hours of operation. Its range and fantastic zoom capabilities proved much less spectacular when trying to detect targets in complex terrain. By late 1999, testing had yet to reflect actual conditions facing scouts in a combat environment, including operations in urban areas, wooded terrain, or amid obstacles. Nor did they incorporate basic techniques and procedures employed, such as bounding and traveling overwatch.[143]

Many of these issues reflected the developmental status of the new system. Most could be corrected and were. The LRAS3 offered a significant increase in the scout's ability to detect targets from afar without compromising his security. It did indeed hold high promise for scout organizations that labored throughout the decade with platforms of

questionable utility, optics that did not overmatch those of potential threats, and who faced extinction if detected and engaged. Amid the plethora of new materiel development stimulated by Force XXI, one officer ruefully noted, "Quite frankly, binoculars are the most sophisticated piece of equipment the scout platoon has today in quantities."[144]

Reconnaissance Doctrine in the 1990s

In 1991, the publication of FM 17-95, *Cavalry Operations,* provided the overarching doctrinal guidance for armored cavalry regiments and division cavalry squadrons. It reflected the AirLand Battle concepts employed during Operation DESERT STORM. The new manual made no fundamental changes to existing principles of cavalry use. Cavalry performed reconnaissance, security, and economy of force functions. It gathered information, provided reaction time and maneuver space, preserved the combat power of other unit types, facilitated movement, and performed rear area operations as necessary.[145]

In what would become a recurring theme, the manual emphasized the value of ground cavalry as a superior intelligence source. Able to counter enemy deception efforts, it actively sought hostile forces and developed tactical situations. It constituted the essence of reconnaissance-pull by identifying enemy weaknesses and guiding friendly forces into and through these vulnerable areas. In fluid, nonlinear situations, cavalry restored command and control by locating friendly units, filling gaps between them, and identifying dead space on the battlefield.[146]

Coverage of reconnaissance operations acknowledged the importance of stealth and aggressiveness, underscoring the need for cavalry organizations to employ both. Reconnaissance fundamentals remained unchanged in their emphasis on the objective, rapid and accurate reporting, and avoidance of decisive engagement. The manual outlined the various reconnaissance techniques and offered criterion for the use of each one. Reconnaissance by fire, for example, suited situations in which time proved limited or became necessary to develop a situation once contact with enemy forces occurred. Coverage of zone, area, and route reconnaissance included more attention to trafficability, urban areas, and obstacles. The emphasis given to time considerations, planning, and the potential value of reinforcing tanks all reflected the experience of Operation DESERT STORM and lessons learned at the NTC.[147]

Security operations gained information on the enemy and provided the parent force reaction time, maneuver space, and protection. These missions were characterized by aggressive reconnaissance to reduce uncertainty

about the enemy and terrain considerations while ensuring a continuous flow of information. Surveillance and counterreconnaissance were considered tasks inherent to any security action. Types of security operations included screen, guard, and covering force, but only the armored cavalry regiment was considered capable of performing the latter without augmentation due to the independent nature of the mission, the large area covered, and the related command and control requirements. Screen operations included a series of observation posts with connecting patrols to observe a given area and impede enemy activity, but they were expected to rapidly transition into a more active, combat-oriented guard role in the event of hostile attack. Threat analysis within the manual continued to template a mechanized Soviet-style force.[148]

Contingency operations received a scant two pages. They were vaguely defined as "military operations requiring rapid deployment to perform military tasks in support of national policy."[149] Related activities included a show of force, deterrence of aggression, reaction to the invasion of a friendly nation, protection of American nationals, or hostage rescue. In contingency operations, cavalry largely performed reconnaissance and security, but no planning or execution guidance was provided for such missions. Similarly, a separate appendix addressed low-intensity conflict. Yet other than acknowledge the potential employment of cavalry in operations other than war and offer a few guiding principles, this section provided little useful guidance for cavalry commanders thrust into these roles.[150] Doctrinally, the situation facing cavalry organizations in contingency operations at the start of the 1990s paralleled that of mounted counterinsurgency in the early 1960s.

In 1996 an updated FM 17-95, *Cavalry Operations,* was published. It constituted a refinement of the earlier manual with much of its content similar or identical. In format and writing style, it proved much clearer and easier to comprehend, losing much of the earlier version's arcane flavor. Its emphasis on training leaders how to think through tactical situations found praise among field commanders.[151] It also reflected many developments impacting the Army by the mid-1990s. Joint operations were referenced throughout, while the chapter addressing battle command included a section devoted to the type of automated information systems being developed as part of Force XXI. A related change occurred through the addition of a special appendix devoted to digital cavalry operations that introduced the reader to a digital cavalry squadron organization. Symptomatic of the developmental status of digital combat organizations, the appendix described their value but also their limitations, including problems interfacing with nondigital units and hardware and software difficulties.[152]

The focus of the manual remained on the armored cavalry regiment and the division cavalry squadron, but it now also addressed the light armored cavalry regiment. The latter was described as a "self-contained combined arms organization capable of being packaged and rapidly deployed by air or sealift as part of a force projection Army responding rapidly to world-wide contingencies."[153] Modular, easily tailored, and able to accept attachments, the light armored regiment supported joint or Army initial entry operations. Intended for operations with the XVIII Airborne Corps, it was expected to be reinforced with corps or division assets. To permit rapid deployment, the regiment lacked many assets found in heavier regiments, including a tactical command post, a smoke platoon, bridging assets, ground surveillance radars, and attack helicopters. The absence of tanks and the minimal protection of the HMMWVs led the manual to note that the regiment required "judicious application of standard cavalry doctrine."[154]

Coverage of reconnaissance and security missions dropped the detailed references to a Soviet-style threat that had been staples in manuals throughout the Cold War. Instead, the new manual provided more guidance for the execution of a broader range of activities. Versatility became one response to the variety of potential threats that might be encountered. The integration of air and ground cavalry also became a common theme, doubtless encouraged by the increased numbers of AH-64 Apache attack helicopters fielded. This aircraft provided cavalry organizations a powerful array of weapons able to support scout activity. In effect, the scout became the helicopter's sensor, identifying targets for it to destroy without compromising the scout's presence. During security operations, the air cavalry added depth, patrolled between observation posts, and augmented the surveillance of key areas of interest.[155]

While reconnaissance guidance included similar principles to those found in the 1991 version, the new manual's coverage of security expanded considerably. The return of tanks to the division cavalry and the growing interest in hunter-killer operations found reflection in the manual's recommendation for the integration of tanks and scouts in screen lines. Area security, including "reconnaissance and security of designated personnel, airfields, unit convoys, facilities, main supply routes, lines of communications, equipment, and critical points," now returned with expanded coverage—a direct reaction to the needs of stability and support operations. Doctrine governing area security included those principles proven in Vietnam, including the use of assigned sectors, the importance of continuous intelligence collection, and the use of quick reaction forces. Similarly, the reader also found himself learning Vietnam-tested techniques for the

execution of route and convoy security. These included checkpoint operations, air and ground patrols, preconvoy reconnaissance, ambush counterattacks, and the use of preplotted indirect fires.[156]

An entire chapter devoted to stability and support operations provided doctrinal acknowledgment of the changed environment in which cavalry organizations might operate. The first page noted:

> Stability and support operations missions and scenarios are not new to the cavalry. For many years cavalry units have been involved in these types of missions: from securing the nation's frontiers during the westward expansion, to border surveillance in Europe, to peace operations missions in Haiti.[157]

While true, stability and support operations did not figure prominently in cavalry manuals at least since the Vietnam war.

A variety of different types of stability and support were outlined. In their execution, emphasis was given to key, recurring principles, including patience, adaptability, and restraint in stark contrast to a more traditional aggressive and fast-paced nature of operations. The importance of intelligence to stability and support missions found reflection in this chapter, which also identified key types of information desired for peacekeeping

Courtesy *Armor Magazine*

Figure 100. Well-camouflaged Bradley Fighting Vehicle at the JRTC.

and peace enforcement. The manual clearly indicated how the information gathering capabilities of cavalry organizations could be adapted to a more unconventional operational environment. Belligerent crowds, legal issues, and political organizations replaced enemy vehicle locations, weapons, and likely intent. The stability and support chapter offered tips and principles but was far less detailed than those pages devoted to traditional cavalry operations. Despite the complexity of operations other than war, much was left to the reader to determine. Perhaps the most useful information lay in training activities suggested to prepare a unit for a stability and support deployment.[158]

In the 1990s, the Army published only one manual devoted to cavalry troop leadership. The principles found in FM 17-97, *Cavalry Troop*, largely applied to armored cavalry regiments and heavy division cavalry squadrons. This manual focused on the troop commander's role as a manager, coordinator, and integrator of his unit and attachments, most commonly engineers, ground surveillance radars, and a fire support team. All mission types included planning and preparation guidance and tips, together with detailed examples that depicted common battlefield developments, the role of the troop leader, and an assessment of the factors influencing each decision together with its impact. Considerable attention was given to what guidance should be issued to platoon leaders and the type of information they required for their actions. In this manner, the manual provided an effective leadership guide and immersed the reader in troop level cavalry operations.[159]

The manual distinguished where necessary between heavy and light cavalry troops. Both shared a similar organization of a headquarters section, two scout platoons, two antitank or tank platoons, a mortar section, and a maintenance section. The tank or antitank platoons provided overwatch and direct fire support, but they could also be integrated with the scouts to form hunter-killer teams. The heavy troop's tank and M3 mix possessed greater combat power and stabilized gunnery for firing on the move. The thermal sights and night vision devices of these vehicles also made the troop better suited to night and low visibility operations. Conversely, "the light cavalry troop's ability to fight under reduced visibility conditions is limited because of its lack of integrated passive and thermal sights on stabilized weapons platforms." The light troop's advantages lay in its deployability and ease of air transport, but it could only perform reconnaissance and screen operations without reinforcement against a weak threat. Both troop types encountered difficulty in close or urban terrain due to their lack of dismounted soldiers.[160]

The mission of the cavalry troop included reconnaissance, security, and actions in an economy of force role. Typical of cavalry organizations, the troop operated in a decentralized manner, increasing the importance of effective small unit leadership and timely monitoring of tactical developments by the troop tactical operations center. The latter served as the nexus of information and proved vital for effective management of subordinate platoons. Indeed, troop leadership remained the theme of the entire manual.[161]

The troop commander retained the decision to approve or disapprove actions recommended by his platoon leaders. Flexibility constituted an important quality for the troop commander; therefore, the manual did not proscribe solutions or actions. Rather it identified the leadership role required and offered a wealth of guidance and tips for its execution. The individual commander, based on his knowledge of cavalry operations and the capabilities inherent to the troop, would have to determine the best means of employing his subordinate platoons.[162]

The troop commander possessed few combat assets under his direct control other than the mortar section and any external attachments. However, he constituted the central influence on the tempo and conduct of platoon actions and how scouts should react to contact with the enemy. By monitoring developments and manipulating the troop's organizational flexibility, he could reorient his platoons to support forces in contact or exploit an opportunity. He also determined the level of indirect fire support available to each platoon via the fire support team. This asset provided the central hub for coordinating mortars, artillery, aviation support, and precision munitions. Its mix of digital and radio communications permitted it to operate in multiple nets, while its target laser designator facilitated the delivery of accurate fires.[163]

Troop assets were deemed capable of reconnoitering a 10-kilometer zone or covering two major routes simultaneously at a sustained rate of 1 kilometer per hour. This pace suited deliberate, stealthy operations, but it could be accelerated at the risk of detection. The manual identified the pros and cons of stealthy and aggressive reconnaissance, and stressed the importance of organizations being capable of both. Lack of combat power made aggressive reconnaissance by the light troop viable only against a weak, nonmechanized enemy. The range of information sought during reconnaissance focused on enemy forces, trafficability, dominant terrain, urban areas, lateral routes, bridges, fords, overpasses, defiles, and obstacles. This listing required time to compile, contributing to the slow pace of deliberate reconnaissance.[164]

The manual's coverage of security operations concentrated on screens and convoy security. These proved common missions for the troop to perform without reinforcement. In a screen mission, troop assets could monitor six different avenues of approach, cover a 10-kilometer wide sector, and sustain up to 12 observations posts (16 for the light troop). However, continuous operations by the observation posts beyond 12 hours stretched the limited dismounted manpower available. Convoy escort operations did not suffer from the same constraint due to their mounted nature. The troop was expected to reconnoiter the route in advance of the convoy, maintain screens to either flank, provide vehicle escorts throughout the convoy, and ensure the presence of a reaction force. Light troops were encouraged to integrate scout and antitank platoon assets for this role. Emphasis lay in early detection and disruption of potential ambushers supported by the reaction force, which could counterattack. This escort organization reflected the development of similar tactics in Vietnam. In all security actions, surveillance, reconnaissance, and counterreconnaissance were considered inherent tasks. Enemy reconnaissance was to be destroyed through direct combat action.[165]

In 1994, publication of FM 17-98, *Scout Platoon*, provided long overdue guidance. It was the first manual to address the HMMWV scout platoon and offered a belated update to its 1987 predecessor. Its comprehensive nature and clearly written style made the new manual ideal for training and introducing a new generation of platoon leaders to scout operations. A special chapter explained communications and command responsibilities, while another detailed the fundamentals of scout operations. Detailed examples showing planning, preparation, and execution phases accompanied most mission types. Its appendixes included detailed coverage of operations in an NBC environment and a wealth of guidance for dismounted operations to include movement, tracking, and search techniques. Finally, another appendix addressed operations other than war, providing practical guidance for the most common platoon tasks, including checkpoint operations and handling prisoners.[166]

The manual made clear distinctions between HMMWV and M3 platoons in terms of their capabilities and optimal employment. Reconnaissance and security operations constituted the primary functions of both unit types, but their platforms determined how these actions would be performed. The M3 platoon possessed more combat power and survivability at the expense of stealth and coverage area. Conversely, the more vulnerable HMMWV platoon offered broader coverage and stealth with only a limited combat capability.[167] The complementary nature of the two

platoons paralleled a similar relationship between horse and mechanized cavalry in the interwar years.

The fundamentals of reconnaissance remained unchanged, but in its execution, the manual emphasized stealth, information collection, and survival. The manual acknowledged the potential value of both stealthy and aggressive reconnaissance, but it demonstrated a clear preference for stealth and undetected operations: "Scouts should dismount their vehicles and use binoculars whenever enemy contact is possible and vehicle movement is not necessary."[168] Nevertheless, the authors noted that such methods might not always prove possible. They offered tactics, techniques, and procedures to govern those situations requiring more overt methods while highlighting the inverse relation between reconnaissance tempo and scout security. Faster movement increased the likelihood of detection and engagement. In general, platoon leaders were expected to employ a mix of formations, techniques, and methods to achieve the best balance of security and operational tempo. Perhaps reflective of Operation DESERT STORM experiences, obstacle reconnaissance also received considerable attention, and scout responsibilities included limited obstacle clearance.[169]

Security operations entailed surveillance rather than combat. In the establishment of screens, scout platoons could expect the attachment of ground surveillance radars, engineers, and combat operation lasing teams. By employing radar to monitor more remote areas, scouts could concentrate their attention on the most important locales. Enemy incursions were to be harassed and impeded, but direct fire engagements were not stressed. Alternatively, the manual acknowledged the potential role of hunter-killer tactics in screen operations. The presence of tanks permitted hostile probes to be eliminated and enabled a more aggressive counterreconnaissance role to be adopted.[170]

Area, route, and convoy security were also missions considered suited to the scout platoon. Each of these mission types possessed relevance to both conventional combat and operations other than war. At the platoon level, area security occurred through adoption of a coil, or defensible laager, that incorporated concertina wire, rocket propelled grenade (RPG) screens, and dismounted emplacements. Route security mandated the use of outposts connected by patrols to detect enemy activity along the protected roadway. When route security could not be assured, the platoon assumed the role of convoy escort. The manual provided detailed coverage of vehicle placement and ambush reaction. HMMWV scouts were expected to clear the ambush point, while the heavier M3 platoons utilized their firepower and armor protection to counterattack.[171]

In 1999, the Army published an updated scout platoon manual. It retained the instructional layout and readability of the earlier version, constituting less a replacement than a refinement. However, the new manual tended toward a common set of principles for scout platoon operations with fewer distinctions drawn between M3 and HMMWW-equipped units, despite major differences in the capabilities of these platforms.[172]

The new manual increased the emphasis of the earlier version on information collection, preferably via stealth. Reconnaissance coverage included a new section governing infiltration/exfiltration—the process of penetrating hostile security screens to complete a mission and return without being detected. The most common mission types included establishment of an observation post, employment of a sensor, and the collection of specific information about the enemy. The narrower range of activity more closely resembled that of the NTC OPFOR in a deliberate attempt to resolve recurring reconnaissance problems reported there. Similarly, the planning and preparation of reconnaissance and surveillance missions received heightened emphasis, particularly in conjunction with battalion/troop missions. The manual encouraged the use of information from scouts in the planning, preparation, and execution of the parent organization's operations. This guidance targeted repeated criticisms from combat training centers concerning failures to integrate scout operations into battalion and troop planning.[173]

Courtesy *Armor Magazine*

Figure 101. Scouts dismount from their HMMWV.

Scout platoon reconnaissance retained its emphasis on information collection. Zone, route, and area reconnaissance remained basic missions, but the new manual included few references to fighting for information.[174] Indeed, scout platoon leaders encountering the enemy were expected to seek approval from their commander before enacting a recommended course of action. In effect, they needed authority to engage any hostile force encountered. This requirement was not new to the 1999 manual, but together with the emphasis on undetected information collection, integrated planning, and the absence of guidance for more combative action, it discouraged aggressive reconnaissance. The manual further warned against massing platoon combat power to defeat an enemy, since doing so might compromise its overall mission. In those instances when the platoon received authorization to attack, targets were limited to unarmored or lightly armored targets.[175]

Dismounted operations remained the most desirable method of conducting reconnaissance: "The platoon should strive to make contact with the smallest possible element: the dismounted scout. Visual contact, in which the enemy is observed but the scout remains undetected, is the goal." Detailed guidance for dismounted scouts became the thrust of the chapter devoted to basic scout skills. It covered the establishment of observation posts, patrols, and hasty dismounted reconnaissance. Gone was the detailed coverage of tracking and related skills, which had emerged in the 1994 manual.[176]

Security missions included primarily screen and surveillance. In fact, the new manual redefined the platoon's mission as that of reconnaissance and "to a limited extent, security for its parent unit." The chapter introduced the reconnaissance avenue of approach, or that path most likely traversed by hostile reconnaissance assets. It had to be identified and covered to prevent penetration of friendly screens, but it might vary from the route followed by the enemy main body. To establish a screen with some depth, the manual anticipated the augmentation of the platoon with engineers, combat operations lasing teams (COLT), and ground surveillance radars. The security team provided surveillance and early warning to friendly commanders. Although counterreconnaissance remained an important related task, the platoon's role was limited to identifying hostile reconnaissance elements for friendly combat forces to eliminate.[177]

Coverage of the scout platoon's role in stability and support operations expanded to reflect overseas experiences in the 1990s. It addressed rules of engagement and the integration of light and heavy forces in operations other than war. Much of the chapter, however, focused on key activities required

of platoons, including checkpoint operations, roadblocks, searches of personnel and vehicles, and the conduct of cordon and search missions.[178]

The urban nature in which stability and support operations occurred, coupled with a renewed Army interest in urban operations that grew throughout the decade, resulted in better guidance for scout activities in built-up areas. The platoon was expected to begin gathering information before entering a town or city, using its reconnaissance work to enable the parent organization to achieve tactical surprise. Scouts identified enemy weakness and helped to determine where combat power should be massed for maximum effect, with particular emphasis on avenues of approach for attacking forces. These principles proved little different than those applied outside urban areas, but towns and cities posed unique challenges. The scouts gathered information for local residents, identified targets, and distinguished between combatants and civilians. In providing a steady stream of information to the parent commander, the scouts were to simplify the friendly force task of isolating the defending forces prior to defeating them in detail.[179]

Reconnaissance at the Combat Training Centers

In the 1990s, the Armor Center made a determined effort to improve cavalry doctrine. The result of this effort became manifest in the manuals published during the decade. They generally provided better guidance for a broader range of missions and situations. The pages of newer manuals contained detailed examples of how to apply doctrinal principles. The clarity and training-oriented nature of the published material reflected a deliberate effort to make unit commanders and staffs more aware of their roles and responsibilities. The improved manuals also marked a doctrinal response to recurring reconnaissance problems at the combat training centers.[180]

Criticism of the new manuals generally focused on their neglect of select topics or their conventional operations orientation. Cavalry doctrine appeared to some to stress the security and economy of force missions over reconnaissance. Guidance for information acquisition suffered from allegations of becoming too dependent on technical means better suited to tracking large, mechanized concentrations than the small militant groups that characterized the principal threat to stability and support operations. Doctrine writers were encouraged to focus more on the interaction of information operations, reconnaissance, and maneuver in lieu of technology, since "the Army as a whole is too enamored with the pursuit of technology to explain how information operations result in increased effectiveness on the battlefield."[181]

Cavalry constituted an active information-gathering source, and it possessed advantages over the growing trend toward standoff sensors and digital systems linked to global information assets. By the end of the decade, a doctrinal need existed to show how emerging technologies improved the quality and timeliness of information collection and expanded the coverage area of cavalry organizations. With Force XXI concepts moving toward reality, doctrine needed to reflect the impact of these ideas and related technology.[182]

For much of the decade, doctrine focused on traditional missions and rectifying problems identified at the combat training centers. These issues required effective responses for immediate implementation by current organizations. A 1996 report covering reconnaissance operations at the NTC outlined multiple shortcomings, including ineffective employment and planning of scout activities. Brigade mission planning often included reconnaissance measures as an afterthought rather than an integral part. Consequently, scouts received vague guidance without specific objectives and their actions went unmonitored.[183]

The development of rigid brigade plans before reconnaissance missions completed and continued commitment to them afterward effectively nullified the battlefield value of scouts. During one training exercise, an armor brigade planned a frontal assault on a heavily fortified position. Scouts identified an open path to the enemy's flank, but the brigade commander and staff remained committed to the plan, which had consumed much of their energy and preparation time. The resultant operation resulted in heavy casualties and significant time loss.[184]

Doctrine encouraged a maximum scout presence forward. Implementation often resulted in a "recon-push." Scouts were thrust forward equipped with a shopping list of information requests but no overarching objective. They were neither expected nor directed to assess battlefield developments. Consequently, scouts provided a mass of diverse data without indication of its relative importance. Nor did commanders receive an analysis of the tactical situation from those soldiers best placed to observe it. Commanders found their understanding of the battlefield and enemy vulnerabilities only marginally improved by their scouts. This condition led to the caustic observation that "recon-push is a Mission Training Plan approach to reconnaissance—a check-the-block method that lends itself to planning in a reconnaissance vacuum."[185]

Recon-pull offered a more effective means of integrating scouts with brigade and battalion operations, and it was supported by the Armor Center. Essentially, scouts maneuvered over a broad frontage to locate

enemy positions and probe for weaknesses. Once identified, the scouts then helped friendly forces to penetrate and exploit these points. In effect, the parent unit relied on its reconnaissance elements to guide it forward instead of adhering to predetermined plans. This concept was not new, but the recurring reconnaissance problems at the combat training centers revitalized interest in recon-pull. To be effective, it required unit commanders and staffs to generate flexible plans readily modified in response to input from scout leaders. It also necessitated a degree of trust in junior leader judgment that not all commanders were willing to accept. Many scouts also proved only mediocre in their ability to conduct the patrols, probes, and reconnaissance in force operations inherent to recon-pull.[186]

The doctrinal emphasis given to the avoidance of combat undermined the ability of advancing scouts to overcome OPFOR security assets. Focused on reaching a predetermined observation point undetected, scouts gained little information en route to guide their parent battalion. Once in place, they found themselves subjected to a continuous and active effort by the OPFOR to locate and eliminate them through a variety of active and passive measures. Simply penetrating the OPFOR security proved difficult, since it relied on combat reconnaissance patrols, a motorized rifle company screen, and antitank guided missiles arrayed in depth.[187]

Counterreconnaissance posed another challenge. Too often, training units found their security zones penetrated by OPFOR reconnaissance assets and their dispositions soon became the knowledge of the OPFOR commander. This information permitted the OPFOR to mass its combat power on vulnerable areas and achieve victory. Doctrinal guidance considered counterreconnaissance an inherent part of any security mission. However, no comprehensive guidance existed to illustrate how counterreconnaissance operations should be organized and conducted, much to the chagrin of unit commanders struggling to cope with OPFOR reconnaissance probes.[188]

The problem lay not in the neglect of counterreconnaissance, but in its execution. Most battalion task forces relied on a screen line manned by scouts and buttressed by a combined arms company team dedicated to counterreconnaissance. The scouts detected and tracked hostile reconnaissance for the company team's armor and infantry components to destroy.[189] This approach necessitated planning and a high degree of coordination that failed to materialize. Like reconnaissance actions, counterreconnaissance found little incorporation into the overall brigade plan of operations. In sharp contrast to the OPFOR, counterreconnaissance was not considered a universal responsibility. Command involvement largely ended with

the designation of a counterreconnaissance team, effectively delegating responsibility to the team leader.[190]

In defensive actions, units experienced another type of problem with screen operations. In accordance with doctrine, most units pushed their scouts forward, massing them to cover one or two avenues of approach. When OPFOR elements advanced, the scouts retired to avoid detection and engagement. In the process, they frequently lost contact with friendly forces to the rear. Consequently, tracking of the enemy penetration ended as soon as the scouts displaced, creating a chaotic situation for the parent organization struggling to relocate and eliminate the OPFOR. To avoid this problem, one solution called for a screen line in-depth instead of a linear arrangement. With one or two observation posts established forward to view the potential pathway for the OPFOR from the flanks, one remained rearward. As the OPFOR advanced, the forward scouts tracked them as long as possible before transferring observation responsibility to the rear observation post. In this manner, the scouts maintained a degree of continuous surveillance of an attacking enemy without necessarily having to relocate and lose contact with them.[191]

The company team assigned to counterreconnaissance often served as the battalion reserve, necessitating separate planning and preparation for this role. This dual responsibility contributed to the speedy degeneration of the counterreconnaissance effort into two separate, uncoordinated actions by the forward screen and the counterreconnaissance team. OPFOR probes thus found it easy to penetrate the linear, unsupported screen and push into and through the defending security zone. In the process, they identified routes for the main attack to follow. Accepting losses, they often managed to secure sufficient information to permit effective planning and execution of offensive action, while the counterreconnaissance force floundered to find and destroy them.[192]

To correct these problems, one commander urged the adoption of counterreconnaissance measures similar to those used by the OPFOR. He believed the root cause lay in the failure to make counterreconnaissance a command-wide responsibility that required command focus and oversight. Security operations in which counterreconnaissance was an integral part required rehearsals like other missions to avoid the confusion and breakdown of control that occurred when OPFOR incursions began. Counterreconnaissance needed to be incorporated into unit planning and continuously monitored in the same manner as reconnaissance.[193]

Cavalry organizations improved counterreconnaissance by strengthening their forward screens with tanks. Through hunter-killer tactics, the

screens became more robust and capable of eliminating OPFOR reconnaissance without additional assistance. Tank sections paired with scout platoons and received further support from engineers, fire support, and the forward pre-positioning of high demand supplies. Careful monitoring and updating of threat activities further enhanced the effectiveness of these measures.[194]

Courtesy *Armor Magazine*

Figure 102. A UAV ready for operations at the NTC.

In all operations, battalion scouts labored under a logistical challenge not shared by cavalry units. The dispersion and continuous employment of the scouts made it difficult to receive supplies, maintenance, and medical support. Doctrine provided a range of options rather than a common standard for service support. The parent battalion could provide a dedicated service support team to support the scouts, the platoon could tap into the logistical support of the nearest company team, or the platoon sergeant could serve as the service support conduit. The first option proved the most effective, because it did not require the scouts to coordinate their resupply actions with any other unit and did not remove a vehicle and crew from information collection. While this solution proved optimal for the scouts, it diverted battalion assets. A proposed remedy lay in the addition of a service support section to the scout platoon, but no organizational change occurred. Each battalion continued to adopt its own means of providing logistical support to the scouts.[195]

Combat training center assessments derived from actions between training units and a dedicated OPFOR. The latter served to test the former and improve unit effectiveness. Yet, for all their realism, the combat training centers remained an artificial environment and the OPFOR a fictitious enemy. Not all commanders were convinced that the OPFOR justified the large investment in training time and funding. At each training center, the

OPFOR benefited from frequent operations on the same terrain at a time when most units in the Army struggled to sustain effective training anywhere. As the nature of the threat facing the Army became more amorphous, ranging from hostile demonstrators to an array of conventional and unconventional enemies, the relevance of the OPFOR came into question. In the words of one commander, "We have become fixated on an OPFOR doctrine that is not executed by anyone but us." With the end of the Cold War, OPFOR organizations would have to become more dynamic and less well defined—much like the threats they needed to represent.[196]

Scout Training

The effectiveness of mounted reconnaissance in part reflected the quality of related training programs and personnel policies. Throughout the 1990s, both remained of high caliber despite significant challenges. One of the most important concerned NCOs. In reconnaissance units, these leaders played central roles as vehicle commanders, section leaders, and tutors for new platoon leaders. However, Army downsizing after the Gulf War contributed to the onset of a general shortage of NCOs that continued throughout the decade. Efforts to develop replacements were hindered by a drop in the numbers of individuals joining the Army to become scouts. The latter received a lower recruitment priority and a smaller enlistment bonus in comparison with other military career paths.[197] Downsizing also reduced the number of training organizations charged with scout training to just one.[198]

In 1996, the Army initiated the change in NCO structure (CINCOS) to enhance career progression. This program reduced the rank associated with a variety of field and staff duty positions. CINCOS resulted in the downgrading of many positions associated with doctrine writing, combat development, and training within the Armor Center. In addition to a general shortfall of NCOs, many now possessed less experience than their predecessors. Competition arose among organizations for the reduced number of seasoned NCOs for a variety of branch-related activities, including small group instruction for tankers and scouts.[199]

More junior NCOs in positions of responsibility necessitated greater oversight by officers, but a shortage of commissioned personnel also existed. The greatest dearth occurred among captains, partly because the Armor Branch failed to meet its annual requirements for new officers of this rank. The mandatory assignment of captains by the Army to non-armor duty assignments only exacerbated this problem, and encouraged the Armor Branch to seek alternate sources of personnel for branch-immaterial postings.[200]

Armor captains found themselves in high demand for a variety of assignments. This situation resulted in most Armor captains spending less time in field command positions than their counterparts in other branches. Combat organizations already facing readiness and manning shortfalls found little relief in the short tenures of company and troop commanders. Consequently, plans emerged to rely on distance learning to enable captains to train without leaving their units to attend school for extended periods. A longer-term solution affected personnel assignments to ensure an increase in the time spent by lieutenants, captains, and majors in command and staff duty positions.[201]

Within the Armor Center, work progressed on the Force XXI Training Program, part of an Army-wide initiative to integrate combined arms doctrine, training, and emerging information technology. It incorporated insights from the Advanced Warfighting Experiments, built on the best practices of simulator use, and sought to streamline training cycles through advanced technologies. The program also sought to incorporate proven technologies and training strategies into existing training, exemplified by the expansion of distance learning.[202]

The Force XXI Training Program exploited computer technology to enhance officer and staff instruction. It directly supported the work of the EXFOR through computer-driven staff training courses, exercises, and support packages. In turn, the experience of the EXFOR provided data for further Force XXI training developments and drove requirements for digital training ranges, gunnery changes, and related upgrades to training infrastructure. At Fort Knox, these requirements resulted in the fielding of the Close Combat Tactical Trainer and Classroom XXI. The former was an enhanced set of networked simulators for unit training. The latter created a network between schools and training facilities. The Cavalry Leaders Course was among the first to utilize Classroom XXI. While the primary instructor remained in a classroom with students, links with the NTC and other branch schools permitted students to interface directly with subject matter experts from those facilities, considerably broadening the in-class discussion.[203]

The Scout Platoon Leaders Course also underwent change in the 1990s. The Gulf War demonstrated the need for more emphasis on route reconnaissance, hostile obstructions, and obstacles. The course, therefore, expanded to include an extended, continuous field exercise. By 1998, the course included 44 hours of advanced reconnaissance techniques and a 4-day field exercise. It also opened to staff sergeants in response to requests from field units, and the course name changed to Scout Leaders Course.

Despite its success, however, the Scout Leaders Course was not immune to budgetary constraints, and the Department of the Army opted to stop funding it. In response, the Armor Center shared the course's operational costs with those units who sent personnel to attend, effectively salvaging an effective cavalry-oriented training program.[204]

Other changes to officer instruction reflected feedback from field units and the influence of Force XXI. The Armor Officer Basic Course grew from 15 to 17 weeks to provide familiarization with the digital M1A2 Abrams tank and more cavalry instruction. In the Armor Officer Advanced Course, brigade level operations and mission execution received greater emphasis. This change reflected the increase in numbers of graduates who went straight into staff positions rather than troop or company command. Other subjects added included the use of training devices for instruction and operations other than war. To offset the impact of a drop in course length from 20 to 18 weeks, distance learning was used to address those subjects not specific to Armor. The course retained 24 hours devoted to reconnaissance and security planning in response to observations from the combat training centers and 32 hours dedicated to terrain exercises without troops.[205]

New scouts similarly benefited from the addition of more M3 and HMMWV driving time in their instruction, together with additional emphasis on mounted and dismounted navigation. The use of global positioning systems was introduced and prospective scouts received more instruction in calling for indirect fire. Opportunities to practice skills taught occurred during a 4-day situational training exercise. Graduates received a reference book that consolidated all of the individual and unit tasks indicated in field manuals and training literature for reference in the field.[206]

Many of these changes also stemmed from emerging Force XXI doctrine that emphasized reconnaissance-pull. Relying on scouts to identify enemy weakness and guide friendly forces into these vulnerable areas necessitated competent junior leaders capable of spotting weakness and commanders who exploited their observations in the direction of their unit. Hence, the Armor Center deliberately sought to expand programs of instruction and devote more training time to reconnaissance actions. The precommand course, for example, introduced students to cavalry organizations, missions, and tactics, which could then be observed in operation during a 5-day NTC visit. Overall, leader instruction in reconnaissance emphasized rapid execution of missions and the ability to plan on the move, because "commanders must be trained to seize the fleeting battlefield opportunities that Information Dominance will present."

Reconnaissance-pull on the fast-paced Force XXI battlefield required decisive commanders who would act without awaiting a perfect alignment of resources and circumstances.[207]

Some combat units already understood these principles. In the 1st Cavalry Division, the scout platoon of the 1st Squadron, 8th Cavalry Regiment, for example, responded directly to the squadron commander, not the S2 or fire support officer. Indeed the linkage between the squadron commander and the platoon leader was considered vital for command decisions to reflect the input of the scouts: "The task force commander must be willing to have a close personal relationship with his scout platoon leader." This relationship facilitated understanding of the commander's priority information requirements and ensured a focused mission for the scouts.[208]

Finding the training opportunities to develop the tight leadership bonds required of recon-pull sometimes proved problematic. For division cavalry squadrons, the 1990s marked the return of tanks to these organizations and a related boost in combat power and capability. Yet combat seemed to offer most squadrons the best opportunity to train. Most of these units faced inadequate training resources and insufficient maneuver space at home station. Moreover, the squadrons now possessed a large number of different weapons. They needed additional range time to permit crews to become proficient in their use, but rarely did squadrons receive extra time necessary for this training.[209]

In Germany, constraints on the movement of heavy combat vehicles directly affected the training of cavalry organizations equipped with tanks, self-propelled artillery, and Bradley Fighting Vehicles. For one scout platoon leader, "these restrictions presented the question of how to train my platoon with little or no maneuver area." During an 18-month command tenure, this officer found only one opportunity to operate his M3-equipped platoon in the field and then only within a very small area. Under these conditions, realistic training became difficult, particularly since the platoon could not utilize its vehicles to conduct battle drills and hone basic skills. In frustration, it turned to the use of HMMWVs as surrogate platforms. These vehicles posed little threat to local infrastructure and were largely exempt from land use restrictions. This expedient increased maneuver opportunities, but did little to acquaint soldiers with their primary platform.[210]

Preparations for contingency deployments posed other challenges. In Europe, the 1st Squadron, 1st Cavalry Regiment prepared for possible operations in Bosnia through a CMTC rotation that focused on operations other than war. The scenario set necessitated protracted dealings with

recalcitrant ethnic factions less than enthusiastic about foreign intervention. The cavalry's role lay in providing a UN convoy escort, establishing checkpoints, dealing with the media, and controlling multiple civilian work groups. Fundamentally different from conventional warfighting missions, one participating officer noted, "This training is exceptionally difficult, putting severe strain on command and control systems and on junior leader initiative and understanding of the political situation and the commander's intent." To their growing list of necessary skills, junior leaders needed to add patience together with cultural and political awareness.[211]

The likelihood of operations in urban areas triggered some units to seek more training opportunities in built-up areas. Before its conversion to the NTC resident OPFOR, the 11th Armored Cavalry developed a training exercise that involved convoy escort into and through an urban area. It made use of the urban combat training site at Bonnland, Germany. Convoy movement through streets became complicated with the addition of role-players representing crowds, a skeptical media, and militants employing ambush tactics. The overall scenario loosely reflected the deteriorating conditions characteristic of Yugoslavia in the early 1990s. In the course of the training, 11th Armored Cavalry personnel were expected to follow restrictive rules of engagement and minimize civilian casualties. Specific training tasks for the scouts included dismounted movement, reaction to snipers, and urban area reconnaissance. In preparation, the regiment applied techniques once commonplace during the Vietnam war, but during actual operations, scouts proved much too aggressive against civilians. A similar problem among other units training for potential contingency operations highlighted the difficulties of transitioning soldiers from warfighting to operations other than war.[212]

For light cavalry organizations, training efforts focused on contingency operations and the optimal employment of assets to offset their limited combat power. The 2d Armored Cavalry Regiment, for example, adopted the integrated scout antitank teams initially associated with light infantry division cavalry. Nevertheless, additional work was required to determine the engagement criteria and best tactics for each of the HMMWV-mounted weapons available. The light regiment needed to avoid protracted engagements, particularly with heavier forces. It therefore focused on the refinement of antiarmor ambush skills and the integrated use of hand-held antitank guided missiles and Claymore mines.[213]

The Force XXI Division and the Brigade Reconnaissance Troop

Force XXI initiatives ultimately aimed at building a more effective force suited to current and future battlefields. Division redesign constituted

the most significant manifestation of this intent. For much of the decade, work on a division structure remained an analytical process encompassing the Army Warfighting Experiments, EXFOR activities, computer modeling, and paper studies. At any rate, by the decade's end a new organization had been adopted for fielding early in the the 21st century. Initially known as the Conservative Heavy Division, reflecting its status among a range of options, it became the Force XXI division and guided materiel fielding needs.

The new division design reflected the Army's shift from a forward deployed to a power projection force that deployed from home stations to operational environments. The collapse of the Soviet Union ended the immediate danger of a confrontation with a large-scale, highly mechanized army. Hence, the Force XXI formation possessed increased deployability, partially achieved through a reduction in size and combat power. Division size fell to about 15,000 soldiers, thereby easing manning problems evident throughout the 1990s. Using digital systems, the formation was expected to possess an unprecedented ability to see and understand the battlefield, permitting its fewer combat assets to be maneuvered with an unmatched degree of precision. The 4th Infantry Division (Mechanized) was the first formation designated to convert to the new configuration in 2000. However, the extent and pace of conversion throughout the Army

Courtesy *Armor Magazine*

Figure 103. The LRAS3-equipped HMMWV was intended for fielding in the new brigade reconnaissance troop.

remained closely tied to the availability of new equipment in a manner reminiscent of similar formation changes in the 1980s.[214]

The basic structure of the Force XXI division remained similar to the Army of Excellence configuration it replaced. The new formation included a HHC, a cavalry squadron, an armor brigade, two mechanized brigades, an artillery brigade, an aviation brigade, and a support brigade. Air defense, military intelligence, and engineer assets completed the structure. Significant changes included the adoption of combined arms battalions and the integration of engineers at the brigade rather than the division level.[215] The division lost its chemical company, but its NBC reconnaissance capability shifted to the division cavalry squadron. It gained a rear area operations company and increased fire support, while losing a second attack helicopter battalion and an antiarmor company in the mechanized infantry battalion. Brigades benefited from increased staffs that included a new S5 (Civil Affairs) officer, more liaison teams, and two retransmission teams for supporting communications over long distances or difficult terrain.[216]

Tank battalions shrank from 4 companies with 58 tanks and 604 soldiers to 3 companies with 44 tanks and 343 soldiers. Precision maneuver via digital communications was expected to offset this loss in combat power. The consolidation of most battalion service and support assets in a separate organization at the division level proved more controversial. This change eliminated the maneuver battalion commander's ability to control his own service support, forcing him instead to rely on external organizations anticipating his logistical needs. Digital monitoring of supply consumption theoretically enabled an accurate sensing of the maneuver unit's needs, but the concept had not been validated at the time the division structure was adopted. The scout platoon remained, but at a new standard organization of six vehicles. Cavalry platoons fielded M3A3s, while the battalion scout platoon included six M1114 up-armored HMMWVs equipped with the LRAS3. Increased protection and surveillance capabilities were expected to offset the impact of a smaller organization. Mortar support within the battalion similarly shrank to four mortars controlled by a dedicated fire direction center for more effective and responsive fires.[217]

The cavalry squadron underwent relatively few changes in the Force XXI division. It retained its basic structure of a HHT, three ground cavalry troops, two air reconnaissance troops, and an aviation service troop. Ground troop organization included two armor and two scout platoons for a total of 9 tanks and 13 M3s. The principal change lay in the addition of the NBC reconnaissance detachment. Despite prior efforts to realign the

squadron from the aviation brigade to direct division control, it remained within the aviation unit.[218]

At the brigade level, the inclusion of an organic brigade reconnaissance troop constituted another significant development. With this unit, each organization from battalion through corps possessed its own dedicated reconnaissance agency. A similar reconnaissance unit had been included in armored divisions from their inception in World War II, but formation changes in the 1970s eliminated them. Initial plans for the Army of Excellence division had included a brigade scout platoon of six M3s, but it became a bill payer for other desired changes and disappeared before fielding began.[219]

The failure to restore a reconnaissance capability did not eliminate the desire to do so. Armor Center analysis in the 1980s demonstrated a consistent need for such an entity in a series of studies devoted to heavy force requirements and reconnaissance assessments. However, despite TRADOC support for a brigade reconnaissance unit, in 1989 the Army Chief of Staff ruled its potential value insufficient to justify its cost in manpower and money. At that time, the addition of a scout platoon for every heavy brigade added a requirement for 1,400 soldiers that could not be readily met.[220]

Operation DESERT STORM reenergized interest in brigade reconnaissance. The conflict seemed to confirm the battlefield value of brigade scouts and led TRADOC to undertake their design and fielding.[221] Similarly, some units began to improvise their own, driven in part by NTC experiences. Although brigades were intended to conduct reconnaissance and surveillance operations up to 15 kilometers beyond their forward elements, they had to rely on battalion scouts, who rarely managed half that distance. The gap was to be covered by aviation, air support, and electronic assets, but these were not controlled by the brigade commander. Coordination became a problem. A brigade commander could overcome this issue by improvising a small HMMWV scout platoon supplemented by ground surveillance radar, combat operations laser targeting, and retransmission teams. Relying on stealth to infiltrate hostile security, their task lay in establishing undetected observation posts out to 15 kilometers as per doctrine.[222]

The Force XXI division design resolved the issue by the incorporation of an organic reconnaissance troop in each armor and mechanized infantry brigade. It reflected a consensus regarding its need based on the Advanced Warfighting Experiments, NTC rotations, and digital training conducted by the EXFOR. Modeled on the light cavalry troop, the brigade unit was intended for a broader range of missions beyond information collection.[223]

In May 1996, the first brigade reconnaissance troop activated at Fort Hood, Texas, as part of the EXFOR. This unit served as a test organization to determine the optimal organization and role for brigade scouts. The initial configuration included a headquarters and two scout platoons, with a personnel strength of 85 soldiers. Each scout platoon included 31 soldiers and 9 HMMWVs, one of which carried either an LRAS3 or a sensor suite. Capability enhancement occurred through the frequent attachment of engineers, military intelligence sensor squads, a combat operations laser targeting team, and a medic. Digital communications sped information sharing and provided much better situational awareness through electronic transmission of maps and graphics. The unit generally operated via stealth, and it was common for a heavier combat unit to open a path through enemy screens at the start of the mission to compensate for the troop's limited combat power and need to avoid casualties. Alternatively, OH-58D helicopters and UAVs might overwatch the troop's movement, with the former providing a direct fire capability as well. Security operations occurred through surveillance and rapid reporting of enemy activity. In effect, they became the forward tier of a layered security zone that ranged from the scouts of the reconnaissance troop to the overwatching OH-58Ds, to battalion scouts, and finally to combat assets.[224]

The new brigade reconnaissance troop participated in its first NTC rotation during the Task Force XXI Advanced Warfighting Experiment in March 1997. It returned in March 1999, but its configuration had changed. Scout platoon size shrank from nine to six vehicles. During this rotation, it benefited from the attachment of a COLT platoon from division artillery that operated as a collection of six teams closely integrated with scout teams. This close cooperation generated positive results during simulated combat, particularly in the request for and delivery of fire missions. The COLT teams worked forward, often in the same observation post as the scouts, providing the brigade commander not only a sense of the battlefield in depth, but the capability through indirect fires to influence hostile activity before his maneuver battalions came into direct contact with the enemy. One of most significant problems encountered, however, lay in efforts to share the same information with battalion commanders. While the brigade commander often received excellent intelligence with which to understand the tactical situation, maneuver battalions did not.[225]

These experiences helped to finalize the reconnaissance troop's composition. By 1999, it included a small headquarters element and two scout platoons. Each platoon was to include 6 up-armored HMMWVs equipped with LRAS3 and 18 soldiers. Total troop strength came to just

49 soldiers.[226] Personnel and equipment for the unit were provided through the simultaneous reduction in strength of battalion scout platoons from 10 to 6 vehicles. The reconnaissance troop was expected to benefit from the frequent attachment of a Striker platoon from the division artillery. This unit carried artillery observers in HMMWVs. Fielding plans envisioned the first brigade reconnaissance troops to be established among those units stationed in Europe, while future plans considered replacement of the HMMWV with the FSCS, probably in the 2007 timeframe.[227]

The new unit's reliance on the up-armored HMMWV quickly drew criticism. Although the reconnaissance troop was intended to operate via stealth and collect information via surveillance, some felt its mission would by default resemble that of a division cavalry squadron. The troop would be the most forward element on the battlefield and likely thrust into traditional route, zone, and area reconnaissance in addition to carrying the brunt of the counterreconnaissance battle. Against this mission set, the M1114 would not survive long enough to complete missions. Despite its improved ballistic protection over unarmored HMMWVs, the M1114 did not offer effective protection against RPGs. The gunner remained unprotected and the armored windows became nearly impossible to see through when struck repeatedly by small arms. The heavier weight of the M1114 also served to erode its cross-country mobility and increase the wear and tear of key components: "The new XM1114 is not the same HMMWV you enjoy back in the garrison environment, a vehicle that requires little maintenance and is able to leap small mountains in a single bound." Less mobile and lacking effective firepower, it could not fight its way out of situations. Given these views, the M3 seemed the optimal platform for the new reconnaissance troop.[228]

These concerns reflected more traditional reservations about the creation of a mounted organization optimized for information acquisition and the avoidance of combat. The brigade reconnaissance troop was not intended to perform the basic information collection, security, and economy of force missions associated with prior reconnaissance organizations. It constituted less a cavalry unit than a collection of digitally networked and maneuverable sensors. The troop provided another set of eyes and ears on the battlefield, but it was not designed to either fight for information or conduct security operations that entailed combat. Its real value lay in the acquisition and rapid transmission of battlefield intelligence and the delivery of fires far forward on the battlefield. Still, questions concerning survivability would continue to surround any organization designed to operate deep in enemy terrain with minimal combat power.

The emergence of the brigade reconnaissance troop and the smaller battalion scout platoon posed other problems. Existing doctrine did not reflect a six-vehicle organization, while the absence of the LRAS3 among current units left a gap in their surveillance capability. The smaller Force XXI scout platoons also suffered from a minimal dismount capability. Their limited manpower permitted the establishment of only two long-duration observation posts. They also lacked the ability to conduct observation in depth and lost much of their effectiveness if they suffered casualties. In short, "The current 18-man, six-HMMWV platoon is simply not capable of accomplishing all the tasks required to ensure mission success."[229]

Recommended changes followed. Infiltration offered the best means of operation, especially when combined with an emphasis on dismounted scouting and the addition of a fourth crewman to each HMMWV. Sniper teams offered some additional capability that had already been demonstrated by other cavalry units. In addition, the attachment of a retransmission team permitted scouts to select observation posts on the basis of best position rather than the ability to receive and transmit information. To ensure maximum effectiveness, training needed to address the coordination of brigade and battalion scouts. Moreover, the small size of the new scout platoons and its perceived weakness encouraged a recommendation for a return to a 10-vehicle organization with a mix of M3s and HMMWVs. Such a platoon had been a common recommendation in the 1980s to capture in one organization the complementary qualities of the Army's two principal reconnaissance platforms.[230]

Regimental Strike Force

The reconfiguration of the 2d Armored Cavalry Regiment into a light cavalry organization constituted the only significant force structure change in response to the changed geopolitical landscape actually implemented. Yet this unit remained in a transitional state throughout the 1990s. Plans for upgrading its vehicle set to an AGS/M113A3 mix ended with the cancellation of the former in 1996. This action, driven by budgetary considerations, left the cavalry unit as a light force built around the HMMWV. It remained highly deployable and able to inundate the battlespace with scout teams. Yet it lacked combat power.[231]

It could perform peacekeeping operations and fulfill the reconnaissance needs of the XVIII Airborne Corps, but its security and economy of force capability depended on the threat and operational environment. A number of recommendations emerged to address this deficiency. Advocates of a heavier organization supported replacement of the TOW HMMWV and towed howitzer with the M1A1 tank and self-propelled M109A6

Paladin, while the scouts transitioned to the up-armored M1114. This mix utilized available Army assets and minimized the number of additional training requirements to be met. The principal value of this configuration lay in boosting combat power without entirely sacrificing the unit's deployability. The presence of armor permitted a more aggressive stance against hostile security and mechanized components as well as offering a deterrence capability in operations other than war.[232]

Other proposed modifications favored mobility, deployability, and a more modest increase in firepower. The regiment needed to remain oriented on operations other than war without sacrificing its rapid response capability. If anything, it required more dismounts. However, such advocates acknowledged the utility of an improved platform such as a "lighter vehicle with a small cannon that offers improved crew protection over the armored HMMWV, yet is easily air transportable." It remained to be seen whether this might be a role for the FSCS.[233] Another alternative called for reequipping the regiment with the LAV family of wheeled vehicles to provide a better balance of firepower, protection, mobility, and supportability. This suggestion found ready support from the Marine Corps, already using the LAV in similar roles.[234]

In February 1997, the Chief of Staff directed the concept development of a modernized cavalry regiment oriented on operations at least a decade in the future. The response featured a regimental strike force structured to rectify through advanced technologies the existing shortcomings of the 2d Armored Cavalry, particularly its poor optics, limited combat power, and inability to fight for information or to gain time for a friendly force. One conceptual strike force design closely paralleled the existing armored cavalry regiment configuration. It included a HHT, three ground cavalry squadrons, an air cavalry squadron, military intelligence assets, engineer support, and related logistical services. A more radical proposal envisioned a brigade organization with two combined arms maneuver battalions, a reconnaissance and surveillance squadron, and a battalion each of motorized infantry, artillery, and aviation. In both cases, the LAV family constituted the intended vehicle mix for the strike force, utilizing a range of different LAV variants. They included a LAV with a turret mounted 120-mm mortar and the LAV-105, carrying a stabilized 105-mm gun. Initially equipped with a mix of towed howitzers, HMMWVs, TOW HMMWVs, and LAV-25s, the regiment was also a candidate for the FSCS when fielded.[235]

The use of the LAV family to equip the strike force permitted use of a platform already in use by the Marine Corps and simplified maintenance

and supply. It also transformed the 2d Armored Cavalry into a medium force that merged the deployability of light forces with some of the combat power associated with heavier organizations. The need for such an organization increased with the rise in contingency operations and the pending inactivation of the 3d Battalion, 73d Armor Regiment—the XVIII Airborne Corps' only light armor unit. The proposed strike force offered a substitute armored capability and the means to perform a broader mission set without augmentation than currently possible for the 2d Armored Cavalry. In addition, the strike force would benefit from those concepts and technologies matured under Force XXI related to command, control, and surveillance. In its final state, the strike force would be characterized by superior strategic mobility, a degree of lethality, high situational awareness, and the capacity for modular augmentation. Planners sought a versatile organization ideal for contingency operations but much more mobile and robust than the light forces actually deployed for such missions.[236]

The medium-weight strike force never progressed beyond a conceptual stage. Despite interest in the unit, it failed to secure the necessary resources from an Army focused on deployments and Force XXI activities. Hence, instead of a combat unit, the Army leadership opted to pursue development of a strike force headquarters that could be implemented in a much shorter time and had immediate relevance to contingency operations. The new headquarters would consist largely of a permanent staff with no organic combat units. Its role lay in organizing, deploying, and controlling a variety of units to respond on short notice to a sudden crisis overseas. In the 1990s, such contingencies had been met by drawing units and command elements from several different formations. This practice disrupted the activities of each affected force and resulted in an amalgam of organizations struggling to develop cohesion in the midst of deployment. A permanent headquarters with a robust communications network and designed to control a variable number of subordinate units drawn from a designated pool offered a more effective means of crisis response.[237]

The strike force headquarters supplemented existing corps headquarters without disrupting their activities. It was intended to control not only Army combat and service units, but organizations taken from all branches and allied nations. It could be utilized for a variety of missions ranging from humanitarian aid to combat. With its personnel and equipment capable of deploying within 96 hours, it offered a much faster response time than current, improvised measures. The planners of the headquarters considered Task Force *Hawk* an example of the role the new command organization might perform. Task Force *Hawk* controlled US forces deployed to Albania in support of military operations in Kosovo in 1999.[238]

The selection of the 2d Armored Cavalry Regiment to craft the strike force headquarters stemmed from several factors. The unit remained in an anomalous state since its conversion to a light force and subsequent stalled modernization. Yet, it possessed the extensive command and communications network characteristic of armored cavalry regiments. In Bosnia, it served as the nucleus for the NATO stabilization force, and demonstrated its ability to integrate a wide variety of attached units. It routinely worked with intelligence, civil affairs, and psychological operations organizations, and its association with the XVIII Airborne Corps placed it squarely among the Army's first responders to sudden contingencies.[239]

Early development of the strike force headquarters centered on Fort Polk, Louisiana, the home station of the 2d Cavalry. There the skeleton of the new headquarters would be generated from regimental assets. Further momentum came with the appointment of a brigadier general and two cells to oversee coordination, organizational development, and related training and leadership issues. Through advanced technology use, the Army sought a much leaner headquarters, but the details of its composition became subject to considerable debate that could not be resolved until tested. By late 1999, however, time ran out for the strike force headquarters. In November, just months after the appointment of Army Chief of Staff General Eric K. Shinseki and the onset of Army Transformation, related activities were formally canceled.[240]

Notes

1. Office of the Army Chief of Staff, *Louisiana Maneuvers: The First Year* (Fort Monroe, VA, 1994), 6.

2. "U.S. Military Operations November 1990-Present," *Defense 96 Almanac*, No. 5 (1996): 41–42.

3. *Louisiana Maneuvers: The First Year*, 5.

4. US Army Armor Center (hereafter referred to as USAARMC), "Desert Shield and Desert Storm Emerging Observations," Report, 7 October 1991, 3-5, 3-10, 5-4, 6-40, US Army Armor Branch Archives (hereafter referred to as Branch Archives).

5. John L. Romjue, *American Army Doctrine for the Post-Cold War* (Fort Monroe, VA: US Army Training and Doctrine Command Military History Office, 1997), 74–77; Robert S. Cameron, "United States Army Armor Center and Fort Knox 1996 Annual Command History," Report, 11 March 1998, 122–123, Branch Archives.

6. *Louisiana Maneuvers: The First Year*, 8–11.

7. Robert S. Cameron, "United States Army Armor Center and Fort Knox 1997 Annual Command History, Draft Report, undated, 4-2 to 4-3, Branch Archives.

8. US Army Armor Center, "Advanced Warfighting Experiment Operation Desert Hammer VI: Final Report," 28 July 1994, Branch Archives; US Army Training and Doctrine Command, "Land Combat in the 21st Century," pamphlet, 1995, 6–7, Branch Archives.

9. US Army Training and Doctrine Command, TRADOC Pamphlet 525-5, *Military Operations: Force XXI Operations, A Concept for the Evolution of Full-Dimension Operations for the Strategic Army of the Early Twenty-First Century* (Fort Monroe, VA: Headquarters, TRADOC, 1994); Romjue, *American Army Doctrine for the Post-Cold War*, 139–141.

10. Romjue, *American Army Doctrine for the Post-Cold War*, 139–141.

11. Memorandum, General Gordon R. Sullivan, Subj: Force XXI Experimental Force Prime Directive, 14 February 1995, quotation from page 2, Branch Archives, 1995 Annual Command History.

12. Briefing, US Army Operational Test and Evaluation Command, Subj: Task Force XXI Advanced Warfighting Experiment Results, 16 June 1997, Branch Archives, 1997 Annual Command History.

13. Armor Conference Briefing, General William W. Hartzog, Subj: Future Army Training, 4 June 1997, Branch Archives, 1997 Annual Command History.

14. E-mail, Major General George H. Harmeyer, Subj: AWE Observations to CG, TRADOC, 11 April 1997, Branch Archives, 1997 Annual Command History; Interview, Major General George H. Harmeyer, 28 May 1997, Branch Archives, 1997 Annual Command History.

15. Lieutenant Colonel Kevin C.M. Benson, "Armor's Role in the Future Combined Arms Team," *Armor* CVII, no. 2 (March–April 1998): 48–49; Cameron, "United States Army Armor Center and Fort Knox Annual Command History," Draft Report, undated, 4–13.

16. W. Blair Haworth Jr., *The Bradley and How It Got That Way: Technology, Institutions, and the Problem of Mechanized Infantry in the United States Army* (Westport, CT: Greenwood Press, 1999), 245–146; "AH 64 Apache," undated, http://www.fas.org/man/dod-101/sys/ac/ah-64.htm (accessed 29 September 2008).

17. Briefing, General Hartzog, Future Army Training, 4 June 1997.

18. BDM International, Inc., "Armor 2000 Study Synopsis," Report, 31 January 1991, 1, Branch Archives.

19. Major General Thomas C. Foley, "An Armored Force for the Future: 2000 and Beyond—Technology," *Armor* C, no. 5 (September–October 1991): 4–5.

20. "Armor 2000 Study Synopsis," 255.

21. Ibid., 99, 101, 256.

22. Ibid., 107–110, quotation from page 107.

23. Ibid., 103, 107–110.

24. End of Tour Interview, Major General Thomas C. Foley, 8 July 1992, 10, Branch Archives.

25. "Armor 2000 Study Synopsis," 100–102, 240–242, 246, 250; Foley, "An Armored Force for the Future: 2000 and Beyond—Technology," *Armor* C, no. 5 (September–October 1991): 5–6; Major General Thomas C. Foley, "An Armored Force for the Future: 2000 and Beyond—Technology" (November–December 1991): 4–6.

26. Lieutenant Colonel Craig B. Whelden, "Light Cavalry: Strategic Force for the Future" (student paper, US Army War College 3 January 1992), 17, DTIC Report no. ADA247881.

27. E-mail, Commander, Combined Arms Combat Development Activity, Subj: Reconnaissance, Counter Reconnaissance, Surveillance Forces, 18 July 1988, 2, Branch Archives, Cavalry.

28. See, for example, Major Robert J. Wottlin, "The Case for Light Cavalry," *Armor* C, no. 6 (November–December 1991): 30–32.

29. Briefing, Combined Arms Center, Subj: Light Armored Cavalry Regiment, August 1992, Branch Archives, 2d Armored Cavalry Regiment; Briefing, USAARMC, Subj: Provide Emerging Results of the Light Cavalry Regiment Suitability and Acceptability Analysis, 27 February 1992, Branch Archives, 2d Armored Cavalry Regiment; Briefing draft, USAARMC, Subj: Light Armored Cavalry Regiment," 27 March 1997, Branch Archives, 2d Armored Cavalry Regiment.

30. USAARMC, "Background Study of Light Armored Cavalry Regiment Issues," Report, 1991, Branch Archives, 2d Armored Cavalry Regiment. While the JRTC did not open until 1993, planning included reliance on a unit permanently stationed at Fort Polk, LA, to support training.

31. Briefing, US Army Training and Doctrine Command, Subj: Light Armored Cavalry Regiment, 24 April 1992, Branch Archives, 2d Armored Cavalry Regiment; USAARMC, "Background Study of Light Armored Cavalry Regiment Issues."

32. Briefing, Combined Arms Center, Subj: Light Armored Cavalry Regiment, August 1992; USAARMC, Light Armored Cavalry Regiment Suitability

and Deployability Study, notes, 1991–92, Branch Archives, 2d Armored Cavalry Regiment.

33. Lieutenant Colonel (Promotable) Stephen L. Bowman, Lieutenant Colonel John M. Kendall, and Lieutenant Colonel James L. Sauders (eds.), "Motorized Experience of the 9th Infantry Division, Fort Lewis, Washington, 1980–1989," unpublished manuscript, 9 June 1989, Branch Archives, 9th Infantry Division.

34. USAARMC, Light Armored Cavalry Regiment Suitability and Deployability Study, notes, 1991–92; E-mail, Subj: Light Cavalry Regiment (LCR) Design Guidance, 29 April 1992, Branch Archives, 2d Armored Cavalry Regiment.

35. Briefing, US Army Training and Doctrine Command, Subj: Light Armored Cavalry Regiment, 24 April 1992; Briefing, Combined Arms Center, Subj: Light Armored Cavalry Regiment, August 1992.

36. Memorandum, Brigadier General Stanley Kwieciak Jr., Subj: Light Armored Cavalry Regiment Briefing, 5 May 1992, 18 May 1992, Branch Archives, 2d Armored Cavalry Regiment.

37. Correspondence, Subj: Light Armored Cavalry Regiment Fire Support Issues, May–July 1992, Branch Archives, 2d Armored Cavalry Regiment.

38. Briefing, USAARMC, Subj: Armor/Cavalry Information Briefing for Commander, USAAVNC, 26 June 1992, Branch Archives, 2d Armored Cavalry Regiment.

39. E-mail, III Corps Commander, Subj: Light Armored Cavalry Regiment (LACR), 16 June 1992, Branch Archives, 2d Armored Cavalry Regiment.

40. Memorandum, Brigadier General Robert B. Rosenkranz, Subj: Redesignation of 199th Motorized Brigade, 16 July 1992, Branch Archives, 2d Armored Cavalry Regiment.

41. Briefing, Combined Arms Center, Subj: Light Armored Cavalry Regiment, August 1992.

42. Memorandum for Record, Colonel Edward A. Bryla, untitled update of actions of US Army Armor Center TIPOF Task Force, 1992, Branch Archives, 2d Armored Cavalry Regiment; Memorandum, Brigadier General Edward G. Anderson III, Subj: Light Armored Cavalry Regiment (LACR) Proponency and Taskings, 24 August 1992, Branch Archives, 2d Armored Cavalry Regiment.

43. "Light Cavalry Regiment Organizational and Operational Plan," c. 1992, Branch Archives, 2d Armored Cavalry Regiment; "Operational and Organizational Concept for the Second Cavalry Regiment (Dragoons)," 28 October 1999, Branch Archives, 2d Armored Cavalry Regiment.

44. Memorandum, Major John C. Woznick, Subj: Position Paper: Second (2d) Cavalry (CAV) Regiment Equipment Issues," 14 October 1993, Branch Archives, 2d Armored Cavalry Regiment; "M113A2 Armored Personnel Carrier," http://www.globalsecurity.org/military/systems/ground/m113a3.htm (accessed 8 October 2008).

45. Lieutenant Colonel Joseph G. Dodd Jr., "The 2d Armored Cavalry Regiment: A Force for Peace Enforcement Operations," *Armor* CIV, no. 2 (March–April 1995): 48–49.

46. Lieutenant Colonel Kevin C.M. Benson, "A Report From Haiti: Cavalry in Peacekeeping Operations," *Armor* CIV, no. 6 (November–December 1995): 15–17; Armor Conference Briefing, Lieutenant Colonel Bill Weber, Subj: 2d Armored Cavalry Regiment, 5 June 1997, Branch Archives, 1997 Annual Command History; "2d Cavalry Regiment," 9 September 2006, http://www.globalsecurity.org/military/agency/army/2acr.htm (accessed 9 October 2008).

47. Benson, "A Report From Haiti: Cavalry in Peacekeeping Operations," 15–17; Lieutenant Colonel Bill Weber, Subj: 2d Armored Cavalry Regiment, 5 June 1997.

48. "2d Armored Cavalry Regiment: Back From Haiti, Then on to Bosnia, the Army's 'Light ACR' Remains 'Always Ready,'" *Armor* CVI, no. 6 (November–December 1997): 23–24.

49. "2d Armored Cavalry Regiment: Back From Haiti, Then on to Bosnia, the Army's 'Light ACR' Remains 'Always Ready,'" 23–24; "2d Cavalry Regiment."

50. "2d Cavalry Regiment."

51. Memorandum, Major David R. Gaumer Jr., Subj: Regimental Fire Support Officer AAR Comments for 2ACR Deployment in Support of Operation Joint Guard, 17 June 1998, 4, Branch Archives, 2d Armored Cavalry Regiment; Memorandum, Lieutenant Colonel Mark T. Little, Subj: 2d Squadron AAR (Operation JOINT GUARD), 9 October 1998, 1, 4, 5, Branch Archives, 2d Armored Cavalry Regiment; Memorandum, Lieutenant Colonel David Lawrence, Subj: 4th Squadron AAR (Operation JOINT GUARD), 9 October 1998, 1–2, 9, 18, Branch Archives, 2d Armored Cavalry Regiment.

52. Memorandum, Lieutenant Colonel Mark T. Little, Subj: 2d Squadron AAR (Operation JOINT GUARD), 9 October 1998, 6; Memorandum, Lieutenant Colonel Mark Corda, Subj: 3d Squadron, 2d Armored Cavalry Regiment's After Action Review for Deployment from 16 August 1997 to 15 May 1998, 22 June 1998, 2, Branch Archives, 2d Armored Cavalry Regiment.

53. Memorandum, Major Richard L. Gingras, Subj: Regimental Engineer AAR Comments for 2ACR Deployment in Support of Operation JOINT GUARD, Bosnia-Herzegovina, undated, 1, Branch Archives, 2d Armored Cavalry Regiment.

54. Memorandum, Lieutenant Colonel Mark Corda, Subj: 3d Squadron, 2d Armored Cavalry Regiment's After Action Review for Deployment from 16 August 1997 to 15 May 1998, 22 June 1998, 4–6, 12–14.

55. Lawrence G. Vowels and Major Jeffrey R. Witsken, "Peacekeeping with Light Cavalry: The 10th Mountain Division's 3-17 Cav Deploys to Somalia," *Armor* CIII, no. 5 (September–October 1994): 26–27.

56. Vowels and Witsken, "Peacekeeping with Light Cavalry: The 10th Mountain Division's 3-17 Cav Deploys to Somalia," 26–28; First Lieutenant John Williamson, "Ground Cavalry Checkpoint Operations in Somalia," *Armor* CIII, no. 6 (November–December 1994): 21.

57. Vowels and Witsken, "Peacekeeping with Light Cavalry: The 10th Mountain Division's 3-17 Cav Deploys to Somalia," 28–29.

58. Ibid., 28–30.

59. Ibid., 27–29.

60. Williamson, "Ground Cavalry Checkpoint Operations in Somalia," 20–22.

61. E-mail, III Corps Commander, Subj: Light Armored Cavalry Regiment (LCR), 16 June 1992.

62. Briefing, Subj: Light Divisions' Cavalry Squadron, 1997, Branch Archives, 1997 Annual Command History.

63. USAARMC, FKSM 71-8, *Armor/Cavalry Reference Data* (Fort Knox, KY: US Army Armor Center, May 1999), annex F, Branch Archives.

64. Briefing, USAARMC Directorate of Force Development, Subj: Directorate of Force Development, 1997, Branch Archives, 1997 Annual Command History.

65. Memorandum, Duane Klug, Subj: 1997 Annual Historical Summary—DFD Organization Division, 1997, Branch Archives, 1997 Annual Command History; Briefing, Subj: Light Divisions' Cavalry Squadron, 1997.

66. Briefing, USAARMC Directorate of Force Development, Subj: Light Divisions' Cavalry Squadron, 23 February 1999, Branch Archives, 1999 Annual Command History.

67. Memorandum, Duane Klug, Subj: 1997 Annual Historical Summary—DFD Organization Division, 1997.

68. Anne W. Chapman, *The National Training Center Matures 1985–1993* (Fort Monroe, VA: US Army Training and Doctrine Command Military History Office, 1997), 310.

69. USAARMC, FKSM 71-8, *Armor/Cavalry Reference Data* (May 1999), annex D.

70. Captain Robert B. Brown, "Kill OPFOR: The 3d Armored Cavalry Regiment at the NTC," *Armor* CVII, no. 2 (March–April 1998): 14–15.

71. "3d Armored Cavalry Regiment: From Bliss to Carson's Canyons," *Armor* CVI, no. 6 (November–December 1997): 19–20; "The 11th Armored Cavalry Regiment: NTC's 'Home Team' Battles with the Best," *Armor* CVII, no. 6 (November–December 1998): 43.

72. Captain Christopher Boyle, "The 3d Armored Cavalry Regiment's Tactical Command Post: An Alternative Command and Control Facility," *Armor* CV, no. 4 (July–August 1996): 32–35.

73. Captain George Salerno, "Repairing the Broken Sabre: Overview of the L-Series Divisional Cavalry," *Armor* CIII, no. 1 (January–February 1994): 29–30, quotation from page 29.

74. Ibid., 30–31, quotation from page 31.

75. Ibid., 32–33; Staff Sergeant Frank R. Belonus, "Dismounted Scouts in Mechanized Cavalry Operations," *Armor* CIV, no. 5 (September–October 1995): 3, 49.

76. Salerno, "Repairing the Broken Sabre," 30, 32.

77. Ibid., 33; Belonus, "Dismounted Scouts in Mechanized Cavalry Operations," 3.

78. Captain John L. Gifford, "Fundamentals of Air-Ground Integration in Division Cavalry Operations," *Armor* CIII, no. 4 (July–August 1994): 15–16; USAARMC, FKSM 71-8, *Armor/Cavalry Reference Data* (Fort Knox, KY: US Army Armor Center, January 1995), annex C; Department of the Army, FM 17-95, *Cavalry Operations* (Washington, DC: Headquarters, Department of the Army, 1996), 1-20, 1-24; USAARMC, FKSM 71-8, *Armor/Cavalry Reference Data* (May 1999), annex C.

79. First Lieutenant Frank Lozano, "The Six-Bradley Scout Platoon in Bosnia," *Armor* CV, no. 5 (September–October 1996): 36–37; Captain Robert G. Ivy, "A Cavalry Experience in Bosnia," *Armor* CVII, no. 3 (May–June 1998): 26–28.

80. Ivy, "A Cavalry Experience in Bosnia," 26–28.

81. FKSM 71-8, *Armor/Cavalry Reference Data* (January 1995), A-3.

82. Captain Bob Burns, "Reconnaissance: Task Force Scouts—Tactics, Techniques, and Procedures," Combat Training Centers Bulletin No. 93-4 (July 1993): 1–5.

83. Martin Goldsmith, *Battalion Reconnaissance at the National Training Center* (Santa Monica, CA: RAND, 1996), iii, ix, 9, 13, 15, quotation from page 15.

84. Captain Karl S. Flynn and First Lieutenant Joseph Miller, "Hunter-Killer Operations," *Armor* CII, no. 4 (July–August 1993): 48–50.

85. Ibid.

86. Cesar A. Cruz, "More on Hunter-Killer Technique," *Armor* CII, no. 6 (November–December 1993): 3.

87. Captain Larry Reeves, "Light Cavalry Table XII," *Armor* CVI, no. 3 (May–June 1997): 44–45.

88. Major John M. Stawasz, "Light Divisional Cavalry and Low-Intensity Conflict Reconnaissance" (student report, School of Advanced Military Studies, Fort Leavenworth, KS, 13 December 1991), 13–14, DTIC Report no. ADA258097.

89. Department of the Army, FM 17-97, *Cavalry Troop* (Washington, DC: Headquarters, Department of the Army, 1995), 2-40 to 2-41.

90. Stawasz, "Light Divisional Cavalry and Low-Intensity Conflict Reconnaissance," 13–14; FKSM 71-8, *Armor/Cavalry Reference Data* (May 1999), F-4.

91. Major Michael K. Robel, "Keeping OPORDs Simple," *Armor* CII, no. 6 (November–December 1993): 2–3; Lieutenant Colonel James F. Crawford, "Reviving Old Concepts," *Armor* CII, no. 6 (November–December 1993): 3, 50; Brigadier General (Retired) Philip L. Bolté, "Full Circle: The Armored Cavalry Platoon," *Armor* CIII, no. 5 (September–October 1994): 36.

92. Crawford, "Reviving Old Concepts," 3, 50.

93. Cruz, "More on Hunter-Killer Technique," 3; Flynn and Miller, "Hunter-Killer Operations," 48–50.

94. Crawford, "Reviving Old Concepts," 3, 50; Bolté, "Full Circle: The Armored Cavalry Platoon," 36; First Lieutenant Christopher M. Doneski,

"Challenges of the 'Three By Five' Platoon," *Armor* CIII, no. 2 (March–April 1994): 3–4; Cruz, "More on Hunter-Killer Technique," 3; Flynn and Miller, "Hunter-Killer Operations," 50.

95. First Lieutenant Eric J. Teegerstrom, "Scout Snipers: One Shot, One Kill," *Armor* CIII, no. 4 (July–August 1994): 20–21.

96. Goldsmith, *Battalion Reconnaissance at the National Training Center*, 15.

97. Lieutenant Colonel John C. Woznick, "The Scout Vehicle," *Armor* CIII, no. 5 (September–October 1994): 31–34.

98. Captain Louis J. Lartigue, "Fixing the Scout Platoon," *Armor* CIV, no. 1 (January–February 1995): 51.

99. See US Army Armor School, "Proponent Evaluation Report for the Concept Evaluation of the Maneuver Battalion Scout Platoon," Fort Knox, KY, 12 March 1990, DTIC Report no. ADA224363.

100. Lieutenant Colonel Henry M. St-Pierre and First Lieutenant Jamie E. Warder, "Team Recon: A New Approach to Armored TF Reconnaissance," *Armor* CVIII, no. 2 (March–April 1999): 24–26, 29.

101. Ibid.

102. Captain Bill Williams, "The Battalion Scout Troop: A Doctrinal and Organizational Answer to Battalion Tactical Reconnaissance," *Armor* CVIII, no. 4 (July–August 1999): 37–40.

103. American Defense Preparedness Association Briefing, Major General Lon E. Maggart, 25 September 1996, Branch Archives, 1996 Annual Command History; Major General Lon E. Maggart, "Cavalry in Force XXI," *Armor* CV, no. 5 (September–October 1996): 11–13.

104. Armor Conference Briefing, Major General George H. Harmeyer, Subj: Report to Force, 4 June 1997, Branch Archives, 1997 Annual Command History; Briefing, USAARMC Directorate of Force Development, Subj: Tank and Scout Modernization Strategy (POM 00-05), 1997, Branch Archives, 1997 Annual Command History; Briefing, USAARMC Directorate of Force Development, Subj: Armor Functional Area Assessment, 1998, Branch Archives, 1998 Annual Command History.

105. USAARMC Directorate of Force Development, "Mission Need Statement for Future Scout and Cavalry System (FSCS), 1996, 1, Branch Archives, 1997 Annual Command History.

106. American Defense Preparedness Association Panel Discussion, Subj: Future Mounted Systems, 25 September 1996, Branch Archives, 1996 Annual Command History; Briefing, USAARMC Directorate of Force Development, Subj: Future Scout and Cavalry System, c. 1997, Branch Archives, 1997 Annual Command History; Briefing, USAARMC Directorate of Force Development, Subj: Directorate of Force Development, 1997, Branch Archives, 1997 Annual Command History.

107. Briefing, USAARMC Directorate of Force Development, Subj: Future Scout and Cavalry System, c. 1997.

108. American Defense Preparedness Association Panel Discussion, Subj: Future Mounted Systems, 25 September 1996; Briefing, USAARMC Directorate of Force Development, Subj: Tank and Scout Modernization Strategy (POM 00-05), 1997; National Defense Industrial Association Briefing, Colonel Peter Wall and Mr. R. Asokalis, Subj: Future Scout and Cavalry System, 22 September 1998, Branch Archives, 1998 Annual Command History.

109. American Defense Preparedness Association Panel Discussion, Subj: Future Mounted Systems, 25 September 1996; USAARMC Directorate of Force Development, Subj: Tank and Scout Modernization Strategy (POM 00-05), 1997.

110. USAARMC Directorate of Force Development, Subj: Tank and Scout Modernization Strategy (POM 00-05), 1997; Briefing, USAARMC Directorate of Force Development, Subj: Directorate of Force Development, 1997; National Defense Industrial Association Briefing, Colonel Peter Wall and Mr. R. Asokalis, Subj: Future Scout and Cavalry System, 22 September 1998; Interview, Major General George H. Harmeyer, 26 January 1998, Branch Archives, 1998 Annual Command History.

111. Headquarters, US Army Training and Doctrine Command, "The United States Army Heavy Force Modernization Plan," Report, 1998, O-18, Branch Archives, 1998 Annual Command History, quotation from USAARMC Directorate of Force Development, Subj: Tank and Scout Modernization Strategy (POM 00-05), 1997.

112. Headquarters, US Army Training and Doctrine Command, "The United States Army Heavy Force Modernization Plan," O-16; USAARMC Directorate of Force Development, Subj: Tank and Scout Modernization Strategy (POM 00-05), 1997.

113. Armor Conference Briefing, Major Mitch Stokan, Subj: Doctrine Development Update, 19 May 1998, Branch Archives, 1998 Annual Command History; Armor Conference Briefing, Major Paul Begemann, Subj: Future Scout and Cavalry System, 19 May 1998, Branch Archives, 1998 Annual Command History; Sergeant First Class Monty A. Miller, "Is the New Scout Motto Death Before Dismount?" *Armor* CVII, no. 1 (January–February 1998): 54–55; Staff Sergeant Dwayne C. Thacker, "Scout Vehicle Designs Must Allow for Easy Dismount," *Armor* CVIII, no. 4 (July–August 1999): 18.

114. Christopher V. Cardine, "At Least in the Near Future, Today's Scouts Will Use Bradleys and HMMWVs," *Armor* CVIII, no. 1 (January–February 1999): 3–4.

115. Colonel John F. Kalb, "Seeking Alternatives to 'Scouting in a Winnegabo,'" *Armor* CVIII, no. 2 (March–April 1999): 3–4.

116. "The Armored Gun System," *Armor* CI, no. 2 (March–April 1992): 13–14; Captain John A. Nagl, "The Armored Gun System: Sheridan Replacement Offers Better Firepower Plus Worldwide Mobility," *Armor* CI, no. 4 (July–August 1992): 26–29; Colonel Franklin Y. Hartline, "AGS Questions," *Armor* CII, no. 2 (March–April 1993): 2–3; Colonel Charles F. Moler and Colonel Richard L.

Knox, "AGS Answers," *Armor* CII, no. 2 (March–April 1993): 3–4; Major Martin N. Stanton, "Assault Gun Battalion 96," *Armor* CIII, no. 5 (September–October 1994): 43.

117. "The Armored Gun System," 14.

118. Memorandum, Gilbert F. Decker, Subj: Armored Gun System, 2 May 1996, Branch Archives, 1996 Annual Command History; Jason Sherman, "Budget Squeeze Drives Army to Terminate Armored Gun System Program," *Inside the Army*, Special Report, 26 January 1996.

119. Sergeant First Class James C. Lawrence, "The Plight of the Scout Vehicle," *Armor* CIII, no. 2 (March–April 1994): 4; Sergeant William Bighouse, "Scout Vehicles: Still No Good Answer," *Armor* CIV, no. 5 (September–October 1995): 49.

120. Lawrence, "The Plight of the Scout Vehicle," 4.

121. Bighouse, "Scout Vehicles: Still No Good Answer," 49.

122. Woznick, "The Scout Vehicle," 32.

123. "M1114/XM1114 HMMWV Up-Armored Armament Carrier," http://www.globalsecurity.org/military/systems/ground/m1114.htm (accessed 24 November 2008); "Up-Armored HUMVEE," http://www.defense-update.com/features/du-3-04/up-armored-humvee.htm (accessed 24 November 2008); "Up-Armored HMMWV," http://www.globalsecurity.org/military/systems/ground/hmmwvua.htm (accessed 24 November 2008).

124. First Lieutenant Jonathan C. Byrom, "Up-Armored HMMWVs: The Answer for Peacekeeping Operations," *Armor* CVII, no. 1 (January–February 1998): 35–36.

125. Lieutenant Colonel Michael Prevou, "HMMWVs Lack the Firepower and Protection for Bosnia Role," *Armor* CVII, no. 1 (January–February 1998): 36, 56.

126. Ibid., 56.

127. National Defense Industrial Association Briefing, Nancy Moulton, Subj: HMMWV, 23 September 1998, Branch Archives, 1998 Annual Command History.

128. Briefing, USAARMC Directorate of Force Development, Subj: Directorate of Force Development, 1997, quotation from same; Briefing, USAARMC Directorate of Force Development, Subj: Reconnaissance Update, 1998, Branch Archives, 1998 Annual Command History; End of Tour Interview, Major General George H. Harmeyer, 1999, 38, Branch Archives, 1999 Annual Command History.

129. Captain T.J. Johnson, "The HMMWV Storage Rack," *Armor* CVIII, no. 3 (May–June 1999): back cover.

130. Woznick, "The Scout Vehicle," 32.

131. Richard K. Fickett, "Wiesel-Mounted Scouts," *Armor* CII, no. 1 (January–February 1993): 2–3; Stanley C. Crist, "The Case for an Airmobile, Amphibious Scout Vehicle," *Armor* CVIII, no. 4 (July–August 1999): 30–32.

132. Charles Lehner, "Bosnia Report: Task Force Eagle's Armor and Cavalry Operations in Bosnia," *Armor* CV, no. 3 (May–June 1996): 9–10, 45–47.

133. See, for example, Captain William S. Riggs, "Global Cavalry," *Armor* CVII, no. 2 (March–April 1998): 23–29.

134. Lieutenant Colonel Stephen L. Melton, "Heavy Force Emphasis Flirts with Irrelevancy," *Armor* CVII, no. 2 (March–April 1998): 3–4.

135. Mike Sparks, "LAV Solution Too Vulnerable," *Armor* CIV, no. 3 (May–June 1995): 48–49, quotation from page 48; Technical Sergeant Mike Sparks, "Winning the 21st Century Battle for Reconnaissance," *Armor* CVIII, no. 4 (July–August 1999): 3–4.

136. Stanley C. Crist, "Best 'Global Cavalry' Mounts Are M113s, Not LAVs," *Armor* CVII, no. 4 (July–August 1998): 53–54; Mike Sparks, "If M113s Don't Work in Snow, Let's Find Out Why," *Armor* CVI, no. 1 (January–February 1997): 48–49.

137. Bighouse, "Scout Vehicles: Still No Good Answer," 49.

138. Haworth, *The Bradley and How it Got That Way*, 145; Headquarters, US Army Training and Doctrine Command, "The United States Army Heavy Force Modernization Plan," 1998, C-3 to C-4; "M2A2ODS/M3A2ODS (Operation Desert Storm) Bradley," undated, http://www.globalsecurity.org/military/systems/ground/m2a2ods.htm (accessed 20 October 2008).

139. 1999 Armor Conference Briefing, Subj: Future Scout and Cavalry System, 18 May 1999, Branch Archives, 1999 Annual Command History.

140. "M2A3 and M3A3 Bradley Fighting Vehicle Systems," undated, http://globalsecurity.org/military/systems/ground/m2a3.htm (accessed 20 October 2008); Test and Experimentation Command Close Combat Test Directorate, "Bradley Fighting Vehicle System-A3 (BFVS-A3), Report, December 1998, DTIC Report no. ADB240666; National Defense Industrial Association Briefing, Colonel Paul S. Izzo, Subj: Bradley Fighting Vehicle Program Manager," 23 September 1998, Branch Archives, 1998 Annual Command History; Headquarters, US Army Training and Doctrine Command, "The United States Army Heavy Force Modernization Plan," 1998, C-3 to C-4; American Defense Preparedness Association Briefing, Subj: Bradley Fighting Vehicle, 25 September 1996.

141. Lieutenant Colonel Craig S. Harju Sr., Sergeant First Class David F. Wilson, and Richard B. Armstrong, "Tactical Employment of the Military Motorcycle," *Armor* CI, no. 3 (May–June 1992): 18–20; Briefing, USAARMC Directorate of Combat Developments, Subj: Combat Developments, October 1991, 142–143, Branch Archives, Cavalry.

142. Darryl A. Phillips, "Long Range Advanced Scout Surveillance System," Information Paper, 1 May 1997, Branch Archives, 1997 Annual Command History; Captain Michel Jones and Sergeant First Class Christopher Wagner, "Long Range Scout Surveillance System (LRAS3)," *Armor* CVII, no. 6 (November–December 1998): 22–24.

143. Review of LRAS3 Initial Operational Test and Evaluation, 22 November 1999, Branch Archives, 1999 Annual Command History.

144. Lieutenant Colonel Rick Lynch and Captain Steve Cichocki, "Training the Task Force Scout Platoon," *Armor* CV, no. 4 (July–August 1996): 42–44, quotation from page 44.

145. Department of the Army, FM 17-95, *Cavalry Operations* (Washington, DC: Headquarters, Department of the Army, 1991), 1-2, 1-4.
146. Ibid., 1-5 to 1-6, 1-17.
147. Ibid., chapter 3.
148. Ibid., chapter 4.
149. Ibid., 7-66 to 7-77.
150. Ibid, 7-66 to 7-77, A-1 to A-14.
151. Cavalry Symposium Briefing, Subj: Contemporary Issues FM 17-95, 1996, Branch Archives, Cavalry.
152. FM 19-95 (1996).
153. Ibid., 1-18.
154. Ibid., 1-18 to 1-19, quotation from page 1-19.
155. Ibid., 2-55 through 2-64, 3-16, 4-11.
156. Ibid., 4-13, 4-40 through 4-49, quotation from page 4-40.
157. Ibid., 7-1.
158. Ibid., chapter 7.
159. FM 17-97 (1995).
160. Ibid., 1-2 to 1-3, 1-8, 1-9 to 1-11, 1-16 to 1-17, 2-40 to 2-41, 3-20, 5-5, quotation from page 1-17.
161. Ibid., 1-16, 2-1, 2-27 to 2-28, 2-31 to 2-32.
162. Ibid., 3-16.
163. Ibid., 2-29 to 2-31, 2-36 to 2-37, 8-1 to 8-8.
164. Ibid., chapter 3.
165. Ibid., chapter 4.
166. Department of the Army, FM 17-98, *Scout Platoon* (Washington, DC: Headquarters, Department of the Army, 1994).
167. Ibid., 1-5 to 1-7.
168. Ibid., 3-2.
169. Ibid., chapter 4.
170. Ibid., chapter 5.
171. Ibid.
172. Department of the Army, FM 17-98, *Scout Platoon* (Washington, DC: Headquarters, Department of the Army, 1999).
173. Ibid., 2-8 to 2-13, 3-47 to 3-55.
174. Ibid., chapter 3.
175. Ibid., 8-40.
176. Ibid., 8-1 to 8-14, quotation from page 8-35.
177. Ibid., 4-4 to 4-26, quotation from page 1-1.
178. Ibid., appendix C.
179. Ibid., appendix D.
180. Briefing, USAARMC Directorate of Force Development, Subj: Reconnaissance Update, 1998, Branch Archives, Cavalry.
181. Lieutenant Colonel Mark J. Reardon, "Development of Cavalry Reconnaissance Doctrine for the Next Century," *Armor* CVIII, no. 4 (July–August 1999): 19–20, quotation from page 20.

182. Ibid., 19–24.

183. Lieutenant Colonel Michael A. Kirby, "Find the Enemy," *Armor* CII, no. 3 (May–June 1993): 20–21; Goldsmith, *Battalion Reconnaissance Operations at the National Training Center*, 1996, ix, 9–14; Cameron, "United States Army Armor Center and Fort Knox 1996 Annual Command History," 101–103.

184. Captain Christopher D. Kolenda, "Reconnaissance in the Offense: 'Command Push' vs. 'Recon Pull,'" *Armor* CV, no. 4 (July–August 1996): 45–46.

185. Ibid., 45–46, quotation from page 45.

186. Cameron, "United States Army Armor Center and Fort Knox 1996 Annual Command History," 101–103; Kolenda, "Reconnaissance in the Offense: 'Command Push' vs. 'Recon Pull,'" 46–47; Briefing, USAARMC Directorate of Force Development, Subj: Reconnaissance Update, 1998.

187. Lieutenant Colonel Chris Baggot, "Executing the Defensive Counterreconnaissance Fight," *Armor* CVII, no. 2 (March–April 1998): 8–9; Captain Richard Randazzo, "OPFOR Counterreconnaissance at the National Training Center," *Armor* CVII, no. 2 (March–April 1998): 12.

188. Captain Blaise Cornell-d'Echert Jr., "Counterreconnaissance: Defining the Nature of Security Area Operations," *Armor* CII, no. 5 (September–October 1993): 5; Baggot, "Executing the Defensive Counterreconnaissance Fight," 7–8.

189. Baggot, "Executing the Defensive Counterreconnaissance Fight," 9; Captain Kenneth L. Deal Jr., "The Counterreconnaissance Battle: Managing the Monster," *Armor* CI, no. 6 (November–December 1992): 22–25.

190. Baggot, "Executing the Defensive Counterreconnaissance Fight," 8–9.

191. Captain Christopher D. Kolenda, "Screen In Depth," *Armor* CII, no. 3 (May–June 1993): 14–15.

192. Deal, "The Counterreconnaissance Battle: Managing the Monster," 22–25; Cornell-d'Echert, "Counterreconnaissance: Defining the Nature of Security Area Operations," 5–11; Baggot, "Executing the Defensive Counterreconnaissance Fight," 8–10.

193. Baggot, "Executing the Defensive Counterreconnaissance Fight," 10–11.

194. Captain Doug Boltuc and Captain Scott Efflandt, "Counterreconnaissance: Taking the Fight to the Enemy," *Armor* CV, no. 6 (November–December 1996): 31–35.

195. Captain Michael L. Maus, "Combat Service Support for the Task Force Scout Platoon," *Armor* CII, no. 2 (March–April 1993): 40–41; First Lieutenant John S. Wilson, "CSS for the Scout Platoon—Another Solution," *Armor* CIV, no. 5 (September–October 1995): 46–47; FM 17-98 (1994), 8-2 to 8-3; FM 17-98 (1999), 7-2 to 7-3.

196. Captain Mark H. Salas, "Who is the OPFOR That We Plan to Fight?" *Armor* CVII, no. 3 (May–June 1998): 3.

197. Briefing packet, Subj: Armor 1998 Functional Review—Proponency, 9 March 1998, Branch Archives, 1998 Annual Command History.

198. Lieutenant Colonel Michael Matheny, "Growing Scouts," *Armor* CI, no. 5 (September–October 1992): 13.

199. Cameron, "United States Army Armor Center and Fort Knox 1997 Annual Command History," 3-32.

200. Briefing, Major General Lon E. Maggart, Subj: The Armor Force in Transition: Armor Functional Area Assessment, 1996, Branch Archives, 1996 Annual Command History; Cameron, "United States Army Armor Center and Fort Knox 1997 Annual Command History," 3-32; Briefing, USAARMC Directorate of Force Development, Subj: Armor Functional Area Assessment (FAA), 1998, Branch Archives, 1998 Annual Command History.

201. Briefing, Major General Lon E. Maggart, Subj: The Armor Force in Transition: Armor Functional Area Assessment, 1996, Briefing, USAARMC Directorate of Force Development, Subj: Armor Functional Area Assessment (FAA), 1998.

202. Cameron, "United States Army Armor Center and Fort Knox 1996 Annual Command History," 11 March 1998, 65.

203. Interview, Colonel William R. Betson, 25 March 1998, Branch Archives, 1998 Annual Command History; Cameron, "United States Army Armor Center and Fort Knox 1997 Annual Command History," 3-6, 3-12, 3-15.

204. John W. Cranston, "United States Army Armor Center and Fort Knox 1994 Annual Command History, Report, undated, 19–20; Cameron, "United States Army Armor Center and Fort Knox 1997 Annual Command History," 3-29 to 3-31; Briefing, USAARMC Directorate of Force Development, Subj: Reconnaissance Update, 1998.

205. Cameron, "United States Army Armor Center and Fort Knox 1997 Annual Command History," 3-9, 3-29, 3-31; Briefing, USAARMC Directorate of Force Development, Subj: Reconnaissance Update, 1998.

206. Major General George H. Harmeyer, "19D and 19K Training in 1st Armor Training Brigade," *Armor* CVI, no. 6 (November–December 1997): 5, 56; Briefing, USAARMC Directorate of Force Development, Subj: Reconnaissance Update, 1998.

207. Briefing, USAARMC Directorate of Force Development, Subj: Reconnaissance Update, 1998.

208. Lynch and Cichocki, "Training the Task Force Scout Platoon," 42–43, quotation from page 42.

209. Memorandum, Lieutenant Colonel Robert M. Schmidt, Subj: Cavalry Symposium Executive Summary, 8 March 1996, Branch Archives, Cavalry.

210. First Lieutenant Todd A. Napier, "USAREUR Maneuver Training: Overcoming the Limitations," *Armor* CVII, no. 4 (July–August 1998): 4.

211. Captain John A. Nagl and Captain Tim Huening, "Training a Divisional Cavalry Squadron for Operations Other Than War," *Armor* CV, no. 1 (January–February 1996): 23–24, quotation from page 23.

212. Lieutenant Colonel Kurt D. Norman and Captain George M. Schwartz, "Scout MOUT: Model for Future Cavalry Training," *Armor* CII, no. 5 (September–October 1993): 36–41.

213. Reeves, "Light Cavalry Table XII," 44–45.

214. Major General George H. Harmeyer, "The New Heavy Division: It's More Deployable and Just as Deadly," *Armor* CVII, no. 4 (July–August 1998): 7–8, 46; Armor Conference Briefing, Major General George H. Harmeyer, Subj: Report to Force, 19 May 1999, Branch Archives, 1999 Annual Command History.

215. Briefing, USAARMC Directorate of Force Development, Subj: Directorate of Force Development, 1997.

216. Harmeyer, "The New Heavy Division: It's More Deployable and Just as Deadly," 8; Armor Conference Briefing, Major General George H. Harmeyer, Subj: Report to Force, 19 May 1999.

217. Harmeyer, "The New Heavy Division: It's More Deployable and Just as Deadly," 8, 46; Briefing, USAARMC Directorate of Force Development, Subj: Armor Functional Area Assessment (FAA), 1998; End of Tour Interview, Report, Major General George H. Harmeyer, 1999, 35; Armor Conference Briefing, Major General George H. Harmeyer, Subj: Report to Force, 19 May 1999.

218. Command Sergeant Major David L. Lady, "The Conservative Heavy Division: Enlisted Impact," *Armor* CVII, no. 5 (September–October 1998): 7; Briefing, USAARMC Directorate of Force Development, Subj: Armor Functional Area Assessment (FAA), 1998; Harmeyer, "The New Heavy Division: It's More Deployable and Just as Deadly," 8.

219. Major Craig S. Harju Sr., "White Paper—A Study of the Maneuver Battalion Reconnaissance or Scout Platoon," Report, US Army Armor School, Fort Knox, KY, 18 September 1989, 76–77, DTIC, Report no. AD-A214 798; John L. Romjue, *The Army of Excellence: The Development of the 1980s Army* (Fort Monroe, VA: US Army Training and Doctrine Command, 1997), 95–96; Major Peter S. Kindsvatter, "The Army-of-Excellence Divisional Cavalry Squadron—A Doctrinal Step Backward?" (master's thesis, School of Advanced Military Studies, Fort Leavenworth, KS, 2 December 1985), 25–26, Branch Archives, Cavalry; Memorandum, Robert L. Keller, Subj: Brigade Scouts, 24 October 1991, Branch Archives, Cavalry.

220. Memorandum, Robert L. Keller, Subj: Brigade Scouts, 24 October 1991.

221. Ibid.

222. Captain William K. McCurry Jr. and First Lieutenant Joel R. Phillips, "Brigade Deep Operations: Task Organizing for Victory," *Armor* CII, no. 5 (September–October 1993): 42–45.

223. Robert S. Cameron, Major General Harmeyer End of Tour Interview, 1999, 36.

224. Captain Thomas M. Feltey, "The Brigade Reconnaissance Troop: Profiling a New Kind of Unit," *Armor* CVII, no. 5 (September–October 1998): 26–27, 55.

225. First Lieutenant Thomas P. Brennan Jr., "Scout-COLT Integration in the Brigade Reconnaissance Troop," *Armor* CVIII, no. 4 (July–August 1999): 35–36, 40.

226. FKSM 71-8, *Armor/Cavalry Reference Data* (May 1999), annex O.

227. Briefing, USAARMC Directorate of Force Development, Subj: Armor Functional Area Assessment, 1998; Major General George H. Harmeyer, "The Armor Force: A Pre-conference Overview," *Armor* CVIII, no. 2 (March–April 1999): 6; Armor Conference Briefing, Major General George H. Harmeyer, Subj: Report to Force, 1999; Harmeyer, "The New Heavy Division: It's More Deployable and Just as Deadly," 8.

228. First Lieutenant Wayne T. Westgaard, "Will the New Brigade Reconnaissance Troop Be Adequately Protected?" *Armor* CVIII, no. 2 (March–April 1999): 27–29, quotation from page 28.

229. Sergeant First Class Frank R. Belonus, "Building on Force XXI Task Force and Brigade Recon Troop Scout Platoons," *Armor* CIX, no. 6 (November–December 2000): 7–9, quotation from page 8.

230. Ibid., 8, 10–12, 14.

231. Lieutenant Colonel Kevin C.M. Benson, "Whither the 2d Cavalry?" *Armor* (January–February 1997): 20.

232. Ibid., 20–21.

233. Colonel Tom Molino, "Don't 'Heavy-Up' the 2d ACR," 3.

234. Riggs, "Global Cavalry," *Armor* CVII, no. 2 (March–April 1998): 23–29; Lieutenant Colonel Michael M. Walker, "Marine Light Armor Tested 'Global Cavalry' Concepts," *Armor* CVII, no. 4 (July–August 1998): 53.

235. Briefing, Combined Arms Center, Subj: Design Concepts 2d Armored Cavalry Regiment, 1 May 1997, Branch Archives (electronic), Transformation; Memorandum, Combined Arms Center, Subj: Redesign Concept for the 2ACR, undated, Branch Archives; Briefing, USAARMC Strike Force Cell, Subj: Strike Force Update, 21 September 1998, Branch Archives, Strike Force.

236. Memorandum, Combined Arms Center, Subj: Redesign Concept for the 2ACR, undated; Briefing, USAARMC Strike Force Cell, Subj: Strike Force Update, 21 September 1998; National Defense Industrial Association Briefing, Major General George H. Harmeyer, 22 September 1998, Branch Archives, 1998 Annual Command History.

237. Interview, Major General George H. Harmeyer, 23 November 1998, Branch Archives, 1998 Annual Command History; Briefing, USAARMC Strike Force Cell, Subj: Strike Force HQ Design CoC [Council of Colonels] Work Group, 15 December 1998, Branch Archives, Strike Force; "Strike Force Organizational and Operational Concept Version 3.5," draft, 15 August 1999, Branch Archives, Strike Force; Armor Conference Briefing, Colonel Michael Mehaffey, Subj: Strike Force, 18 May 1999, Branch Archives, 1999 Annual Command History.

238. Armor Conference Briefing, Colonel Michael Mehaffey, Subj: Strike Force, 18 May 1999; End of Tour Interview, Major General George H. Harmeyer, 1999, 36–37.

239. Memorandum, Combined Arms Center, Subj: Redesign Concept for the 2ACR, undated.

240. Cameron, Harmeyer end of tour interview, 36–37; "Strike Force Organizational and Operational Concept Version 3.5," Draft, 15 August 1999; Permanent Orders, Subj: Experimentation Coordination Cell-Strike Force (W3U202), Fort Knox, KY 40121-5000, 19 November 1999, Branch Archives, 2000 Annual Command History.

Chapter 8

Army Transformation, RSTA Squadrons, and ISR Operations

The years 1999 to 2003 witnessed major changes within the US Army. Transformation initiated a major reorganization of the force structure simultaneous with a commitment to doctrine and technologies oriented toward future battlefields. These actions necessarily impacted mounted reconnaissance, which increased its tilt toward greater reliance on digital networks, combat avoidance, and the achievement of an unprecedented level of situational understanding. These occurrences became manifest in the development of the reconnaissance squadrons for the new Stryker Brigade Combat Team (SBCT) and in the concept design work undertaken for the Future Combat System. These trends marked a shift away from the powerful combined arms teams that comprised the heavy division cavalry squadron and the armored cavalry regiment. Indeed, the former disappeared altogether while the latter remained an anomalous unit type with an uncertain future. Cavalry in the traditional sense appeared on the verge of extinction. However, combat operations in Iraq began before completion of most Transformation objectives. It remained to be seen whether battlefield experiences would validate the new reconnaissance concepts or justify the need for more robust organizations capable of combat.

Army Transformation

In June 1999, General Eric K. Shinseki became Army Chief of Staff. He introduced a new direction for military development known as Army Transformation. Its thrust lay in preparing to cope with the broad array of 21st century threats anticipated. The Army also required the ability to provide humanitarian assistance and disaster relief and execute stability and support operations. Contrasting these needs with current capabilities, Shinseki noted a gap between heavy and light forces. While the former possessed great combat power, they remained slow to deploy and required a developed infrastructure to support operations. These qualities made the heavy forces less than ideal for responding to the varied contingencies likely to emerge in the future. Conversely, light forces proved faster to deploy, but lacked sufficient survivability, lethality, and the ability to sustain combat operations once committed. Both force types remained too reliant on extensive and costly logistical support.[1]

Therefore, General Shinseki sought to reduce the logistical tail of combat organizations and improve their deployability. The desired force structure included the ability to work within a joint framework and conduct

all likely military operations, including those supporting humanitarian relief. Combat units also needed the ability to transition quickly from one type of operation to another. Rapid deployment became synonymous with deterrence, since a force able to respond quickly to a contingency might prevent crisis escalation and far larger troop commitments. In 1999, the Russians demonstrated the disproportionate influence of a small but rapidly deployed force when they moved a motorized unit from Bosnia-Herzegovina to Kosovo just before NATO forces moved into that province. Consequently, Russia became an active participant in the negotiations underway to determine the long-term status of Kosovo.[2]

To accomplish his goals, General Shinseki sought to leverage existing and emerging technology to build a new force that blurred the distinction between heavy and light. He also anticipated that redesigning the Army would necessitate changes in doctrine, training, and organizational structure. He believed the Army possessed a window of opportunity to undertake the major changes intended. With a strong economy, no significant national threat, and the absence of a major military rival, Shinseki wanted rapid action to realize Transformation goals before these conditions changed.[3]

Shinseki classified the force structure according to three categories: Legacy, Interim, and Objective. The first constituted the existing force with current materiel, while the last included high-tech combat organizations organized in brigade sets. Relying on innovative concepts and new technologies, the Objective Force was to become the mainstay of the Army in the 21st century. Intended to operate in nonlinear battlefield environments, it relied on a new family of ground platforms, known as Future Combat Systems (FCS).[4]

The Objective Force relied on high-tech combined arms organizations. Networked together to permit rapid data sharing and also linked to satellites and a host of national and joint intelligence and imagery databases, these units were intended to operate as a collection of fast-moving noncontiguous elements that presented multiple threats to an enemy force. By leveraging the latest information technology, Objective Force units could plan operations en route to a theater of operations. Once there they utilized available intelligence sources to track hostile activity and plan tactical movements long before combat occurred. Information technology was expected to permit enhanced coordination and faster decision cycles and expedite planning among commanders of widely dispersed units.[5]

The desire to accelerate decision cycles and operational tempo through the innovative application of the latest information technology was not

unique to the Objective Force. In general terms, similar objectives had influenced combat organizations at least since the interwar period. The difference, of course, lay in the far greater span of capabilities, which Objective Force planners sought to harness to a combat force. They envisioned tactical units able to see an enemy first, understand the situation first, take appropriate action before the hostile force reacted, and decisively defeat it. Sometimes referred to as a "quality of firsts," this simple concept succinctly summarized the purpose of Objective Force design, although the realization of this goal proved much more complex and dependent on an array of new technologies seamlessly interacting.[6]

Objective Force planners envisioned combined arms brigades and battalions built around the FCS. These general-purpose units were to possess a radically reduced logistical tail, partially achieved through maximum use of common platforms and parts. Modular in design, they could be tailored to fit specific operational environments with each combined arms team a basic building block for task organization. The FCS was designed to provide lethality and survivability equal to or greater than the Abrams/Bradley team and weigh much less to facilitate deployability. The FCS would benefit from active protection systems and signature management. Armament varied with the particular variant. The maneuver combat system, for example, fulfilled a role akin to that of the tank and mounted a large caliber main gun. The reconnaissance vehicle carried a smaller weapon but more sensors to assist information acquisition. These manned platforms worked alongside unmanned air and ground vehicles and robotic devices. Through the network, each one could access precision fires delivered from aircraft, unmanned aerial vehicles (UAVs), or other FCS platforms. Non-line-of-sight and beyond line-of-sight munitions provided further fire support to assist elimination of targets without revealing the firing or spotting element's location.[7]

The FCS-equipped brigade combat team (BCT) was intended to operate over a 150 x 150 kilometer box, marking a significant expansion over current units. Moreover, the FCS organization would only require resupply every other day due to efficiencies gained through reliability improvements, commonality, and technology enhancements.[8] The improved capability and agility of the planned FCS brigade permitted economies in personnel strength. Initial plans for the unit indicated a manning level of less than 2,500 soldiers with the bulk of these assigned to 3 combined arms battalions. Each battalion and the brigade included a reconnaissance troop intended for intelligence, surveillance, and reconnaissance; but these troops numbered just 60 soldiers. Overall, the brigade constituted a much smaller and more dispersed organization than previous brigade designs,

but planners anticipated its ability to deliver much more destructive and precise firepower to select targets and achieve a faster rate of sustained maneuver.[9]

Building such an organization required a massive technology investment to realize the quantum leap in desired capability and permit fielding of the first FCS brigade in 2010. This commitment occurred in the early stages of General Shinseki's tenure as Army Chief of Staff. Although the entire Transformation process built on the Force XXI effort of the 1990s, still further advances in technology and capabilities were sought beyond the establishment of digital combat formations. Transformation entailed an entire makeover of the Army and its related doctrine, organization, training, materiel, leadership, personnel, and facilities. On completion, the nation would possess a powerful instrument of policy, suited to the entire spectrum of military operations from stability and support to conventional, high-intensity warfare. Moreover, it would possess a rapid deployment and response capability that would obviate the lengthy preparation and deployment time so characteristic of 1990s contingency operations.[10]

Yet even at an accelerated pace, the Objective Force required time to develop. In the meantime, the Army still faced a dilemma. Its heavy forces, while powerful, required lengthy deployment times and remained optimally suited for operations in central Europe. Operation DESERT STORM demonstrated the adaptability of heavy forces to much different battlefield

Armor Branch Archives

Figure 104. Preproduction Stryker infantry carrier vehicle.

environments, but their deployment time remained slow. Conversely, light forces proved capable of rapid deployment, but they lacked the lethality and survivability of the heavy forces, particularly when confronted by a large-scale, hostile armored threat. Pending the arrival of heavy forces, they remained at risk—a condition that characterized the status of the 82d Airborne Division during Operation DESERT SHIELD in 1990. General Shinseki desired a medium force that possessed a balance of light and heavy force capabilities. He wanted the rapid responsiveness of the former and some of the lethality and survivability of the latter.[11] Until fielding of the Objective Force, the Interim Force would provide these capabilities.

At least since 1980 the Army had pursued such a goal. The High Technology Light Division, the 2d Armored Cavalry Regiment (Light), and the Strike Force initiative all reflected efforts to build a rapid deployment force with some combat capability, but each one became a victim to budgetary concerns and the difficulties of fielding enhanced technologies in a short period.[12] Under General Shinseki's leadership, the medium force concept quickly evolved from concept to reality. By the end of 2002, two Interim Brigade Combat Teams had been organized at Fort Lewis, Washington. A wheeled platform, loosely based on the LAV III, served as the basis for the design of a family of vehicles for the principal combat and combat support vehicles. Known as the Interim Armored Vehicle, in February this platform was formally designated the Stryker after medal of honor winners from World War II and Vietnam.[13] Fielding began the same year and the brigades that received them became known as Stryker Brigade Combat Teams (SBCTs).[14] The Army planned to convert six maneuver brigades, including one National Guard unit, into SBCTs.

In 2002, the Army participated in Millennium Challenge, one of several experiments associated with Army Transformation. It involved 13,500 troops and 70,000 computer-generated forces. Set in 2007, Army, Air Force, Marine, and Naval personnel all participated in the simulated battles against a hypothetical enemy. The exercise utilized multiple engagement areas on land and sea across the country—many simulated on computers. It culminated in maneuvers at the National Training Center (NTC) in which the new Stryker vehicles participated. The overall scenario pitted a Blue Force, equipped with the latest digital communications and networks, against an opposing force (OPFOR) using unconventional tactics to offset the Blue Force's technological superiority. Millennium Challenge served to test a variety of Transformation ideas in a climate not unlike that of the Middle East. It also permitted participants to experiment with new tactics, doctrine, and materiel in an operational setting.[15]

Millennium Challenge underscored the military's tilt toward jointness on and off the battlefield. Through the interaction of personnel from different service branches at multiple locations, it provided a taste of how the military expected to conduct future operations and use information superiority to achieve battlespace dominance. The growing reliance on improved situational awareness, net-centric operations, and the tactical internet were all staple elements of emerging Transformation doctrine and found expression during Millennium Challenge.[16]

The demands of Army Transformation for new capabilities fostered a continuous development process. As new technology became available, it was inserted into existing programs. Hence, technology upgrades to a platform or organization would occur in a continuous manner, without waiting for all requirements to be met before production and fielding. In this manner, new capabilities could be exploited by combat organizations in a more timely fashion. In the context of Transformation, this process—known as "spiral development"—permitted the Army to pursue new technologies for the FCS and insert select capabilities into the Legacy and Interim Forces as they became available. These capabilities in turn became subject to subsequent upgrades through ongoing research and development. Inspired by the software industry, spiral development differed from previous military acquisition processes in that the result was not known in detail at the outset. Instead, spiral development provided the flexibility to pursue unanticipated advances in capabilities resulting from continuous concept/technology evolution.[17]

The fielding of the first SBCTs and the simultaneous development of the Objective Force impacted the Legacy Force. Modernization and upgrades to the latter received reduced priorities and in some critical cases were canceled outright. The Army's focus lay on the future and a different type of combat environment than that for which the conventional Legacy Force had been designed. Funding reflected this emphasis. Although military leaders supported Legacy Force modernization, they proved unwilling to slow development of the Interim and Objective Force to do so. In 2002 alone, the Department of Defense (DOD) canceled 14 separate programs associated with the Legacy Force. This action marked a major setback for the Army's current force capability, because programs affected included the M1A2 System Enhancement Program (SEP), the Bradley Fighting Vehicle (BFV), and the Crusader artillery system. The last proved among the most contentious, with Army officials lobbying for the program only to be overruled by the Secretary of Defense. Collectively, these actions severely impacted production and modernization plans for the Legacy Force, although some programs were later restored, including the M1A2 SEP.[18]

The challenges facing Transformation increased substantially after 11 September 2001. On that day, terrorist attacks on the World Trade Center and the Pentagon killed nearly 3,000 Americans and augured the start of a new era of increased security and uncertainty at home and abroad. In response, President George W. Bush authorized a direct invasion of Afghanistan, responsible under the Taliban regime for harboring the al-Qaeda terrorists who launched the 9/11 attacks. He also embarked on a variety of actions intended to thwart terrorism worldwide. The nation's foreign policy shifted toward preemptive strikes against threatening forces. Given the brutality and potentially catastrophic effects of terrorism, particularly when combined with weapons of mass destruction (WMD), the Bush administration determined to strike first against known enemies likely to act against the interests of the United States.[19]

In October 2001, American forces began military activity in Afghanistan to overthrow the ruling Taliban regime, destroy the al-Qaeda terrorist cells in that country, and capture Osama Bin Laden—considered the mastermind behind the 9/11 attacks. Subsequently, American forces were to assist the reconstruction and transition of Afghanistan to a democratic state. Designated Operation ENDURING FREEDOM, this action involved the projection of Marines and Soldiers, supported by the Air Force and Navy, to central Asia. Initially, much of the military action was borne by Special Forces operatives working with local anti-Taliban militias and American airpower.[20] However, combat operations continued into 2002 and significant numbers of American ground forces deployed to Afghanistan. Taliban authority as a governing body soon collapsed, but terrorist cells and Taliban soldiers continued to fight, retreating into the mountainous region along Afghanistan's border with Pakistan. The remaining al-Qaeda and Taliban forces resorted to roadside bombings, intermittent mortar barrages, and the attempted assassinations of key leaders.[21] The end of Taliban rule in Afghanistan led to the creation of an interim government to preside over the nation's efforts to rebuild and hold its first elections. US and NATO forces helped to provide security and humanitarian assistance.[22]

The nature of operations in Afghanistan seemed perfect for the SBCT. The qualities that made these units ideal as first responders to international crises also suited them to the type of stability and support operations now underway. Hence, the war on terror was used to justify an accelerated pace of development and fielding of these new units. Simultaneous work on the Objective Force offered the promise of incorporating related technologies and concepts directly into the SBCTs to make them among the most technologically sophisticated of the Army's units.[23]

Operations in Afghanistan, nevertheless, were not the only threats faced by America in its war on terror. Despite the continuation of combat activity in Afghanistan, tension with Iraq increased. The Bush administration believed Iraq and its dictator, Saddam Hussein, to be a principal instigator and supporter of terrorism to include the actions of al-Qaeda. Already suspected of violating UN resolutions and secretly building a stockpile of WMDs, its apparent link with terrorism made Iraq an especially dangerous threat. While American diplomats waged a campaign to convince NATO allies and the UN to take strong action against Iraq, DOD began preparations for possible military action, including the buildup of US forces in the Middle East.[24] The likelihood of other, near-term commitments of forces encouraged greater attention to the needs of the Legacy Force, whose personnel and materiel would be utilized in any new deployments. Moreover, the increased tension with Iraq drew attention to conventional, heavy force readiness needs.

Stryker Brigade Combat Team

The design of the SBCT constituted one of the first major developments associated with Army Transformation. This unit embodied the essence of the Interim Force. It directly addressed problems encountered by the Army in the execution of contingency missions in the 1990s.[25] The Army found its ability to respond to sudden crises overseas limited by its heavy/light force dichotomy. The heavy force provided combat power but required time to deploy and operated best in an environment with a developed infrastructure—a condition not always found in the lesser developed parts of the world most likely to experience political or economic upheaval. Light forces could deploy in a much shorter timeframe and proved less dependent on established road nets, high capacity ports, and large airports. This responsiveness came at the cost of combat power. The SBCT addressed this capability gap.[26]

The Army planned to field at least six such brigades.[27] Design work began in 1999 under Training and Doctrine Command (TRADOC) leadership. The brigades were intended primarily for contingency missions rather than major combat operations in a conventional war. The organizational challenge lay in balancing rapid responsiveness with an ability to defeat a variety of threats. Planners also needed to minimize personnel and logistical requirements while retaining a desirable level of lethality, survivability, and mobility: "The Brigade Combat Team must approach the deployability standards of a light force while arriving with the punch and staying power approaching that of a mechanized formation."[28]

The resultant organization received a unique mission:

> The Brigade Combat Team is a ***full spectrum, combat force***. It has utility, confirmed through extensive analysis, in all operational environments against all projected future threats, but it is designed and optimized primarily for employment in small scale contingency operations (SSCO) in complex and urban terrain, confronting low-end and mid-range threats that may employ both conventional and asymmetric capabilities. . . . The Brigade Combat Team deploys very rapidly, executes early entry, and conducts effective combat operations immediately on arrival to prevent, contain, stabilize, or resolve a conflict through shaping and decisive operations.[29]

The organization of the medium brigade centered on three motorized combined arms infantry battalions. Each included three combined arms companies with three infantry and one mobile gun system (MGS) platoon plus a mortar section and sniper team. The MGS provided armored direct fire support for the infantry. Available battalion combat support included snipers, mortars, and fire support teams for observation and targeting. Other brigade assets included reconnaissance, artillery, antitank, engineer, signal, and military intelligence; while the brigade support battalion provided maintenance, logistics, and medical services.[30]

The principal qualities that defined the unit lay in its high tactical mobility and capacity for dismounted combat operations. Dismounted infantry operations constituted the principal form of combat and related activities.

Armor Branch Archives

Figure 105. The basic components of the FBCB2.

Light armored vehicles provided rapid tactical mobility. The nature of the combined arms infantry units facilitated operations in complex and urban terrain. The brigade and its component battalions were intended to operate as a concentrated mass or as a collection of dispersed elements linked together via a digital communications network that included higher headquarters. The antitank company provided a degree of protection from mechanized threats, but against a robust armored presence the brigade required augmentation.[31]

The SBCT reflected design parameters established by the Army leadership. These included reduced logistical and maintenance requirements with a parallel minimization of personnel that did not compromise combat ability. The entire unit had to be deployable via C-130 air transport to ensure ready access to operational theaters that might not possess large airstrips. The combined arms nature of the infantry battalions reflected a deliberate desire to create tactical elements organized as they would normally operate. The brigade did not include those functions that could be provided by another force or command. Instead, the brigade relied on its digital network to access nonorganic capabilities. This "reach-back" capability particularly applied to the delivery of fire support, intelligence, planning, sustainment, and force protection.[32]

Much of the planned effectiveness of the SBCT stemmed from its communications network. Force XXI Battle Command Brigade and Below (FBCB2) constituted a central component. It included a computer system complete with keyboard and screen mounted on individual vehicles together with related software. FBCB2 transmitted information via digital and FM radios, sharing situational awareness data and command messages throughout the brigade. It provided a common operational picture of the battle area to commanders, staffs, and units by automatically updating the location of all friendly, digital forces. It also depicted the most recently reported locations of enemy units. This information was graphically depicted on the screen. This image also provided key terrain information useful for maneuver and determining line of sight. For command purposes, FBCB2 provided standard message formats and enabled the transmission of graphics. These tools simplified the issuance of command guidance and planning documents, which could now be computer generated and disseminated without the time-intensive requirement to make and distribute paper copies. Moreover, it ensured that all recipients received identical guidance and imagery.[33]

The unit also interfaced with higher headquarters and external Army assets via the Army Battle Command System, a collection of digital communications devices each focused on a particular function. Through

the Army Battle Command System, the brigade could, for example, request air or fire support from other organizations or tap into intelligence data otherwise unavailable. Together with FBCB2, this system provided the means of sharing and acquiring information continuously to obtain the level of situational awareness necessary for a high operational tempo and rapid, effective decisionmaking.[34]

The digital communications architecture also enhanced the operation of the brigade's reconnaissance, surveillance, and target acquisition (RSTA) squadron. The mission of this unit lay in acquiring information to guide the brigade's operations and in establishing situational understanding. Given the brigade's orientation on contingency response, the squadron focused on an area of operations rather than a specific enemy force. It also sought a broader range of information including not only terrain and enemy forces but also political, cultural, and economic factors. To do so required an analytical capability found in the squadron headquarters, supplemented by brigade and external intelligence assets. The actual collection of information occurred preferably through stealth and direct interaction between squadron personnel and local inhabitants.[35]

To perform its mission, the RSTA squadron possessed a mix of sensors, radars, UAVs, manned platforms, and intelligence personnel. It constituted an unusually large organization for a BCT, which generally included only a single reconnaissance troop. The large size and special nature of the RSTA squadron reflected the importance attached to information acquisition and situational awareness. The squadron also fundamentally differed from other mounted reconnaissance units. Its principal components included a headquarters and headquarters troop (HHT), three reconnaissance troops, and one surveillance troop. Each reconnaissance troop comprised a headquarters, three platoons, and a mortar section. The platoons in turn possessed four reconnaissance vehicles, each carrying a two-man crew and a three-man dismount team that included a human intelligence (HUMINT) collector. The surveillance troop included a headquarters and one platoon each of UAVs; sensors; and nuclear, biological, and chemical (NBC) reconnaissance. The UAV platoon constituted the aerial component of the squadron and performed observation and surveillance missions, while the sensor platoon included ground surveillance radars and devices intended to intercept hostile transmissions and identify the direction of their origin. The NBC reconnaissance platoon provided early warning of contaminated areas and assisted the location of WMDs.[36]

The RSTA squadron constituted a unique reconnaissance unit, yet it also incorporated organizational trends stretching back to the Vietnam era. The RSTA squadron consolidated a broad range of information assets that

sometimes worked together but were distributed among different units and command echelons. This concentration created a powerful combination that further benefited from the enhanced digital communications available. The inclusion of dismount teams and counterintelligence personnel helped alleviate earlier platform manning problems, while boosting the ability to gather intelligence related to a civilian population. In terms of its ability to gather information, the RSTA squadron was unprecedented, but its headquarters elements possessed the staff necessary to both plan intelligence missions and analyze the data. This reduced the burden on brigade planners and facilitated the integration of reconnaissance operations into the overall brigade plan. At the brigade level, several organizations existed within the headquarters to assist in data collection and analysis.[37]

The RSTA squadron was not expected to fight for information. Instead, it employed its assets to gather information without being detected, using organic weapons primarily in self-defense. In sudden contact situations, RSTA elements relied on supporting fires to provide the necessary combat power to disengage. Hence, the squadron constituted a large organization optimized for information acquisition with only limited combat power. In low-threat environments, it could perform security missions, but generally security and economy of force activities lay outside its responsibility. Through information acquisition and situational awareness, the squadron provided advance warning and assisted the brigade commander to maneuver his infantry battalions. In this sense, the RSTA squadron marked a return to the type of pure reconnaissance organization that had not found favor in the past. An important difference, however, existed in the level of information assets available to the squadron coupled with the digital communications network. It remained to be seen whether these features would, in fact, enable the unit to realize its purpose in an actual combat environment.[38]

Plans for the medium brigade's vehicle set called for the use of an existing platform. The Army gathered data on a variety of different vehicles. The Platform Performance Demonstration conducted at Fort Knox in December 1999–January 2000, for example, provided an opportunity to inspect potential vehicles and observe their operation in various field activities. After assessing potential vehicle candidates, the Army opted for a family of vehicles based on the wheeled LAV III for use in the medium brigades.[39] This platform underwent substantial modification to accommodate specific functions, including reconnaissance, command, infantry transport, antitank, mortar support, NBC reconnaissance, medical evacuation, engineer operations, fire support, and direct fire support for

the infantry.[40] Design work proceeded rapidly and the first vehicles were delivered to the Army in 2002.[41]

The Armor Center played a key role in the development of the SBCT. Despite its infantry nature, responsibility for developing the communications architecture, RSTA squadron, reconnaissance vehicle, command platform, and the direct fire support MGS all lay with the Armor Center. Major General B.B. Bell commanded at Fort Knox from 1999 to 2001 and made support for the medium brigades a primary branch focus.[42]

Platform development reflected the intended use of the brigade. Each vehicle carried sufficient armor to protect the crew and passengers from small arms fire and fragmentation, but add-on armor packages could be applied to provide increased levels of protection, especially against rocket propelled grenades (RPGs). The reconnaissance vehicle came equipped with a global positioning system (GPS), FBCB2, long-range advanced scout surveillance system (LRAS3), and a radio. Its equipment included either a grenade launcher or a machinegun for self-defense. Able to achieve speeds up to 60-miles per hour, its run-flat tires also offered the ability to escape dangerous environments with one or more flat tires before losing its mobility. Like the rest of the Stryker family, the reconnaissance vehicle was designed to fit into a C-130 aircraft for rapid deployment. Compared to previous reconnaissance platforms, the Stryker variant offered multiple improvements, specifically in the ability to navigate, communicate, and identify targets from a long distance. Its principal drawback lay in its large size, particularly in comparison with the high-mobility multipurpose wheeled vehicle (HMMWV), but it possessed better protection and the capacity to carry a larger dismount team.[43]

The decision to base the Stryker on the LAV III encountered fierce criticism from supporters of the M113. They considered the M113 a superior, proven vehicle. Already in the Army inventory, it did not seem to require the same level of design and development work to transform it into the desired family of vehicles for the medium brigade. This resistance manifested itself on Internet Web sites dedicated to highlighting flaws in the LAV III and in efforts to sway members of Congress and force a reconsideration of the Army's decision. Part of this reaction stemmed from a preference for a tracked vehicle over the wheeled Stryker. Tracks were believed to offer better cross-country mobility and facilitate movement through rubble and other obstacles and were less vulnerable than wheels. Despite such opposition, the Army pushed forward with Stryker development. Congress did mandate a side-by-side comparative evaluation with the M113, but this event did not prove the alleged inferiority of the LAV III design.[44]

Development and fielding of the first SBCT demonstrated the Army's commitment to rapid implementation of a key Transformation goal. However, SBCT fielding generated fears among armor soldiers. The new brigades were created through the conversion of existing units, including tank battalions. The increased reconnaissance component of the SBCT generated a demand for additional cavalry soldiers. To fill this need, many tankers found themselves reclassified as scouts, fueling fears about the future of tank units and the related Military Occupational Specialty (MOS) 19K.[45]

Light wheeled vehicles seemed poised to replace the combat power of the Abrams tank. Such a development proved particularly worrisome, since many nations possessed large quantities of Soviet-built tanks and mechanized vehicles that eclipsed the combat power of the Stryker.[46] These concerns were sufficiently widespread for the Army leadership to mount an information campaign to explain the rationale behind the SBCT. They focused on the role of these brigades in providing an additional capability rather than replacing current ones. Specifically, they highlighted the continued importance of tank organizations and their need in the future. A related theme lay in stressing the orientation of the SBCTs on contingency operations rather than the conventional warfighting associated with heavy force elements.[47] These efforts partially ameliorated concerns of armor soldiers, but they did not entirely remove concerns over the future of the branch's heavy component.[48]

Courtesy *Armor Magazine*

Figure 106. Officers confer during a training exercise at Fort Knox.

The development of the SBCT stimulated study of the potential of combining several such brigades into a division. Analysis suggested that overall effectiveness of the SBCT increased if employed as part of a larger formation. Hence, a conceptual design for an interim division (IDIV) emerged between 2000 and 2002. Intended to operate as part of a corps or joint task force, this formation included additional assets, combat power, and an expanded RSTA element that increased the flexibility of each brigade and the ability to tailor each one to a particular tactical environment. In effect, the IDIV amplified the capabilities of subordinate SBCTs, boosting brigade capability while offering a greater range of options in the conduct of operations throughout the division sector. However, fielding such a formation raised questions of manning, funding, and equipping not readily resolved. The IDIV, therefore, never progressed beyond a notional state.[49]

Transforming the 2d Armored Cavalry Regiment

Army Transformation and the establishment of SBCTs created an opportunity to modernize the 2d Armored Cavalry Regiment. After previous plans to upgrade this HMMWV-based organization into one built around an Armored Gun System (AGS)/M113A3 mix failed, the regiment remained a light unit with limited capabilities. It could perform reconnaissance and limited security, but it required augmentation to operate against most conventional force threats. It could not perform the standard armored cavalry regiment functions of guard, cover, and economy of force operations with its organic assets. It possessed only minimal lethality, encountered difficulties operating in complex terrain, included no armored platform for direct fire support, and could not ensure 24-hour information acquisition in all weather and visibility conditions. However, it did incorporate all the deficiencies associated with the HMMWV.[50]

The Army's decision to create several medium brigades and build the related equipment set offered the chance to upgrade the 2d Cavalry using the Stryker family of vehicles. TRADOC Commander General John N. Abrams directed the Armor Center to develop a modernization strategy and an organizational and operational concept for the regiment. This effort utilized the expertise of other Army centers and schools in addition to the collective wisdom of retired senior armor officers. The latter served as mentors to the process, while several Blue Ribbon Panels provided forums for all participating organizations to meet, exchange ideas, and generate the necessary modernization plans and employment concepts.[51]

Basic design parameters for the restructured regiment included an emphasis on combined arms operations, air deployability, and the ability to perform all missions associated with corps cavalry organizations. The

regiment was to include "only those organic capabilities that are always needed and cannot be reasonably provided through force tailoring from corps or Army assets." In short, its design would occur under size and manning restraints. Similarly, it would make use of equipment either already in or soon expected to be in the Army inventory.[52]

The first step lay in resolving identified deficiencies. This work provided the foundation for a more capable organization in line with the Objective Force, thereby ensuring cavalry's role in the future. The Armor Center played a central role in this work, and its commander, Major General Bell, directed the work of the Blue Ribbon Panels and related analysis:

> Initially, my intent is to produce an O&O that articulates the use of 2d Armored Cavalry Regiment as XVIII Airborne Corps' cavalry regiment, capable of conducting all traditional cavalry missions. This O&O will allow the 2ACR to become a strategically deployable, multi-dimensional, and lethal warfighting force that is sustainable; highly deployable; has a 'friendly' MANPRINT which needs no new equipment or MOS's; survivable through its dispersion; tactically mobile; and possesses a co-efficient of lethality to accomplish security missions. We will roll these characteristics into a force effectiveness model, bringing about the interim cavalry regiment, which will be the harbinger of the objective force cavalry regiment. This objective force allows for the reconnaissance, surveillance, and security capabilities for a Corps.[53]

Several challenges faced the redesign effort. Like the SBCTs, the 2d Armored Cavalry was expected to operate in complex and urban terrain. Underdeveloped infrastructure in prospective operational environments required a unit able to sustain itself and function without dependence on comprehensive road nets or modern airfields. Threat forces included conventional, paramilitary, terrorist, and other irregular organizations. They were likely to employ a variety of tactics and technologies to offset American superiority, including attacks on command and control nodes, logistics support, and the denial of access to the region.[54]

Given the failure of previous modernization efforts, the Armor Center commander deliberately sought the support and involvement of multiple organizations within TRADOC and Forces Command (FORSCOM). Doing so helped to build a consensus of support to simplify manning and funding decisions while ensuring the project's viability. Hence, the views

of the commanders of FORSCOM, the XVIII Airborne Corps, and the 2d Armored Cavalry Regiment (ACR) became central in shaping how the organizational and operational concept evolved.[55]

The late summer and fall of 2000 witnessed considerable energy toward developing a structure for the 2d Cavalry. The first two Blue Ribbon Panels convened to begin developing possible organizations, while simulation and modeling work provided data suggesting the capabilities of each one. The focus of this virtual analysis lay in the Balkans and Southwest Asia, both areas that had seen the deployment of American forces and would likely do so again. Potential organizations were evaluated for their ability to perform the full range of reconnaissance, security, and economy of force roles typically associated with an armored cavalry regiment, although no intent existed to duplicate the 3d Armored Cavalry Regiment.[56]

Simulations and modeling focused on three organizational designs: the existing 2d Armored Cavalry Regiment structure and two more based on Stryker platforms. The latter differed primarily in the composition of their ground squadrons, which contained either embedded MGSs and an attached ATGM company or the reverse. The MGS was the direct fire version of the Stryker and mounted a fully stabilized 105-mm gun. Unsurprisingly, computer gaming found the capabilities of the Stryker-equipped configurations significantly superior to the existing organization. The existing 2d Cavalry lacked both the standoff surveillance of the LRAS3 and the ability to acquire targets while moving at night. Consequently, the unit found itself forced to react to hostile threats, often entering the effective direct-fire range of the latter. The HMMWV platforms proved susceptible to most weapons, including small arms, and the unit had to commit substantial air and ground cavalry assets to destroy even small enemy incursions. Indeed, the unit's OH-58D helicopters served as one of its principal combat platforms to the detriment of their intended reconnaissance role. The Stryker-equipped organizations possessed more combat power, benefited from UAV tracking of targets, leveraged the MGS ability to engage targets while moving day or night, and proved much more survivable. Detection ranges proved twice those of the existing organization.[57]

Nevertheless, the Stryker configurations were not perfect. While the MGS received considerable accolades for its ability to acquire and engage targets on the move, this capability needed to be more widespread. The Stryker seemed to need better protection and the unit needed the ability to destroy hostile reconnaissance. Scouts needed the means to eliminate a broad range of targets, leading to discussions regarding the viability of mounting a 25-mm weapon on the reconnaissance vehicle. Such a solution

contradicted efforts to control funding and the acquisition of new materiel. It simply was unrealistic. The Stryker units also possessed no long-range antitank system other than the ATGM platforms, and the squadron headquarters troop included no indirect fire capability or sensors.[58]

By November 2000, force designers found themselves confronted with another challenge. At the start of the 2d Armored Cavalry Regiment modernization process, the goal lay largely in improving the capabilities of the current unit. However, this purpose became superseded by Major General Bell's growing emphasis on using the modernization process to build the foundation for an Objective Force cavalry regiment. Rather than evolve the current regiment through an interim design, it would transition to an organization much closer in concept and equipment to the Objective rather than the Legacy Force. In effect, force designers were attempting to craft the interim and final organization simultaneously. They attempted to look 10 to 20 years into the future and build a mounted unit appropriate for an operational environment whose threats and nature could only be guessed. This shift paralleled a desire to ensure a future for cavalry organizations by aligning them with the high-profile and future-oriented Objective Force that constituted the ultimate goal of Army Transformation.[59]

In the process, the 2d Armored Cavalry transformation plans ensured satisfaction of XVIII Airborne Corps needs. Satisfying that formation's commander also ensured his support in the ongoing struggle to secure resources and authorization to implement the new configuration. These included the ability to perform traditional reconnaissance, security, and economy of force actions. Through reliance on a large number of MGS platforms, the proposed unit improved survivability and lethality. Given the nonlinear nature of the anticipated battlefield, the regiment's capacity for dispersed operations and self-sustainment made sense. The value of these capabilities directly depended on their immediate availability via air deployment.[60]

The emerging design for the 2d Armored Cavalry required a related effort to ensure Congressional support. Much of this action entailed highlighting the purpose of the regiment in clear terms. The design work to date suffered from a malady that plagued many Army Transformation projects—"too many buzzwords, that it is confusing gibberish. Language needs to be simple and understandable to the non-military layman. Couldn't sell this on the Hill with this kind of language." The regiment's unique reconnaissance capabilities needed to be highlighted to show a requirement for this type of organization and how the proposed organization fulfilled this need, in turn encouraging field commanders, particularly the XVIII Airborne Corps commander, to press for the fielding of this unit.

It also required underscoring the differences between the SBCTs and the redesigned 2d Armored Cavalry.[61]

By January 2001, the redesign effort had garnered support from the Army Chief of Staff, the TRADOC commander, and numerous field commanders. However, questions remained among other members of the senior leadership. Their concerns centered on funding, the need for the cavalry regiment, and whether or not the SBCT could perform its mission. The Armor Center design team undertook an effort to explain the rationale for the inclusion of cavalry organizations in the Objective Force, justify reliance on dismounted scouts rather than sensors, and assess SBCT performance of the intended mission set for the reconfigured 2d Armored Cavalry Regiment. At issue was not simply the fate of the 2d Armored Cavalry, but the entire concept of cavalry.[62]

Courtesy *Armor Magazine*

Figure 107. Two M3 cavalry fighting vehicles conducting live fire exercise.

Consequently, work on the regiment focused on reducing its strength, justifying its utility, and generating the most effective organization within a personnel cap. It still utilized an SBCT equipment set, but the mix of Stryker platforms varied to reflect the cavalry nature of the 2d Armored Cavalry. In particular, the number of MGS platforms proved significantly higher than that planned for the SBCT. In the proposed cavalry organization, the MGS performed a role broader than that of direct fire support for infantry. It constituted the principal mobile, offensive capability of the cavalry regiment, enhancing its ability to fight for information, perform security missions, and engage hostile armor if necessary.[63]

During January–February 2001, the TRADOC Analysis Center (TRAC) conducted a focused simulation intended to test the relative effectiveness of the current 2d Armored Cavalry, the Armor Center's emerging design for the regiment, and an SBCT. Related analysis examined the optimal size of MGS platoons. The computer simulations evaluated these organizations in the performance of zone reconnaissance and moving flank guard missions. Data analysis found the proposed 2d Armored Cavalry organization to perform zone reconnaissance faster than the SBCT, provide coverage over a broader area, and eliminate the greatest number of threat reconnaissance forces. Against hostile armor, the modernized cavalry regiment proved capable of defeating the threat the fastest and with the least risk to itself. Generally, the computer study supported the value of the emerging cavalry design over the SBCT and existing 2d Armored Cavalry. Results also emphasized the value of the MGS platoon, encouraging reliance on a regiment design with far more of these platforms than the 27 intended for the SBCT.[64]

In the wake of the terrorist attacks of 9/11 and the start of military operations in Afghanistan, new questions arose concerning the nature of the recommended cavalry regiment organization. General Montgomery C. Meigs, commanding Army forces in Europe, preferred a mounted unit oriented toward reconnaissance rather than traditional cavalry operations. In his view, operations in Afghanistan better suited a RSTA-type unit rather than the large force now proposed for the 2d Armored Cavalry. He questioned its deployability and believed the Stryker too large to serve as an effective reconnaissance platform. To address the latter issue necessitated the design and development of a new vehicle to be fielded to a single unit. Given the failure of the AGS once intended for two or three organizations, this approach was not likely to succeed.[65]

The Armor Center continued to advocate a more robust cavalry organization. By October 2002, the proposed structure for the 2d Armored Cavalry included a HHT, three ground cavalry squadrons, one aviation squadron, and a support squadron. Its strength totaled 4,077 soldiers, 334 Stryker vehicles, and 41 helicopters. It retained the traditional characteristics associated with cavalry units of robust command and communications, ability to accommodate a variety of attached forces, organizational flexibility, and combined arms nature. Artillery support was decentralized under squadron control, while UAVs and advanced sensors and ground surveillance radars enhanced its ability to monitor the battlefield. The ground squadrons included four troops, each one configured in the more familiar 2x2 arrangement with two Stryker reconnaissance platoons, two MGS platoons, a fire support platoon, and a headquarters element. The

MGS overwatched the reconnaissance platoons and helped to ensure scout survivability and sustain operational tempo. The aviation component included a mix of attack, observation, and utility helicopters, alleviating the current light armored cavalry regiments forced dependence on the OH-58D for both combat and reconnaissance.[66]

However, the large number of MGS platforms increased the cost associated with fielding. Indeed, the price tag for the unit surpassed that of the SBCT by nearly $260 million. Funding for the proposed regiment had to compete with a variety of other high-priority demands facing the Army, including the growing cost associated with the Objective Force. While the cavalry organization offered a powerful capability, it also constituted an unfunded requirement for which no easy method of paying for it existed. Hence, in February 2003, TRADOC Commander General Kevin P. Byrnes, who replaced General Abrams, requested the Armor Center validate the need for the high number of MGS platforms.[67]

The Armor Center completed this analysis by August, confirming the need for 96 MGSs. General Byrnes disagreed with this finding and directed a redesign of the cavalry regiment with only 48 MGSs.[68] This new action resulted in changes to the organizational and operational concept. No longer could one MGS platoon provide overwatch for one reconnaissance platoon. Instead, each ground cavalry troop shrank in size through the elimination of one MGS platoon. The surviving platoon became responsible for supporting two reconnaissance platoons. Despite these changes, the proposed cavalry regiment still constituted a significant increase in capability over the existing 2d Armored Cavalry. Each reconnaissance platoon included larger dismount teams transported in armored vehicles. The inclusion of LRAS3, UAVs, and sensors greatly enhanced the ability to observe hostile activity at greater ranges, while the digital communications network improved the ability to access close air and fire support. Moreover, the effectiveness of the latter improved through integration of the artillery and aircraft observers on the same platform to boost coordination.[69]

By February 2004, most issues facing approval of the proposed cavalry regiment had been resolved, and the Army Chief of Staff approved the organization. Planning immediately began on related production and fielding, and the Armor Center's involvement ended. Although several issues surrounded MGS development, the Army leadership resolved to proceed with fielding the new cavalry organization regardless of the outcome.[70]

These decisions seemingly ended the saga of 2d Armored Cavalry modernization and the Army's efforts to field an effective light cavalry

regiment. Yet, just 3 months after committing to fielding such a force, the senior Army leadership reversed itself and canceled the entire action. Instead, the 2d Armored Cavalry would transition into an SBCT, retaining its cavalry orientation in name only. According to the press release of the decision,

> The conversion of the 2d ACR to an infantry-centric SBCT supports the Army's transition to modularity, standardizes the design for all six planned SBCTs, and increases the number of Army infantry formations available to combatant commanders worldwide to set the tempo of battle and act decisively against enemy forces.[71]

This rationale called into question the need for any cavalry organization at all.

ISR Operations and the New Contact Paradigm

Between 1999 and 2002, the SBCT and its RSTA squadron dominated mounted reconnaissance doctrinal development. This work benefited from the confluence of Force XXI developments, Army Transformation, and new information technologies. The resultant reconnaissance concepts marked a significant shift in the manner of battlefield information collection and use. These ideas soon began to permeate all reconnaissance organizations.

Force XXI experimentation with digital technologies and communications devices led to greater emphasis on situational awareness, understanding, and the development of a common operation picture. Situational awareness entailed a basic sense of the disposition of friendly and hostile forces. A digital communications network supported by satellite feeds and GPS input that automatically tracked and updated friendly forces locations in real time directly supported it. The most current information on threat positions was similarly tracked. Automatically shared among friendly forces, this information gave the commander and subordinate leaders of a combat organization an identical view of the battle area. This common operational picture facilitated rapid planning and maneuver by all combat, support, and service elements. It simplified coordination of dispersed units toward common objectives.

Still, knowledge of friendly and enemy force dispositions alone did not equate to comprehension of enemy intentions. Such situational understanding required an analytical effort that encompassed background information on hostile doctrine, weapons, and past operations, coupled with all significant data collected from the battle area by friendly assets. This

analysis clarified the tactical situation and enabled a much higher degree of precision in the maneuver of friendly forces.

Situational understanding stemmed directly from the actions of a commander's staff responsible for reviewing information gathered from the battlefield, analyzing it, and providing an intelligence assessment. Traditionally, this staff process occurred separately from the actual acquisition of information on the battlefield. However, doctrinal guidance for the SBCT merged the actions into a single set of intelligence, surveillance, and reconnaissance (ISR) operations that integrated the information collection function of the RSTA squadron and the intelligence generation function of the brigade's military intelligence company. In essence, "Where reconnaissance and surveillance answered the 'what,' 'where,' and 'when' on the battlefield, ISR has the additional requirement of answering 'why.'"[72]

Armor Branch Archives

Figure 108. The mounted urban training site built at Fort Knox to support the training of heavy forces in built-up areas.

ISR operations were continuous in nature, and they both shaped and were influenced by information collection efforts. Not only did they help to influence the commander's understanding of the battlefield, they also served to direct information acquisition toward those areas or items considered vital to decisions governing the maneuver of friendly forces. The ISR process promoted a more effective linkage between reconnaissance and surveillance activities and the planning efforts of commanders and their staffs throughout an operation. The rapidity of information sharing associated with the SBCT's digital communications network further

enhanced the integrating nature of ISR operations. It ensured the timely and continuous influx of information from the battlefield and similarly speedy issuance of guidance to reconnaissance and surveillance assets.

The fusion of information collection and intelligence generation was encouraged by the number and variety of information gathering systems within the SBCT. The RSTA squadron included scouts, LRAS3, ground surveillance radars, and signal detection devices. The HMMWV-mounted AN/MLQ-40 Prophet detected signal emissions, intercepted them, and provided direction finding to the signal source. The improved remotely monitored battlefield sensor system (REMBASS) detected seismic, acoustic, magnetic, and infrared signatures. Radars within the artillery battalion enhanced counterfire capability through the detection of hostile mortar, artillery, and rocket fire. Additional reconnaissance assets included the engineer company and the NBC reconnaissance platoon of the RSTA squadron's surveillance troop. The brigade or a higher headquarters might also provide Guardrail and Quickfix support. The former provided rapid signal recognition, direction finding, and targeting information from an aerial platform. Quickfix enabled direction finding and jamming from a helicopter. Further information on the battle area could also be accessed via civil affairs channels, satellite tracking, and more conventional aerial reconnaissance.[73]

Collectively, these systems proved more reliable, robust, and capable than similar previous devices. Used together in a coordinated manner, they offered the SBCT commander an effective means of monitoring developments within his area of operations. Indeed, the powerful combination of scouts, sensors, radars, platforms, and high-powered optics made possible a change in the way reconnaissance elements gained contact with the enemy. Traditionally, scouts advanced until they encountered a hostile presence. For the SBCT, initial contact was sought through sensors or radars beyond direct fire engagement range. Further development of the situation also occurred via other sensors without endangering the scouts. The information gathered while the enemy remained out of physical contact permitted the commander to determine how best to maneuver his forces. He sought to engage the hostile force at a time, place, and manner of his choosing. Under this new contact paradigm, reconnaissance and surveillance elements permitted early warning of the threat and provided continuous information to the commander without detection and at reduced risk. Scouts employed the devices at their disposal to collect information via stealth.[74]

This approach suited the high-tech nature of the SBCT in general and the RSTA squadron in particular. It offered a solution to the problem of HMMWV scouts blundering into hostile forces without the ability to

either attack a weak enemy or disengage from a more powerful one. The integrated and coordinated use of all reconnaissance and surveillance assets provided a high degree of situational awareness to reduce the chance of an unexpected encounter. However, even in such a case, the armored Stryker reconnaissance vehicle offered a much better chance of survival and escape than the HMMWV.

The reconnaissance platoons of the RSTA squadron also employed a vehicle crew and an organic three-man dismount team. This arrangement eliminated the problem faced by past reconnaissance units of insufficient manpower to both conduct dismounted operations and properly man their vehicles. Indeed, their platforms could operate independently.[75] Dismounted teams were intended especially for urban areas. They mapped enemy positions, identified key structures for seizure by brigade combat elements, and observed tactical developments via stealth. They played a central role in collecting information on the social, political, and economic environment, relying on their organic HUMINT collector to interact with friendly civilians and police.[76]

The urban orientation of the reconnaissance scout teams stemmed from the SBCT's optimization for small-scale contingency operations. These would necessarily entail action in population centers, particularly given global urbanization trends. The emphasis given to collecting information on the people reflected the experience of the 1990s in which major deployments necessitated operations among a civilian population. Understanding that population proved central to the achievement of key objectives and helped to prevent incidents that would alienate it. RSTA squadron doctrine stressed the importance of multidimensional reconnaissance, or reconnaissance focused on a broad array of social factors in addition to the more conventional emphasis on the enemy and terrain.[77]

The new contact paradigm placed a premium on information collection and made combat superfluous for the reconnaissance platoon scouts. Indeed, engaging the enemy other than in self-defense meant the neglect of the scout's primary mission. Hence, the RSTA squadron was not designed or intended to fight for information in the same manner as cavalry. It was not a cavalry organization, and its mission set did not entail the execution of those security and economy of force functions long associated with the mounted arm.[78] It constituted a major shift in mounted reconnaissance thinking, making full use of the digital communications networks and information technology pioneered under Force XXI.

RSTA squadron employment concepts also built on a longstanding belief that the purpose of reconnaissance lay primarily in information

acquisition. Such a view could be traced back to the horse cavalry, but it certainly found expression in the transition to HMMWV-equipped scout platoons with minimal combat power. The RSTA squadron's array of sensors, radars, UAVs, armored platforms, and LRAS3-equipped scouts working under the rubric of ISR operations, offered a resolution to many of the problems that plagued reconnaissance units in the 1980s and 1990s while demonstrating how to boost the ability to collect information.

Not surprisingly, the doctrinal concepts developed for the RSTA squadron began to influence other mounted reconnaissance organizations. This migration occurred through briefings, training guidance, and in the publication of new doctrinal manuals. In 2002, the publication of FM 3-20.971, *Reconnaissance Troop: Recce Troop and Brigade Reconnaissance Troop,* marked the formal incorporation of the new contact paradigm into doctrine. This manual provided overdue guidance for the operation of the brigade reconnaissance troop in addition to the reconnaissance troop of the SBCT RSTA squadron. Like previous reconnaissance manuals produced by the Armor Center, it highlighted the scout's value and ability to operate in all weather and mixed terrain and maintain 24-hour operations. He continued to be "the eyes and ears of the maneuver commander and provide the necessary information to allow him to make timely and accurate decisions."[79]

Both types of reconnaissance troops supported the attainment of situational understanding through application of the new contact paradigm and exploitation of the capabilities of UAVs, radars, satellite tracking systems, and sensors. They were expected to perform multidimensional reconnaissance, satisfy critical information requirements, support targeting of threat troops, and generally build and maintain a clear picture of the battlefield for their parent brigade.[80]

The principal missions of both troop types included route, zone, and area reconnaissance together with area and convoy security. Other missions necessitated substantial augmentation. Against other than a weak threat, the manual considered both troop types capable of only zone and area reconnaissance with their organic assets and combat power. Both lacked medical and maintenance support, possessed minimal survivability in the face of a mechanized threat, and carried weapons of limited lethality. Unlike cavalry organizations, "rarely will the troop fight for information. The troop primarily conducts reconnaissance, using surveillance, technical means, and human interaction to gain information." Reconnaissance coverage varied with the threat encountered. Against minimal opposition, route reconnaissance could be conducted at the rate of one per platoon.

Against heavier resistance, this number fell to just one for the entire troop. In the conduct of screen and surveillance missions, each troop could continuously monitor up to six battalion-size avenues of approach and maintain six observation posts (OPs) for long periods.[81]

Neither troop type possessed the means to sustain or survive protracted engagements. Therefore, the manual stressed the importance of undetected operations. To minimize the chance of a sudden, unexpected encounter with hostile forces, troop elements were to exploit the common operational picture shared via FBCB2 and the input of other ISR assets to avoid such potentialities. Premission threat and terrain analysis using data from multiple sources within the command chain provided opportunities to plan movements to maximize cover and concealment. The same data feeds facilitated stealthy movement and infiltration.[82]

Should contact with the enemy occur, the reconnaissance element was expected to develop the situation report, formulate a course of action, and act. This basic response remained unchanged in principal from earlier guidance, but the manual expected greater reliance on sensors, radars, UAVS, and indirect fires in lieu of direct fire engagements. To the extent possible, the reconnaissance element was expected to avoid or disengage from physical combat, possibly using extensive lateral and/or dismounted movement.[83]

The importance of building and sustaining situational awareness found expression in the introduction of battle handover. This term referred to the

Armor Branch Archives

Figure 109. Vehicle road march during the Platform Performance Demonstration at Fort Knox in 1999–2000.

transfer of responsibility between units for the observation or surveillance of a particular area or target. Battle handover proved critical to the avoidance of gaps in the coverage of the battle area, and it required a degree of coordination to determine not only which units were involved but also the type of sensor, radar, or aerial platform concerned.[84] Done wrong, it provided hostile forces an opportunity to operate unobserved with potentially catastrophic results. The nonlinear nature of the expected battlefield and nature of the contact paradigm made uninterrupted reconnaissance and surveillance critical. The NTC had already witnessed too many incidents in which attacking forces compelled scouts to retire without other assets able to assume their observation role.[85]

Security coverage emphasized screen, area, and convoy-related operations. In screening operations, the reconnaissance troop monitored developments to the flanks and rear of its parent organization to prevent enemy surprise action. In these operations, the limited combat power of the reconnaissance elements restricted their action to detection and tracking of hostile forces. Although they were expected to utilize indirect fires to impeded intruding elements, the destruction of the latter was left to designated combat elements. The manual clearly expected the relation of the reconnaissance and combat assets so employed to function in a hunter-killer relationship. Area and convoy security guidance relied on the proven principles established during the Vietnam War, updated to reflect new technologies. Area security entailed the creation of platoon perimeters integrated with sensors and attached combat elements, while convoy operations anticipated the use of UAVs for aerial reconnaissance.[86]

The reconnaissance troop manual provided overdue guidance for brigade reconnaissance troop and RSTA squadron reconnaissance troop personnel. Training activities for the latter had commenced in 2001 and with the first SBCT nearing operational status, the need for clear doctrinal guidance became critical. A parallel manual published at the same time addressed reconnaissance platoons. In FM 3-20.98, *Reconnaissance Platoon*, an effort was made to consolidate all reconnaissance and scout platoon manuals into one.[87] The complexity of this task lay in the existence of four different organizations not including those in the light cavalry units: the reconnaissance platoon of the RSTA squadron, the cavalry platoon, the six-HMMWV platoon of the division's battalion scouts and brigade reconnaissance troop, and the traditional 10-HMMWV platoon. The applicability of basic reconnaissance fundamentals to all platoons provided the justification for the consolidation.[88]

The final product numbered over 800 full-size pages that underscored its complexity in relation to prior platoon manuals. Although comprehensive

in scope, it lacked the training-oriented nature of earlier publications. No doubt this reflected the challenge facing the writers who sought not only to merge existing manuals but also to address digital communications, ISR operations, and the new contact paradigm. The manual also included chapters dedicated to stability and support, urban, and dismounted operations. Another section addressed "Essential Field Data," a grab bag of detailed information related to the assessment of terrain and infrastructure capability.[89]

Overall, however, the new platoon manual reflected those concepts associated with the RSTA squadron. Platoon guidance mirrored or closely resembled that issued for the reconnaissance troop. The primary platoon missions addressed in detail included route, area, and zone reconnaissance, while security coverage focused on screen, area, and convoy security. The platoon manual addressed battle handover, infiltration, and urban operations. It reiterated the importance of avoiding decisive engagement, because "It is critical that scouts never lose sight of their reconnaissance priorities and become involved in battles that invariably wear down reconnaissance forces."[90] This lesson learned from the earliest rotations at the NTC now found full expression in a manual nearly devoid of any discussion of direct fire engagements. While such action was not expressly forbidden, the overall emphasis of the manual lay on reconnaissance by stealth and sensor. On contact with hostile forces, the platoon developed the situation through the use of undetected dismounted scouts, stealth, attached ground surveillance radar, and supporting UAVs. Direct fire might be utilized to suppress the enemy or in self-defense, but it did not constitute the preferred option. Similarly, reconnaissance by fire coverage referred only to indirect fire use.[91]

The manual made few references or even acknowledgment of the far-greater combat capability of the cavalry platoon. The same principles of stealth and combat avoidance applied, despite the broader range of missions expected of cavalry organizations in general. The writers noted the existence of two types of reconnaissance units—those optimized for passive surveillance, HUMINT, and technical means of gaining information and those capable of fighting for information. The manual's orientation lay on the former, which included the scouts of the RSTA squadron, the brigade reconnaissance troop, and the battalion scout platoon. The concepts developed for these units were superimposed on all platoons, including the more capable M3-equipped cavalry units.[92]

The reconnaissance platoon manual marked one of the first to clearly address FBCB2 use and the related tactical internet. It also devoted considerable attention to ISR operations and their planning. This emphasis

reflected the nature of ISR in which reconnaissance and surveillance operations had to be integrated with intelligence generation at the lowest tactical level. It marked a response to repeated problems noted at the combat training centers. ISR effectiveness depended on the close linkage of the scout platoon's actions and the ongoing efforts to build situational awareness and understanding at every command echelon.[93]

Publication of the reconnaissance platoon manual was preceded by the issuance at Fort Knox of a special training text summarizing its basic principles.[94] These employment concepts also began to circulate via briefings and inclusion in Armor School training curriculums. At the brigade level, the publication of FM 3-90.3, *The Mounted Brigade Combat Team,* addressed changes in heavy brigades, including digitization. An entire chapter focused on ISR concepts and their application to help commanders and staffs leverage information assets to better understand the battlefield and maneuver with greater precision.[95]

A new gunnery manual for cavalry and reconnaissance units emerged at the same time. It, too, consolidated prior separate coverage into a single manual. Despite the deemphasis on combat operations by reconnaissance organizations, the gunnery manual expanded the range of potential targets and engagement types for all mounted reconnaissance units. Reflective of the broadening nature of potential battlefield threats, gunnery training shifted from single to multitarget engagements. Snipers, bunkers, urban areas, and a civilian presence were also introduced together with digital reporting of gunnery results. For the Stryker reconnaissance vehicle, the crew and dismount teams pursued separate qualification standards, including a Javelin engagement for the latter.[96]

Reaction to the new contact paradigm, ISR operations, and the related concepts for employing reconnaissance troops and platoons proved mixed. For some, the emerging reconnaissance ideas did not appear new, but rather a rediscovery of much older principles driven by combat training center experiences in which training units lacking sufficient time for proper reconnaissance simply blundered into contact. Reserve Component personnel faced a more pressing challenge: how to implement ISR concepts without the necessary communications equipment, sensors, radars, and UAVs.[97]

Skeptics found little wisdom in the fielding of tactical reconnaissance organizations that did not fight. They feared what might occur if such a unit were forced into combat. Others wondered what its survivability in an urban environment might be, particularly in light of Russia's disastrous 1994–95 experience in the streets of Grozny. Training challenges

Armor Branch Archives

Figure 110. Downtown Grozny, which became the scene of bitter and bloody street fighting between Russians and Chechens in 1994–95.

also loomed, given the increased emphasis on and requirements for dismounted operations. For scouts already burdened with a long list of skills to master, new requirements for urban dismounted skills more often associated with infantry posed a serious challenge.[98]

At the combat training centers, efforts to plan and execute successful ISR operations similarly proved difficult. Too often ISR actions did not benefit from an integrated staff effort and responsibility for their coordination rested on junior officers with little experience. Scouts found themselves receiving guidance that lacked clarity or emphasis on specific objectives. Worse, their actions were not always incorporated into the overall planning effort of their parent unit, thereby reducing their ability to influence command decisions. The presence of aerial platforms, sensors, radars, and satellites generated a degree of reconnaissance and surveillance clutter that required careful and continuous command oversight to avoid confusion. Such monitoring became noticeable by its absence. Generally, units struggled to plan and execute effective ISR operations, encountering difficulties similar to those experienced by units striving to apply earlier reconnaissance doctrine.[99]

Cavalry at the Crossroads—Again

The start of the 21st century found cavalry organizations facing an uncertain future. The emerging RSTA concepts with their decoupling of the traditional linkage between reconnaissance and security left heavy cavalry organizations in an anomalous position. With their combined arms nature and combat power, they constituted powerful organizations capable of influencing any area of operations, including those associated with

the stability and support operations for which the SBCT was optimized to execute. However, heavy cavalry was left behind in the scramble to generate light, stealthy reconnaissance elements dependent on an array of technical devices.

The principal manual governing the operation of the armored cavalry regiment and the heavy division cavalry squadron remained FM 17-95, *Cavalry Operations*, published in 1996.[100] It did not reflect the proliferation of digital systems, the impact of ISR operations, or related changes in materiel since then. Moreover, discrepancies existed between the manual, which outlined the basic principles of employment, and related training publications that governed unit readiness. Similar problems afflicted the value of FM 17-97, *Cavalry Troop*.[101]

Cavalry organizations continued to suffer from an insufficient dismounted capability. At full strength, the M3s of each platoon carried a two-man scout team, but losses to any cause forced the adoption of varied expedients. This problem was not new, but it had never been properly addressed in any reconnaissance organization. The M3s, which equipped cavalry platoons, proved large enough to carry more scouts, but reloads for the TOW missile launcher consumed much of the interior space. This state reflected the Cold War need for reconnaissance platforms with a powerful antitank capability. In the years since the Cold War's end, cavalry platoons needed more scouts than missiles. This problem, like that of doctrinal updates, ranked a low priority.[102]

The effectiveness of cavalry units also suffered from a diminished familiarity with cavalry operations among Army officers. Most received little institutional training related to cavalry organization and doctrine. The resultant unfamiliarity resulted in the issuance of ineffective orders to cavalry forces during training exercises. Outside the Cavalry Leaders Course and Scout Leaders Course, few opportunities existed for officers to become familiar with cavalry operations. Consequently, a number of unit commanders lacked the background to train and develop subordinate leaders into effective cavalry leaders.[103] This problem was not alleviated by the discrepancy between the doctrine that cavalry units operated under and those concepts most familiar to senior commanders and their staffs. The latter proved more conversant with the 2001 FM 3-90, *Tactics*, but most cavalry organizations still trained and functioned according to principles outlined in manuals published in 1995–96. In any event, cavalry troop commanders struggled with orders and guidance that too often did not focus their capabilities on key information objectives. Instead, they found themselves given too many tasks that dispersed their assets and made them susceptible to frequent combat and a rapid erosion of strength.[104]

Courtesy *Armor Magazine*

Figure 111. Instruction for officers attending the Armor Captains Career Course.

In the absence of Army-wide understanding of cavalry operations, implementation of RSTA-related reconnaissance concepts created new problems. Within the division, for example, the proper interaction between the new brigade reconnaissance troops and the division cavalry squadron constituted uncharted waters. Efforts to work through this and similar problems were subject to periodic piecemeal deployments of key personnel or subordinate units. The aviation component was the most common element thus tasked, and its absence undermined unit readiness and combined arms training.[105]

Nevertheless, the armored cavalry regiment and division cavalry squadron still constituted powerful, combined arms teams. With their mix of scouts, tanks, and helicopters, they retained their ability to fight for information and influence battlefield developments in a less high-tech but still effective manner. Indeed, they proved one of the few reconnaissance assets capable of functioning in the presence of a strong threat with or without detailed information on the enemy's disposition and status. The continued fielding of the M1A2 SEP tank and the M3A3 Cavalry Fighting Vehicle also offered the promise of even greater combat and visualization powers in the near term.

Amid the spread of RSTA concepts, cavalry organizations focused on improving the effectiveness of those assets available to them. Within armored cavalry troops, attention was given to better integration of scouts and mortar sections, fire support in general, the refinement of hunter-killer concepts, and the employment of quick reaction forces.[106] The use of dismounted scout teams to support both stealth and aggressive reconnaissance also received more emphasis, particularly in complex terrain. Their intelligent use helped their parent platoon to avoid premature contact, ensured that the heavy cavalry retained a degree of stealth, and increased the depth of security missions. As observers, these teams benefited from the use of GPS devices and mini eye safe laser infrared observation sets (MELIOS) to complement their more traditional binoculars and paper maps.[107]

Tactics, techniques, and procedures for the optimal use of air cavalry within the division cavalry squadron also continued to improve. In light of previous and ongoing organizational changes, this unit remained "the only organization in our Army that possesses both ground and air elements in a single battalion-sized organization."[108] At any rate, Army Transformation triggered a proposal to remove aviation assets from division cavalry squadrons and armored cavalry regiments. Part of the rationale lay in previous advanced warfighting experiments in which aviation capabilities seemed constrained by their link to ground scouts. Moreover, the growing capabilities of aviation platforms, particularly those associated with the RAH-66 Comanche before its cancellation, suggested that they might be able to achieve greater results if employed independently. This proposal gained support outside the Armor community, but it was not implemented. However, it caused considerable consternation among cavalry supporters already alarmed at the steady erosion of cavalry capabilities in favor of high-tech devices and RSTA principles. The commander of the 3d Armored Cavalry expressed a common view among cavalry soldiers when he characterized the concept as "dumb as dirt," because it merely detracted from a proven combined arms capability.[109] Another officer noted,

> The single best enhancement to our reconnaissance efforts was the ability of the ground scouts to talk directly to the air scouts and to reinforce one another's capability. It's difficult for the scout on the ground to develop such a relationship with a sensor or UAV.[110]

Indeed, the trend toward reconnaissance and surveillance reliant on technology and the avoidance of combat engendered concern among some mounted officers. They reasserted the enduring relevance of cavalry organizations. In contrast to sensors and UAVs, cavalry provided a continuous, all-weather ability to gather detailed information regarding

the enemy, his intent, and his capability to conduct operations. Cavalry possessed a critical human quality that permitted assessment of hostile intent and civilian interaction during small-scale contingency operations. Support for cavalry organizations stemmed from operational experience rather than the theoretical and simulations-based justification for new technologies and RSTA principles. They considered the ability to fight for information and employ combat power to execute combat missions critical enablers of brigade and division commanders, who otherwise had to divert maneuver assets to perform the same roles. While the latter might perform such actions, doing so diverted them from their primary functions. Moreover, they lacked the training, agility, and robust communications architecture associated with cavalry organizations.[111]

Faced with future concepts that preferred reliance on air and ground sensors linked via a digital network to enhance information acquisition and obviate the need for traditional security missions, critics found fault with the underlying assumptions. They considered the new contact paradigm fundamentally flawed. It depended on accurate and detailed information regarding the enemy and the operational environment that sensors and aerial platforms could not continuously provide, particularly during operations in urban and/or complex terrain. As the US military improved its technical prowess, threat forces seemed more likely to seek methods and locations to negate technology and force a close fight. Urban environments became likely battlegrounds. Threat analysis and experience with both Serbian forces during the 1999 air campaign in Kosovo and the Taliban in Afghanistan demonstrated the growing effectiveness of deception measures and the use of inexpensive jamming devices to interfere with GPS navigation and targeting. In Kosovo, aerial platforms and sensors provided much of the intelligence used to locate, identify, and target Serbian ground forces for air attack. However, subsequent analysis found that these measures resulted in only limited Serbian losses. A better means of securing accurate information about the enemy was required—one that could sustain contact with the enemy. Organizations trained and equipped to execute traditional cavalry missions constituted one viable solution.[112]

Brigade and Battalion Scouts

The fielding of the new heavy division based on Force XXI principles and technologies (also known as the limited conservative heavy division) impacted reconnaissance at the brigade and battalion levels. The new division introduced the brigade reconnaissance troop, which filled a void between battalion and division reconnaissance. The troop included 49 soldiers distributed among a small headquarters element and 2 scout

platoons. This structure reflected the results of testing by Experimental Force (EXFOR) elements in the 1990s. The brigade reconnaissance troop supported the information needs of the brigade commander, who now benefited from the activities of five subordinate scout platoons.[113]

The brigade reconnaissance troop enhanced the brigade commander's ability to see the battlefield. It also eliminated the danger of battalion scouts operating too far forward in pursuit of brigade information requirements at the expense of their parent unit.[114] Increased effectiveness also occurred through the attachment of a Striker platoon with its six fire support teams. Integrated with the scouts, these teams provided an effective sensor-shooter linkage between the scouts observing targets and supporting artillery, while enhancing the brigade commander's ability to shape the battlefield with indirect fires. Coordination between the brigade and battalion scouts also provided maximum situational awareness, although it did necessitate some additional training. Battalion scouts monitored the communications network of the brigade reconnaissance troop, while both organizations relied on the same graphics and ensured seamless battle handover through practice.[115]

However, the fielding of the brigade reconnaissance troop came at a cost. To provide the men and materiel necessary, the size of battalion scout platoons in the new division organization shrank from 30 men and 10 HMMWVs to just 18 men and 6 vehicles. This change made the brigade and scout platoons identical, but reduced the coverage area and general effectiveness of the battalion scout platoon. The smaller platoons limited the number of OPs that could be established and constrained route reconnaissance to just one route per platoon. The platoon no longer possessed sufficient strength to offset losses through chance contacts. Moreover, the platoon leader did not have the option of controlling his unit—he had to both manage the platoon and perform as an active scout. Although the fielding of new equipment, including the LRAS3, was expected to offset this strength reduction, the organizational change began before the new equipment became available.[116] The LRAS3, for example, was planned to equip every scout vehicle, but by 2004 its slow fielding supported only three per platoon. Hence, the principal means of observation remained the binoculars, although light cavalry scout platoons might benefit from the use of TOW missile launcher sights.[117]

The smaller size of the new scout platoons and their reliance on the vulnerable HMMWV constituted the most significant concerns. Each platform carried only a single scout for dismounted operations. Losses to any cause all but eliminated even this minimal capability. Common recommendations for improving the platoon, therefore, sought more men and vehicles

with better survivability, since the "current 18-man, six HMMWV platoon is simply not capable of accomplishing all the tasks required to ensure mission success." Suggested vehicle alternatives included the Stryker or a M3/HMMWV mix.[118] The Future Scout and Cavalry System (FSCS) with its suite of sensors and capabilities was the planned solution. However, the program became the subject of restructuring and a source of funds to support other actions associated with Transformation. Although technologies related to the FSCS continued to develop, by 2003 the program was effectively dead and its requirements incorporated into ongoing work on the FCS.[119]

In the absence of a more effective platform or more scouts, other recommendations for the platoon as a whole focused on attachments. While scout platoons regularly worked with attached ground surveillance radar teams, combat operations lasing teams (COLT), and engineers, snipers were considered another powerful enhancement to its effectiveness in both reconnaissance and security operations.[120] The attachment of a retransmission team allowed scouts to select OPs on the basis of optimal observation rather than on the ability to transmit signals. Similar attachments were planned for the reconnaissance platoons of the SBCT's RSTA squadron.[121] The regular attachment of a medic and a mechanic were considered partial fixes to the absence of organic combat service support in the platoon. The inclusion of a medic helped to sustain wounded scouts, but it did not resolve the problem of removing him from the battlefield. Hence, units continued to improvise solutions.[122]

The publication of a consolidated reconnaissance platoon manual provided uniform doctrine for the brigade and battalion scouts. Yet the concepts it introduced required time to master, particularly those associated with infiltration and battle handover. Infiltration operations proved highly effective when successfully completed, but this did not always occur. Too often battalion staffs focused on the main fight proved less than attentive to the intricate planning necessary for infiltration. Once the mission began, scouts tended to neglect the use of dismounts to guide their vehicles through complex and/or potentially defended terrain. Other problem areas included actions on contact, casualty evacuation, and the selection of OP sites. Improvement came through practice and the involvement of the battalion staff in all stages of planning and preparation.[123]

Operation IRAQI FREEDOM—Major Combat Operations

Against the backdrop of Transformation and ongoing military operations in Afghanistan, the United States moved toward war with Iraq. Despite its defeat by a US-led coalition in the 1991 Gulf War, Iraq

continued to defy UN sanctions, brutally suppressed uprisings by Shiites and Kurds, and continued to threaten regional stability. Under Saddam Hussein's leadership, the governing regime appeared to have developed WMDs. Iraq's unwillingness to work openly with UN weapons inspectors encouraged this belief, while its financial support for Palestinian terrorist organizations gave credence to fears that the state supported terrorism. In the wake of the 9/11 terrorist attacks and America's adoption of a preemptive approach to terrorism in general, Iraq's activities brought it into direct conflict with the United States and its allies. After the failure of diplomatic efforts to avert a war, American forces spearheaded a multinational effort to remove Saddam Hussein from power and eliminate all WMDs.

The opening phases of the conflict began with cruise missile strikes, air attacks, and information operations intended to separate the population from the regime leadership and undermine the nation's capacity for military resistance. A ground campaign followed to seize Baghdad, the center of Saddam Hussein's political, military, and economic power. Simultaneous operations focused on preventing the destruction of the nation's oil industry.

The US Army's 3d Infantry Division bore responsibility for leading the drive to Baghdad. Its task lay in the destruction of Iraqi forces and isolation of the city. Marine Corps and United Kingdom forces constituted supporting efforts responsible for securing the city of Basra and the

Courtesy *Armor Magazine*

Figure 112. Combined arms elements of 3d Squadron, 7th Cavalry in the early days of Operation IRAQI FREEDOM.

oilfields of southern Iraq to prevent their destruction. They also protected the 3d Infantry Division's right flank during its drive to Baghdad. The 82d Airborne and 101st Air Assault Divisions followed to eliminate bypassed resistance. Initial plans also called for the digitized 4th Infantry Division to enter Iraq from Turkey, but the latter's government refused to allow this movement. The formation had to be redeployed to Kuwait from where it entered Iraq well after combat operations began. Preparations for these operations assumed a determined resistance by Iraqi forces, particularly when Baghdad became threatened.

Operations began on 19 March and within a month, Baghdad had fallen and with it Saddam Hussein's regime. The 3d Infantry Division played a central role in this turn of events, fighting through Iraqi resistance that varied from well-equipped Republican Guard elements to paramilitary organizations. Its drive to Baghdad taxed its logistical support and often resulted in the dispersal of combat assets. Nevertheless, it maintained a rapid pace in accordance with initial plans intended to keep Iraqi resistance off balance. Although not intended to become embroiled in urban combat, the division could not entirely avoid such engagements. Indeed, when it arrived outside Baghdad, rather than assume positions outside the city and await the arrival of other forces, the division conducted a limited incursion to test the defenses. The favorable result triggered a more involved operation that resulted in division elements moving into and remaining inside the city. These actions, dubbed Thunder Runs, undermined the credibility of Saddam Hussein's regime and directly contributed to its collapse.

Mounted reconnaissance during these operations did not follow the pattern inherent to ISR doctrine or the new contact paradigm. Instead, tactical operations at brigade level and below constituted a series of movements to contact.[124] Many command decisions were made with only a limited sense of Iraqi intent and capability, and what intelligence did influence command came from small units in contact with the enemy. As one planner noted,

> We went in with the assumption that with all the sensors we have like the Joint Surveillance and Target Attack Radar System (JSTARS), the unmanned aerial vehicle (UAV) feeds, and things like that, we would know where each individual tank was and then we could just attack accordingly. Well, that wasn't necessarily the case.[125]

The failure to apply the new ISR doctrine stemmed from multiple reasons. It assumed a viable intelligence template on which initial plans and the commander's priority intelligence requirements were determined. These

requirements then guided the information operations by reconnaissance and surveillance assets utilizing stealth and infiltration. Their actions permitted the unit commander to maneuver his combat elements to engage hostile forces in the time, place, and manner of his choice. In Iraq, the campaign's high operational tempo established at theater level precluded deliberate and extensive reconnaissance by subordinate units. Tactical formations struggled to keep pace, resulting in reconnaissance measures at variance with doctrinal procedures.[126] One scout platoon found itself performing route reconnaissance for its parent task force at 25 to 30 kilometers per hour, far in excess of normal standards. Moreover, this pace prevented the use of dismounted drills to check danger areas and the careful use of terrain to offset the vulnerability of the unit's HMMWVs.[127] Consequently, battalion task force and company team commanders often maneuvered with little sense of the enemy and simply reacted to a continuously evolving tactical situation.[128]

ISR doctrine relied heavily on many information sources via a digital communications network. However, the 3d Infantry Division possessed few of the requisite devices to make this concept viable, and communications proved less than ideal. According to the division operations officer,

> I think maneuver commanders at brigade, battalion, company, and troop levels will tell you that they received very little pinpoint intelligence with any degree of fidelity from higher headquarters. This was aggravated by a couple of things, not least of which was that our communications backbone was broken. . . . Our ability to transfer data, particularly video and other types of data that come from satellites and unmanned aerial vehicles (UAVs), was significantly limited.[129]

Information, nevertheless, moved more easily between the division and higher echelons, but at brigade and below levels, it tended to bottleneck. The lower the command echelon, the fewer computers were available to receive imagery and graphics. Hence, information flow became largely limited to what could be transmitted via radio.[130] The general absence of computers at battalion level precluded effective "reachback" to access resources from other commands and agencies. Connectivity problems only made things worse, no doubt contributing to a lack of information sharing between adjacent units and the absence of reconnaissance battle handover.[131]

Battalion task forces did receive intelligence from brigade and division levels, but it proved limited in value. Much of the focus at these higher

commands remained on the activities of large enemy formations. This emphasis proved less than useful to battalion commanders, who found the enemy transitioning to the employment of small groups of fighters and paramilitary units. Battalion staffs noted this change and altered their planning process and operations without input from higher commands, which remained oriented toward conventional Republican Guard formations. In effect, "The brigades were looking for the knock-out punch only to discover that the anticipated opponent had already left the ring."[132]

The collective impact of these issues lay in tactical units advancing with little sense of the opposition awaiting them. Intelligence from higher echelons indicating the size and weaponry of enemy units provided little indication as to the type and intensity of resistance to be expected. At the tactical level,

> Since the size and composition of the enemy said little about his capability or his intent, commanders found this type of detailed information that often flowed down from satellite imagery, UAV surveillance, or passive reconnaissance efforts was essentially meaningless. To understand the enemy's intent, they needed human intelligence.[133]

Armor Branch Archives

Figure 113. An armored task force en route to Baghdad.

In the 2d Brigade Combat Team, the 3d Battalion, 69th Armor Regiment found itself the target of a large counterattack on 3 April, following its seizure of a bridge over the Euphrates River in preparation for an advance on Baghdad. Despite the massing of Iraqi units that made little effort to conceal their actions from aircraft and loitering UAVs, the battalion received no warning of the pending attack. It broke up the Iraqi assault, but the event underscored the danger of relying too much on sensors and technology to provide intelligence in a combat zone.[134] An Army study of the Iraqi operations further noted,

> The ability of the Iraqis to hide, with some success, from the incredible array of technical intelligence available to the coalition may give pause to those advocating that US forces will be able to develop the situation out of contact and attack from standoff distances.[135]

At brigade and battalion levels, the most useful intelligence often came from Iraqi civilians or captured soldiers. At An Najaf, the 1st Brigade Combat Team commander possessed little sense of hostile activities until warned by Iraqi civilians of the nearby presence of Saddam Hussein loyalists compelling the local population to attack American forces. Such situations encouraged brigade and battalion commanders to rely on information obtained by their own unit rather than that provided from higher echelons. In the case of the 3d Infantry Division's cavalry squadron, it received little information from division and relied largely on the intelligence gained through its own actions.[136]

In lieu of doctrinally prescribed ISR operations and the new contact paradigm, the 3d Infantry Division employed much simpler reconnaissance techniques. The division cavalry squadron's mix of M3s and Abrams tanks led the formation for much of the drive to Baghdad, receiving its guidance directly from the division commander. In the first month of the war, it constituted the only heavy cavalry unit in combat. While leading the division, the squadron performed screen, guard, and economy of force missions intended to protect division assets. It established blocking positions to prevent Iraqi interference with the main division effort, and it moved quickly to seize critical objectives, including bridges, in advance of the BCTs. The extent of dispersion that characterized 3d Infantry Division operations often resulted in the squadron functioning semi-independently as another maneuver element. Unit activities were not oriented toward meeting the formation commander's priority intelligence requirements.[137]

Extensive and frequent combat accompanied the squadron's activities. According to a unit summary:

> The troopers faced everything from traditional mechanized and light infantry to organized RPG ambushes, infantry in civilian clothes intermixed with civilians to suicide bombers. There were times when Cavalry Troopers were engaging dismounts with small arms that were less than 5 meters from their vehicles. Every trooper in the Squadron received contact. . . . Many times they engaged armored vehicles at ranges less than 1000 meters.[138]

The squadron employed indirect fires, close air support, and benefited greatly from its organic aviation.

Survival during combat owed much to the armor protection, optics, and firepower found on the tanks and M3s. Their effectiveness was further enhanced through the prewar reconfiguration of platoons into hunter-killer teams of two tanks and three M3s. During the march to Baghdad, the use of these integrated hunter-killer teams helped to sustain momentum. On contact with the enemy, platoons utilized their own available organic firepower to eliminate resistance rapidly and continue their mission. In this manner, combat power served to prevent the platoons from becoming decisively engaged. In those circumstances in which the intensity of resistance made even the M3's survivability problematic, tanks assumed the most forward positions.[139]

Other organizational changes helped to tailor the squadron for operations in Iraq. The lack of a significant air threat freed air defense artillery platforms to secure forward arming and refueling points for the squadron's aviation. The retransmission section benefited from the addition of several M113s for additional protection. However, the division cavalry lacked sufficient supply platforms and heavy vehicle recovery assets. The importance of these requirements increased the further the squadron advanced and the more dispersed operations became. To some extent, it overcame the supply challenges generated by independent operations through the creation of an improvised supply company using squadron personnel and assets—a solution used previously in Bosnia and again at the NTC. An attached engineer company proved instrumental in ensuring the speedy removal of obstacles and sustaining momentum. Yet organizational adjustments could not improve less than ideal long distance communications or boost the squadron's intelligence analysis capability.[140]

Overall, the division cavalry squadron performed tasks and operations similar to those performed by parallel organizations in previous conflicts. It performed reconnaissance, security, and economy of force missions in support of the division effort. In the course of these activities, it experienced

sustained combat, although losses sustained proved minimal. It did not perform ISR operations as intended, and its entire experience seemed to raise anew the question of cavalry organization and role. After interviewing 3d Infantry Division personnel about their experiences, one officer seeking operational insights on behalf of the Armor Center concluded:

> Conduct further study into the relevance of Division Cavalry Squadrons and ACRs in the conduct of Cavalry Operations. Traditional missions of such large cavalry organizations are more relevant to linear battlefields. Is the RSTA model the accurate depiction of future cavalry?[141]

For those soldiers who fought their way to Baghdad in the 3d Infantry Division's cavalry squadron, the answer was a resounding negative. Even those scouts assigned to brigade reconnaissance troops and battalion scout platoons had cause to rethink the validity of the RSTA model. Scouts at the brigade and battalion levels started operations executing reconnaissance in advance of their parent organization, but this orientation soon shifted to a less forward role that reduced their potential exposure to combat. As the RPG threat increased, the 2d Brigade Combat Team removed its brigade reconnaissance troop from reconnaissance operations. The 2d Battalion, 69th Armor Regiment employed its scouts forward, but kept them close to the maneuver companies for their own protection. In the 3d Battalion, 15th Infantry Regiment, the battalion scouts served as convoy escorts, and their reconnaissance role became assigned to M2 Bradley Fighting Vehicles drawn from mechanized infantry companies. Scouts provided immediate early warning for their parent battalion, helped secure tactical assembly areas, screened rear areas, and assisted in the passage of lines.[142]

Nevertheless, they could not entirely be kept out of danger. During the 7 April Thunder Run, one scout platoon found itself escorting a convoy of fuel tankers and ammunition trucks along a fire-swept route inside Baghdad to resupply combat units under attack.[143] Scouts moving forward to find and monitor enemy activities soon found themselves in direct fire contact and required heavy force assistance to disengage. Indeed, the 2d Brigade Combat Team found that its reconnaissance troop could not be employed in screen operations without significant augmentation.[144]

The diversion of scouts into route and convoy security missions, or activities other than forward reconnaissance, reflected survivability concerns. In general, both brigade and battalion scouts entered combat equipped with HMMWVs. Many were the up-armored M1114, but this platform sacrificed some mobility for improved protection that still left the vehicle vulnerable. In the 3d Battalion, 69th Armor Regiment, the scout

platoon exchanged several of its HMMWVs for M113s taken from the maintenance section to improve survivability.[145] Nor was it uncommon for the scout platoon to be integrated into a company team with tanks and mechanized infantry.[146] One operational analysis concluded:

> In short, they [commanders] elected to give up their "eyes" rather than risk losing them. Put another way, commanders chose not to employ scouts and brigade reconnaissance troops in the role for which they were intended. This phenomenon warrants study and arguable action to correct problems commanders perceived. Heavier scout vehicles may not be the answer; perhaps the answer is how reconnaissance units are trained and supported.[147]

During urban operations, the scouts played only a marginal role. They did not conduct the urban mapping outlined in doctrine or provide a clear template of enemy positions and key facilities. The high tempo of operations did not offer the time for such operations and survivability concerns led commanders to employ them in less high-risk missions. When 3d Infantry Division forces reached Baghdad, they determined the Iraqi's strength and willingness to resist through a reconnaissance in force by an armored task force—not through scout infiltration.

Armor Branch Archives

Figure 114. Urban combat on the outskirts of Baghdad.

Brigade and battalion scouts did make important contributions to 3d Infantry Division operations, but they did not inundate the battlefield with human and artificial sensors to build and maintain the commander's situational understanding. Arguably, their most important activities lay in establishing initial contact with hostile forces, particularly when equipped with LRAS3. This device provided the scout the ability to spot and identify targets at safe distances. Additionally, it permitted the scout to provide a digital grid coordinate and share this data with supporting artillery, which could deliver accurate fire with a minimal response time.[148] In this manner, "Our task force scouts made contact with the enemy and did a solid job of maintaining contact, going to ground, reporting, and then providing that information to shape the environment."[149] LRAS3 thus became a critical enabler that permitted the scouts to have some information gathering role and support combat operations. When part of a company team, the scouts helped to detect hostile targets for heavier platforms to destroy.[150]

Even so, the high tempo of operations, the absence of general information about the enemy, and lack of survivability all combined to reduce the role of brigade and battalion scouts. They certainly did not prevent the drive to Baghdad being other than a series of movements to contacts. Moreover, scout platoons did not benefit from the attachment of COLTs due to the latter's lack of survivability. Urban operations also minimized the effectiveness of the LRAS3.[151]

The FBCB2 proved popular, but its limited fielding constrained usage.[152] The 3d Infantry Division's cavalry squadron, for example, possessed only five of the devices, while brigade reconnaissance troops included only three. No unit included sufficient numbers to equip every combat platform or even every command vehicle. Consequently, FBCB2 could not be used to maintain a detailed situational awareness picture, although it did give users a general sense of friendly force locations. Its primary employment included navigation and long-distance communications. Its reliance on satellites enabled it to carry messages far beyond the range of radio communications. This ability proved exceptionally useful when division elements became dispersed. Its ability to provide exact grid coordinates for locations also facilitated the delivery of indirect fire quickly and on target. For those commanders and staffs with access to the device, its ability to transmit images and graphics all but eliminated dependence on paper maps and overlays.[153]

For many users, the drive to Baghdad marked their first exposure to FBCB2, and they were skeptical. The commander of the 3d Battalion, 15th Infantry Regiment, for example, remained wedded to the use of paper maps

and radio until a sandstorm shut down radio communications. Forced to rely on FBCB2, he soon discovered its capabilities, which included tracking combat mission events in the worst weather. This experience "completed my conversion to digital battle command."[154]

Combat operations in Iraq quickly generated a number of recommendations to drive changes in the training of armor soldiers. Many participants questioned the value of NTC rotations that reflected conventional battlefields rather than the more varied operational environment in Iraq. Within the 3d Infantry Division, a general consensus emerged to improve the extent and nature of intelligence and reconnaissance-related training given to captains and lieutenants. Related weapons training recommendations included a shift toward close-range engagements, greater small arms use, and a broader array of target types. The urban nature of many of the most intense battles encouraged more attention to combat in built-up areas. The Scout Leaders Course received high praise, but proposed changes included the insertion of LRAS3 training and expanded FBCB2 use.[155]

Modularity

In 2003, General Peter Schoomaker succeeded General Shinseki as Army Chief of Staff. Schoomaker continued his predecessor's Transformation initiatives, but introduced a new dimension to them. To make the Army more responsive to a broad array of threats, Schoomaker directed a shift in the Army's force structure away from divisions and toward BCTs as the principal element of maneuver. This change aimed at increasing strategic flexibility and enhancing the ability of Army organizations to operate within a joint framework.[156]

The reconfigured brigades were intended for employment alone, as part of a division structure, or within a task force with elements from other Services. The modular brigades were designed to be mixed in different ratios to suit the needs of commanders in the field. Each new brigade was to benefit from enhanced communications networks to facilitate information sharing within the unit and with other organizations typically found in a joint task force.[157]

The modularity initiative sought an increase in the total number of brigades available. Overall, the Army leadership sought to raise the total number of BCTs in the Active Component from 33 to as many as 48 over a 3-year period. A parallel change was also planned for the National Guard. These increases provided a larger pool of deployable forces to meet worldwide needs. They also helped to build predictability into Army deployment schedules and permit units longer periods between overseas tours.[158]

The brigades fell into maneuver and support categories. The former included heavy, infantry, and Stryker. Another type would be added to reflect the FCS when it became available.[159] Each brigade received assets normally retained at division or corps level to enable independent operations. Division and corps headquarters also underwent restructuring to permit them to manage a variable number of brigade teams and campaign operations. They could be tailored for a specific mission and their internal composition remained variable. They assumed a role similar to the flexible corps structure adopted during World War II in which the corps received troop assignments based on its theater of operations and mission.[160]

To generate more maneuver brigades, each ground division was expected to reconfigure its assets into five BCTs. On its return from Iraq in 2004, the 3d Infantry Division became the first to undergo this transition, followed by the 101st Air Assault and 4th Infantry Divisions. Shortfalls in equipment and personnel soon resulted in the restructuring of divisions into just four maneuver brigades. These early efforts coupled with planning assessments of much larger deficiencies across the force led the DOD to authorize a temporary increase of 30,000 soldiers to the Army's end strength. However, these additions did not directly address the related challenges of cost and training that accompanied the transition to modular forces. Building a robust, digital network into each brigade required time and money, particularly since many formations, like the 3d Infantry Division, were not digital organizations. The combined arms nature of the new maneuver brigades also made training more complex.[161]

Armor Branch Archives

Figure 115. A suicide car bomber attacks an American armored column.

The 3d Infantry Division was due to return to Iraq late in 2004, where it would provide a field test of the modular concept. Its experiences would shape the implementation of modularity among other formations. Even before this deployment began, other formations had begun to reconfigure into modular brigades. When the 3d Infantry Division did arrive in Iraq, it had not finished its conversion. Only its heavy brigades and the aviation support brigade had done so. Nor did the division commander control a reconnaissance asset with which to supplement brigade and battalion information collection efforts. Traditionally, the division cavalry squadron fulfilled this role, but this organization ceased to exist under the modular redesign. The division commander, therefore, resorted to pooling brigade and battalion UAVs under division control.[162]

Support brigades provided additional capabilities and helped to tailor a force for a specific deployment or operation. These brigades included aviation, reconnaissance, maneuver enhancement, fires, and sustainment. They constituted functions traditionally organic to corps and divisions, but their assignment was no longer limited to a particular formation. For the Aviation community, modularity offered the ability to concentrate aircraft and related maintenance into one brigade devoted to aviation operations. This marked a change from existing division designs in which aviation and division cavalry constituted a single brigade. Moreover, the aviation brigade was designed for independent employment—it was not tied to a particular division. The RSTA brigade provided an ISR capability outside the BCTs. The maneuver enhancement brigade provided force protection for headquarters at different command echelons and possessed a limited capacity for offensive and defensive operations.[163]

The continuity of senior leadership support facilitated the transition to a modular force structure largely between 2004 and 2007. Indeed, the pace of conversion for two brigades was accelerated in December 2006. The nature of modularity also suggested new sources of manpower among those functions no longer considered critical on the battlefield. The reduced aircraft threat to American forces, for example, made the Air Defense Artillery a likely candidate for the transfer of personnel to other duties for which a personnel shortfall existed. Similarly, the need for engineer, field artillery, and armor soldiers fell while that of scouts, military police, transportation, civil affairs, psychological operations, and biological operations increased.[164]

The Army's shift to a modular structure directly impacted reconnaissance organizations. The operational emphasis placed on self-sufficient BCTs rather than divisions led to enhancements in the former's capabilities, but it also eliminated the division cavalry squadron. Consequently,

at the division level, no significant reconnaissance and surveillance organization remained unless through the assignment of a RSTA brigade. A heavy brigade combat team (HBCT) organization included a headquarters element, a reconnaissance squadron, and two combined arms battalions supported by artillery and service support assets. They contained no aviation, since such assets were being consolidated in the aviation support brigades. A headquarters, two tank companies, two mechanized infantry companies, an engineer company, and a forward support company constituted the essence of each combined arms battalion. The headquarters company also included a scout platoon and mortar platoon, while each of the mechanized and tank companies included UAVs.[165]

Within the modular BCT, the brigade reconnaissance troop disappeared. In its place, the brigade gained a reconnaissance squadron. This unit reflected the influence of the RSTA squadron initially designed for the SBCT.[166] It included three reconnaissance troops, one surveillance troop, and an HHT. The surveillance troop included a mix of UAVs, sensors, and radars in addition to an NBC reconnaissance section. Service support and platoon reconnaissance proved more robust in the HBCT reconnaissance squadron. Each reconnaissance platoon included three M3s and five HMMWVs equipped with LRAS3. Typically, two HMMWVs functioned as the platoon headquarters, controlling three scout sections each including one M3 and one HMMWV. Other configurations were possible, including a hunter-killer organization at both the troop and platoon level. Overall, the platoon possessed more combat power and greater survivability than the Stryker reconnaissance platoon or all-HMMWV units.[167]

The new reconnaissance squadron marked several developments. First, all elements of the squadron were part of a digital network that facilitated reporting, information sharing, command and control, and situational awareness. However, this capability did not extend to dismounted scout teams operating away from their vehicles. At the platoon level, the dismount team of each M3 included a soldier charged with human intelligence collection.[168] The mix of M3 and HMMWV constituted a belated response to the vulnerability problems associated with pure HMMWV organizations. Combat operations in Iraq underscored the HMMWV's poor survivability and the related hesitancy of commanders to employ it near hostile forces. These factors provided the driving force for a change in platoon structure.

Reactions to the new reconnaissance squadron proved cautious at best. At least one officer found a similarity between the new units and the World War II-era mechanized cavalry organizations. The design of each

focused on reconnaissance rather than a broader mission set that necessitated combat. The difficulties experienced by the mechanized cavalry when employed in roles other than information collection and their routine use in such roles underscored the concerns surrounding the new reconnaissance squadrons. The new units might well be forced into functions they were not designed to perform, creating major challenges for unit commanders and potentially greater losses of men and materiel.[169]

While the HBCT squadron possessed the ability to perform reconnaissance and some security, it lacked the means to perform the full range of operations traditionally associated with cavalry organizations, particularly economy of force. Indeed, one officer concluded, "After modularity, a fully functional cavalry force effectively no longer exists." The reconnaissance squadron was not designed to conduct guard, covering, or offensive and defensive missions, but because the division no longer possessed a cavalry squadron, these missions could not be left to a division asset to execute. Even in the presence of an RSTA brigade, these missions remained unaddressed, since this support brigade was not intended to fight for combat. A gap in capabilities appeared at the division and brigade levels, despite the improved functionality of the brigade reconnaissance squadron in comparison with its predecessor brigade reconnaissance troop. The squadron benefited from its link to a tactical communications network that provided access to a variety of assets, but even with the M3, the M1114, and the

Armor Branch Archives

Figure 116. The combat power of the Abrams/Bradley team is unleashed.

LRAS3, it possessed insufficient combat power to assume the role once performed by division cavalry. Moreover, each troop included only two platoons, which further limited its span of operations.[170] These limitations led one observer to conclude that new reconnaissance organizations "are not cavalry squadrons at all—they are merely groupings of scout platoons standardized under a permanent headquarters. It might look good on an organizational chart; it is, however, woefully inadequate."[171]

The modular infantry BCT also included a reconnaissance squadron. Its composition differed significantly from that of the heavy brigade. It included two mounted reconnaissance troops and one dismounted troop. Although a surveillance troop was expected to routinely operate with the squadron, the actual troop was a brigade asset. The mounted troop included three platoons, a mortar section, and a COLT. Each platoon possessed six HMMWVs, including two with a TOW missile system, three with LRAS3, and one with a .50-caliber machinegun. Each platoon also carried two Javelins. This mix permitted the use of antitank ambush tactics and the integration of TOW and non-TOW platforms, which had been customary since the introduction of the light division in the 1980s. However, the platoon retained only a limited dismounted capability and remained vulnerable to most weapons on the battlefield. The squadron also included a dismounted reconnaissance troop. This provided a much greater degree of dismounted capability, but it also presented a transportation problem unless supported through the attachment of vehicles. The squadron marked an increase in reconnaissance ability, but the dismounted troop posed a dilemma not unlike that once associated with long-range surveillance detachments—how to get the scouts into position without organic transport.[172]

Above the brigade, the RSTA brigade provided ISR support. This organization included a mix of capabilities designed to collect intelligence from imagery, signals, people, signatures, reconnaissance, and surveillance. This unit also assisted the division commander in the planning and execution of reconnaissance and surveillance missions. It was intended to cover those parts of the battlespace not addressed by the BCTs. It possessed the ability to conduct persistent surveillance using organic UAVs, Prophets, and long-range surveillance detachments.[173] The RSTA brigade's principal components included a headquarters, military intelligence battalion, long-range surveillance detachment, signal, and support elements. It possessed no ground reconnaissance other than the surveillance detachment.[174]

The RSTA brigade proved less than ideal in its early configuration. The unit remained a work in progress. Its precise mission and the manner

in which it would apply proven reconnaissance principles had yet to be resolved. It lacked an all-weather reconnaissance capability, and its interaction with the brigade combat teams required determination. Further analysis followed to refine its organization and provide the RSTA brigade with a more effective set of capabilities.

Notes

1. General Eric K. Shinseki and Louis Caldera, "The Army Vision: Soldiers On Point for the Nation—Persuasive in Peace, Invincible in War," 12 October 1999, presentation transcript, Armor Branch Archives, electronic, Transformation/CSA/Vision 1999.

2. Briefing, Major General B.B. Bell, Subj: Medium Weight Brigade, 3 November 1999, Armor Branch Archives, paper, Transformation files.

3. Shinseki and Caldera, "The Army Vision: Soldiers On Point for the Nation—Persuasive in Peace, Invincible in War," 12 October 1999.

4. US Army, United States Army Posture Statement, 2002, Armor Branch Archives, paper, 2002 Annual Command History files; Secretary of Defense, *Annual Report to the President and Congress*, 2002, Armor Branch Archives, paper, 2002 Annual Command History files; Shinseki and Caldera, "The Army Vision: Soldiers On Point for the Nation—Persuasive in Peace, Invincible in War," 12 October 1999.

5. "The Foundations of Army Transformation and The Objective Force Concept," Final Draft, 3 May 2001, quotation from page 45, Armor Branch Archives, paper, Transformation/Objective Force.

6. US Army, "Concepts for the Objective Force," white paper, 2001, iv, Armor Branch Archives, paper, Transformation/Objective Force.

7. Armor Conference Briefing, Major Brian Byers, Subj: FCS ORD Update, 18 May 2004, Armor Branch Archives, paper, 2004 Annual Command History files; UABML, "Mission Need Statement for Future Combat System (FCS), Version 1.2, Working Draft, 28 May 2002, Armor Branch Archives, paper, Transformation/FCS.

8. Armor Conference Briefing, General John N. Abrams, Subj: Objective Force in Context of the Changing Operational Environment, 23 May 2001, Armor Branch Archives, paper, 2001 Annual Command History files; Armor Conference Briefing, Colonel Fletcher, Subj: Unit of Action Maneuver Battle Lab Experimentation, 18 May 2004, Armor Branch Archives, paper, 2004 Annual Command History files.

9. Briefing, Major General R. Steven Whitcomb, Subj: Operational Maneuver by Ground in Offensive Operations (Mounted Enabled by Dismounted), July 2002, Armor Branch Archives, electronic, Transformation/OBJ Force/UA MBL/Briefings.

10. Shinseki and Caldera, "The Army Vision: Soldiers On Point for the Nation—Persuasive in Peace, Invincible in War," 12 October 1999.

11. Briefing, General Eric K. Shinseki, Subj: Army Transformation: Soldiers on Point for the Nation, October 2000, Armor Branch Archives, electronic, Transformation/CSA/2000.

12. For more information on the High Technology Light Division, see Lieutenant Colonel (Promotable) Stephen L. Bowman, Lieutenant Colonel John M. Kendall, and Lieutenant Colonel James L. Sauders, eds., "Motorized Experience of the 9th Infantry Division, Fort Lewis 1980–1989," unpublished manuscript, 9 June 1989, Branch Archives, 9th Infantry Division.

13. Michael Gilbert, "'Stryker' is Name Army Selects for New Light Armored Vehicles," *Tacoma News Tribune*, 28 February 2002.

14. Tom Gordon, "Depot Rolls Out First of 1000 Strykers," *Birmingham (AL) News*, 23 April 2002.

15. Dennis O'Brien, "Controversial War Game Improved Warriors," *Norfolk Virginian-Pilot*, 23 August 2002; Linda D. Kozaryn, "Demystifying 'Transformation,'" *American Forces Press Service*, 14 August 2002; Peter Pae, "War Exercise Adds a Digital Front," *Los Angeles Times*, 9 August 2002; Kim Burger, "US 'Super Exercise' is Window on Future Warfare," *Jane's Defence Weekly*, 7 August 2002; "Largest Military Experiment to Test Transformation Theories," *American Forces Press Service*, 18 July 2002; "Joint Forces War Games Focus on Real-World Scenarios," *Honolulu Advertiser*, 22 July 2002; Sean Naylor, "Stryker Impresses in its First Real Test," *Army Times*, 19 August 2002, 10; United States Joint Forces Command, "Millennium Challenge 2002: Experiment Initiatives," July 2002, Armor Branch Archives, paper, 2002 Annual Command History files.

16. Burger, "US 'Super Exercise' is Window on Future Warfare"; Timothy L. Rider, "Transformation Director Explains Importance of Situational Understanding in Combat," MC02 Media Operations Center, 28 July 2002; Jim Garamone, "Largest Military Experiment to Test Transformation Theories," *Armed Forces Press Service*, 18 July 2002; "Joint Forces War Games Focus on Real-World Scenarios," *Honolulu Advertiser*, 22 July 2002; Megan Scully, "Millennium Challenge Communications, Information Sharing Hailed," *Inside the Army*, 19 August 2002; "US Explores a New World of Warfare," Early Bird, *New York Times*, 20 August 2002; Jim Caldwell, "MC02 Experiment Extends C4ISR to All Services," *TRADOC News Service*, 26 June 2002.

17. Jason Sherman, "Aldridge to Clarify 'Spiral Development,'" *Defense News*, 3–9 June 2002, 12.

18. Erin Q. Winograd, "Army Prepares to Kill 14 More Programs to Pay for Objective Force, *Inside the Army*, 29 July 2002; Andrew Koch, "End of the Line for US Tanks?" *Jane's Defence Weekly*, 7 August 2002; Erin Q. Winograd, "Shinseki Orders Review of Proposed POM Cancellations, Reductions," *Inside the Army*, 5 August 2002, 1. Funding was subsequently restored to some programs in recognition of the Legacy Force's role as the primary tool for upholding national interests in the near term. The M1A2 SEP was one such beneficiary. In early 2004, the 3d Armored Cavalry Regiment received 129 SEP tanks.

19. David E. Sanger, "Bush to Formalize a Defense Policy of Hitting First," *New York Times*, 17 June 2002, 1.

20. House of Commons Library, "Research Paper 01/81: Operation Enduring Freedom and the Conflict in Afghanistan—An Update," 31 October 2001, Armor Branch Archives, electronic, 02ACH/Army/Ops/Afghanistan; Stephen Biddle, "Afghanistan and the Future of Warfare: Implications for Army and Defense Policy," 20 October 2002, Strategic Studies Institute, US Army War College, Armor Branch Archives, electronic, 02ACH/Army/Ops/Afghanistan.

21. Ann Scott Tyson, "Anaconda: A War Story," *Christian Science Monitor*, 1 August 2002, 1; Peter Baker, "GIs Battle 'Ghosts' in Afghanistan," *Washington*

Post, 16 May 2002, 1; Vernon Loeb, "Built for the Cold War, Flown in a Hot One," *Washington Post*, 28 April 2002, 16; David Rohde, "Anatomy of a Raid in the Afghan Mountains," *New York Times*, 3 June 2002; John Burns, "Afghan President Escapes Bullets; 25 Killed By Car Bomb in Kabul," *New York Times*, 6 September 2002, 1.

22. "Afghanistan—Army," 7 June 2004, http://www.globalsecurity.org/military/world/afghanistan/army.htm (accessed 11 August 2004).

23. "Report of the Secretary of the Army," included in Secretary of Defense, *Annual Report to the President and Congress*, 2002; US Army, "United States Army 2002 Posture Statement."

24. Michael Evans, "Ship to Move More Tanks to the Gulf," *London Times*, 5 September 2002; Noelle Phillips, "3d Division Prepares for War," *Savannah Morning News*, 15 November 2002; Michael R. Gordon, "GIs Train on Iraq's Border," *New York Times*, 20 November 2002, 1; Greg Jaffe, "Number of US Troops in the Gulf is Expected to Nearly Double," *Wall Street Journal*, 19 December 2002; Walter Pincus and Karen DeYoung, "US Sets Late January Decision on War," *Washington Post*, 19 December 2002, 1.

25. USAARMC, "The Brigade Combat Team Organizational and Operational Concept," 6 January 2000, 4–6, Armor Branch Archives, paper, Transformation/IBCT; US Army, "2002 Army Modernization Plan," undated, 45, Armor Branch Archives, paper, 2002 Annual Command History files.

26. USAARMC, "The Brigade Combat Team Organizational and Operational Concept," 6 January 2000, 4, 10.

27. US Army, "2002 Army Modernization Plan," undated, 21.

28. USAARMC, "The Brigade Combat Team Organizational and Operational Concept," 6 January 2000, 10–11, quotation from page 11.

29. Ibid., 7.

30. USAARMC, "The Brigade Combat Team Organizational and Operational Concept," 6 January 2000, 21–25; Briefing, Brigade Coordination Cell—Forward (Alaska), Subj: SBCT-3 Staff Officer's Organizational and Operational (O&O) Information, 15 September 2003, Armor Branch Archives, paper, 2003 Annual Command History files.

31. Briefing, USAARMC, Subj: The Brigade: Providing Freedom's Guardian with Tomorrow's Victories, 20 January 2000, Armor Branch Archives, paper, Transformation/IBCT files.

32. USAARMC, "The Brigade Combat Team Organizational and Operational Concept," 6 January 2000, 12–13, 19.

33. Briefing, TSM XXI, Subj: FBCB2, 2003, Armor Branch Archives, paper, 2003 Annual Command History files; Major Michael C. Kasales and Chief Warrant Officer (2) Matthew E. Gray, "Leveraging Technology: The Stryker Brigade Combat Team," *Armor* CXII, no. 1 (January–February 2003): 10.

34. Briefing, TSM XXI, Subj: FBCB2, 2003; Kasales and Gray, "Leveraging Technology: The Stryker Brigade Combat Team," 10.

35. USAARMC, "The Brigade Combat Team Organizational and Operational Concept," 6 January 2000.

36. Briefing, USAARMC, Subj: The Brigade: Providing Freedom's Guardian with Tomorrow's Victories, 20 January 2000; Briefing, USAARMC, Subj: The Brigade: RSTA O&O, 13 July 2000, Armor Branch Archives, electronic, Transformation/IBCT/RSTA files.

37. Kasales and Gray, "Leveraging Technology: The Stryker Brigade Combat Team," 9–11; Briefing, Captain Denny, Subj: Assets to Support Reconnaissance, 10 July 2000, Armor Branch Archives, paper, Transformation/RSTA files.

38. USAARMC, "The Brigade Combat Team Organizational and Operational Concept," 6 January 2000, 41; Briefing, USAARMC, Subj: Medium Weight Brigade In-Progress Review, 12 November 1999, Armor Branch Archives, paper, Transformation files.

39. Initial data for this assessment was collected during the Platform Performance Demonstration conducted at Fort Knox in December 1999 to January 2000. For information on this event, see USAARMC G3/DPTM, Operations Order 00-01 (Platform Performance Demonstration), 16 November 1999, Armor Branch Archives, electronic, Transformation/IBCT/PPD/OPORD files; Briefing, USAARMC, Subj: The Brigade: Providing Freedom's Guardian With Tomorrow's Victories, 20 January 2000; Briefing, Army Test and Evaluation Command, Subj: Initial Brigade In-Progress Review and Performance Demonstration Decision Brief, 15 November 1999, Armor Branch Archives, electronic, Transformation/IBCT/PPD/Purpose.

40. "Roll On! Army Selects LAV III Variants to Equip New Interim Brigades," *Armor* CX, no. 1 (January–February 2001): 13–15; Thomas E. Ricks, "Light Armored Vehicles Key to New Army Units," ***Washington Post***, 18 November 2000, 8; Contract Announcement, Offices of the Secretary of Army and Legislative Liaison, 16 November 2000, Armor Branch Archives, electronic, Transformation/IBCT/Platform Dev/Contract Award.

41. Army Press Release, "Army Announces Name for Interim Armored Vehicle," 27 February 2002, Armor Branch Archives, electronic, Transformation/IBCT/Platform Dev/Articles/2002.

42. Major General B.B. Bell, "Armor Branch's 'Way Ahead' Advances on Four Thrust Lines," *Armor* CX, no. 4 (July–August 2001): 5–6; Briefing, Major General B.B. Bell, Subj: Address to Fort Knox Permanent Party, 3 November 1999; Statement to AUSA Core Comte, Major General B.B. Bell, Subj: USAARMC and Fort Knox Command Information Update, 16 May 2000, Armor Branch Archives, paper, Transformation/USAARMC CG; Statement to Armor Force, Major General B.B. Bell, Subj: Medium Weight Force Initiative Brigade Combat Teams: What it Means to the Armor Force, 3 March 2000, Armor Branch Archives, paper, Transformation/USAARMC CG; Statement to Armor Force, Major General B.B. Bell, Subj: Chief of Armor Update, 21 February 2000, Armor Branch Archives, paper, Transformation/USAARMC CG.

43. "The Stryker 'Reconnaissance Vehicle,'" *Armor* CXII, no. 4 (July–August 2003): 54; "Stryker 8-Wheel Drive Armoured Vehicles, USA," http://www.army-technology.com/projects/stryker/ (accessed 15 December 2008).

44. Stanley C. Crist, "We Already Have Light Armor: It's Called an M113,"

Armor CIX, no. 2 (March–April 2000): 3; Don Loughlin, "M113's Versatility Meets Test for Lighter Force Initiative," *Armor* CIX, no. 2 (March–April 2000): 3–4; A. William Criswell, "LAV III Fails to Meet the Army's Own Requirements," *Armor* CX, no. 4 (July–August 2001): 3; Sean D. Naylor, "It's Stryker Against M113A3—Again," *Inside the Army*, 23 September 2002, 13; Joe Burlas, "Test Compares Stryker with M113," *Army News Service*, 16 September 2002.

45. Briefing, USAARMC Office Chief of Armor, Subj: Mission Statement and Plan of Action, 23 November 1999, Armor Branch Archives, electronic, Transformation/IBCT/Personnel; Briefing, USAARMC Office Chief of Armor, Subj: Brigade Combat Team Command Update to FORSCOM Commander, 1 February 2000, Armor Branch Archives, electronic, Transformation/IBCT/Personnel; Briefing, USAARMC Office Chief of Armor, Subj: Personnel Manning Strategy, 20 January 2000, Armor Branch Archives, paper, Transformation/USAARMC Personnel/Personnel Status.

46. See, for example, First Lieutenant Alfred C. Prill, "The Medium Weight Force: Reinventing the Wheel?" *Armor* CIX, no. 1 (January–February 2000): 3–4.

47. E-mail, Major General B.B. Bell, Subj: Abrams Tank Update, 8 December 1999, Armor Branch Archives, electronic, Transformation/USAARMC CG; Statement to Armor Force, Major General B.B. Bell, Subj: Medium Weight Force Initiative Brigade Combat Teams: What it Means to the Armor Force, 3 March 2000, Armor Branch Archives, electronic, Transformation/USAARMC CG; Major General B.B. Bell, "Manuscript's Tone Raised Editing Questions," *Armor* CIX, no. 1 (January–February 2000): 5, 47; Armor Conference Briefing, General Eric K. Shinseki, Subj: Army Transformation, 25 May 2000, Armor Branch Archives, 2000 Annual Command History files; Armor Conference Briefing, Major General B.B. Bell, Subj: Report to Force, 24 May 2000, Armor Branch Archives, 2000 Annual Command History files; Armor Conference Briefing, General John N. Abrams, Subj: Army Transformation, 24 May 2000, Armor Branch Archives, 2000 Annual Command History files; Erin Q. Winograd, "Army Executes PR Gambit to Bolster Stryker Against Critics," *Inside the Army*, 21 October 2002, 1.

48. While teaching branch history classes to the officer basic course, the author repeatedly fielded questions related to Stryker vulnerabilities and its relative capabilities in comparison with the T-72.

49. USAARMC, "Interim Division (COA4) O&O Plan," Draft version 3.7, 9 January 2001, Armor Branch Archives, electronic, Transformation/IDIV/O&O; TRAC, "Interim Division Design Analysis Final Report," July 2001, Armor Branch Archives, electronic, Transformation/IDIV/Final Report; "Armor Modernization Plan, 2002, 23; Briefing draft, USAARMC, Subj: The Division: USAARMC IDIV Reconnaissance Recommendation," 2 May 2000, Armor Branch Archives, electronic, Transformation/IDIV/O&O IDIV.

50. Briefing, USAARMC, Subj: 2d Armored Cavalry Regiment Transformation, 15 September 2000, Armor Branch Archives, paper, 2CR/IPR.

51. Memorandum, General John N. Abrams, Subj: Blue Ribbon Panel (BRP) Charter for 2d Armored Cavalry Regiment (2ACR) Transformation, 17 July 2000, Armor Branch Archives, paper, 2ACR files.

52. Ibid.

53. Major General B.B. Bell, "Operations Order 00-18 (2ACR Transformation)," 11 September 2000, quotation from page 2, Armor Branch Archives, paper, 2ACR files.

54. Briefing, USAARMC, Subj: 2d Armored Cavalry Regiment Transformation, 23 August 2000, Armor Branch Archives, paper, 2ACR files.

55. Briefing, USAARMC, Subj: 2ACR In-Progress Review, 22 September 2000, Armor Branch Archives, paper, 2ACR files; Blue Ribbon Panel 1 Briefing, Major General B.B. Bell, Subj: 2ACR Transformation, 11 October 2000, Armor Branch Archives, paper, 2ACR files; Blue Ribbon Panel 2 Briefing, Major General B.B. Bell, Subj: 2ACR Transformation, 1 November 2000, Armor Branch Archives, paper, 2ACR files.

56. Blue Ribbon Panel 1 Notes, 11–13 October 2000, Armor Branch Archives, paper, 2ACR files; Memorandum, Colonel John L. Ballantyne, Subj: 2d Armored Cavalry Regiment (2ACR) Blue Ribbon Panel Session 1 Notes, 13 October 2000, Armor Branch Archives, paper, 2ACR files; Blue Ribbon Panel 2 Briefing, USAARMC, Subj: Modeling Insights, 1 November 2000, Armor Branch Archives, paper, 2ACR files.

57. Blue Ribbon Panel 2 Briefing, USAARMC, Subj: Modeling Insights, 1 November 2000.

58. Blue Ribbon Panel 2 Briefing, USAARMC, Subj: Modeling Insights, 1 November 2000; Blue Ribbon Panel 2 Briefing, USAARMC, Subj: Organization, 3 November 2000, Armor Branch Archives, paper, 2ACR files.

59. Blue Ribbon Panel 2 Briefing, USAARMC, Subj: Roles, Missions, and Requirements, 3 November 2000, Armor Branch Archives, paper, 2ACR files; Blue Ribbon Panel 2 Briefing, USAARMC, Subj: O&O, 3 November 2000, Armor Branch Archives, paper, 2ACR files; Blue Ribbon Panel 2 Briefing, USAARMC, Subj: After Action Review, 3 November 2000, Armor Branch Archives, paper, 2ACR files; Briefing, USAARMC, Subj: 2d Armored Cavalry Regiment Transformation Executive Update, 9 November 2000, Armor Branch Archives, paper, 2ACR Files.

60. Briefing, USAARMC, Subj: 2d Armored Cavalry Transformation, 9 November 2000, Armor Branch Archives, paper, 2ACR files.

61. E-mail, Colonel John L. Ballantyne, Subj: 2ICR Meeting with the CG, 27 November 2000, Armor Branch Archives, paper, 2ACR files.

62. Blue Ribbon Panel 4 Briefing, Major General B.B. Bell, 17 January 2001, Armor Branch Archives, paper, 2ACR files.

63. Blue Ribbon Panel 4 Briefing, USAARMC, Subj: Transformation Strategy, 17 January 2001, Armor Branch Archives, paper, 2ACR files; Blue Ribbon Panel 4 Briefing, Colonel John L. Ballantyne, Subj: Organizational Update, 17 January 2001, Armor Branch Archives, paper, 2ACR files; Blue Ribbon Panel 4 Briefing, USAARMC, Subj: C4ISR-TA Panel Outbrief, 19 January 2001, Armor Branch Archives, paper, 2ACR files.

64. Major Karl Gingrich and Lawrence G. Vowels, "Interim Cavalry Regiment Analysis," Report, 1 June 2001, Armor Branch Archives, paper, 2ACR files.

65. Robert S. Cameron, "2d Cavalry Regiment Status Update," 5 February 2004, Armor Branch Archives, paper, 2ACR files.

66. Briefing, Department of the Army Military Operations, Subj: 2d Cavalry Regiment Unit Transformation CSA Decision Brief," 9 October 2002, Armor Branch Archives, electronic, Transformation/2CR/2002/2CR Briefings.

67. Executive summary memo, Charlie Shepard, Subj: 2CR, Impact of Requirement to Conduct Additional MGS Analysis, 12 February 2003, Armor Branch Archives, electronic, Transformation/2CR/2003.

68. Robert S. Cameron, "2d Cavalry Regiment Status Update," 5 February 2004.

69. Robert S. Cameron, "2d Cavalry Regiment Status Update," 5 February 2004; USAARMC, "2d Cavalry Regiment O&O Summary," draft, 17 December 2003, Armor Branch Archives, electronic, Transformation/2ACR/2003; Briefing, USAARMC, Subj: 2d Cavalry Regiment Transformation, 4 February 2004, Armor Branch Archives, electronic, Transformation/2ACR/2004.

70. Robert S. Cameron, "2d Cavalry Regiment Status Update," 5 February 2004.

71. Press release, Subj: Army Announces Reconfiguration of Fourth Stryker Brigade, 14 May 2004, Armor Branch Archives, paper, Transformation/2ACR files.

72. Department of the Army, FM 3-21.31, *The Stryker Brigade Combat Team* (Washington, DC: Headquarters, Department of the Army, 2003), 3–1.

73. Advanced NCO Course Briefing, Sergeant First Class Frank Belonus, Subj: Cavalry Brief, 2001, Armor Branch Archives, paper, 2001 Annual Command History files; Briefing, Brigade Coordination Cell—Forward (Alaska), Subj: SBCT-3 Staff Officer's Organizational and Operational (O&O) Information, 15 September 2003.

74. Advanced NCO Course Briefing, Sergeant First Class Frank Belonus, Subj: Cavalry Brief, 2001; Armor Conference Briefing, Major Ricketts, Subj: Situational Awareness, 23 May 2000, Armor Branch Archives, paper, 2000 Annual Command History files.

75. One potential role identified for the reconnaissance vehicles operating apart from their dismount teams included a communications node to assist command and control. A similar role was once advocated for the armored cars of the horse cavalry.

76. Armor Conference Briefing, Captains Athey and Denny, Subj: RSTA Squadron, 22 May 2000, Armor Branch Archives, paper, 2000 Annual Command History files; Staff Sergeant Dwayne C. Thacker, "The 'Recce Stryker'—Making a Good Vehicle Great," *Armor* CXII, no. 3 (May–June 2003): 3; Sergeant First Class Andrew L. Barteky, "The Stryker-Equipped Cavalry Squadron in an Urban Environment," *Armor* CXII, no. 4 (July–August 2003): 28–36.

77. Department of the Army, FM 3-20.971, *Reconnaissance Troop: Recce Troop and Brigade Reconnaissance Troop* (Washington, DC: Headquarters, Department of the Army, 2002), chapter 7; Barteky, "The Stryker-Equipped Cavalry Squadron in an Urban Environment," 28–36; Armor Conference

Briefing, Lieutenant Colonel Jim Berg, Subj: Doctrine Overview, 20 May 2001, Armor Branch Archives, paper, 2001 Annual Command History files; Advanced NCO Course Briefing, Sergeant First Class Frank Belonus, Subj: Cavalry Brief, 2001; Briefing, DTDCD, Subj: The Cavalry Squadron—RSTA (Reconnaissance Surveillance and Target Acquisition Squadron): Doctrine Overview & Practical Exercise, "Reconnaissance in Support of Urban Operations," c. 2001, Armor Branch Archives, paper, Transformation/RSTA.

78. Armor Conference Briefing, Captains Athey and Denny, Subj: RSTA Squadron, 22 May 2000.

79. FM 3-20.971 (2002), 1-1.

80. Ibid., 1-2 to 1-3.

81. Ibid., 1-13 to 1-15, quotation from page 3-1.

82. Ibid., 3-6, 3-15, 3-18, 3-28 to 3-30.

83. Ibid., 3-15 to 3-20.

84. Ibid., 3-21 to 3-22.

85. Captain Christopher D. Kolenda, "Screen in Depth," *Armor* CII, no. 3 (May–June 1993): 14–15.

86. FM 3-20.971 (2002), 4-10 to 4-11, 4-16, 4-30, 4-33 to 4-35.

87. Department of the Army, FM 3-20.98, *Reconnaissance Platoon* (Washington, DC: Headquarters, Department of the Army, 2002).

88. Armor Conference Briefing, Lieutenant Colonel Jim Berg, Subj: Doctrine Overview, 20 May 2001.

89. FM 3-20.98 (2002).

90. Ibid., 3-2.

91. Ibid., 2-35 to 2-36, 2-38, 3-19.

92. Ibid., 1-2.

93. Ibid., 1-25 to 1-27, 1-29.

94. US Army Armor Center and School, ST 3-20.983, *Reconnaissance Handbook* (Fort Knox, KY: USAARMC and School, 2002).

95. Briefing, TDCD, Subj: FM 3-90.3 (FM 71-3): The Mounted Brigade Combat Team Information Brief, 2002, Armor Branch Archives, paper, 2002 Annual Command History files.

96. Briefing, Sergeant First Class Matthew Sheets, Subj: FM 3-20.8: Cavalry Gunnery, 2002, Armor Branch Archives, paper, 2002 Annual Command History files.

97. Armor Conference Briefing, Major Ricketts, Subj: Situational Awareness, 23 May 2001.

98. Armor Conference Briefing, Captains Athey and Denny, Subj: RSTA Squadron, 22 May 2000.

99. Captain David A. Meyer, "On a Wing and a Prayer: Reversing the Trend in BCT ISR and Shaping Operations," *Armor* CXII, no. 4 (July–August 2003): 22–25; Center for Army Lessons Learned, *CTC Trends: National Training Center*, No. 03-10 (Fort Leavenworth, KS: Center for Army Lessons Learned, 2003), 5–11; Center for Army Lessons Learned, *CTC Trends: National Training Center*, No. 03-11 (Fort Leavenworth, KS: Center for Army Lessons Learned, 2003), 4–9.

100. Department of the Army, FM 17-95, *Cavalry Operations* (Washington, DC: Headquarters, Department of the Army, 1996).

101. Department of the Army, FM 17-97, *Cavalry Troop* (Washington, DC: Headquarters, Department of the Army, 1995); Captain William E. Benson, "The Cavalry Paradigm: 'We Aren't Training as We Intend to Fight,'" *Armor* CX, no. 4 (July–August 2001): 8–9.

102. Benson, "The Cavalry Paradigm: 'We Aren't Training as We Intend to Fight,'" 8–9.

103. Ibid., 10.

104. Captain Scott K. Thomson, "Focused Reconnaissance and Developing Battlespace in the Armored Cavalry Troop," *Armor* CXII, no. 2 (March–April 2003): 14–15.

105. Benson, "The Cavalry Paradigm: 'We Aren't Training as We Intend to Fight,'" 10, 15.

106. First Lieutenant John M. Ives, "Armored Cavalry Mortars: Operations and Myths," *Armor* CX, no. 6 (November–December 2001): 22–26; Chief Warrant Officer 3 Christopher A. Saindon, "Targeting and Fire Support with the Brave Rifles Regiment," *Armor* CXI, no. 2 (March–April 2002): 26–27; First Lieutenant Leif Nott and First Lieutenant Ryan Popple, "The Cavalry Team: Scout-Tank Integration," *Armor* CXI, no. 5 (September–October 2002): 26–31.

107. Captain Jarrod P. Wickline, "Integrating Dismounts Into Reconnaissance and Security Operations in the Heavy Cavalry Troop," *Armor* CXIII, no. 2 (March–April 2004): 34–36.

108. Captain Thomas M. Feltey, Major Brian K. Serota, and Captain Erick W. Sweet II, "Air-Ground Integration: Proven TTPs," *Armor* CXI, no. 4 (July–August 2002): 22–25, 50, quotation from page 22.

109. E-mail, Colonel Christopher Baggott, Subj: Division Cavalry Future, 15 February 2000, 1, Armor Branch Archives, paper, Cavalry files.

110. E-mail, Daniel R. Murdock, Subj: Division Cavalry Future, 15 February 2000, 4, Armor Branch Archives, paper, Cavalry files.

111. Colonel John D. Rosenberger and Major Jerry P. Schulz, "White Paper: Cavalry Operations," Draft, version 6.0, 20 November 2002, Armor Branch Archives, paper, 2002 Annual Command History files; Major Louis B. Rago II, "Cavalry Transformation: Are We Shooting the Horse Too Soon?" (student report, School of Advanced Military Studies, Fort Leavenworth, KS, 2002).

112. Colonel (Retired) John D. Rosenberger, "Breaking the Saber: The Subtle Demise of Cavalry in the Future Force," Institute of Land Warfare, Land Power Essay No. 04-1, June 2004, http://www.ausa.org/SiteCollectionDocuments/ILW%20Web-ExclusivePubs/Landpower%20Essays/LPE04-1.pdf (accessed 24 February 2009); Timothy L. Thomas, "Kosovo and the Current Myth of Information Superiority," *Parameters* (Spring 2000): 13–29.

113. Major Michael C. Kasales, "Reconnaissance and Security Forces in the New Heavy Division Structure," *Armor* CIX, no. 2 (March–April 2000): 27.

114. Sergeant First Class Frank R. Belonus, "Building on Force XXI Task

Force and Brigade Recon Troop Scout Platoons," *Armor* CIX, no. 6 (November–December 2000): 11.

115. Lieutenant Colonel Bart Howard and Captain Jeff Ramsey, "Employing the Brigade Reconnaissance Troop," *Armor* CXI, no. 2 (March–April 2002): 17–19.

116. Belonus, "Building on Force XXI Task Force and Brigade Recon Troop Scout Platoons," 7; Kasales, "Reconnaissance and Security Forces in the New Heavy Division Structure," 27–28.

117. Staff Sergeant Matthew Mayo, "Adjustments to the Task Force Scout Platoon," *Armor* CXIII, no. 2 (March–April 2004): 19; Captain T.J. Johnson, "TOW-HMMWV's Thermal Sight Works Fine for Light Cavalry," *Armor* CXI, no. 1 (January–February 2002): 3–4.

118. Belonus, "Building on Force XXI Task Force and Brigade Recon Troop Scout Platoons," 8–9, quotation from page 8; First Lieutenant Greg W. Dameron, "Training Killers," *Armor* CXI, no. 2 (March–April 2002): 5, 47; Captain Ryan Seagreaves, "Transforming the Task Force Scout Platoon," *Armor* CXII, no. 2 (March–April 2003): 40–42.

119. "Future Scout and Cavalry System (FSCS), Tactical Reconnaissance Armoured Combat Equipment Requirement (TRACER), Armored Scout and Reconnaissance Vehicle (ASRV)," http://www.globalsecurity.org/military/systems/ground/fscs.htm (accessed 25 February 2009).

120. Belonus, "Building on Force XXI Task Force and Brigade Recon Troop Scout Platoons," 12; Staff Sergeant Brendan F. Kearns, "Scout Platoons Need Snipers," *Armor* CXII, no. 6 (November–December 2003): 51.

121. Belonus, "Building on Force XXI Task Force and Brigade Recon Troop Scout Platoons," 14.

122. Belonus, "Building on Force XXI Task Force and Brigade Recon Troop Scout Platoons," 13; Sergeant First Class Harald Jeffery, "CSS and the Battalion Scout Platoon," *Armor* CX, no. 3 (May–June 2001): 37–39; Howard and Ramsey, "Employing the Brigade Reconnaissance Troop," 19; Captain Geoffrey A. Norman, "Planning Scout Casualty Evacuation," *Armor* CXII, no. 2 (March–April 2003): 46–49.

123. Major O. Kent Strader, "Successful Scout Mounted Infiltration," *Armor* CXIII, no. 1 (January–February 2004): 43; Center for Army Lessons Learned, *CTC Trends: National Training Center*, No. 03-10, 5–6, 32–33, 80–81; Center for Army Lessons Learned, *CTC Trends: National Training Center*, No. 03-11, 22–23.

124. Interview, Major Christopher Mahaffey, 15 August 2007, 1–2, Armor Branch Archives, electronic, OIF/3ID/Thunder Run; Memorandum, Major Chris L. Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 10, Armor Branch Archives, 2003 Annual Command History files; Major Curtis D. Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" (master's thesis, US Army Command and General Staff College, Fort Leavenworth, KS, 2005), 41.

125. Interview, Major Christopher Mahaffey, 15 August 2007, 1–2.

126. Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 41–42, 48.

127. Major J. Bryan Mullins, "Defining the Core Competencies of U.S. Cavalry" (student report, SAMS, Fort Leavenworth, KS, 2004), 50.

128. Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 41–42.

129. Interview, Colonel (Promotable) Peter Bayer, 13 August 2007, 2, Armor Branch Archives, electronic, OIF/3ID/Thunder Run.

130. Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 44.

131. Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 5, 12–13.

132. Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 10–11, quotation from page 11; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 45–46.

133. Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 10; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 43, quotation from same.

134. Mullins, "Defining the Core Competencies of U.S. Cavalry," 53; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 45; Jim Lacey, *Takedown: The 3rd Infantry Division's Twenty-One Day Assault on Baghdad* (Annapolis, MD: Naval Institute Press, 2007), 148–155.

135. Colonel (Retired) Gregory Fontenot, Lieutenant Colonel E.J. Degen, Lieutenant Colonel David Tohn, Operation Iraqi Freedom Study Group, *On Point: The United States Army in Operation Iraqi Freedom* (Fort Leavenworth, KS: Combat Studies Institute Press, 2004), 422.

136. Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 43–46.

137. Briefing, Lieutenant Colonel Terry R. Ferrell and Command Sergeant Major Gabriel Berhane, Subj: Operation Iraqi Freedom, 3d Squadron, 7th US Cavalry Regiment, 3d Infantry Division (Mechanized), 2003, Armor Branch Archives, paper, 2003 Annual Command History files; Major J.D. Keith, "3d Squadron, 7th U.S. Cavalry Up Front: Operation Iraqi Freedom Lessons Learned," *Armor* CXII, no. 5 (September–October 2003): 28; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 49; Mullins, "Defining the Core Competencies of U.S. Cavalry," 51–53.

138. Briefing, Ferrell and Berhane, Subj: Operation Iraqi Freedom, 3d Squadron, 7th US Cavalry Regiment, 3d Infantry Division (Mechanized), 2003.

139. Keith, "3d Squadron, 7th U.S. Cavalry Up Front: Operation Iraqi Freedom Lessons Learned," 26; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 47.

140. Keith, "3d Squadron, 7th U.S. Cavalry Up Front: Operation Iraqi Freedom Lessons Learned," 28–31.

141. Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 6.

142. Interview, Major Christopher Mahaffey, 15 August 2007, 1–2; Interview, Colonel Eric Schwartz, 21 April 2007, 6, Armor Branch Archives, electronic, OIF/3ID/Thunder Run; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 46–48; Mullins, "Defining the Core Competencies of U.S. Cavalry," 50.

143. Dennis Steele, "Baghdad: The Crossroads," *Army Magazine* 53, no. 6 (June 2003): 30–40; Lacey, *Takedown: The 3rd Infantry Division's Twenty-One Day Assault on Baghdad*, 256–257; David Zucchino, *Thunder Run: The Armored Strike to Capture Baghdad* (New York, NY: Atlantic Monthly Press, 2004), 205–215.

144. Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 48.

145. E-mail, Lieutenant Colonel Ricky J. Nussio, Subj: HMMWV Use in OIF by 3ID, 22 January 2007, Armor Branch Archives, paper, Cavalry files; Mullins, "Defining the Core Competencies of U.S. Cavalry," 50.

146. Memorandum, Captain Larry Q. Burris, Subj: Operation Iraqi Freedom After Action Review Comments, 24 April 2003, 8–9, Armor Branch Archives, paper, 2003 Annual Command History files; Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 9.

147. Fontenot, Degen, and Tohn, *On Point: The United States Army in Operation Iraqi Freedom*, 423.

148. "Scout Platoon Actions on 23 March 03," included in "Unit History for Task Force 3-69—Operation Enduring Freedom and Operation Iraqi Freedom," 2003, Armor Branch Archives, paper, 2003 Annual Command History files; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 46.

149. Interview, Colonel Eric Schwartz, 21 April 2007, 6.

150. Memorandum, Captain Larry Q. Burris, Subj: Operation Iraqi Freedom After Action Review Comments, 24 April 2003, 8–9.

151. Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 14; Taylor, "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" 48.

152. In 2003, most units operating in Iraq were equipped with a variant of FBCB2 known as Blue Force Tracker, an appliqué system that possessed many of the basic capabilities associated with FBCB2. For simplicity, the term FBCB2 is used throughout the text.

153. TSM XXI, "FBCB2/BFT-A After Action Review Packet," following items: 3d ID AAR (Major Vogelhut), 31–32, 34; Interview with 3d Squadron, 7th Cavalry (Major Brad Gayle, Major John Keith, and Captain Clay Lyle), 59–60,

63; Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, Enclosure 1, 24 October 2003, 1–8.

154. Frank Tiboni and Matthew French, "Blue Force Tracking Gains Ground," FCW.Com, 22 March 2004, http://www.fcw.como/fcw/articles/2004/0322/tec-blueforce-03-22-04.asp (accessed 26 September 2006).

155. Memorandum, Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 5–7; Enclosure 1 to same, 24 October 2003, 1-1 to 1-10.

156. Department of the Army, FM 1, *The Army* (Washington, DC: Headquarters, Department of the Army, 2005), 4–7; Andrew Feickert, "U.S. Army's Modular Redesign: Issues for Congress," Congressional Research Service Report, 6 January 2005, 6–7, Armor Branch Archives, electronic, 2005 ACH/Army/Modularity.

157. Briefing, Subj: This is Modularity: The Redesigned Army, 26 March 2004, Armor Branch Archives, paper, 2004 Annual Command History files; Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004, Armor Branch Archives, 2004 Annual Command History files.

158. FM 1 (2005), 4–7; Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004; Armor Conference Briefing, OCOA, Subj: The Modular Army, 17 May 2004, Armor Branch Archives, paper, 2004 Annual command history files.

159. Initially, the redesigned brigade combat teams were referred to as Units of Action. This term was subsequently dropped and for simplicity is not used in this text.

160. Briefing, Subj: This is Modularity: The Redesigned Army, 26 March 2004; News Release, Army Public Affairs, Subj: Army Announces FY05 and FY06 Modular Brigade Force Structure Decisions, 23 July 2004, Armor Branch Archives, paper, 2004 Annual Command History files.

161. News release, Army News Service, Subj: Army Restructure Effort Needs Additional Troops Through 2007, 29 January 2004; Ron Martz, "Fort Stewart Unit is First to Undergo Reorganization," *Atlanta Journal-Constitution*, 2 January 2004; Elaine M. Grossman, "Third Infantry Division Redesign May Require Thousands More Troops," *Inside the Pentagon*, 22 January 2004; Anne Plummer, "TRADOC: Analysis Points Toward At Least Four Brigades Per Division," *Inside the Army*, 26 January 2004; Megan Scully, "U.S. Army Division Tries Out New Info Network," *Defense News*, 13 September 2004; Feickert, "U.S. Army's Modular Redesign: Issues for Congress," 7, Armor Branch Archives, electronic, 2004 Annual Command History files; US Government Accountability Office, "Force Structure: Capabilities and Cost of Army Modular Force Remain Uncertain," GAO Report No. 06-548T, 4 April 2006, Armor Branch Archives, electronic, 06ACH/Army/Modularity.

162. Center for Army Lessons Learned, "Initial Impressions Report No. 06-10: 3ID Modular Force Assessment," March 2006, ix, x, 8, Armor Branch Archives, electronic, 06ACH/Army/Modularity; Department of Defense, "Modular Army Brigades Prepare for Deployment," 22 November 2004, www.defenselink.mil/transformation/articles/2004-11/ta112204e.html (accessed 26 February 2009).

163. FM 1 (2005), 4–7; Briefing, Subj: This is Modularity: The Redesigned Army, 26 March 2004; Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004.

164. Grossman, "Third Infantry Division Redesign May Require Thousands More Troops"; Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004; Major General Terry L. Tucker, "Restructuring the Force," *Armor* CXIII, no. 3 (May–June 2004): 5; *Army News Service*, "Army Accelerates Conversion of Brigade Combat Teams," 20 December 2006, *Army.Mil/News*, Armor Branch Archives, electronic, 07ACH/Army/Modularity.

165. Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004; Armor Conference Briefing, OCOA, Subj: The Modular Army, 17 May 2004.

166. Major General Terry L. Tucker, "Future Cavalry Organization and the Recon Squadron," *Armor* CXIII, no. 4 (July–August 2004): 4.

167. Major Christopher Connolly, "Reconstructing the Cavalry Force," *Armor* CXIII, no. 5 (September–October 2004): 16–18.

168. Ibid., 18.

169. Captain William S. Nance, "The Armored Reconnaissance Squadron and the Mechanized Cavalry Group," *Armor* CXV, no. 1 (January–February 2006): 7–11.

170. Major Andrew D. Goldin, "Ruminations on Modular Cavalry," *Armor* CXV, no. 5 (September–October 2006): 13–17, quotation from page 14.

171. Lieutenant Colonel (Retired) Chester A. Kojro, "Restructuring the Cavalry Force: Has the Armor Center Missed its Mark?" *Armor* CXIV, no. 1 (January–February 2005): 3.

172. Goldin, "Ruminations on Modular Cavalry," 15–16; Connolly, "Reconstructing the Cavalry Force," 17–18.

173. Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004.

174. Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004; Armor Conference Briefing, OCOA, Subj: The Modular Army, 17 May 2004.

Chapter 9

Into the Storm: Counterinsurgency in Iraq

Combat and counterinsurgency (COIN) operations constituted major influences on mounted maneuver developments in the years following the initial invasion of Iraq. They generated a wealth of experience against which to measure organizational, doctrinal, and materiel changes associated with Army Transformation and the transition to modular brigade combat teams (BCTs). Many reconnaissance units found themselves employed as maneuver units with a broad range of activities beyond information collection. Others found it difficult to employ doctrinal principles based on the use of stealth and technology in major urban areas. Most found their capacity for dismounted operations insufficient. Conversely, the demand for and effectiveness of mounted reconnaissance remained high. These trends raised important questions concerning doctrine and organization that facilitated ongoing efforts to determine the path of future development.

Overview

The 2003 capture of Baghdad by coalition forces triggered the collapse of Saddam Hussein's regime. Government authority broke down and contributed to widespread civil disorder. Mob action and looting became commonplace in Iraqi cities. This sudden change in conditions caught US forces unprepared. They struggled to transition from combat to stability operations in the absence of clear guidance from higher headquarters. The resultant confusion left soldiers struggling with street situations for which they were not ready. In Baghdad, the 3d Infantry Division attempted to restore order, but the tactics that brought victory on the battlefield no longer applied. Subordinate units lacked the means to secure the densely populated urban areas that now became their responsibility. Moreover, "Guidance on how to handle the chaos and looting of an anarchic urban area was missing and the effect was shocking to the units. Small unit leaders were routinely being asked to provide security and management—in effect, be the mayor—for tens of thousands of people."[1]

Their ability to do so was further undermined by the breakup of teams that had fought well together and developed a high degree of cohesion. The reassignment of the aviation troop, for example, stripped the 3d Infantry Division's cavalry squadron of its ability to conduct aerial reconnaissance and support ground elements with a helicopter reaction force. Small unit commanders sought to impose some degree of order on their own authority

by establishing checkpoints, conducting presence patrols, and organizing humanitarian support. In doing so, they leveraged the experience of soldiers who had performed similar tasks in Bosnia and Kosovo. Civil affairs personnel arrived to provide assistance, but their tendency to operate independent of military organizations undermined their effectiveness. Nor did most military commanders possess much experience in coordinating their efforts with the efforts of other US Government agencies active in Iraq.[2]

Conditions remained unstable throughout the rest of 2003. The establishment of the Coalition Provisional Authority asserted temporary governing powers while plans for a new Iraqi Government materialized. However, the provisional body lacked the means to restore basic services, including power and water. Coalition forces also proved inadequate to securing Iraqi military installations and weapons stores. The disbandment of the Iraqi Army and the removal of individuals with a Baath Party membership from any government service created a mass of unemployed disgruntled soldiers and bureaucrats with little reason to support coalition efforts.

Opposition to the coalition emerged from this unsettled state of affairs. Resistance initially lacked organization and purpose. Random attacks tended to be sporadic, poorly planned, and haphazardly executed. By 2004, a more coherent insurgency had arisen, comprised of several different groups, including al-Qaeda. Muslim clerics opposed to the Western presence spurred resistance on the basis of religious principles. Coalition forces became the subject of more frequent and better-organized attacks by insurgents who demonstrated a willingness to contest openly reconstruction and stability actions. They did so through a combination of conventional and terrorist tactics. The year witnessed some of the heaviest fighting in Fallujah, An Najaf, and Sadr City, where insurgents defended safe havens. Coalition personnel and Iraqis seeking to assist the reconstruction of their country became prime targets for terrorism. Torture, executions, and death squads intimidated local populations and undermined coalition credibility. Wherever a coalition presence could not be maintained, insurgents sought to expunge all signs of Western support through coercion and violence. These activities further destabilized the nation at the same time the Abu Ghraib scandal discredited the American military mission.

In 2005, the election of a transitional Iraqi Government provided a promise of hope, but a Sunni boycott of the political process undermined its value. While the Sunnis once benefited from the old regime, Shiites now dominated the new government, spurring fear that their power would permit retribution for their persecution under Saddam Hussein's rule. The

election did not end violence or rapidly improve quality of life. A growing divide emerged between Shiite and Sunni that escalated into civil war in 2006. American forces struggled to establish the security necessary for reconstruction. In Iraq, suicide bombings rose in frequency, while at home public support for the war waned.

President George W. Bush made the unpopular decision to commit additional forces to Iraq. These combat organizations focused on reasserting security in Baghdad and establishing a permanent presence among the inhabitants. This surge coincided with the success of efforts to work with Sunni leaders disenchanted with the brutality of their erstwhile al-Qaeda allies. Ex-Sunni insurgents began to help the coalition establish security and provide intelligence regarding insurgent activities. Reconstruction efforts benefited from a drop in sabotage and terrorist attacks, and Iraq's economy began to recover. The Iraqi Government began to assert its authority, bolstered by a coalition-trained army growing in size and effectiveness. These positive developments led American forces to transition to a training and support role, gradually turning over primary security responsibility in one province after another to the Iraqi Government. At the beginning of 2009, an agreement between the US and Iraqi Governments mandated the complete withdrawal of American combat forces by 2011.

Operational Environment

After Saddam Hussein's overthrow, the focus of American forces shifted to COIN, reconstruction, and support for the new Iraqi Government. Formation commanders soon discovered that COIN operations rooted in

Courtesy *Armor Magazine*

Figure 117. Combat elements of the 1st Cavalry Division in Sadr City.

combat operations alone proved a fool's game and alienated the population. Major General Peter W. Chiarelli, commanding the 1st Cavalry Division, considered the creation of an effective sewage and solid waste disposal system central to the accomplishment of his formation's overall mission. The project provided jobs, improved living conditions, and resulted in direct relationships with key local leaders. These positive developments eroded insurgent support.[3] Therefore, COIN assumed a multifaceted quality at the unit level. Combat operations occurred simultaneous with efforts to improve quality of life, train Iraqi security personnel, promote economic opportunity, and support the establishment of a local government. All of these actions served to rebuild Iraq, encourage support for the coalition, and create an environment anemic to insurgents and terrorists.[4]

Soldiers required a broader range of skills to perform this mission set. Those individuals with prior service in Europe, particularly if they participated in operations in Bosnia or Kosovo, were often better prepared for the variety of activities required—at least until training in the United States became more reflective of conditions in Iraq. Balkan experience proved especially useful for the conduct of searches, patrols, checkpoint operations, and interaction with the local population.[5]

Security actions entailed deterrence of insurgence attacks coupled with the identification and apprehension of terrorists. Related tasks included the removal of improvised explosive devices (IEDs), the creation of checkpoints, vehicle searches, and identification checks. Within Iraqi towns and cities, key facilities required protection, while mounted and dismounted patrols sought to prevent insurgent attacks and promote a sense of stability among the populace. Checkpoints became commonplace. During the day, they tended to be more elaborate and located amid areas of high traffic density. Personnel manning them searched vehicles and passengers to disrupt insurgent movement and detain wanted individuals. At night, smaller forces conducted rolling checkpoints. Moving under blackout conditions, checkpoints targeted vehicles to apprehend criminals and insurgents seeking to benefit from the cover of darkness.[6]

Active measures included regular sweeps for weapons caches and raids on the suspected insurgents. Company and troop level actions often included cordon and search operations. Intelligence for these missions typically originated with Iraqi citizens. The information was analyzed and, if considered valid, a reconnaissance of the objective followed. The forces available formed into an outer cordon element, an inner cordon component, and an assault team. The first isolated the targeted area. The dismounted inner cordon then blocked escape routes from the objective

structure. Finally, the assault team secured an entry point, cleared the objective, and sought weapons and bomb-making materials.[7]

In urban areas, mounted and dismounted patrols served to establish the coalition presence, but they also helped to identify suspected insurgents and gauge local sentiment. Their success often hinged on the patrol members' ability to gain the respect of local inhabitants. Only through frequent interaction could soldiers gain an understanding of the neighborhoods in their area of operation. When available, the addition of tactical human intelligence (HUMINT) teams to these patrols could significantly enhance the quality and nature of information gained. Initially, high-mobility, multipurpose wheeled vehicles (HMMWVs) constituted the principal mode of transport for these patrols. The vehicle doors were removed to improve visibility and facilitate return fire from all passengers in the event of an attack. As the frequency of IED attacks rose, this mode of operations became increasingly hazardous.[8] To better protect its patrols, the 3d Armored Cavalry Regiment utilized its armored combat vehicles to create a loose cordon around the area in which dismounted patrols operated. The mounted element helped to deter interference with the soldiers on foot and doubled as a quick reaction force.[9]

Dismounted patrolling constituted a common activity for all American soldiers, including armor crewmen and cavalry scouts. For mounted soldiers, the frequency of dismounted operations necessitated the development of skills more commonly associated with infantry. Indeed, the emphasis on dismounted operations led to recommendations to provide training, battle drills, and weapons instruction more akin to riflemen. Such measures had the undesired effect of eroding those skills specific to mounted maneuver combat. Armor and cavalry units lacked the personnel to sustain regular foot patrols. Although reconnaissance organizations included scouts intended for actions away from their vehicles, they were too few in number for the scope and frequency of dismounted missions required in Iraq. To generate more soldiers for such operations, some armored reconnaissance squadrons merged headquarters and mortar platoon personnel to form an ad hoc dismount team. Leaving one or more vehicles behind during a mission freed their crews for foot operations. To strengthen the firepower of dismounted teams, most units collected additional small arms while some created their own sniper teams. Cavalry organizations also applied hunter-killer concepts to dismounted operations, particularly in the interdiction of hostile IED teams and during route security missions. They also created dismounted small kill teams to ambush insurgents attempting to establish IED attacks. These teams relied on marksmanship, stealthy movement, and accurate intelligence regarding insurgent activities for success.[10]

Military operations in Iraq depended on a network of convoys to provide regular deliveries of supplies. These convoys became prime targets for insurgents, making their security a standard mission for most units.[11] Typical protection methods included regular route reconnaissance over roads traveled by supply vehicles and the provision of an escort to accompany the convoy. The 2d Armored Cavalry Regiment conducted over 1,000 such missions during its 2003–2004 rotation. It found a ratio of 4 armed HMMWVs to every 12 supply vehicles sufficient security.[12] Indeed, HMMWVs were common escort vehicles throughout Iraq, but their use in this role led to improvised modifications to improve protection and firepower.[13] Convoy escort necessarily diverted units from other tasks, but the related personnel, vehicle, and maintenance requirements made it especially resource intense. Hence, when the 1st Squadron, 14th Cavalry Regiment assumed responsibility for protecting supply traffic in its operational area, the mission necessitated the employment of the entire squadron.[14]

Armor Branch Archives

Figure 118. 1st Cavalry Division HMMWV and crew engaging insurgents in An Najaf.

Convoys were subject to a variety of attacks. The most common involved IEDs ranging from small explosives hidden near a roadway to multiple artillery rounds daisy chained together. Dead animals, roadside trash, guardrails, and light poles became common locations for such

devices. IED use was sometimes coordinated with a more traditional ambush. Alternatively, assailants targeted a single vehicle for an IED attack to cause casualties. Medical personnel attempting to assist the victims then came under small arms or sniper fire. Vehicle-borne IEDs were used either as stationary car bombs or as mobile platforms that could be detonated alongside convoy vehicles. Drive-by attacks by insurgents firing small arms and RPGs also proved common. Other than suicide bombings, most attacks were of a hit and run nature and reflected a degree of planning.[15]

Convoy security encompassed several different actions. Regular reconnaissance of supply routes facilitated identification and removal of IEDs. Establishing observation posts (OPs) along a convoy route also provided a degree of security, but this method proved less effective in urban areas. Buildings provided cover and concealment for the initial ambush and simplified escape.[16] An effective but labor-intensive approach lay in the combined use of OPs, route clearance, and regular route reconnaissance. OPs watched for efforts to emplace IEDs or prepare an ambush. Soldiers manning these posts generally included a sniper whose task lay in eliminating insurgents planting bombs. Route clearance entailed the removal of all trash and potential items along roadways that might hide explosive devices. This task required a sustained effort over time. Afterward, regular patrols over the same route served to keep it clear of fresh attempts to place IEDs.[17] Special techniques emerged to maneuver and secure the convoy through congested built-up areas, particularly in the danger areas posed by traffic circles, major intersections, overpasses, and traffic stops. Aviation support for convoys proved especially effective, since the precise location of a target could be relayed via Force XXI Battle Command Brigade and Below (FBCB2) for aerial platforms to attack.[18]

Initially, convoys under attack were trained to fight through the ambush and continue movement toward their objective. Similarly, vehicles that broke down were pushed to predetermined safe areas before any repair effort began.[19] When a route became subject to repeated attacks, convoys were redirected to less vulnerable roadways. These generally proved more circuitous and less developed. They remained clear only until insurgents shifted their focus to them. This failure to contest principal roadways caused frustration among some commanders who felt that the initiative was being ceded to the insurgents. Cavalry commanders responsible for convoy escort also preferred to exploit their superior firepower by counterattacking the insurgents.[20] In 2006, the passive reaction to attacks on convoys gave way to a more aggressive one in which escorts were directed to engage and destroy the assailants.[21]

All military organizations needed to maintain bases from which to conduct operations. These installations required staffing and security. Initially, forward operating bases provided secure areas to which soldiers returned after completing missions. In accordance with the new COIN doctrine adopted in 2006, most units shifted to the creation of combat outposts directly among the population. This transition from remote locations to a permanent presence directly amidst the civilian populace helped to improve intelligence, stability, and security for the immediate vicinity. However, most outposts came under attack shortly after their creation, due to the threat they posed to insurgent activity.[22]

Mounted units faced another challenge in Iraq: maintenance. Large operational areas, frequent long-distance travel, and operations conducted on varied terrain generated considerable wear and tear on vehicles resulting in increased maintenance requirements. The Strykers of the 1st Squadron, 14th Cavalry Regiment experienced frequent steering faults and a high demand for tire replacements. Hull damage also resulted from the installation of slat armor. Designed to protect the vehicles from rocket propelled grenade (RPG) attacks, the armor increased vehicle width. In congested urban areas, vehicles so equipped were more prone to collisions with other vehicles and buildings. When the unit moved to border security operations along the Syrian border, the rugged terrain, dust, and high temperatures increased the number of engine and power train failures. Electronic components experienced more failure rates due to a combination of high temperature and the continuous power demands of the communications and surveillance systems.[23] Tracked vehicles experienced additional problems from sustained operations on paved roads. These included rapid wear of track pads, road wheels, and suspensions. Shortages of parts sometimes resulted in otherwise minor problems deadlining vehicles for extended periods.[24]

The continuous wear and tear on men and materiel was often the most tangible experience of COIN operations. The insurgents proved adaptive and elusive, frustrating efforts to eliminate them. They observed American units and adjusted their tactics to exploit perceived weaknesses. US commanders responded by changing their techniques frequently, which resulted in a continuous cycle of change as both sides sought to outfox the other. The insurgents also operated as a collection of cells, each operating semi-autonomously from one another. Decentralized leadership tended to mitigate the effects of leader loss and complicated efforts to eradicate an insurgent organization in its entirety. Conversely, insurgents deliberately targeted key leaders among the Iraqi security forces to erode their morale. Command guidance occurred through direct personal contact, cell phones,

Armor Branch Archives

Figure 119. The An Najaf battlefield, scene of heavy fighting against Shiite militia using the urban area and large, ancient cemetery for cover.

and conferences held in mosques, which coalition forces were prohibited from attacking to avoid offending the Muslim population. The insurgents financed their operations through criminal activities, including carjackings and kidnappings.[25]

In 2004, the most common forms of threat attacks included small arms fire, IED attacks, ambushes, and mortar attacks. Efforts were also made—with some success—to shoot down helicopters. Coalition checkpoints, convoys, and patrols were frequent targets for attacks that varied in their intensity and sophistication. Mortars conducted harassing attacks either alone or in conjunction with other insurgent operations. Periodically, they were massed to unleash a barrage on coalition positions. Firefights often were initiated at very short ranges in urban environments to offset the effects of superior American firepower and artillery support. Foreign fighters often provided the insurgency with a degree of military experience and planning capability that resulted in more sophisticated and dangerous operations.[26]

Insurgent attacks tended to become more lethal over time. IEDs became more sophisticated in their construction and detonation method. Those using large caliber shells or explosively formed penetrators proved capable of destroying tanks. In early 2007, American forces reported an increase in assaults on military bases and the use of more powerful explosives. In some instances, chlorine gas was included in IEDs to add a chemical

dimension to these attacks.[27] Noting the effectiveness of American snipers, insurgents formed their own sniper teams to target key personnel such as medics, chaplains, engineers, officers, and tank drivers.[28]

Countering the insurgent threat required an understanding of Arab culture and the application of this knowledge to every mission.[29] Without an understanding of Iraqi society and the Arabic language, the ability to gather intelligence so vital to COIN proved minimal. Early operations were hindered by the general inability of soldiers to understand Arabic or comprehend Iraq's tribal, religious, and ethnic divisions. One unit's after action analysis of its first deployment noted:

> Our unwillingness to shed the "heavy mentality" and conduct dismounted patrols in the communities denied a "human face" to the locals. Over time, we learned how important interpersonal relationships are in the Arab culture, but we were slow in effectively using this knowledge.[30]

Lack of cultural awareness exasperated other problems facing soldiers. Frequent changes to the rules of engagement that governed when and how force should be employed against the populace caused frustration.[31] Their correct implementation depended on an understanding of the Iraqi people that took time to develop:

> There is a lot of tension between Iraqis and American forces. Some of this tension is understandable. It should not matter what phase of the operation we are in to determine what is right and proper behavior and treatment of people and what is not proper. For example, when is it appropriate to fire a warning shot or hand out food and humanitarian items. Every soldier (from the chain of command down to the private) is poorly trained on when to use such varying levels of actions with and against civilians. The statement "react if you feel threatened" is inadequate since soldiers have not been trained to know when they should feel threatened in a non-war environment.[32]

The ability to speak to Iraqis in their own language increased mission effectiveness. Generally, the Arabic speaking skills of American soldiers improved over time, but the lack of language skills hampered initial operations. The 1st Cavalry Division found that tactical HUMINT teams intended to gather information proved ineffective because they could not communicate with local civilians. Lacking Arabic linguists, units became

dependent on interpreters whose quality and motivation varied. Most did not remain with the same unit very long and, therefore, developed no bonds with it.[33]

Even without a language or cultural barrier, the dispersed nature of operations complicated intelligence collection. Decentralized operations resulted in small units operating at considerable distances from higher headquarters with their superior ability to analyze intelligence data. Troop and company commands shouldered a greater share of the responsibility for analysis in addition to information collection. They were not staffed to analyze data, monitor events, and manage multiple, simultaneous operations. Personnel attachments from senior headquarters sometimes alleviated the problem, but more often the unit simply struggled to make do with existing resources. Some units endeavored to form and train their own organic tactical HUMINT team. Others benefited from the compression of unit areas of responsibility that resulted from the 2007 influx of American soldiers into the Baghdad area, but an ideal solution did not exist. A similar and related problem surrounded the management of civil affairs operations and reconstruction contracts. Not surprisingly, recommended improvements included the addition of more staff personnel at squadron and troop levels.[34]

To cope with the array of intelligence and civil related actions required, the headquarters of Task Force 1-77 Armor created its own civil-military operations section and an information operations cell. The personnel for this staff expansion came from attached psychological operations (PSYOPs) and civil affairs teams. These elements provided a core of expertise to which additional officers and noncommissioned officers (NCOs) were assigned from within the task force. The civil-military section participated in mission planning and assisted the execution of all contracting and construction projects. The information cell supported mission planning, coordinated efforts among the task force and its subordinate company teams, and evaluated the overall civil-military and information operations effort. Further enhancements to the task force's ability to implement actions involving the populace came through liaison with Iraqi security forces.[35]

Cultural awareness and language ability directly facilitated the fostering of relationships with local leaders and residents. These links proved vital to implementing public works projects and gathering intelligence. The dispersion of American forces meant that fostering constructive ties with the local populace often fell to small unit leaders. Some of this work entailed financial skills and familiarity with contracting processes. It also

involved the disbursement of cash. Such skills generally did not constitute much if any of the predeployment training for the junior officers who became responsible for their implementation. Ready or not, company grade commanders often found themselves invested with considerable diplomatic and economic power. In the words of one observer, "Young Army and Marine captains have become American viceroys, officers with large sectors to run and near autonomy to do it. In military parlance, they are the 'ground-owners.' In practice, they are power brokers."[36]

Over time, the effectiveness of American COIN efforts improved. The ability of soldiers to understand their operational environment, their enemy, and the Iraqi people increased. As it did so, soldiers became more adept at gathering intelligence and making assessments from it. In this manner, the war in Iraq tended to validate the emphasis of recent reconnaissance doctrine on social, political, economic, religious, and demographic factors. Careful tracking of all activities within an area of operation provided an ability to conduct trend analysis and anticipate enemy attacks. In responding to improvised explosive device attacks, for example, this type of information helped to identify and locate the chain of operatives responsible for making the device, deploying it, and triggering its detonation.[37] The capture of Saddam Hussein proved an exercise in comprehending family and tribal ties.

Mounted Reconnaissance

Between 2004 and 2008, most Active Component divisions were in the process of transitioning to the modular BCT configuration of two combined arms battalions and a reconnaissance squadron. Their deployment sometimes occurred before completion of this change, resulting in deficiencies in materiel and personnel. Once in Iraq, brigades dispersed their subordinate assets to cover the large areas of responsibility assigned, which included towns and cities. Attachments of Iraqi security forces and assets from higher headquarters only partially offset the effects of this dispersion.

Under the modular design, reconnaissance squadrons constituted the primary means of information collection for each brigade. In the heavy brigade combat team (HBCT), the armored reconnaissance squadron bore responsibility for building and sustaining situational understanding. It gathered the intelligence necessary for precision maneuver and through continuous information acquisition and dissemination provided security for its parent brigade. This concept of operations proved unrealistic in Iraq. There the small size of the BCTs coupled with their large areas of operation necessitated the employment of the reconnaissance squadron as

Courtesy *Armor Magazine*

Figure 120. 2d Armored Cavalry Regiment mounted patrol.

another maneuver element. It gathered information, but it also performed a much broader range of mounted and dismounted operations.[38]

Employment in this manner contradicted its information-gathering configuration. The unit lacked the combat power and the personnel to perform this expanded mission set, particularly in comparison with the now defunct division cavalry squadron. Augmentation and improvised solutions ensued. In Iraq, the armored reconnaissance squadrons needed more combat power and the ability to provide effective and lethal overwatch for scouts.

The squadron's effectiveness depended on a digital communications network and the availability of sufficient sensors, radars, and long-range advanced scout surveillance systems (LRAS3s). Yet many units commenced operations without their full complement of these devices. Moreover, the operational realities of Iraq necessitated the execution of more traditional security missions than those depicted in a doctrinal base focused on intelligence, surveillance, and reconnaissance (ISR) operations and the new contact paradigm's "quality of firsts." The ability to identify the enemy first and develop a situation outside direct contact proved nearly impossible in crowded urban environments in which insurgents blended into the civilian population. Assumptions regarding the attainment of information superiority via technical means shaped the squadron's design, but they proved largely unfounded in Iraq. The reconnaissance unit proved

unable to realize the expectations that engendered its creation, and it lacked the organic means to fight for information otherwise unobtainable.[39]

Nor could it rely on the close support of aviation assets, since it possessed none. Under modularity, aviation became consolidated in separate brigades that simplified satisfaction of multiple requirements, including training and maintenance. The absence of organic aviation in the reconnaissance squadron reduced the amount of helicopter support available and prevented the close integration of aviation and ground components otherwise possible.[40] Squadron unmanned aerial vehicles (UAVs) provided some of the support once provided by helicopters, but a lack of personnel skilled in their use limited their accessibility. Therefore, they tended to be consolidated under division control and less available to small unit commanders.[41]

Many field commanders considered the net result of consolidated UAV and aviation support a reduction in aerial support for brigade and smaller unit operations. Department of the Army force designers saw few alternatives. Insufficient personnel and platforms existed to assign UAVs and aviation to each BCT in the numbers desired. Without additional funding, consolidation at a higher echelon proved one of few options left. Indeed, the question of UAV and aviation allocation exemplified the tradeoffs the Army had to accept to transition to a modular force structure. The BCT constituted a compromise solution, but commanders in the field were only too aware of the capabilities it lacked.[42]

Not surprisingly, when a BCT did receive aviation support, coordination issues emerged between the ground element and the external aerial attachment. To ensure effective synchronization of the BCT and attached aviation, the Army leadership developed the brigade aviation element. This six-man team constituted an organic cell with the expertise necessary to integrate aviation and UAV operations with those of the brigade. They also helped to manage the airspace over the brigade and assisted in mission planning. Although the brigade aviation element could not replace organic aviation support, it could ensure the effective employment of those aerial assets that became temporarily available.[43]

Armored reconnaissance squadrons fared better in securing attachments of civil affairs, PSYOPs, and HUMINT collection teams. These assets boosted the squadron's ability to gather information, support reconstruction, and improve civil-military relations. The manner of their employment, however, depended on the squadron commander. In the case of the 3d Squadron, 1st Cavalry Regiment, these attachments were configured into a separate platoon and provided with their own security. The

consolidation of special skill sets made it especially effective in gathering intelligence and working with the local populace and government, particularly in the execution of reconstruction projects.[44]

The reconnaissance platoons of heavy brigade combat teams possessed a less than ideal platform mix. Each platoon included three M3s and five HMMWVs. While this configuration provided a degree of firepower and protection, it could not entirely offset the HMMWV's vulnerability. The unarmored version initially employed proved susceptible to most insurgent weapons. Field solutions to improve their survivability included sand bags, Kevlar blankets, and bolted on steel plates. More than one National Guard unit improvised armor protection with the help of local welding companies before deploying to Iraq, and one resorted to painting its doors the same color as armored HMMWVs to confuse would-be assailants.[45]

The problem of HMMWV survivability intensified in the months following the cessation of major combat operations. Many formations increased their use of the vehicle to present a less-threatening demeanor to the populace. Increased violence aimed at the coalition reversed this trend, triggering demands for more armored vehicles, including tanks. Production and delivery of the M1114 up-armored HMMWV increased along with specially manufactured armor kits that could be installed in the field. Indeed, a shipment of M1114s intended for Israel was redirected to Iraq to meet the spike in demand. The need for more armor protection drew Congressional attention and resulted in allegations of Army neglect and misjudgment.[46]

Increased fielding of the M1114 did not provide scouts with a better platform. The M1114 offered better protection to its passengers, but not to

Courtesy *Armor Magazine*

Figure 121. 2d Armored Cavalry Regiment soldiers establishing a cordon to prevent the escape of potential terrorists during a search operation.

its gunner, who remained in an exposed position. Dangling electrical lines that hung low in many urban areas posed an added danger of electrocution for gunners. During fighting in An Najaf, tanks preceded the HMMWVs, relying on their height and bulk to tear down low electrical lines.[47] The development of an improved weapons station and the crew remotely operated weapon system (CROWS) reduced this vulnerability, but such enhancements did not save the vehicle from destruction or major damage. It did prove a lifesaver to many soldiers, but often was destroyed in the process. Its heavier weight reduced mobility, while its different handling requirements necessitated special training to prevent rollovers. Its box-like configuration remained susceptible to mines and IEDs that exploded beneath it. The vehicle also reduced passenger visibility. By 2005, little disagreement existed in the armor community that the HMMWV, particularly the M1114, was not an ideal reconnaissance vehicle. However, while improvements and a new solution were sought, it remained a better choice than other immediately available alternatives.[48]

Reconnaissance doctrine anticipated the use of the FBCB2 and LRAS3 to offset HMMWV vulnerability. Ideally, these devices permitted scouts to observe and report hostile activity outside direct fire engagement ranges. In Iraq these expectations were only partially realized. The LRAS3 did permit scouts to observe hostile actions at a safe distance, and it proved reliable and popular. Its value diminished in the crowded urban areas where insurgents often operated.[49] Similarly, FBCB2 proved an effective means of communications and reporting, often being able to transmit much further than FM radio. Its ability to transmit digital imagery and automatically track friendly forces proved invaluable to building a common operational picture. Yet despite dramatic increases in FBCB2 fielding, most units did not possess their full complement. When available, they made many converts among commanders and staffs. Still, most soldiers lacked the expertise to repair them when they malfunctioned, resulting in the permanent loss of their capabilities. The ability of FBCB2 to interact with other digital command systems also remained a work in progress, although significant improvements in interoperability occurred.[50]

All of these factors made the armored reconnaissance squadron the subject of criticism by those who believed a more robust organization was required. An imbalance existed between the unit's organizational capabilities and the mission set required in Iraq. Conversely, the experience of the 3d Infantry Division's cavalry squadron during the drive to Baghdad seemed to underscore the importance of sufficient strength to respond to multiple threats, fight for information, and sustain combat operations. The

armored reconnaissance squadron lacked these qualities, because it was not designed to operate in this manner.[51]

Recommendations emerged to improve its ability to perform independent operations and execute counterreconnaissance and economy of force operations. The most common suggestions included more dismounts and the addition of tanks. In the field, the latter could be provided by shifting a tank company from one of the combined arms battalions. This solution reduced maneuver battalion strength, but made the squadron capable of acting as a brigade guard or covering force—roles which the maneuver battalions already performed with their own assets.[52]

The desire to bolster the reconnaissance squadron reflected the need for an organization capable of reconnaissance and security missions rather than the reconnaissance and surveillance emphasis originally envisioned. The collection of organic skills and assets found in armored cavalry organizations made them likely models for a reorganized squadron. Cavalry units possessed decentralized logistics support and a combined arms nature at the small unit level considered ideal for COIN operations. The contrast in capabilities between the armored reconnaissance squadron and parallel cavalry organizations led to recommendations within the senior leadership to transform each squadron into an armored cavalry unit. This approach proved less costly than adding a third maneuver battalion to each brigade, but it still constituted a major bill for the Army. Another proposal added more scouts, bolstered each troop with two tank platoons, and called for the replacement of all M1114s with M3s. Any change in organization, however, necessitated competition for resources within a military establishment committed to Future Combat System (FCS) development, the wars in Iraq and Afghanistan, and the continued implementation of Transformation goals.[53]

Armored Cavalry

Armored cavalry served as the standard of comparison for the new reconnaissance squadrons. The former's more robust, combined arms nature compared favorably to the latter, although the reconnaissance squadrons were not designed to perform the same mission set. Modularity further drained the force structure of armored cavalry, leaving the 3d Armored Cavalry as the only heavy armored cavalry regiment (ACR) in the Active Component. Its preparations for initial deployment to Iraq focused on conventional operations and included the activation of a second troop of attack helicopters. The regiment arrived in Iraq in early 2003, but too late to participate in the drive to Baghdad. Its mission entailed securing

Courtesy *Armor Magazine*

Figure 122. Dismounted patrols became the norm for armor and cavalry soldiers.

and stabilizing Al Anbar province in western Iraq. This area encompassed some 140,000 square miles and amounted to nearly a third of Iraq. It also shared long borders with Saudi Arabia, Jordan, and Syria. Its population included many Baath Party members and individuals loyal to Saddam Hussein's regime. Coalition information on the province proved limited.[54]

The regiment became the core of a regimental combat team strengthened through additional troop attachments to 8,300 soldiers. Its principal activities included reconnaissance to identify insurgents, the removal of Baathists, and the elimination of anticoalition media sources. Combat operations focused on the destruction of insurgent camps and weapons caches. Parallel civil-military operations served as a conduit for the allocation of money for reconstruction projects and UN food deliveries. These actions helped to identify both local leaders and those individuals hostile to the coalition. Regular meetings with local sheiks and tribal members followed to build working relationships and preempt terrorist actions. Money was also used to influence activity, because "the introduction of American currency to the population does wonders for operations and intelligence."[55]

One regimental squadron assumed responsibility for border security, but the magnitude of the task required it to limit its focus to known crossing points and waterholes. Local Bedouins provided intelligence on

individuals attempting to enter Iraq and engage in operations against the coalition. The dispersal of the regiment to provide a presence throughout the province necessitated the creation of a network of forward operating bases and regular supply convoys. Both the installations and the convoys required security details, although efforts to train new Iraqi security personnel offered a source of additional manpower.[56]

The broad mission set of the regiment included direct engagement of insurgents. Combat demonstrated the value of heavy mounted maneuver forces capable of closing with hostile forces in all terrain and destroying them. Against sometimes fanatical resistance, armored cavalry platforms proved largely immune and much more resistant to the IED attacks, which posed a common threat throughout the province:

> M1 tanks are nearly invincible in an insurgency. Very few weapons the enemy possesses can disable, or much less destroy one. They create a powerful psychological force on the enemy (who only rarely directly attack them) and give soldiers both on and operating with the tank added confidence.[57]

Organic aviation served to provide security for ground troops, clear rooftops of threat forces in urban areas, and serve as aerial retransmission stations. Against ambushes, soldiers were encouraged to—

> . . . try to trap the enemy by intersecting your fields of fire. If you can cut off his escape routes, you can trap him into a small area. If you can pinpoint a building where fire came from, level the building. The enemy has the uncanny ability to know where you are at all times. Vehicles cannot approach stealthily.[58]

Such tactics suited the regiment's combat capabilities, but their impact on public support was much more uncertain.

Operations in western Iraq demonstrated the importance of effective communications and navigation aids. The dispersed nature of regimental operations resulted in many units moving beyond FM radio range. Hence, FBCB2 became critical for sustained communications in addition to its value in tracking operations and facilitating casualty evacuation. Together with satellite imagery and GPS devices, FBCB2 ensured the availability of an exact grid coordinate and digital image of each targeted objective. Conversely, paper maps wore out from weather and the impact of daily use, while their 1:50,000 and 1:100,000 scales often proved impractical for detailed tactical planning. Imagery maps proved ideal for navigation

and planning, but they were often in short supply. Scouts especially felt the shortage, because "more often than not, a scout platoon of three independently working sections had one or two imagery maps to navigate and conduct operations with. This is insufficient and unnecessary."[59]

Scouts also labored under other problems. Their training did not prepare them for COIN operations. Hence, their information collection efforts did not initially focus on religious, political, and demographic issues. They searched for IEDs over long patrol routes in unarmored HMMWVs, while inadequate night vision devices required constant redistribution to ensure their availability to those teams participating in night operations. Scout shotgun use increased once the value of such weapons in breaching gates and doors as well as cowing hostile crowds became clear. Bradley-equipped scouts, however, appreciated their vehicle's reliability, firepower, and armored protection.[60]

The regiment departed from Iraq in March 2004, returning for a second tour of duty in February 2005. In the interim, training focused on COIN operations and cultural awareness, exemplified by mandatory Arabic language training and the study of Iraq's history. When it returned to Iraq, the 3d Armored Cavalry commenced operations south of Baghdad, where insurgents planned and prepared attacks in the capital. With the exception of the 3d Squadron, the regiment was redeployed northwest of Baghdad, where its operations focused on Tal Afar. This city had become a staging area for insurgents crossing the Syrian border en route for Mosul to operate against coalition and Iraqi Government forces there. Tal Afar had also become a safe haven for terrorists and insurgents, particularly in that part of the city where narrow streets and sturdy structures made movement by armored vehicles difficult.[61]

To reduce this strongpoint, the regiment first sought to reduce the flow of foreign fighters into Tal Afar. Along the Iraqi-Syrian border, one ground cavalry squadron together with attached Iraqi soldiers focused on the interdiction of infiltrators. Locations noted for providing temporary housing for foreign fighters were taken by American soldiers and secured by Iraqis. Outside Tal Afar, the regiment built a berm and ring of checkpoints to control movement into and out of the city. Intelligence operations helped to identify local leaders, tribal affiliations, and kinship ties. This information resulted in the roundup of many insurgents, including those seeking to escape from the city. With the city effectively isolated, the regiment began methodical clearing operations. Close integration of aviation and ground elements simplified the task of identifying, tracking, and engaging insurgents. The creation of outposts linked by regular patrols

throughout the city then secured areas taken through combat and ensured a permanent presence among the population. Interaction with local leaders fostered a new city government and police force to prevent the return of insurgents. The success of these measures made the regiment's actions a model for subsequent operations in other parts of Iraq.[62]

Armor Branch Archives

Figure 123. American trucks burn after an attack on a convoy.

The 3d Squadron functioned independently of the regiment. It operated near Baghdad attached to other commands, ultimately operating under six different brigades and two divisions. Despite these changes, its area of operation remained the built-up area immediately south of the capital. The squadron's mission lay in establishing a stable and secure environment in the face of staunch opposition. Related operations included training Iraqi forces and securing the main supply route for coalition forces in Baghdad. The squadron undertook all of these actions simultaneously. It also performed some civil-military actions, but a lack of funds prevented widespread use of reconstruction projects and jobs to draw local residents away from supporting insurgents.[63]

The squadron faced several insurgent groups that continuously modified their tactics in actions against the cavalry. The squadron first seized houses from which to launch patrols. These small bases, manned by Iraqi and American soldiers, became staging areas for further operations. They were linked together via OPs and regular combat patrols by tanks and Bradley Fighting Vehicles. Over time, the 3d Squadron steadily expanded its presence, even in the face of regular attacks that utilized powerful IEDs capable of destroying armored vehicles. October 2005 alone witnessed 132 attacks on the squadron.[64]

Against an elusive, adaptive enemy who routinely exploited local ambivalence to the coalition presence, the squadron relied heavily on intelligence and trend analysis to pinpoint insurgents. It developed lists of suspicious personnel and known terrorists and established a roster of the different insurgent organizations and their chain of command. This information guided combat operations, including one in which the squadron sought to eliminate multiple insurgent commanders at once. The attack

failed when Iraqi government officials leaked news of the pending action. Nevertheless, the steady collection and analysis of information permitted development of a clear picture of threat activity. It became possible, for example, to track bomb maker activity by the configuration of their IEDs. Ultimately, intelligence efforts culminated in combat missions to eliminate or capture insurgents. Aerial reconnaissance provided digital photographs of target locations in advance, while the actual execution of a mission was monitored by UAVs. The tactics employed varied, but success often depended on the effectiveness of blocking forces preventing insurgent escapes from a targeted locale.[65]

The success of the 3d Armored Cavalry stemmed partly from its organic capabilities, particularly combat power and intelligence collection and assessment. It proved able to not only collect information but follow up with combat operations in sometimes extremely hostile environments. This experience encouraged criticism of the assumptions underpinning the shift in reconnaissance doctrine toward ISR concepts and away from traditional cavalry missions. For both the 3d Armored Cavalry and other reconnaissance organizations, the ability to achieve perfect situational awareness and understanding proved chimerical, resulting in confrontations with threat elements. Indeed, the commander of the Training and Doctrine Command (TRADOC) noted the inability of subordinate commanders to possess complete comprehension of an entire battlefield: "Somebody is always doing a movement to contact." These situations became opportunities for armored cavalry to exploit its superior firepower and generate insurgent casualties.[66]

Armor Branch Archives

Figure 124. LRAS3-equipped HMMWV in Iraq.

The 2d Armored Cavalry Regiment (Light) also participated in Operation IRAQI FREEDOM, entering Iraq in April 2003. The regiment secured supply lines before transitioning to a security and stabilization

role in Baghdad. There, it conducted regular patrols and raids to apprehend terrorists, criminals, and prospective insurgents. To bolster the regiment's combat power, it exchanged a ground cavalry squadron equipped with HMMWVs for the 2d Battalion, 37th Armored Regiment from the 1st Armored Division. Equipped with M1A2 tanks, the armor battalion permitted the regiment to play an active role during combat operations against the Mahdi army in 2004. Large-scale uprisings by this organization triggered the commitment of the 2d Armored Cavalry to combat operations in Sadr City and An Najaf. In the former, regimental elements retook police stations captured by the Mahdists and engaged them in combat operations. They also used their mobility to disengage rapidly from Sadr City, execute a rapid road march, and immediately undertake street clearing operations against other Mahdist forces in Al Kut and An Najaf. The attached tank battalion proved central to the effective suppression of organized resistance.[67]

The urban nature of these operations necessitated extensive dismounted actions. To provide the necessary manpower, scout platoons reduced the number of vehicles in use. The extra crews provided the soldiers necessary to form two four- or five-man dismount teams. These teams sought to gain and maintain contact with Mahdist elements amid a confused and cluttered city environment. Combat often resulted, with platoon members seizing key terrain and buildings from which to deliver fire into alleys, streets, and rooftops. Scouts worked directly with supporting armor to mark targets and engage hostile personnel seeking to avoid the firepower of the tanks. Dismounted OPs served to locate and eliminate Mahdi forward observers marking the fall of enemy mortar rounds.[68]

While these operations may have constituted a high point for the 2d Cavalry in terms of their intensity, the regiment worked to establish stability throughout its deployment. It did so by training and working with Iraqi security forces, assisting reconstruction efforts, and conducting continuous civil-military operations. These efforts were applied to Sadr City after the Mahdist uprising had been quelled. The regimental leadership considered its tour in Iraq a success, but it marked its last deployment as a light armored cavalry regiment. On its return to the United States, it converted to a Stryker Brigade Combat Team (SBCT).[69]

In November 2004, the National Guard's 278th Armored Cavalry Regiment deployed to Iraq. There it reconfigured into a regimental combat team through the attachment of additional combat and support elements. Other modifications further reduced its resemblance to a heavy armored cavalry regiment. These included the absence of its aviation component

throughout its tour of duty and the replacement of many Bradley Fighting Vehicles and tanks with M1114 up-armored HMMWVs. This change reflected a belief that the unit's mission did not require heavy firepower. Its principal role lay in securing Iraq's border with Iran and protecting the convoy network necessary to sustain its operating bases. A single ground cavalry troop served under the control of the 3d Infantry Division in Baghdad, where it supported security for the 2005 Iraqi elections.[70]

The manpower intense requirements of operations in Iraq resulted in the mobilization and deployment of the 11th Armored Cavalry Regiment. Normally, this unit constituted the National Training Center's (NTC's) opposing force. It was not organized as a deployable combat organization. Nevertheless, in 2004 regimental elements began to arrive in Iraq, although they did not operate as a single maneuver unit. Instead, the regimental headquarters became the division headquarters for Multi-National Force–Northwest, while the other components supported four different BCTs in Baghdad and surrounding environs.[71]

RSTA Squadron Operations

The arrival of the 3d Brigade, 2d Infantry Division in Iraq in 2003 marked the first combat deployment of an SBCT. Its subordinate RSTA squadron, the 1st Squadron, 14th Cavalry, was considered ideal for COIN due to its mix of human and technological information collection assets. In November the squadron supported the 4th Infantry Division's efforts to secure Samarra through the creation of traffic control points around its perimeter. Due to its limited combat power, the squadron was not allowed to conduct missions inside the city. The unwillingness to risk the squadron in a hostile urban environment prevented it from gathering information to assist its parent brigade. Therefore, the SBCT's infantry battalions advanced through the streets until they met contact, effectively being made to "troll for contact."[72]

No doubt this cautious use of an RSTA squadron stemmed partly from the high visibility associated with SBCT activity. It also reflected the squadron's limited combat power. Against a determined opponent, the RSTA unit had few options but to disengage. One troop commander found the conduct of rapid, aggressive reconnaissance against even a weak threat nearly impossible without massing several platoons. He found that despite the new contact paradigm, "it is still necessary for the troop to fight in contact to allow the infantry battalions to conduct decisive maneuver out of contact."[73]

The combination of large operational areas and limited manpower in Iraq necessitated employment of the RSTA squadron in roles other than

reconnaissance. Despite the earlier reluctance to permit its operation in one urban environment, the 1st Squadron, 14th Cavalry soon assumed a much larger role in another. In Mosul, this unit became responsible for an array of activities similar to those performed by most tactical organizations, including reconnaissance, security, convoy escort, reconstruction, and the training of Iraqi soldiers. It simultaneously undertook civil-military operations and secured its own forward operating base. When another RSTA squadron, the 2d Squadron, 14th Regiment, replaced the 1st Squadron, the broad mission set remained. The routine attachment of aviation provided an additional set of capabilities, although attacks by aerial platforms were subject to limitations imposed on the use of firepower in urban areas.[74]

In 2007, the 2d Squadron, 1st Cavalry Regiment arrived in Iraq as part of the surge in American troops deployed to secure Baghdad. The squadron operated in Diyala province, immediately east of the capital. There it assisted in the clearance of towns noted for their terrorist and insurgent activity. In this hostile, built-up area, the squadron engaged in combat operations, helped train Iraqi security forces, established operating bases, manned traffic checkpoints, and opened a major highway long closed to the passage of coalition traffic. Regular raids and cordon operations targeted insurgent leadership. When the parent SBCT's infantry deployed to clear objectives of insurgents, the squadron created a cordon to block their escape. Once towns were cleared of hostile forces, the squadron assumed a defense posture to hold them. All of these operations occurred simultaneously with efforts to begin reconstruction and organize local residents to manage their own affairs. Reconnaissance activity focused on gathering intelligence to guide brigade combat operations, but the squadron found itself subjected to IED attacks and routinely in firefights.[75]

The broad nature of these operations, often in the midst of urban battlegrounds between insurgent and coalition forces, eliminated the ability of RSTA squadrons to avoid combat. Insurgents often controlled the time and place of a firefight by triggering an ambush. Sometimes, small incidents quickly escalated into full-scale battles. In September 2004, for example, the downing of an OH-58 Kiowa helicopter in Tal Afar resulted in the dispatch of a Stryker reconnaissance platoon to secure the crew and the crash site. The platoon established a perimeter and awaited the arrival of additional forces, but it soon came under attacks that grew in size and intensity. The arrival of Stryker-borne infantry companies defeated these attacks with minimal loss, but only after a sustained street battle.[76]

In addition to limited combat power, RSTA squadrons faced a problem common to most reconnaissance organizations: insufficient personnel to conduct extensive dismounted operations. At full strength, the

Armor Branch Archives

Figure 125. Remains of a HMMWV after an IED attack.

reconnaissance platoons included 4 vehicles, 1 officer, and 20 soldiers. Each vehicle carried a two-man crew and a three-man dismount team. In practice, proper manning of each platform required three men to provide adequate all-round security and monitor the digital communications. Meeting this requirement left just eight men for dismounted operations, but losses to routine causes often reduced this number to six or less. Improvisation resulted. Sometimes a platoon left a vehicle behind, using the crew and passengers to bolster the dismount teams available. Alternatively, soldiers might be borrowed from another platoon, or the troop commander could reassign mortar section personnel to the reconnaissance platoons. It was common to find personnel normally assigned to air defense and field artillery units working alongside scouts to conduct IED sweeps, escort convoys, perform raids, or execute searches.[77]

Dispersed operations generated force protection requirements not easily met. The ground surveillance troop, for example, depended on other organizations to provide security. It possessed no organic ground scouts—a deficiency characterized as "loopy."[78] The 2d Squadron, 1st Cavalry Regiment made its headquarters and headquarters troop (HHT) responsible for forward operating base security, while assigning its nuclear, biological, and chemical (NBC) reconnaissance platoon to serve as part of the squadron's quick reaction force.[79] Such use highlighted the organizational flexibility of the unit and the willingness of commanders to

use nonstandard solutions to problems. It also highlighted the discrepancy between unit manning and operational reality.

Operations in Iraq demonstrated the need for reconnaissance platoons in the RSTA squadrons to both find and fix hostile forces. They could not simply locate insurgentas and await the arrival of combat elements to destroy them, lest the enemy slip away before they could be engaged. Scouts needed the means to engage insurgents immediately on discovery—a lesson similarly identified in Vietnam. However, the RSTA platoons were not designed for this role. Each Stryker M1127 Reconnaissance Vehicle mounted an LRAS3, but the positioning of this device interfered with operation of the platform's machinegun. This configuration complicated rapid engagement of insurgents, particularly in cluttered urban environments that often left the gunner only seconds to identify, acquire, and engage targets. His task was made still more difficult by the weapon's lack of stabilization. One recommended solution called for the substitution of two of the platoon's reconnaissance platforms with Stryker M1126 Infantry Carrier Vehicles. This change reduced the number of LRAS3 devices available, but each infantry carrier mounted a more effective, precision weapon system that could be fired from under cover. The proposed platform mix offered a more versatile combination with enhanced firepower. Similarly, recommendations for the RSTA troop included the addition of the M1128 Mobile Gun System to provide heavier firepower capable of engaging targets inside buildings. These changes sought to make RSTA organizations more robust and broaden their capabilities.[80]

In contrast to platform and organizational issues, operations in Iraq validated the emphasis given by doctrine writers to multidimensional reconnaissance. The success of COIN operations often hinged on the availability of information on the local populace and the tracking of insurgent trends. Initially, however, RSTA squadrons labored under the twin difficulties of inadequate language skills and manpower shortages. Without Arabic speaking skills, the reconnaissance platoon HUMINT collectors could not gather intelligence from detainees or local residents. Units relied on interpreters, but many were hired from the local populace and not always properly screened to confirm their loyalty and reliability. Platoon leaders competed with senior officers in their chain of command also seeking interpreters. The pool of available candidates quickly shrank amid the twin influences of high demand and terrorist intimidation. Consequently, the HUMINT soldiers often found themselves employed as ad hoc scouts at the expense of their special skills.[81]

Ironically, improvements in language ability increased the effectiveness of HUMINT collectors, but higher utility made them more susceptible

to consolidation at troop or squadron level where a demand for their skills existed. They assisted in the evaluation of intelligence data and helped to refine target lists. The best solution to meeting RSTA squadron HUMINT needs occurred through the attachment of additional intelligence collection teams from a higher headquarters. Indeed, reliance on these collectors became the preferred means of determining individuals to target and apprehend. Their value also extended to the collection of related material and information useful to subsequent prosecution.[82]

Intelligence dissemination in the RSTA squadron generally proved rapid via the digital communications network. The proliferation of FBCB2 sets down to platform level coupled with experienced operators made this device an exceptionally valuable command and communications tool. Operational readiness rates also remained high. Nevertheless, communications problems did exist. The dispersed nature of operations often resulted in the RSTA squadron being unable to sustain FM communications with its parent brigade and other units. During the 3d Brigade, 2d Infantry Division's first deployment, the brigade S2 did not have voice or FBCB2 communications with subordinate forward elements, necessitating reliance on relay stations. HUMINT collection teams carried their own special communications equipment, but often could not use it on operations. Lacking armored transport of their own, they often rode with other soldiers in Strykers. In doing so they gained protection at the expense of communications.[83]

The Stryker platform entered combat operations under intense public scrutiny, fueled by the competing claims of skeptics and supporters. Like all new vehicles, it possessed its share of faults. Soldiers quickly identified them and proposed solutions. Overall, the Stryker proved a successful, popular platform. It offered better protection than HMMWVs and carried more passengers and equipment. The speed and relative quiet of the Stryker permitted it to move quickly from one location to another, sometimes achieving surprise. The vehicle's survivability also gained attention. One Stryker was hit by a vehicle car bomb, suffered from nine IED attacks, received eight direct hits from RPGs, and came under extensive small arms fire during the course of operations. The vehicle was quickly repaired and back in action.[84]

Stryker survivability improved with the attachment of slat armor and better ceramic armor tiles. The slat armor increased fuel consumption and maintenance requirements. It also altered the vehicle's handling characteristics, necessitating special driver training. To protect crewmen standing in open hatches, sandbags were piled on the top of the vehicle. This measure helped to offset the danger posed by external fuel tanks that might explode

Courtesy *Armor Magazine*

Figure 126. M1114 Up-Armored HMMWV with improved protection for the gunner.

if hit. Not surprisingly, the wheeled suspension attracted considerable enemy fire, resulting in numerous flat tires. Despite the run-flat system employed to ensure the vehicle could escape from danger, it sometimes failed when subjected to the combined stress of long distance travel and multiple flat tires. Tire problems became a regular feature of contact with the enemy and were at first exasperated by a shortage of tire jacks.[85]

The Stryker was vulnerable. As IED lethality increased, no vehicle, including the Abrams tank, could be ensured against loss. In 2006, the 4th Brigade, 2d Infantry Division operating in Diyala province became the subject of media scrutiny after a series of Stryker losses. One infantry company lost five Strykers in a single week. In a separate incident, the destruction of a Stryker also killed six soldiers and a journalist riding inside. These losses reflected the use of an SBCT against a determined enemy in an urban area not intimidated by the vehicle's presence. In this environment, vehicle losses were unavoidable, but critics quickly reopened earlier questions about the Army's wisdom of fielding the vehicle.[86]

For RSTA squadrons in general, operations in Iraq generated recommendations to improve their organization and capability. The most significant favored an increase in combat power, particularly through the addition of more dismounted capability. At the troop level, criticism focused on the use of a HMMWV platform burdened by a cargo trailer to transport the tactical operations center. This vehicle offered little protection, could

not keep pace with mobile operations, and offered minimal command and control capability while in motion. Similarly, a 5-ton truck and trailer combination served as the troop mortar platoon leader's transport. It could not match the mobility or speed of the Stryker-based mortar carriers. Personnel issues included reconnaissance platoons comprised of equal numbers of NCOs and soldiers, a rank structure that posed responsibility issues.[87] Action on these and similarly recommended changes proved slow. Theater modifications and unit improvisation remained the principal means to overcome organizational deficiencies.[88]

Doctrinal Refinement

In August 2006, the Army published FM 3-20.96, *Reconnaissance Squadron*. This manual addressed the principles for employing the reconnaissance units found in the heavy, infantry, and SBCTs. It introduced few new concepts, but it offered a clearer and more comprehensive depiction of existing principles. The manual enunciated a common set of principles for the three squadron types addressed. The reconnaissance squadron served as the commander's eyes and ears. It developed a common operational picture to assist visualization of the battlefield by finding and tracking enemy developments. Orientation on hostile forces continued to embrace a multidimensional nature that included political, economic, and social information in addition to the more traditional emphasis on combatants and terrain. Guidance for stability operations was embedded throughout the manual.[89]

The manual writers anticipated future enemies to conceal their activities, employing a variety of new technologies and procedures to offset American technical dominance. They would operate in close, complex, or urban areas, utilizing dispersion and signature reduction to evade detection and observation. Against such a threat, the reconnaissance squadron's role lay in building situational awareness and gathering information to assist brigade operations. Supported by joint and national intelligence assets, the squadron provided a continuous stream of information regarding the threat to preserve its parent brigade's freedom of action and avoid surprise. In a best case, the squadron's activities let the brigade commander determine how to maneuver his battalions to destroy hostile elements.[90]

The squadron manual reaffirmed the value of the new contact paradigm and ISR operations. The doctrine writers, determined to present these concepts in a clear manner, rejected recommendations to broaden the mission set and capability of the squadron. The manual repeated the emphasis of earlier manuals on more capable technologies, asserting, "The increased capabilities of information-age technologies give the

Courtesy *Armor Magazine*

Figure 127. American checkpoints like this one became a common sight throughout Iraq's towns and cities in an effort to disrupt terrorist movement.

reconnaissance squadron's leadership the opportunity to 'see first' with insights into the enemy's decision-making process."[91] The writers reminded readers that the reconnaissance squadron's particular capabilities and vulnerabilities were addressed in the construct of the modular BCT. The squadron was to be used according to its abilities as a reconnaissance unit and not thrust into missions for which it was never designed to perform. The manual brooked no deviation from the squadron's singular reconnaissance purpose:

> . . . the BCT reconnaissance squadrons are not designed, equipped, or intended to be employed as a robust direct combat force. Although they possess sufficient armament and firepower for self-defense, they were not overendowed with weapons systems and armor protection for a distinct reason. The historical principle is that reconnaissance units that are sufficiently equipped to fight ***are*** routinely used for fighting instead of performing reconnaissance. In our nation's history, reconnaissance and cavalry units that were impressively armed (possessing organic armor, aviation and artillery, for example) were routinely employed in direct combat roles. When reconnaissance units engage in direct combat missions, *reconnaissance ceases*. When reconnaissance ceases, the potential for achieving and capitalizing on information dominance is lost.[92]

The new manual effectively applied those principles associated with the SBCT RSTA squadron to all BCT squadrons. Primary missions included area, route, and zone reconnaissance, while security operations emphasized screens, area security, and convoy escort.[93] Other missions necessitated augmentation due to the limited combat power and absence of organic armor. Reconnaissance elements were expected to avoid combat and rely on stealth to acquire information. More aggressive reconnaissance found little support:

> Although the reconnaissance squadron has close combat capabilities, it is not organized, equipped, or trained to conduct a reconnaissance in force. That is a maneuver battalion mission. The reconnaissance squadron can conduct screen operations and other security operations, but it is designed to be most effective when employed in reconnaissance roles. To avoid giving away their position, scouts will rarely engage the enemy with direct fire on their own initiative. Rather, they are armed with direct fire weapons only for protection. Mortars are provided to reconnaissance troops for immediate suppression and disengaging fires. All scouts can engage targets without giving away their locations through the fires network with a variety of indirect means, depending on the requirement.[94]

Reconnaissance and combat were considered mutually exclusive. While combat generated some information regarding the enemy, the manual writers considered the related cost of casualties, time, and diversion from more profitable reconnaissance too high. Therefore, the reconnaissance squadrons "must be focused not on engaging the enemy with direct fire, but on conducting reconnaissance in a never-ending quest to continually update the common operational picture (COP) and answer the commander's critical information requirements (CCIR)."[95] The absence of powerful direct fire systems further discouraged employment in an aggressive manner likely to trigger combat.[96] The squadron relied on sensors and other ISR assets to detect the enemy beyond direct fire engagement range and avoid chance contacts. The reconnaissance squadron was expected to use its weapons in self-defense, but indirect fires constituted the weapon of choice.[97]

Coverage of security operations included the same cautions against combat operations. The manual noted:

> Security operations cannot be divorced from reconnaissance and surveillance missions. It is essential to

> remember, however, that reconnaissance squadrons in the modular brigade combat teams (BCT) are not organized, manned, or equipped to execute the full spectrum of security missions previously executed by armored cavalry regiments and squadrons. By virtue of their smaller organization, relatively lighter armament, and lack of organic armor, artillery or aviation, reconnaissance squadrons must focus their efforts and mission sets on reconnaissance. There will be times and circumstances, however, when reconnaissance squadrons are tasked to execute security missions. In these instances, they may execute a screen or area or local security without significant augmentation. Guard and cover missions will require substantial augmentation and will, in most cases, be executed by the BCTs themselves.[98]

The reconnaissance squadrons were expected to provide timely information to the brigade commander, exploiting their digital communications network. Given the dispersed, nonlinear and noncontiguous nature of the battlefield, gaps between maneuver battalions were likely. The reconnaissance squadron monitored these gaps, leveraging its ability to operate in limited visibility or in inclement weather conditions. More traditional security missions considered viable for the squadron included area security, screening operations, route security, and convoy escort. Principles for these missions remained unchanged from earlier manuals.[99]

The manual's emphasis on reconnaissance contradicted actual employment experience in Iraq. There squadrons found themselves thrust into the role of ad hoc maneuver units required to assume responsibility for a broader range of actions than information collection. Indeed, this reality encouraged recommendations from the field for a more robust squadron. The discrepancy between doctrine and field experience raised concern over an organizational trend toward lightness and singularity of purpose at the expense of needed capabilities. Together with the demise of traditional cavalry organizations, this trend increased fears that reconnaissance units would lose entirely the ability to fight for information. For veterans familiar with mounted reconnaissance trends and experiences since World War II, the combined arms cavalry platoon warranted reconsideration as a possible basis on which to restructure the squadron.[100]

COIN operations in Iraq influenced views on reconnaissance. Opponents of a reconnaissance-only organizational and doctrinal emphasis

noted that such units depended on the availability of time and stealth. Too often, however, the time necessary for stealthy reconnaissance did not exist. Even when it did, the ability of insurgents to blend into a population called into question the validity of relying on stand-off observation. Little information was likely to be obtained. In this situation:

> . . . someone must go forward into the unknown and make contact with the enemy. If that element possesses the combat power to survive that contact and the flexibility to react, tactical commanders can sustain the tempo advantage, understand the enemy based on his actions and react faster than the threat. This will be the key to victory on the future battlefield. To engage in combat beyond the supporting range of friendly forces, reconnaissance forces must have access to the full suite of combined arms critical to tactical success.[101]

A parallel concern surrounded the proper reconnaissance platform. The unarmored HMMWV proved too vulnerable in Iraq. The M1114 up-armored HMMWV offered better protection for its crew and passengers at a cost in mobility and visibility. The HMMWV facilitated interaction with civilians by not intimidating them, but it was not an optimal scout platform.[102] In Iraq, the M1114 proved among the most commonly targeted vehicle by insurgents. Consequently, it was associated with a high number of killed or wounded soldiers. Casualties led to decreased use by some commanders. The vehicle's weight and visibility limitations made its value as a reconnaissance platform questionable at best, while its survivability remained an issue. Pending development of a new scout platform, the M3 constituted a better solution, despite its size and noise.[103]

Courtesy *Armor Magazine*

Figure 128. The growing sophistication of terrorists became evident in the wide variety of electronic devices, including this cell phone, used to detonate IEDs.

In 2006, the Armor Center conducted a comprehensive force protection initiative to demonstrate the capabilities of currently available platforms considered superior to the M1114 and suitable for employment in a COIN environment. This action constituted a demonstration and assessment to

gather information similar to the 1999 platform performance demonstration. It was not a procurement decision. Nevertheless, despite considerable interest to field a more effective scout platform to replace the M1114, a quick, affordable solution did not exist, and scouts continued to operate in HMMWVs.[104]

HBCT Reconnaissance Squadron Experiment

Questions regarding reconnaissance squadron doctrine coupled with the difficulties experienced by the Israeli Defense Force during combat operations in Lebanon encouraged further analysis. In 2007, the battle lab at Fort Knox undertook a simulations-based experiment to assess the effectiveness of a heavy brigade combat team (HBCT) reconnaissance squadron operating against a hybrid threat that employed a mix of irregular and conventional tactics in the 2017 timeframe. The experiment sought to provide data and insights into ongoing development work on mounted reconnaissance organizations, doctrine, and platforms.[105]

The threat included some 2,000 irregulars, highly trained, motivated, and equipped. They operated in a dispersed, decentralized manner, utilizing a mix of conventional and asymmetric tactics. Arrayed in a multilayered defensive network, the threat forces made extensive use of minefields and IEDs to channel attacking forces into prepared engagement areas. Although the fighters possessed no armored assets, they used an array of small arms, machineguns, recoilless rifles, multiple launch rockets, surface-air missiles, antitank guided missiles, and precision mortars. The near future timeframe permitted depiction of likely weapons improvements and capabilities available to both the attacking and defending forces.[106]

The focus of the experiment lay on troop and platoon operations. The principal situation pitted a reconnaissance squadron operating in advance of its parent BCT. The squadron applied reconnaissance pull principles to determine the best attack routes for the brigade's maneuver battalions. For this operation, the squadron had access to limited aviation support, extensive fire support, and UAVs. Since one objective of the experiment lay in reviewing reconnaissance materiel, several different organizations were modeled and their effectiveness compared. These organizations included the current mixed M3/HMMWV platoon and two other pure configurations based on upgraded versions of the M3 with mast-mounted sensors, an active protection system, and varied enhancements to armor protection and firepower.[107]

During the course of the experiment, the tactics employed by the threat forces varied. In some instances, they engaged targets as soon as possible

with long-range precision weapons. At other times, they permitted reconnaissance elements to penetrate their defenses without molestation before engaging them from multiple directions with a mix of weapons. Indirect fires served to draw American attention away from critical areas. Intense, multiweapon engagements were reserved for the most heavily armored platforms, while machineguns routinely focused on HMMWVs. To overcome active protection systems, threat fighters employed high-volume fires to strip away the active protection before attacking the target with an antitank guided missile. The use of laser designation teams in the forward areas of the defense network also enhanced the effectiveness of long-range precision fires and placed all American reconnaissance vehicles in jeopardy early in their missions. Conversely, threat fighters wore no uniforms and easily blended into the surrounding populace. The carefully coordinated use of urban areas, complex terrain, minefields, and IEDs all served to channel the squadron into preplanned engagement areas. Unmanned aerial systems were considered high-value targets and deliberately attacked with considerable success.[108]

Against this threat, the reconnaissance squadron found its ability to develop the situation out of contact as per doctrine largely negated. Stationary sensors deployed to observe deep into the defensive network were quickly targeted and destroyed. A similar fate befell vehicles that stopped to employ onboard devices. This issue particularly impacted the LRAS3-equipped M1114, since the system could not be used while the vehicle moved. For the M3/M1114 platoon, this development forced heavier reliance on UAVs. Indeed, all modeled reconnaissance configurations employed these aerial systems to a much greater extent than anticipated, with some units delaying forward movements until a UAV could provide a view of their advance route. In many instances, the presence of these aerial assets directly contributed to a unit's survivability and ability to operate at a desired operational tempo.[109]

Nevertheless, the nullification or loss of standoff detection and observation systems coupled with disciplined threat fighters who remained hidden until directed to attack forced scouts to close with the enemy. It remained otherwise impossible to determine the threat dispositions and identify potential weaknesses for the parent brigade to exploit. Against an elusive enemy and contrary to reconnaissance squadron doctrine, reconnaissance by fire and combat became the primary methods of securing information. Closing with the enemy to detect and eliminate him, however, increased the vulnerability of the reconnaissance units. Already targeted by precision long-range weapon systems, fighting for information increased their exposure to attacks from a variety of shorter range direct

fire weapon systems and underscored the importance of platform survivability. Ironically, in those cases where scouts sought to avoid decisive engagement through maneuver, they often found themselves subjected to a chance contact with threat forces in conditions less advantageous than deliberate efforts to secure information through combat.[110]

Throughout the experiment, reconnaissance units made extensive use of indirect fires to suppress threat weapons and assist penetration of the defensive network. Constraints on use proved light, resulting in large-scale expenditures of ordnance, often in the early stages of a mission. This fire support enhanced scout survivability, but it also raised questions about rules of engagement. In a real world situation, the likelihood of using artillery to eliminate strongpoints and help clear a path for the reconnaissance forces through urban areas was much more problematic given the danger of civilian casualties and the impact on local attitudes.[111]

The reconnaissance squadron lacked the means to breach minefields. This deficiency required scouts to bypass them, even when they had advance knowledge of their presence. Too often detouring around minefields brought units into prepared enemy engagement areas that necessitated a fight for survival. Augmentation with engineers when available overcame this problem and raised the issue of whether or not an engineer element should be organic to the squadron. In other instances,

Courtesy *Armor Magazine*

Figure 129. Personal interaction with the local population proved critical to counterinsurgent operations.

units found themselves blundering into minefields and IED ambushes, detecting them only after detonation.[112]

Overall, the reconnaissance squadron found itself hard pressed to detect the enemy until engaged. Similarly, it experienced difficulty wresting the initiative from threat fighters who posed a series of challenges and tactical dilemmas not readily resolved. When casualties began to mount, the desire to save lives often transformed a mission into one of casualty evacuation. Initiative passed to the enemy, who intensified attacks on those individuals and platforms employed to recover wounded soldiers.[113]

In assessing the experiment's outcome, evaluators acknowledged the exercise's artificial nature. However, the experience suggested that modular reconnaissance with its emphasis on information collection via stealth and standoff observation might be insufficient to satisfy tactical intelligence requirements. If so, they lacked the combat power to close with the enemy and did not possess the survivability to win either deliberate or chance encounters without incurring substantial loss. The final report noted:

> The findings of this experiment suggest that the modular force concepts need revision. The reconnaissance squadron proved unable to develop the situation out of contact in all cases during the HBCT Reconnaissance Squadron Experiment. In all trials the reconnaissance squadron was forced to fight its way into the enemy's "Disruption Zone" to discover the information required to answer the commander's PIR [priority information requirement].[114]

Recommendations followed to improve the squadron's capabilities. These addressed organizational, materiel, and doctrinal changes. The experiment encouraged a doctrinal revision that accepted the need for units to fight for information. The value of unmanned aerial systems necessitated measures to improve their protection, and their utility could be further enhanced through their ability to observe and engage targets while moving or hovering. For ground scouts, the experiment confirmed the effectiveness of mast-mounted sensors and the employment of dismounted teams to gather information. Still, to avoid the constraints on maneuver posed by hostile minefields, the squadron needed its own engineering element to facilitate rapid obstacle detection and clearance. These findings confirmed the value of a combined arms organization possessing broader capabilities than the light reconnaissance squadron. Not surprisingly, they gained the support of the 3d Armored Cavalry Regiment commander.[115]

TRADOC also seemed to endorse the general conclusions from the experiment. In August 2008, the command published a concept capability

Courtesy *Armor Magazine*

Figure 130. Potential insurgent being detained and searched.

plan for future ISR operations. It confirmed the importance of ground reconnaissance, but noted the need for multiple capability improvements. These included greater survivability for scout platforms, the ability to outperform hostile forces in the collection of information at both close and standoff distances, and the means to employ an extensive array of fire support. The planners desired reconnaissance units with the "capability to defeat threat counterreconnaissance efforts with comprehensive lethality overmatch and to survive and operate in the same battlefield conditions as the supported force in all environmental conditions."[116] This requirement was matched by similar emphasis on communications, sensor use, all-weather operations, dismounted action, and the ability to "interact, interdict, and fight for information, allowing immediate action by the operational commander."[117] The plan did not alter the existing reconnaissance emphasis on information acquisition, but it added those capabilities necessary to make a robust and more combat-capable organization. In effect, TRADOC merged several different schools of thought regarding reconnaissance into one. Whether the resultant laundry list of desired capabilities could be incorporated into a single organization remains to be seen.[118]

Organizational Limbo

The growing momentum for altering reconnaissance organizations and doctrine did not result in rapid action. Evidence of institutional change

remained noticeable by its absence. Analysis certainly occurred and task organization in the field addressed conditions in Iraq, but the tables of organization and equipment for these modular units remained largely unchanged. Budgetary concerns and manpower limitations accounted for much of this seeming inertia, but a consensus supporting a return to powerful, multicapable reconnaissance organizations did not yet exist. Moreover, the Army's commitment to the FCS limited its ability to implement unrelated large-scale organizational changes.

For the 3d Armored Cavalry Regiment, this condition of stasis proved a welcome relief. The regiment remained an anomaly among the Active Component, and it was due for a reconfiguration following its return from Iraq in 2006. Amid the trend toward light reconnaissance organizations that eschewed contact with the enemy and relied on stealth and sensor technology to gather information, the regiment had become the subject of debate—particularly governing its future. Discussion of the need for an armored cavalry regiment constituted part of a broader issue concerning the need for any cavalry organization at all. Indeed, one proposal called for the removal of the cavalry designations given to the reconnaissance squadrons.[119]

When the 3d Armored Cavalry Regiment completed its second tour in Iraq, it did not undergo conversion into a modular organization. However, it faced the loss of its air cavalry squadron, following Army Vice Chief of Staff guidance for the consolidation of all aviation units into special aviation support brigades. This action constituted part of the Army's conversion to a modular force structure, but it disrupted the combined arms teamwork—long a hallmark of armored cavalry. Loss of the air cavalry eliminated the expertise with integrated ground-air operations, reduced the regiment's ability to operate without augmentation, and limited the area coverage it could provide with organic assets. Opposition to this action was bolstered by the high-profile success of the unit in Tal Afar and by the Aviation Center, whose leaders did not seek the organizational disruption of a proven combat organization. The regiment retained its air cavalry component and its unique nature.[120]

A more constructive change occurred through a command directed initiative to review the regiment's headquarters and support organizations. The action sought to improve the unit's ability to control attached modular organizations and refine its maintenance support. While the basic structure of the regiment remained unchanged, recommended modification focused on expanding command, control, and communications capabilities to make them commensurate with those found in the HBCT. A deputy regimental commander served to provide more command flexibility. Proposed

organizational changes included the addition of a signal company, a more robust military intelligence company, and an armored platform in the engineer company to facilitate breaching operations.[121]

Outside the cavalry regiment, reconnaissance platoons could look forward to an increase in their personnel strength. Unit reports highlighting too few soldiers to conduct operations combined with the firsthand observations of senior Army leaders to prompt a change. In 2007, analysis of the doctrinal responsibilities of the platoon demonstrated the discrepancy between required actions and available manpower. The Armor Center submitted a formal request to increase the size of reconnaissance platoons in the BCTs and the armored cavalry regiment by six men.[122] This action was approved and sources identified for the additional manpower, but by early 2009 it remained unclear when units in the field would actually see their new scouts.

Combat experience generated a broader assessment of organizational and materiel issues related to mounted reconnaissance. A series of proposed changes followed to correct the most serious problems. Frequent employment of the HBCT's reconnaissance squadron in roles other than pure information collection coupled with its limited combat power led the Armor Center to recommend a more powerful organization. The proposed configuration added tanks and replaced the reconnaissance platoon's M3/HMMWV mix with all M3s. These changes effectively transformed the unit into an armored cavalry squadron with a headquarters, a mortar section, two scout platoons, and two tank platoons. Parallel recommendations boosted the SBCT reconnaissance platoon strength by two Strykers, while the dismounted troop of the Infantry Brigade Combat Team (IBCT) reconnaissance squadron gained a third platoon.[123]

A holistic review of the BCT manning and organization followed in 2008. This analysis also addressed the 3d Armored Cavalry Regiment and provided another opportunity to identify possible alterations based on operational experience and commander feedback.[124] It resulted in proposals to improve the targeting, intelligence, fire support, and UAV capability of the brigade headquarters. Similarly, the reconnaissance squadron benefited from suggested increases in its headquarters staff, particularly those functions associated with operations, fire support, and intelligence analysis at the troop level. Parallel proposals for the 3d Armored Cavalry Regiment enhanced the unit's ability to perform HUMINT collection, planning, information operations, and public affairs.[125]

All of these proposals gained senior leadership support. Nevertheless, final approval and implementation required time, particularly because

every branch advanced similar proposals. While the recommendations for mounted reconnaissance proved modest, their implementation necessitated additional manpower. Without an increase to the Army's end strength, these increases required other organizations to suffer a personnel loss. Determining which proposals to adopt and identifying sources to meet the manpower requirement required time, but the review constituted a deliberate effort to identify deficiencies and find solutions.

Despite the proven efficacy of the heavy armored cavalry regiment and recommendations to use this organization as a template for restructuring the heavy brigade combat team, the Army leadership gravitated toward abandonment of the regiment. The unique nature of this organization and its high cost made it an anomaly amid a trend toward smaller and more standard BCT configurations. The mounted maneuver community sought to highlight the value of the armored cavalry regiment, but its efforts failed to secure the necessary senior leader support. Instead, the Army announced its decision to convert the 3d Armored Cavalry Regiment into another SBCT. This action effectively eliminated traditional armored cavalry organizations capable of reconnaissance, security, and economy of force operations with their organic assets.[126]

The Battlefield Surveillance Brigade

The Army's transition to modular BCTs resulted in the elimination of the division cavalry squadron and the related appearance of the reconnaissance surveillance and target acquisition (RSTA) brigade. This unit was intended for attachment to a division or larger formation, and it strove to "focus joint combat power and effects with precision to simultaneously support current and future operations throughout the area of operations." The RSTA brigade addressed the division commander's information requirements and complemented the ISR efforts of the brigade reconnaissance squadrons. In its original configuration, the unit possessed little organic ground reconnaissance beyond a long-range surveillance element. For additional support, it depended on external attachments.[127] The unit designation changed to battlefield surveillance brigade (BFSB) in 2005, but no significant structural modification occurred.[128]

Initial activities by the first BFSB identified problems that drove further organizational development. The unit proved capable of extensive surveillance, observation, and intelligence analysis, but its lack of combat power necessitated the attachment of maneuver elements to provide security. This requirement added to the mission burden already stretching the smaller BCTs and maneuver battalions. They were not designed to provide force protection to assets operating outside their area of operations.

Armor Branch Archives

Figure 131. Stryker with slat armor installed to provide improved protection against RPGs.

Traditionally, a higher headquarters performed this role, but modularity shifted many of the assets previously available to a division commander to the BCTs. Within the BFSB, a similar issue surrounded the employment of the long-range surveillance unit. This force included teams intended for deep insertion and observation, but they possessed no organic transport. Instead, they depended on the availability of aviation assets no longer organic to either the division or the BCT.[129]

These issues spurred efforts to create a BFSB capable of meeting its own needs. Between 2004 and 2006, the Combined Arms Center (CAC) developed the unit's organization through simulations, modeling, analysis, and testing in conjunction with other Army organizations.[130] The design that resulted included a headquarters and headquarters company (HHC), a military intelligence battalion, a reconnaissance and surveillance squadron, a network support company, and a support company. It also possessed the staff to accommodate additional attachments of maneuver, aviation, and intelligence assets. The military intelligence battalion included HUMINT teams, counterintelligence personnel, UAVs, and radars. The reconnaissance and surveillance squadron bore little resemblance to the squadrons found in the BCTs. It included a HHT, a long-range surveillance company, and two ground reconnaissance troops. The last were patterned on the earlier brigade reconnaissance troop of two HMMWV scout platoons. The long-range surveillance company controlled 15 separate teams that utilized a common pool of HMMWVs and all terrain vehicles to provide organic transport. Their purpose remained stealthy observation far forward.[131]

The new BFSB organization marked a significant improvement in capabilities. It provided multiple means of gathering and assessing intelligence from aerial and ground platforms. It could monitor those portions of the battlespace left uncovered by the BCTs. Indeed, the ground reconnaissance elements were intended to function up to 50 kilometers from a brigade area. The BFSB offered several unique capabilities and skills not found in either brigade reconnaissance or within the armored cavalry regiment. It could not perform traditional cavalry missions, but its capacity for stealth and infiltration made it a viable complement to existing reconnaissance organizations.[132]

Nevertheless, the organization of the BFSB remained a work in progress. It remained oriented on information collection rather than combat, and it did not possess the means to fight for information. Its lack of combat power made it the target of criticism from proponents of more robust cavalry-type organizations. Others feared it might evolve into a powerful maneuver unit at the expense of its special information gathering capabilities. Whether the unit required the ability to conduct combat operations lay at the center of this debate, but no simple answer existed. Further design work and analysis ensued.[133]

The experience of the 525th Battlefield Surveillance Brigade provided valuable insights for further organizational development. It was the first BFSB to deploy to Iraq. There, it operated under a modified organization that included a reduced headquarters and two small military intelligence battalions. Instead of a full reconnaissance and surveillance squadron, it fielded only the long-range surveillance company. Shortages encountered by other units deployed overseas also impacted the 525th Battlefield Surveillance Brigade, which suffered from deficiencies in equipment and personnel. Consequently, its command and control capabilities suffered, while the absence of tactical air control parties impaired the unit's ability to coordinate the close air support considered necessary for its survivability. The long-range surveillance company also went to war manned by riflemen rather than specialized scouts familiar with ISR operations.[134]

In 2008, proponency for the BFSB shifted from CAC to the Armor Center.[135] This change in responsibility reflected the assignment of armor soldiers to surveillance brigades. Analytical work continued to draw on operational experience, field commanders, and the support of other branches, particularly Military Intelligence.[136] The Armor Center conducted a computer assisted map exercise (CAMEX) to evaluate the existing BFSB mission and organization. The scenario involved a BFSB operating as part of a division given a counterattack role in a conventional war setting. The

exercise designers sought to assess BFSB effectiveness in major combat operations as well as more familiar COIN and stability actions.[137]

The experiment found the BFSB unable to operate forward of an advancing division to shape the battlespace. It did not permit the division commander to see beyond his forward BCTs. However, the BFSB proved much more effective operating on the division's flank and rear. It was able to cover critical areas and implement a flank screen that provided early warning to the division and its subordinate brigades. The surveillance brigade's staff proved sufficient to handle attachments, but it lacked the means to sustain the additional forces. Mine detection proved deficient, and the reconnaissance and surveillance squadron possessed only a marginal ability to operate to the division's front. Observers noted the squadron's greater likeness to a long-range surveillance unit rather than other mounted reconnaissance units. Overall, the BFSB proved highly effective when employed in stability operations, but its ability to bridge the gap in intelligence, surveillance, and reconnaissance needs between the BCTs and higher headquarters proved problematic.[138]

Courtesy *Armor Magazine*

Figure 132. A Stryker unit rolls into action.

By year's end, it remained unclear whether the BFSB satisfied the need for a reconnaissance capability above the brigade. It functioned less as a source of actionable intelligence driving combat maneuver than it did a means to collect and report information. In short, it did not reflect the fusion between information acquisition and intelligence dissemination inherent to ISR operations. The BFSB's surveillance capability also outstripped its ability to conduct reconnaissance. This observation suggested that the unit's design reflected COIN needs more than the Army's broader mission needs. Although new technologies associated with the FCS might benefit the BFSB, no such linkage existed.[139]

A different perspective of the BFSB's capabilities emerged during an exercise conducted by US Army Japan. In this event, a surveillance brigade participated as part of a larger organization engaged in major combat operations. It was augmented with maneuver elements, indirect fires, and close air support. These additions transformed the BFSB into a powerful combat organization capable of gathering information and acting immediately with its own assets. The unit proved effective in the exercise, but its enhanced configuration was considered atypical. It fundamentally altered the very nature of the BFSB from a light reconnaissance unit with special abilities into something more akin to an armored cavalry regiment. Permanently reshaping the BFSB in this manner was not seriously considered. The Army did not possess the resources to do so.[140]

The BFSB offered a unique set of capabilities, but it left senior leaders uneasy about its effectiveness and utility. Therefore, the TRADOC commander directed the Armor Center to revise the organizational and operational concepts underpinning the unit. The collection of lessons learned from the BFSBs deployed overseas would help shape this effort together with further experimentation and testing of both the current organization and alternatives. The Armor Center's mission lay in refashioning the BFSB into a unit that offered a needed capability that clearly benefited commanders at multiple echelons.[141]

By December 2008, an initial revision of organizational and operational concepts emerged for staffing throughout the Army. The following February, a panel of subject matter experts convened to review the input received and refine the draft. Its participants included members drawn from across TRADOC, a BFSB contractor support team, and soldiers from the 525th BFSB. The panel generated a much improved description of the BFSB and eliminated some of the confusion surrounding this unit. The new organizational and operational concept also served to identify subjects for experimentation and those actions requiring senior leadership action. Reconnaissance in force ceased to be a BFSB mission. Similarly, earlier references to its ability to conduct limited offensive operations and fight for information disappeared. The BFSB remained a lightly armed organization with minimal combat power, although it could be augmented with a variety of maneuver and combat support elements. Unsuited for most security missions, it was nevertheless considered capable of screen operations and area security.[142]

Computer assisted map exercises in March and August 2009 served to test the revised organizational and operational principles. The first exercise focused on the ability of the BFSB to meet division level information

requirements; provide supply, maintenance, and medical support; execute signal operations; employ UAVs; and conduct ground reconnaissance. In this exercise, the BFSB received missions considered well within its capabilities, and no effort occurred to evaluate the ground reconnaissance squadron's combat ability. In general, the CAMEX tended to support the emerging principles for the BFSB and identified new study areas for further experimentation.[143]

By the time of the August CAMEX, work on a field manual to govern BFSB operations had begun. The exercise served to test the concepts included and provide feedback that could be incorporated before the manual's final draft. The CAMEX did not test alternate BFSB organizations or require the unit to operate outside its intended capability parameters. It provided a better understanding of the BFSB together with its capabilities and limitations that directly supported doctrinal development.[144]

The emerging configuration for the BFSB included a headquarters and headquarters company, two military intelligence battalions, one reconnaissance and surveillance squadron, a signal company, and a brigade support company. The reconnaissance and surveillance squadron constituted the brigade's ground reconnaissance component. It included a headquarters element, two ground reconnaissance troops, and a long-range surveillance company. Troop organization included a small headquarters and two mounted reconnaissance platoons, each one equipped with six HMMWVs carrying LRAS3 and either a grenade launcher or a machinegun. Although the troop headquarters included a UAV, the unit possessed no mortars. However, the squadron possessed a variety of intelligence collection and surveillance means. The headquarters also was designed to accommodate augmentation from a variety of unit types, and it integrated personnel drawn from the military intelligence and maneuver communities. Unlike earlier configurations, the intended long-range surveillance company possessed its own vehicles, eliminating its dependency on external attachments. The BFSB as a whole proved ideal to control a variety of intelligence, reconnaissance, and surveillance assets. Indeed, its organic collection of human, signals, and imagery intelligence, coupled with ground reconnaissance and robust, long-range communications made it highly suited to gathering information over a broad area. The BFSB's principal constraint lay in its lack of combat power. With no organic aviation or fire support and only a small, lightly armed ground reconnaissance element, the brigade's focus lay in information collection rather than more traditional cavalry operations in a contested environment.[145]

Yet even this configuration required time to implement. The first BFSBs to see combat in Iraq did so minus many of their basic components,

including the ground reconnaissance squadron. Nevertheless, the Army planned to field over 10 BFSBs in the Active Component and National Guard. While the Active Component units gradually began their restructuring to the planned organization, the National Guard brigades would not begin fielding before 2011.[146]

Doctrinal development occurred at a faster pace. By September 2009, the Armor Center had completed a final draft of FM 3-55.1, *The Battlefield Surveillance Brigade*. It incorporated the revised organizational and operational principles and comments obtained through an Army-wide staffing process. Publication of the new manual was planned for 2010. It reflected the evolution of views concerning the BFSB. The basic mission of this unit lay in addressing intelligence and information requirements at the division, corps, and joint task force levels. It constituted the only modular brigade specifically designed for this mission. It also supported brigade-level reconnaissance, surveillance, and intelligence efforts. The information collection focus of the BFSB lay on hostile combat forces, terrain, and the local population—much like the original RSTA Squadron from which the BFSB traced its roots. It possessed a wealth of tools to both collect and evaluate information, particularly when used in conjunction with the intelligence assets of a division, corps, or joint task force headquarters. The brigade's capabilities proved especially suited to gathering information on people and the social, political, religious, and economic environment in which they lived. Such information proved central to successful counterinsurgency and stability operations and increased the utility of the BFSB in Iraq and Afghanistan. However, it did not generally fight for information and sought the avoidance of direct fire engagements. While special circumstances might provide opportunities for the limited firepower of the BFSB, it was neither intended nor designed as a combat organization.[147]

Unfortunately, the difficulties associated with the employment of ground organizations intended to avoid combat were becoming manifest in experiments conducted by the Maneuver Battle Lab between 2007 and 2009. These experiments addressed a variety of organizations executing missions in different operational environments. The threats modeled proved similarly varied and reflected combatants US forces might face in real world encounters. These threats often included a mix of conventional and guerrilla-type capabilities. In urban and/or complex terrain, they proved capable of sophisticated concealment and avoiding early detection by friendly reconnaissance. The nature of urban areas and rugged terrain further reduced the ability of US forces to find, track, and engage threat elements without committing ground reconnaissance. The American

units modeled in these experiments were forced to fight for information. The presence of civilians added another dimension of complexity to the experiments, permitting threat soldiers to mask themselves among local populations. Too often, American commanders proved unaware of hostile fighters until they elected to reveal themselves, usually to trigger an ambush.[148]

In these circumstances, ground reconnaissance found itself forced to close with the enemy to determine his location, identify concealed obstacles, and even assess the ability of friendly forces to move through terrain features. These actions often required a degree of combat power that American reconnaissance units lacked. Yet, they were unable to rely on augmentation from brigade combat teams, already fully committed to offensive actions in the nonlinear environments depicted. A need existed for more robust reconnaissance organizations.[149]

Operational experience from Iraq and analysis of Maneuver Battle Lab experimentation demonstrated a clear need for ground reconnaissance with an ability to fight for information and execute traditional security missions. Reconnaissance required the ability to find hostile forces, prevent their escape, and ensure their destruction—either through direct action or by coordinating the efforts of other combat forces. Reconnaissance further required the ability to survive and respond to surprise encounters with enemy combatants. Even when a hostile force was detected, reconnaissance still required an ability to develop the situation and hamper enemy activities. Otherwise the enemy retained a freedom to maneuver or simply evade the reconnoitering unit.[150]

The combination of real world and simulated combat operations underscored the importance of each command echelon possessing its own reconnaissance element. While brigade combat teams included organic ground reconnaissance at the brigade and battalion levels, division and corps headquarters possessed none. Yet these echelons bore responsibility for a broader battle space than the brigades. The BFSB helped to address this void, but its noncombative nature prevented it from executing aggressive reconnaissance or the traditional array of security missions to include guard and cover. While the BFSB provided an array of capabilities that enhanced situational understanding and command decisions, it could not satisfy the need of division and corps echelons for a robust, combined arms ground reconnaissance unit able to fight for information and perform security missions.[151]

To address this capability gap, in June 2009 the TRADOC commander directed the Armor Center to articulate the specific limitations of the BFSB

and identify the ground reconnaissance and information requirements for division and corps commands. This analysis provided the foundation for developing a plan to address reconnaissance needs above the brigade through enhancement of the BFSB. Although the plan would not be complete until sometime in 2010, emerging concepts clearly embraced a robust and versatile organizational concept. A division/corps ground reconnaissance unit required the ability to conduct continuous operations in varied environments and execute reconnaissance, surveillance, and security missions. It was expected to develop a tactical situation through direct action, employing a mix of lethal and nonlethal effects. A variety of sensors that included electronic devices, ground scouts, UAVs, and military intelligence personnel provided both active and passive means of obtaining information. The prospective unit's area of responsibility extended far beyond that assigned to subordinate brigade combat teams and embraced the full spectrum of military operations. Related analytical work focused on restructuring military intelligence organizations to make them more compatible with the Army's modular force structure.[152]

BFSB enhancement and the related studies effectively sought to restore the Army's tiered reconnaissance structure. The shift to a modular force structure resulted in brigade combat teams with increased reconnaissance capability. This gain, however, was partially offset by the shrinkage in brigade combat power to just two maneuver battalions, often necessitating the use of reconnaissance in roles other than information collection. Divisions lost their cavalry squadrons, while the pending demise of the armored cavalry regiment negatively impacted corps reconnaissance capability. The BFSB only partially satisfied the information needs of these formations, but it did not possess the versatility or broad mission set associated with armored cavalry. BFSB enhancement sought to identify corps and division information and reconnaissance needs in their entirety and provide the necessary capabilities.

The Quest for Core Competencies

Military operations in Afghanistan and Iraq created stresses on the Armor School's ability to train new scouts. Prior to these wars, the Army leadership opted to maintain combat formations at full strength. It reduced the manning levels of service schools to provide the necessary manpower. The onset of combat operations further drained students and training cadre. Units seeking to stabilize their personnel while engaged in active operations or anticipating overseas deployment proved reluctant to release experienced officers and NCOs to attend schools. Similarly, qualified specialists were retained in their positions instead of being promoted

or going before a board to become NCOs. The Armor School was also pressured to send graduates of the Officer Advanced Course directly to combat units rather than allow them to attend the Combined Arms and Services Staff School (CAS3) at Fort Leavenworth, Kansas. The training cadre also became subject to overseas requests for soldiers with specific skills or experience. The net impact of these developments lay in the erosion of the Armor Branch's ability to grow new leaders and meet future training needs.[153]

Combat operations and the transition to modular brigades increased the need for scouts to man the new reconnaissance squadrons. This demand resulted in a training base expansion. With Reserve Component support, a second training battalion became dedicated to developing new scouts.[154] The nature of operations in Iraq also necessitated changes in the training provided to ensure familiarity with COIN and urban environments. The time necessary to secure additional resources for training constrained initial efforts to make the instruction at Fort Knox more realistic. In the interim, a number of local alterations occurred within the existing scout training program based on the needs of field commanders. Within the 16-week training cycle, 126 of the 176 tasks taught were combat-oriented. Areas given emphasis included patrols, weapons use, vehicle driving, traffic control operations, and urban combat skills. The amount of time a new scout spent training in the field tripled. This increase was partially enabled by merging the instruction of several tasks during field exercises.[155]

By 2007, basic and advanced training for scouts included some 134 basic combat training skills and 82 additional tasks specific to Military Occupational Specialty (MOS) 19D. Major changes had been implemented to reflect the operational environment in Iraq and to a lesser extent Afghanistan. Increased attention to weapons use, dismounted operations, urban areas, forward operating bases, and mounted combat constituted the principal thrust. Physical fitness remained a central theme to help condition new soldiers for duty in Iraq. Scout weapons training expanded to include the broad range of small arms and larger caliber guns found among reconnaissance organizations. A 7-day field exercise marked the culmination of training. It included a mix of urban operations, dismounted patrols and combat, mounted maneuver, and actions related to the management and security of a forward operating base. Throughout the exercise, soldiers were exposed to the presence of civilians and media represented by role players.[156]

The differences found among reconnaissance organizations in the infantry, heavy, and SBCTs broadened the range of skills required by

Courtesy *Armor Magazine*

Figure 133. Stryker conducting mounted patrol.

scouts. Too some, this skill set had become too large and was resulting in the degradation of those basic abilities traditionally associated with the 19D soldiers.[157] However, to others the basic scout skills remained unchanged by modularity, ISR concepts, or the new contact paradigm. Mounted scouts traditionally proved flexible in their assignments and capabilities. More recent changes in reconnaissance doctrine, organization, and materiel offered the ability to further enhance these abilities by harnessing them to newer technologies.[158]

Armor officer training also adjusted to better prepare leaders for COIN operations. Veterans with service experience in Iraq and/or Afghanistan taught many instructors, while newer instructors were sent overseas to serve with a unit for a month before assuming their training responsibilities. In 2005, the basic course featured more emphasis on reconnaissance and weapons familiarization. Instruction was provided in mounted and dismounted patrols, checkpoints, building clearance, and the conduct of raids. A 7-day field exercise exposed students to urban operations, COIN, and stability missions.[159] The following year, the Officer Basic Course became known as the Basic Officer Leadership Course (BOLC). This name change reflected a major shift in the manner of developing platoon leaders throughout the Army that addressed their instruction during precommissioning and a common core training phase focused on basic skills required of all junior leaders regardless of branch. Afterward, students received their branch-specific training in their final phase of instruction.[160]

The BOLC curriculum at Fort Knox reflected the Armor Branch's shift from a tanker heavy force to one weighted in favor of scouts. It bore the influence of the Scout Leaders Course and included more cavalry and reconnaissance instruction at the expense of pure armor training. It retained a culminating field exercise that incorporated both armor and reconnaissance platoons while introducing new platoon leaders to a civilian presence, terrorists, RPG attacks, and stringent rules of engagement. On

graduation, those students slated for reconnaissance unit assignments were strongly encouraged to attend the Scout Leaders Course before they arrived at their unit.[161] Modifications in 2008 resulted in the inclusion of light cavalry gunnery together with increased maintenance and recovery training in a longer BOLC course.[162]

The specialized scout course suffered a temporary suspension due to resourcing issues, but it had resumed training by 2006. Many of its students were BOLC graduates, although it remained open to all Combat Arms and Military Intelligence Branches. Its quality derived in part from the low student-to-teacher ratio. For immersion in mounted reconnaissance principles, the Scout Leaders Course continued to be unparalleled, although the changing nature and needs of the Army led some potential students to attend other schools instead, particularly the Reconnaissance and Surveillance Leaders Course and Ranger School.[163] The former once provided training for long-range surveillance units, but it had expanded to address reconnaissance in infantry and SBCTs.

The advanced officer course similarly underwent change to reflect experiences in Iraq and in response to the cancellation of CAS3. The latter course introduced students to brigade operations and related staff duties. Some of its subject matter migrated to a redesigned and lengthened Armor Captains Career Course (AC3). The program of instruction included a 10-day segment focused on COIN operations together with more content related to brigade, stability, support, and security operations. It also addressed intelligence, surveillance, and reconnaissance in more detail. The availability of improved simulators for training further enhanced familiarity with digital equipment, including FBCB2. Parallel adjustments occurred to the Reserve Component version of the course.[164]

Further changes to the training of mounted troop and company commanders followed the 2005 announcement of the realignment of the Armor Center and School to Fort Benning, Georgia, where they would be organized together with their Infantry counterparts into the Maneuver Center of Excellence. The emergence of a Maneuver Captains Career Course (MC3) no longer rooted in either branch resulted. Its purpose lay in training company-level commanders and staff officers for combined arms units within a 21-week timeline. It emphasized mental agility, critical thinking, and familiarization with a variety of different unit types. In the latter half of the course, students found their instruction focused on the brigade type to which they would be assigned upon graduation. Special sections addressed COIN, the execution of stability and support operations in an urban environment, and reconnaissance squadron operations.[165] The initial course design continued to evolve to become more reflective

of the operational environment in Iraq. Principal additions included COIN exercises and the importance of cultural understanding to military operations.[166]

Redesign of the Cavalry Leaders Course in 2005 also helped to improve the preparation of commanders and staff officers for operations involving the modular reconnaissance squadrons. The course detailed coverage of reconnaissance units in each type of brigade. It also served to immerse students in the doctrine, missions, and capabilities of each of the related reconnaissance squadrons. The course was open to most branches to help instill a broader-based understanding of reconnaissance organizations and doctrine. Specifically, it prepared senior NCOs and officers through the rank of major for assignment to a cavalry organization or brigade reconnaissance squadron.[167]

These training improvements, coupled with related changes at the combat training centers, helped mounted soldiers cope with the challenges of COIN operations. However, they came at the cost of skills once valued for conventional combined arms operations. Basic maneuver, gunnery, and command and control abilities began to erode amid the sustained focus on combating terrorism and performing stability and reconstruction work in Iraq. Surveys of Armor School students, training cadre, combat

Courtesy *Armor Magazine*

Figure 134. Dismounted patrol backed up by the heavy firepower of a Bradley Fighting Vehicle.

training centers, and unit commanders all indicated skill degradation that undermined the effectiveness of mounted units to conduct conventional combat operations. Company and troop units proved adept at cordon and search missions but rarely participated in company or higher-level maneuvers. Similarly, the sense of offensive and defensive operations began to fade. Other tactical skills associated with declining proficiency included direct fire planning, support by fire actions, breaching operations, smoke use, battle position preparation, and the employment of indirect fires.[168] Vehicle maintenance also suffered a shift in emphasis from preventive maintenance to reactive, crisis management.[169]

Tank gunnery skills atrophied through lack of use and limited opportunities to apply them. The technical nature of gunnery coupled with the skill loss also resulted in a declining ability to train the related skills and principles. Indeed, among MC3 students, two-thirds experienced none or only limited gunnery training. These problems extended to the enlisted ranks. At the platoon level, soldiers demonstrated difficulty with basic gunnery tasks and tactical maneuver.[170]

This skill slippage became especially worrisome in light of the Israeli experience during the Second Lebanon War of 2006. The war followed a series of incidents between Israeli Defense Forces (IDF) and Hezbollah fighters operating out of southern Lebanon. The deliberate abduction of two Israeli soldiers by Hezbollah fighters precipitated a crisis. Israel responded with large-scale ground operations into Lebanon, but its army proved far less effective than in prior conflicts. Much of the IDF's recent operational experience lay in COIN and stability operations in Gaza. Many soldiers lacked or lost the skills necessary for the type of combined arms maneuver operations that Israel sought to apply in Lebanon. Hezbollah fighters used a combination of conventional and irregular tactics to slow down and defeat Israeli armor. Instead of a quick victory, the IDF found itself mired in sustained combat that highlighted major readiness deficiencies. One disgruntled reservist noted, "For the last six years we were engaged in stupid policing missions in the West Bank. . . . Checkpoints, hunting stone-throwing Palestinian children, that kind of stuff. The result was that we were not ready to confront real fighters like Hezbollah."[171]

The difficulties faced by the IDF in Lebanon underscored the potential cost of prolonged and extensive emphasis on COIN and stability operations. Traditional combat skills suffered and could not readily be reacquired once hostilities commenced—especially against an adaptive enemy. This lesson was not lost on American military planners. Indeed, the Armor Center's HBCT Reconnaissance Squadron Experiment suggested that US forces would also face significant challenges fighting a hybrid threat similar to

that posed by Hezbollah to the Israeli Defense Force in 2006. These two events combined with mounting evidence of a real decline in combined arms maneuver skills encouraged preventive action.

An emphasis on preserving core competencies, or those skills deemed fundamental to the performance of mounted maneuver, resulted. In 2007, these competencies were generally described as command and control, maintenance and combat service support, gunnery, and maneuver.[172] To determine what related tasks should be identified and preserved within the training base, the Armor Center established a core competency work group that included representatives from Fort Knox, the RAND Corporation, the NTC, and a BCT. Its work paralleled at the branch level a similar effort undertaken by TRADOC for the entire Army. The work group revised the basic core competencies to include movement and maneuver, command and control, sustainment, and fires. The first grouping included offensive and defensive operations, reconnaissance, security, and gunnery.[173]

Courtesy *Armor Magazine*

Figure 135. Platoon leader training at Fort Knox.

This preliminary work was followed by a more detailed review and assessment of the Armor School curriculum that assessed the training of each task associated with the basic core competencies. In 2008, this effort focused on BOLC and MC3. While the former course was considered acceptable given the time and resources available, the evaluation found "many Cavalry Tasks (Reconnaissance, Surveillance, and Security) are not covered in great detail or are not taught in MC3." Corrective measures sought to ensure greater emphasis on the broad range of military operations from stability to high-intensity conventional combat. Similar assessments were planned for NCO courses, the Cavalry Leaders Course, and the Scout Leaders Course. The results were to guide revisions to training curriculums.[174]

In effect, the armor leadership sought to readjust mounted maneuver training from a dominant emphasis on COIN to a more balanced one that

ensured the retention of basic skills necessary for other combat operations.[175] Positive developments in Iraq assisted this effort. By the start of 2009, conditions in that country had improved dramatically and attacks against coalition forces had diminished. Reconstruction rather than combat came to define the focus of many units in Iraq, in stark contrast to the nearly guaranteed combat facing earlier deployments. While the nation remained in a fragile state, it appeared to be moving away from civil war and dissolution. This development made it possible to refocus training on a broader range of military operations.

Yet the precise method of achieving this end state remained unclear. The positive developments in Iraq were offset by a deteriorating situation in Afghanistan and President Barack Obama's determination to increase military support there. Operations in Afghanistan, however, seemed to require many of the COIN skills acquired in Iraq. A shift in training back toward conventional capabilities might not suit this operational environment. Moreover, major training changes in the schoolhouse and at the unit level required resources whose availability remained problematic. At branch and TRADOC levels, core competency preservation remained a work in progress. Yet some corrective measures were implemented to sustain mounted reconnaissance skills. For MC3 graduates slated for assignment to a cavalry or reconnaissance unit, the Cavalry Leaders Course became a mandatory follow-on course.[176] Other initiatives included the addition of cavalry troop instruction into MC3, and the possibility of providing sustainment training via distance learning, training support packages, and mobile training teams that brought instruction to the units.[177]

Into the Future

Core competency assessment and sustainment proved vital to an Army seeking to retain its effectiveness against a broad range of threats. For the mounted reconnaissance community, however, deeper issues remained. Operations in Iraq raised serious questions about the validity of a doctrine that eschewed aggressive action in favor of information gathering via stealth and sensors. They also called into question organizational and training trends in reconnaissance units while tending to validate the effectiveness of the traditional heavy armored cavalry regiment. The Army's continued support and determination to field the FCS further clouded reconnaissance development, since the planned FCS-equipped BCT placed a much heavier emphasis on technology and unmanned systems.

The year 2009 opened with the Army in a state of transition. Combat operations in Iraq and Afghanistan continued, but the emphasis in military

activity began to shift. Declining violence in Iraq coupled with significant gains in capability by the new Iraqi Government helped reconstruction efforts. Insurgent and terrorist activity continued, but it proved far less widespread or effective than in previous years. These conditions created an environment favorable to the start of a gradual drawdown of US forces that was encouraged by a new American president determined to end the large-scale commitment of resources and soldiers to Iraq. Between 2010 and 2011, the American presence was expected to become much smaller and focus on training and support. Already in 2008, American combat forces began withdrawing from Iraqi towns and cities, turning over primary responsibility for their security to Iraqi military and police elements. Simultaneously, the war in Afghanistan began to receive greater attention and led to an increase in the American military presence there.

In June 2009, the FCS program was officially canceled. Secretary of Defense Robert Gates did not feel the program's collection of high-tech assets suited the needs of the military in its current conflicts, particularly in the areas of personnel and armor protection. Although some of the nonvehicular components remained in development, the planned family of networked combat vehicles did not survive. In effect, FCS became a casualty of the wars in Iraq and Afghanistan, because it did not reflect the needs of either operational environment. Funding for FCS, however, was redirected toward the design and development of a new ground combat vehicle better suited to operations in IED-invested areas and offering better survivability. Nevertheless, FCS cancellation ended an effort that had been the Army's focus for nearly a decade. The program had influenced modernization, doctrine, and the way in which future combat operations were envisioned. Its demise forced the Army to reconsider the course of its development and related modernization actions.[178]

By late 2009, concepts for the new family of ground vehicles to replace the FCS began to emerge. The new platforms were intended to support the full range of operations expected of an increasingly expeditionary Army. Hence deployment would occur via air, land, or sea. Planned survivability centered on armor protection that could be scaled to a particular threat or operational environment. The weapons mix for the vehicle family included nonlethal assets. Intended to possess high mobility in urban as well as countryside areas, the new ground vehicle aimed at reliability similar to that of the Stryker, reduced fuel consumption, and lower sustainment needs. It was also intended to interact with existing and planned digital communications systems. These basic objectives incorporated some concepts associated with the now defunct FCS, but they also reflected

an effort to refocus design on a versatile platform capable of accepting technology upgrades and easily incorporated into brigade combat teams.[179]

These developments provided the backdrop for constructive changes in mounted reconnaissance doctrine and training. Efforts to improve reconnaissance organizations generally through increases in personnel and capabilities awaited final approval and authorization by the Army senior leadership. Only the modest increase of six scouts to the reconnaissance and scout platoons was ready for implementation. Nevertheless, doctrinal and training changes provided a more realistic conceptual foundation for reconnaissance operations that reflected lessons learned from several years of combat, COIN, and stability operations in Iraq. The exclusive emphasis on a "quality of firsts," the new contact paradigm, and a greater reliance on sensors and standoff technology gave way to a more balanced approach in the execution of reconnaissance and security missions.

In February 2009, before announcement of plans to convert the 3d Armored Cavalry Regiment into an SBCT, the Armor Center submitted an updated reconnaissance troop manual for final approval and publication. It incorporated insights from the combat training centers, unit commanders, and combat operations overseas. It also consolidated coverage of the different troop types found in the BCTs, the armored cavalry regiment, and the BFSB. In general, all troops served to build and maintain situational awareness and understanding for their parent squadron through

Courtesy *Armor Magazine*

Figure 136. Training new scouts at Fort Knox.

the execution of reconnaissance and security. They retained a focus on multidimensional information collection, particularly cultural factors, in all weather and terrain conditions, employing a wide range of reconnaissance and surveillance systems.[180]

However, the manual writers acknowledged the different capabilities of each troop type throughout the text, noting where appropriate those qualities that made a particular unit either more effective or constrained in the conduct of a particular mission type. It noted, for example, the light, flexible, and mobile nature of the BCT and BFSB troops, with their optimization for reconnaissance. Similarly it underscored the limited combat capability of the BFSB troop due to its lack of armored vehicles, mortars, and missile systems.[181] Unlike previous manuals that generally ignored the greater combat capabilities of armored cavalry, this one openly acknowledged them and devoted an entire chapter to the use of armored cavalry in offensive and defensive operations.[182] Compared to other troop types, the armored cavalry troop was the only one considered capable of reconnaissance, security, and economy of force operations without mandatory augmentation or the existence of a weak threat.[183]

Many of the principles indicated in prior manuals remained unchanged, but their depiction in the new publication proved much clearer. The reconnaissance and cavalry troops were expected to assist the operation of their parent squadron by acquiring information that satisfied command needs to facilitate decisions and maneuver combat forces. The threat envisioned included a broad spectrum ranging from conventional forces to insurgents and terrorists to unruly mobs in similarly varied environments. Urban operations were considered highly likely due to global urbanization and the tendency of potential opponents to offset American combat power and technology superiority with close range engagements in complex terrain.[184]

Reconnaissance guidance continued to reflect an emphasis on ISR operations and the collection of information outside direct physical contact with a threat force. The information gained was expected to assist the precision maneuver of combat forces through either reconnaissance-pull or reconnaissance-push. Similarly, reconnaissance assets were expected to rely on stealth and avoid detection: "Under normal circumstances, however, to avoid giving away their position, scouts will rarely engage the enemy with direct fire on their own initiative. Rather, they are armed with direct fire weapons primarily for protection."[185]

In contrast to previous doctrine, this statement did not mark the final word regarding potential combat situations. Instead, it was the preferred method of information collection, but the manual writers

openly acknowledged the likelihood of some degree of combat and its desirability in select circumstances. Reconnaissance in force, for example, became an acceptable mission for reconnaissance and cavalry troops when operating as a part of a combined arms team. This acceptance of combat clearly reflected the reality of operations in Iraq and marked an important adjustment to doctrinal principles. Hence, reconnaissance organizations:

> . . . are capable of employing combat power to fight for information. Because these units are usually the forward-most elements in full spectrum operations, they must have the capability to survive meeting engagements and to destroy or impede enemy forces as necessary to sustain operations. Reconnaissance and cavalry troops must maintain contact once they have established it. If a platoon or section leader has established sensor contact with an enemy element, the troop must pursue the contact until it has finally identified and reported the enemy. In general, troops are capable of fighting through enemy reconnaissance (destroying the enemy's "eyes and ears") to gain combat information needed by higher unit commanders. In shaping operations, the ability to fight for information is important in determining the intent of a threat (for example, whether the threat is willing to defend, withdraw, fight when confronted, or wait for a specific target such as C2 or resupply elements) without requiring the higher commander to commit main body infantry or armor units.[186]

The ability to fight for information directly correlated to available combat power. The armored cavalry troop with its organic tanks possessed the most, while the limited capabilities of the BFSB troop required a careful understanding of the hostile force and its environment. These varied unit capabilities influenced the engagement criterion and tempo associated with reconnaissance missions. Therefore, included mission examples addressed the different types of troops showing how each could be employed to maximize their particular mix of mounted, dismounted, and sensor assets. These depictions also gave considerable attention to the planning of reconnaissance operations and the type of command guidance necessary to execute them as intended.[187]

A second manual submitted alongside the troop publication for final approval and publication addressed reconnaissance and scout platoon operations. It, too, consolidated guidance for the platoons found in the BCTs, the BFSB, and the armored cavalry regiment. Each different platoon

type, however, received coverage oriented on its particular capabilities, although a general set of principles applied to all. In this manner it differed sharply from the 2002 version, which superimposed concepts intended for the RSTA squadron reconnaissance platoon on all reconnaissance and scout platoons without respect to their varied capabilities.[188]

Platoon operations focused on reconnaissance with a more limited capacity for security operations. Like the troop, platoons were expected to operate via stealth and avoid combat while gathering information to satisfy commander information requirements and provide targeting data.[189] Although combat and direct fire engagements were not encouraged, they were not ignored. The more realistic tone found in the troop manual was paralleled in the platoon publication: "Reconnaissance and scout platoons must be prepared to operate beyond the traditional roles of reconnaissance, surveillance, and target acquisition of enemy forces."[190] While HMMWV-mounted scouts were expected to favor stealthy and discreet information collection due to their vulnerable platforms and limited firepower, they were not required to do so. Instead, a careful understanding of the environment and the threat were to be the guiding influences. The writers expected the employment of a mix of reconnaissance methods during a single mission to be commonplace. They avoided a prescriptive approach that locked a platoon leader into a single course of action. A mental flexibility, able to adapt method to evolving tactical condition was preferred.[191]

This flexibility also applied to fighting for information: "All reconnaissance and scout platoons must be prepared to fight for information and report it."[192] The inclusion of this subject in a manual whose previous version intentionally eschewed combat reflected a more realistic appraisal of actual operational conditions. The new platoon manual outlined a broader range of methods and techniques for the accomplishment of reconnaissance based on likely conditions and threats on the battlefield. In some respects, it merged the cavalry's traditional emphasis on a more combat-oriented, aggressive style of operations with the stealthy and sensor driven approach of the original RSTA squadrons. The resultant document provided the new platoon leader with a range of actions from which he could select those most suited to his unit type, capabilities, and tactical situation.[193]

Combat comprised only a fragment of the reconnaissance coverage provided. Planning reconnaissance missions received considerable emphasis at both the platoon and troop levels to ensure more effective mission execution. Scouts required clear objectives to guide their actions lest they provide a laundry list of information rather than those specific items necessary for a command decision. Multidimensional reconnaissance, urban operations, infiltration, battle handover, dismounted operations,

and interaction with HUMINT teams remained important topics for platoon reconnaissance. The coverage given to these areas complemented that given to use of the tactical internet, unmanned aerial systems, and sensors. In short, the new platoon manual provided a clear sense of the unit's purpose, the tools available to it based on its type, and the methods of operations that could be applied at the commander's discretion and understanding of the tactical situation.[194]

The broader range of tools and employment concepts offered by the manual suited the wide range of potential threats and operational environments facing the US Army. However, it placed a premium on high-caliber leadership at the platoon level. To exploit the flexibility inherent to their reconnaissance or scout platoon, new platoon leaders needed more than familiarization with reconnaissance before assuming command. They required a thorough grounding in the fundamentals of scouting and the related mental ability skills and accumulated experience to varied tactical environments.

Developing these skills among soldiers destined for reconnaissance and scout platoon leadership positions became the focus of a redesigned Scout Leaders Course. This course consistently received high praise throughout the armor community, but several factors encouraged a shift in its nature and emphasis. The TRADOC commander directed this action, which also reflected the shift in the Armor Branch from a predominantly tank-oriented focus to one weighted in favor of reconnaissance organizations. The 2005 Base Realignment Commission (BRAC) decision to collocate the Armor and Infantry Schools at Fort Benning centralized the reconnaissance instruction traditionally conducted separately in Georgia and Kentucky. The movement of the Armor School to Fort Benning offered an opportunity for mounted reconnaissance instruction to benefit from the materiel support available there. Similarly, the expertise associated with the Infantry School's Reconnaissance and Surveillance Leaders Course, which prepared soldiers for service in long-range surveillance units, could be leveraged to support scout training.[195]

The resultant Army Reconnaissance Course constituted a fundamental change in the nature of reconnaissance/scout leader training. The course spanned 27 days, a significant increase over the 17 days of the Scout Leaders Course. The longer timeline permitted the inclusion of more field exercises and hands-on instruction directly relevant to the operation of a reconnaissance platoon assigned to a BCT or an armored cavalry regiment. Instruction was derived from the emerging troop and platoon manuals, but it also emphasized reporting, navigating, mission planning, employing fires and air support, relating cultural awareness to military operations,

and using new surveillance technologies. While these subjects did not constitute the entire range of instruction, they did reflect concerns from unit commanders and the combat training centers.[196]

The new course diverged from other training models and practices in its emphasis on teaching skills rather than tasks. Course designers sought to determine those qualities that made the scout unique and embed those into the overall training objectives. Graduates were to demonstrate a higher ability in the execution of basic missions such as reconnaissance, security, surveillance, navigation, and communications. They were to possess a better understanding of their commander's information requirements and how to meet them. They showed a greater capacity for effective mission planning, proved comfortable with the use of organic and attached assets, and demonstrated confidence in their leadership and abilities.[197]

Developing this type of competent, capable, and adaptive leader required fundamental changes in the nature of instruction and the role played by the training cadre. It was not an easy transformation, but the potential value to reconnaissance operations could not be overstated. Junior leaders able to think, learn, and apply a broad range of information to complex tactical situations suited the doctrinal flexibility found in the new reconnaissance troop and platoon manuals. Moreover, such leaders would possess the mental mobility to adjust to the broad range of operational environments in which the Army might find itself engaged.

In 2009, the Army Reconnaissance Course remained a work in progress. A pilot course in the early spring built on the lessons learned from work done the previous 2 years. Resourcing issues remained to be resolved, although it was believed that the ranges and materiel support available at Fort Benning would ease these problems. The course, like mounted maneuver reconnaissance in general, lay in a state of transition. The future remained uncertain, but the flexibility embedded in the emerging doctrine and the new course suggested a more balanced approach to reconnaissance organizations and their principles of employment. The unrealistic expectations once associated with the "quality of firsts" had given way after 6 years of combat operations in Iraq to an acknowledgment of the value of more robust reconnaissance organizations capable of fighting for information. Ironically, this acceptance did not prevent the abolition of armored cavalry, though it did generate efforts to create a more versatile BFSB. If the past is prologue, future operations by the US Army will require the capabilities of both stealthy and fighting reconnaissance organizations.

Notes

1. Memorandum, Major Chris L. Connolly, Subj: Detailed Trip Report 6–8 October 2003 3ID Operation Iraqi Freedom Seminar, 22 October 2003, 15, Armor Branch Archives, 2003 Annual Command History files.

2. Ibid., 11, 15, 17.

3. Scott Wilson, "A Different Street Fight in Iraq," *Washington Post*, 27 May 2004, 1, Armor Branch Archives, electronic, 04ACH/Army/Iraq/Impressions/1stCAVDIV.

4. Major General Peter W. Chiarelli, "Winning the Peace: The Requirement for Full Spectrum Operations," *Military Review* (July–August 2005): 4–17; Briefing, Major General Peter W. Chiarelli, Subj: Task Force Baghdad, 9 March 2005, Armor Branch Archives, electronic, 05ACH/Army/Iraq/Impressions/1CD; Briefing, Major General Peter W. Chiarelli, Subj: "Task Force Baghdad," 22 March 2005, Armor Branch Archives, electronic, 05ACH/Army/Iraq/Impressions/1CD; Lieutenant Colonel Ross A. Brown, "Commander's Assessment: South Baghdad," *Military Review* (January–February 2007): 27–34; Armor Warfighting Symposium, COIN Panel Discussion, 18 May 2006, Armor Branch Archives, paper files, 2006 Annual Command History files.

5. US Army Armor Branch History Office, Operation Enduring/Iraqi Freedom Experience Survey, executive summary, 2 May 2006, Armor Branch Archives, electronic, OIF/Surveys (History Office).

6. First Lieutenant Michael Gantert, "Checkpoint and Traffic Control Point Operations," *Armor* CXIII, no. 5 (September–October 2004): 38–40.

7. Captain Dale Murray, "Company-Level Cordon and Search Operations in Iraq," *Armor* CXIII, no. 5 (September–October 2004): 26–31.

8. First Lieutenant Gregory S. Hickerson, "Reconnaissance Patrols in Baghdad," *Armor* CXIII, no. 5 (September–October 2004): 35–37.

9. Memorandum, Major James J. Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 6–7, Armor Branch Archives, electronic, 04ACH/Army/Iraq/Impressions/Lessons Learned.

10. Captain Mike Sullivan, "Arming the Knight for Dismounted Combat," *Armor* CXIII, no. 3 (May–June 2004): 7–10; Major Mark J. Aitken, "Hunter-Killer Teams," *Armor* CXVII, no. 1 (January–February 2008): 20; Captain William C. Baker, "The Anatomy of an Ambush: Small Kill Teams in the Contemporary Operating Environment," *Armor* CXVIII, no. 4 (July–August 2009): 5–9.

11. Memorandum, Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 14.

12. Captain Jonathan Dunn, "Mounted Security Procedures in Iraq," *Armor* CXIV, no. 4 (July–August 2005): 11–14.

13. Richard E. Killblane, Global War on Terrorism Occasional Paper 13, *Circle the Wagons: The History of US Army Convoy Security* (Fort Leavenworth, KS: Combat Studies Institute Press, 2005), 77–78.

14. Captain Walt Reed, "Fault Trend Analysis: A Proactive Maintenance Approach," *Armor* CXIV, no. 4 (July–August 2005): 36–37.

15. Raymond Michaud, "TTPs and Lessons Learned in Iraq 2003–2004," Informal scout observations, 2004, Armor Branch Archives, electronic, 04ACH/Army/Iraq/Impressions/Lessons Learned.

16. Ibid.

17. Captain Nicholas C. Sinclair, "An Approach to Route Security," *Armor* CXVII, no. 2 (March–April 2008): 26–32.

18. Dunn, "Mounted Security Procedures in Iraq," 11–14.

19. Michaud, "TTPs and Lessons Learned in Iraq 2003–2004."

20. Captain Robert B. Gillespie, "Route Ownership Versus Route Concession," *Armor* CXIV, no. 5 (September–October 2005): 18–20.

21. Seth Robson, "Convoys Will Now Stand and Fight When Attacked in Iraq," *Stars and Stripes*, 31 March 2006.

22. For example, see Captain Jim Capobianco and First Lieutenant John Dickson, "Be There: A Case Study in Counterinsurgency Warfare," *Armor* CXVII, no. 4 (July–August 2008): 42–44.

23. Reed, "Fault Trend Analysis: A Proactive Maintenance Approach," 36–39.

24. Captain Jonathan Kluck, "OIF Vignettes," Personal experience monograph, 4 April 2004, Armor Branch Archives, paper, 2004 Annual Command History files.

25. Armor Warfighting Symposium, COIN Panel Discussion, 18 May 2006; Greg Grant, "Insurgency Chess Match," *Defense News*, 27 February 2006, 6; Captain Daniel Helmer, "The Poor Man's FBCB2: R U Ready 4 the 3G Celfone?" *Armor* CXV, no. 6 (November–December 2006): 7–10.

26. Sinan Salaheddin, "Chopper Shot Down; All Aboard Evacuated," *Washington Times*, 22 February 2007, 13; Richard A. Oppel Jr., "Attacks Surge as Iraqi Militants Overshadow City," *New York Times*, 16 April 2007, 1; US Army Armor Branch History Office, Operation Enduring/Iraqi Freedom Experience Survey, executive summary, 2 May 2006; Briefing, Chiarelli, Subj: Task Force Baghdad: Operation Iraqi Freedom, 9 March 2005.

27. Ann Scott Tyson and Joshua Partlow, "Insurgents Broaden Arsenal In Battles With U.S., Iraqi Forces," *Washington Post*, 23 February 2007, 15.

28. John Diamond, "Insurgent Snipers Sent After Troops," *USA Today*, 28 July 2006, 1; Rick Jervis, "More Troops Means More Targets for Snipers," *USA Today*, 25 October 2006, 8.

29. Briefing, Chiarelli, Subj: "Task Force Baghdad," 22 March 2005; First Lieutenant David A. Tosh, "Engaging the Population and Local Leaders," *Armor* CXIII, no. 5 (September–October 2004): 41–43.

30. Memorandum, Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 33.

31. US Army Armor Branch History Office, Operation Enduring/Iraqi Freedom Experience Survey, executive summary, 2 May 2006.

32. Memorandum, Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 54.

33. Briefing, Chiarelli, Subj: "Task Force Baghdad," 22 March 2005.

34. Reconnaissance Summit Briefing, Subj: Unmanned Aerial Systems, 13 December 2007, Armor Branch Archives, paper, 2007 Annual Command History files; First Lieutenant David R. Cowan, "The Company Intelligence Section," *Armor* CXVII, no. 4 (July–August 2008): 19–22, 50.

35. Captain Jason Goodfriend and Captain David Levasseur, "An Armored Task Force Approach to Civil-Military Operations," *Armor* CXIV, no. 4 (July–August 2005): 28–32.

36. Michael Kamber, "Sovereigns of All They're Assigned, Captains Have Many Missions to Oversee," *New York Times*, 21 March 2008, 6.

37. "4th Infantry Division Lessons Learned Executive Summary," After Action Report (FOUO), undated, 38; Armor Warfighting Symposium, COIN Panel Discussion, 18 May 2006.

38. Lieutenant Colonel Jeff Broadwater, "Reorganizing the Recon Squadron to Enhance Heavy Brigade Combat Team Capabilities," *Armor* CXVI, no. 5 (September–October 2007): 37.

39. Reconnaissance Summit Briefing, TDCD, Subj: Backbrief of Summit Findings to CG TRADOC, 14 December 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

40. General Officers Reconnaissance Integrated Concept Team Briefing, Aviation Center, Subj: Aviation Concept of Operations, 24 August 2005, Armor Branch Archives, paper, 2005 Annual Command History files.

41. Reconnaissance Summit Briefing, Ted Maciuba, Subj: Unmanned Aerial Systems, 13 December 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

42. Ibid.

43. General Officers Reconnaissance Integrated Concept Team Briefing, TDCD, Subj: HBCT Tactical Scenario—Recon Operational Requirements, 24 August 2005, Armor Branch Archives, paper, 2005 Annual Command History files; Paul V. Marnon and Robert D. Carter, "Manning, Equipping, Training, and Deploying the Brigade Aviation Element," *Infantry Magazine,* September–October 2005, http://findarticles.com/p/articles/mi_m0IAV/is_5_94/ai_n16084363 (accessed 11 March 2009).

44. Captain David J. Smith and First Lieutenant Jeffrey Ritter, "Team Enabler: Combining Capabilities During the Execution of Full Spectrum Operations," *Armor* CXVII, no. 2 (March–April 2008): 43–45.

45. Special Defense Department Briefing, Lieutenant General R. Steven Whitcomb, Subj: Armored Vehicles, 9 December 2004, transcript, Armor Branch Archives, paper, 2004 Annual Command History files; Steve Liewer, "Sandbags Become Makeshift Vehicle Armor," *European Stars and Stripes*, 26 April 2004; Greg Jaffe, "Cold-War Thinking Prevented Vital Vehicle From Reaching Iraq," *Wall Street Journal*, 19 March 2004; "Pentagon OKs Reinforcing Trucks,

HMMWVs," *New York Times on the Web*, 29 January 2004; Amy Schlesing, "39th's Humvees, Armored At Last, Ready to Enter Iraq," *Arkansas Democrat-Gazette*, 6 April 2004.

46. Special Defense Department Briefing, Lieutenant General R. Steven Whitcomb, Subj: Armored Vehicles, 9 December 2004; Eric Schmitt, "U.S. Forces Rush to Send Tanks To Iraq," *New York Times*, 29 April 2004; Amy Klamper, "Hunter Faults Pentagon Over Lack of Armor for Vehicles," *National Journal's Congress Daily AM*, 22 April 2004; "Rare Armored Humvees Save Troop Lives," *Colorado Springs Gazette*, 26 April 2004; Arieh O'Sullivan, "Armored Hummers Shipment to Iraq Instead of Israel," *Jerusalem Post*, 15 April 2004; Lisa Troshinsky, "U.S. Army at Halfway Mark for Up-Armored Humvees," *Aerospace Daily*, 9 March 2004.

47. Jason Chudy, "Humvee Gunners in Najaf Face Web of Wires," *European Stars and Stripes*, 31 August 2004.

48. General Officers Reconnaissance Integrated Concept Team Briefing, Major General Terry L. Tucker, Subj: Closing Remarks/Way Ahead, 25 August 2005; US Army Armor Branch History Office, Operation Enduring/Iraqi Freedom Experience Survey, executive summary, 2 May 2006; Greg Jaffe, "Cold-War Thinking Prevented Vital Vehicle From Reaching Iraq," *Wall Street Journal*, 19 March 2004; Lisa Burgess, "New Humvee Weapons System Keeps Gunner Covered Inside," *European Stars and Stripes*, 8 February 2004.

49. Major Edward J. Stawowczyk, "A Combat Multiplier in Iraq: The Long Range Advanced Scout Surveillance System," *Armor* CXIII, no. 2 (March–April 2004): 39–41.

50. Armor Warfighting Symposium Briefing, Major Tom McNew, Subj: FBCB2, 17 May 2006, Armor Branch Archives, paper, 2006 Annual Command History files; US Army Armor Branch History Office, Operation Enduring/Iraqi Freedom Experience Survey, executive summary, 2 May 2006; Captain Shane Robb, "FBCB2: Past, Present, and Future," *Armor* CXV, no. 4 (July–August 2006): 15–18.

51. General Officers Reconnaissance Integrated Concept Team Briefing, TDCD, Subj: HBCT Tactical Scenario—Recon Operational Requirements, 25 August 2005; Major Daniel L. Davis, "Fighting for Information," *Armor* CXVII, no. 3 (May–June 2008): 26–35.

52. Broadwater, "Reorganizing the Recon Squadron to Enhance Heavy Brigade Combat Team Capabilities," 37–40.

53. Reconnaissance Summit Briefing, TDCD, Subj: Backbrief of Summit Findings to CG TRADOC, 14 December 2007.

54. 3d Armored Cavalry Regiment, "Regimental History," http://www.hood.army.mil/3d_acr/regimental_history.aspx (accessed 3 February 2009).

55. Memorandum, Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 12–13, 55, quotation from page 12; 3d Armored Cavalry Regiment, "Regimental History."

56. Memorandum, Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 18; 3d Armored Cavalry Regiment, "Regimental History."

57. Memorandum, Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 3, 16, 47, quotation from page 47.

58. Ibid., 6, 8–10, quotation from page 6.

59. Ibid., 18, 31, 33, 40, quotation from page 33. In the fully digitized 4th Infantry Division, the large map supply provided at the start of operations remained unused in favor of digital navigation during its first deployment.

60. Memorandum, Gallivan, Subj: 3ACR MSC AAR Comments for OIF I (FOUO), 14 March 2004, 21, 29, 33; David N. Simms, Personal experience monograph, 4 April 2004, Armor Branch Archives, paper, 2004 Annual Command History files; Kluck, "OIF Vignettes," Personal experience monograph, 4 April 2004.

61. Thomas E. Ricks, "The Lessons of Counterinsurgency," *Washington Post*, 16 February 2006, 14.

62. 3d Armored Cavalry Regiment, "Regimental History"; Thomas E. Ricks, "The Lessons of Counterinsurgency," 14; Ricardo A. Herrera, "Brave Rifles at Tall 'Afar, September 2005," in *In Contact! Case Studies from the Long War*, *Vol. I,* ed. William G. Robertson (Fort Leavenworth, KS: Combat Studies Institute Press, 2006), 125–152; Captain Gregory R. Mitchell, "Disrupting an Insurgent Bedroom Community," *Armor* CXV, no. 3 (May–June 2006): 16–19.

63. Armor Warfighting Symposium Briefing, Lieutenant Colonel Ross A. Brown, Subj: 3d Squadron, 3d Armored Cavalry Regiment, 18 May 2006, Armor Branch Archives, paper, 2006 Annual Command History files; Captain Amos Y. Oh, "Rush Hour: 24 Hours of Route Security Along MSR Tampa," *Armor* CXVII, no. 1 (January–February 2008): 47–49.

64. Armor Warfighting Symposium Briefing, Brown, Subj: 3d Squadron, 3d Armored Cavalry Regiment, 18 May 2006; Brown, "Commander's Assessment: South Baghdad," 27–34.

65. Armor Warfighting Symposium Briefing, Brown, Subj: 3d Squadron, 3d Armored Cavalry Regiment, 18 May 2006; Brown, "Commander's Assessment: South Baghdad," 27–34.

66. General Officers Reconnaissance Integrated Concept Team Briefing, Lieutenant General William Wallace, Subj: Brigade Combat Team Reconnaissance Comments, 24 August 2005, quotation from same, Armor Branch Archives, paper, 2005 Annual Command History files; Reconnaissance Summit Briefing, Lieutenant Colonel Mark Eastman and Bill Betson, Subj: HBCT Reconnaissance Experiment Analytic Insights, 13 December 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

67. Donald P. Wright and Colonel Timothy R. Reese, *On Point II: Transition to the New Campaign: The United States Army in Operation IRAQI FREEDOM May 2003–January 2005* (Fort Leavenworth, KS: Combat Studies Institute Press, 2008), 28, 117–118, 126, 141, 329–330; "2d Cavalry Regiment, 'Second Dragoons,'" undated, http://www.globalsecurity.org/military/agency/army/2acr.htm (accessed 4 February 2009); Major Todd E. Walsh, "The Fight for Kufa: Task Force 2-37 Armor Defeats al-Sadr's Militia," *Armor* CXIII, no. 6 (November–December 2004): 26–30.

68. First Lieutenant Jonathan Silk, "Light Cavalry Platoon—Armor Team Integration Procedures," *Armor* CXIV, no. 4 (July–August 2005): 6–10.

69. Wright and Reese, *On Point II*, 117–118, 411, 440, 460; "2d Cavalry Regiment, 'Second Dragoons.'"

70. Lieutenant Colonel Jeffrey Holmes, "The Cavalry Model In Iraq: Right Time, Right Place," *Armor* CXV, no. 1 (January–February 2006): 12–14; "278th Armored Cavalry Regiment (United States)," http://en.wikipedia.org/wiki/278th_Armored_Cavalry_Regiment_(United_States)#OPERATION_Iraqi_Freedom (accessed 4 February 2009).

71. 1st Squadron, 11th Armored Cavalry Regiment unit history, undated, http://wapedia.mobi/en/11th_Armored_Cavalry_Regiment_%28United_States%29?t=3 (accessed 4 February 2009); "History of the 11th Armored Cavalry Regiment," http://www.irwin.army.mil/Units/11TH+Armored+Cavalry+Regiment/11th+CR/ (accessed 4 February 2009).

72. Captain Keith R. Walters, "The RSTA Squadron: Agile and Adaptive, Relevant and Ready," *Armor* CXIII, no. 6 (November–December 2004): 19–21; Captain Matthew L. Blome, "The Stryker Cavalry Reconnaissance Troop," *Armor* CXV, no. 4 (July–August 2006): 29, quotation from same; Mark J. Reardon and Jeffery A. Charlston, *From Transformation to Combat: The First Stryker Brigade at War* (Washington, DC: Center of Military History, 2007), 19–26.

73. Blome, "The Stryker Cavalry Reconnaissance Troop," 29–30, quotation from page 30.

74. Armor Warfighting Symposium, Subj: Reconnaissance Panel Discussion, 18 May 2006, Armor Branch Archives, paper, 2006 Annual Command History files; Blome, "The Stryker Cavalry Reconnaissance Troop," 26–27, 29–30; Reardon and Charlston, *From Transformation to Combat,* 26–34.

75. 2d Squadron, 1st Cavalry Regiment, "The Blackhawk Journal: Operation Iraqi Freedom 2007–2008," Unit history, 2008, 8–9, 31, 49, 50–51, 52, 83, Armor Branch Archives, electronic, OIF.

76. Matthew Cox, "They Weren't Going to Get This Bird," *Army Times*, 22 November 2004, 22.

77. Blome, "The Stryker Cavalry Reconnaissance Troop," 26–29; Master Sergeant John Hegadush, "A Better Recce Troop," *Armor* CXV, no. 5 (September–October 2006): 38–39.

78. Reconnaissance Summit Briefing, Colonel Steven Mains, Subj: OIF/OEF Lessons Learned Reconnaissance Squadron (FOUO), 13 December 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

79. 2d Sqdn, 1st Cav Regt, "The Blackhawk Journal: Operation Iraqi Freedom 2007–2008," 53–54.

80. Sergeant First Class James Gentile, "Enhancing the Recce Troop's Lethality," *Armor* CXVIII, no. 4 (July–August 2009): 10–13.

81. Hegadush, "A Better Recce Troop," 37; Blome, "The Stryker Cavalry Reconnaissance Troop," 27, 32.

82. Ibid.

83. 3d Brigade, 2d Infantry Division, After Action Review notes, 1 April 2005, Armor Branch Archives, electronic, 05ACH/Army/Iraq/Impressions/SBCT; Wright and Reese, *On Point II,* 332.

84. Matthew Korade, "Working Out the Kinks: Soldiers Testing Out the Stryker in Iraq Reap Benefits, Discover Problems," *Anniston Star*, 12 September 2004, 1; General Officers Reconnaissance Integrated Concept Team Briefing, TDCD, Subj: SBCT Tactical Scenario—Recon Operational Requirements, 25 August 2005, Armor Branch Archives, paper, 2005 Annual Command History files; "Soldiers Hail New Army Troop Transport," *New York Times on the Web*, 5 April 2005, Armor Branch Archives, electronic, 05ACH/Army/Iraq/Materiel/Stryker; Michael E. Kurilla, "Strykers Get the Job Done," *Washington Post*, 5 April 2005, 22.

85. Paul Alfieri and Don McKeon, "Stryker Suitability Challenges in Complex Threat Environment," *Defense A R Journal,* 1 April 2008, Armor Branch Archives, electronic, OIF/SBCT; R. Jeffrey Smith, "Study Faults Army Vehicle," *Washington Post,* 31 March 2005, A01; Sandra Jontz, "Despite its Flaws, Troops Prefer Stryker," *Mideast Stars and Stripes,* 23 May 2005; Wright and Reese, *On Point II,* 512.

86. Robert H. Reid, Anne Flahery, Todd Pitman, and Pauline Jelinek, "U.S. Strykers Take Beating in Iraq," *Washington Times*, 6 June 2007, 13.

87. Hegadush, "A Better Recce Troop," 37–39; Blome, "The Stryker Cavalry Reconnaissance Troop," 26–31.

88. US Army Armor Center, FKSM 71-8, *Armor/Cavalry Reference Data: Ground Cavalry and Reconnaissance Organizations* (Fort Knox, KY: US Army Armor Center, 2007), A-30 to A-37 (FOUO).

89. Department of the Army, FM 3-20.96, *Reconnaissance Squadron* (Washington, DC: Headquarters, Department of the Army, 2006).

90. Ibid., 1-7 to 1-9.

91. Ibid., 2-23.

92. Ibid., 1-9 to 1-10.

93. Ibid., 1-14.

94. Ibid., xi.

95. Ibid., 3-2.

96. Ibid., 3-4.

97. Ibid., 3-5 to 3-6, 3-16. Similar principles were affirmed in the December 2007 draft version of the reconnaissance troop manual.

98. Ibid., 4-1.

99. Ibid., 4-2, 4-9 to 4-22.

100. Lieutenant Colonel (Retired) Charles W. Treese, "Taking Another Hard Look at the Combined Arms Cavalry Platoon," *Armor* CXV, no. 5 (September–October 2006): 3.

101. Curtis D. Taylor, "Trading the Saber for Stealth: Can Surveillance Technology Replace Traditional Aggressive Reconnaissance?" Association of the US Army, The Institute of Land Warfare, No. 53 (September 2005), 21, Armor Branch Archives, electronic, 06ACH/TDCD/Recon Dev.

102. Major Mark S. Leslie, "The HMMWV is an Effective Option in COIN Operations," *Armor* CXVI, no. 4 (July–August 2007): 3.

103. General Officers Reconnaissance Integrated Concept Team Briefing, Major General Tucker, Subj: Closing Remarks/Way Ahead, 25 August 2005; Reconnaissance Summit Briefing, Colonel Robert Valdivia, Subj: Backbrief to CG TRADOC, 14 December 2007.

104. Briefing, TDCD, Subj: Fort Knox CFPI Platform Demonstration Overview, 2006, Armor Branch Archives, electronic, 06ACH/TDCD/Vehicle Demo.

105. Briefing, Mounted Maneuver Battle Lab, Subj: HBCT Reconnaissance Squadron Experiment In-Progress-Review 4, 1 August 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

106. "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), Technical Report, draft version 2.0, 28 September 2007, 13, 17, 59–60, Armor Branch Archives, paper, 2007 Annual Command History files.

107. Reconnaissance Summit Briefing, Eastman and Betson, Subj: HBCT Reconnaissance Experiment Analytic Insights, 13 December 2007; "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 5–7, 9–10, 54–58.

108. Reconnaissance Summit Briefing, Eastman and Betson, Subj: HBCT Reconnaissance Experiment Analytic Insights; "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 14–15, 18–20.

109. Reconnaissance Summit Briefing, Eastman and Betson, Subj: HBCT Reconnaissance Experiment Analytic Insights; "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 4, 16, 20–22, 24–25, 33.

110. "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 17, 44–45.

111. Ibid., 5, 26–27.

112. "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 4, 13–14, 25, 35; Reconnaissance Summit Briefing, Eastman and Betson, Subj: HBCT Reconnaissance Experiment Analytic Insights.

113. "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 35; Reconnaissance Summit Briefing, Eastman and Betson, Subj: HBCT Reconnaissance Experiment Analytic Insights.

114. "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 53.

115. "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment" (FOUO), 4, 13, 18, 20, 22, 25, 29, 45; Reconnaissance Summit Briefing, Eastman and Betson, Subj: HBCT Reconnaissance Experiment Analytic Insights.

116. US Army Training and Doctrine Command, TRADOC Pam 525-7-9, *The United States Army's Concept Capability Plan: Intelligence, Surveillance,*

and Reconnaissance, 2015–2024 (Fort Monroe, VA: US Army Training and Doctrine Command, 2008), 35, 56.

117. Ibid., 56–57, quotation from page 57.

118. Ibid., 56–58.

119. Elaine M. Grossman, "Army Cavalry Regiment May Be Last Bastion in 'Fight for Information,'" *Inside the Pentagon*, 10 February 2005, 1; Sean D. Naylor, "End of the Road?" *Army Times*, 21 February 2005.

120. E-mail, Duane F. Klug, Subj: 3ACR Air Cav Squadron Retention Justification, 1 October 2008, Armor Branch Archives, electronic, 08ACH/TDCD; Memorandum, Lieutenant Colonel Gregory D. Reilly, Subj: Value of Organic Air Cavalry Squadron to Regimental Operations, 2008, Armor Branch Archives, electronic, 08ACH/TDCD; USAARMC, FKSM 71-8, *Armor Cavalry Reference Data: Armored Cavalry Regiment* (Fort Knox, KY: US Army Armor Center, 2008).

121. Reconnaissance Summit Briefing, Lieutenant Colonel Clifford T. Burgess, Subj: Platforms/Dismounts/Organization—Force Design Updates, 13 December 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

122. Briefing, Lieutenant Colonel (Promotable) Jeffrey Davidson Jr., Subj: Mounted Scout Platoon FDU April 2007, Armor Branch Archives, electronic, 2007 Annual Command History files.

123. Reconnaissance Summit Briefing, Burgess, Subj: Platforms/Dismounts/Organization—Force Design Updates.

124. Memorandum, John J. Twohig, Subj: Requirements Determination for the Brigade Combat Team and Armored Cavalry Holistic Review," 25 November 2008, Armor Branch Archives, paper, 2008 Annual Command History files.

125. Briefing, TDCD&E, Subj: BCT/ACR Holistic Review: FDU Unit Reference Sheets (URS), 28 November 2008, Armor Branch Archives, paper, 2008 Annual Command History files; Briefing, TDCD&E, Subj: BCT/ACR Holistic Review: 3d ACR Unit Reference Sheets, 10 December 2008, Armor Branch Archives, paper, 2008 Annual Command files.

126. Major Christopher Mahaffey, "Maintaining the ACR and its Capabilities for the Force," *Armor* CXVIII, no. 4 (July–August 2009): 34–43; Dan Murdock, "White Paper for Full Spectrum Reconnaissance and Security for Echelons Above Brigade (EAB) Combat Team," action officer working draft (FOUO), 11 August 2009, Armor Branch Archives, electronic, Cavalry Development/2007–2010/2009/3ACR Fate; Colonel Robin Mealer, Decision Paper: Conversion of Two Active Component HBCTs to SBCTs, 25 August 2009, Armor Branch Archives, electronic, Cavalry Development/2007–2010/2009/3ACR Fate; Gina Cavallaro and Kris Osborn, "U.S. to Switch 2 Heavy Brigades to Strykers," *Defense News*, 5 October 2009, 1.

127. Briefing, FORSCOM, Subj: Army Modularity, 31 March 2004, Armor Branch Archives, paper, 2004 Annual Command History files.

128. Briefing, Association of the US Army, Subj: Unit Designations in the Army Modular Force, 2005, Armor Branch Archives, electronic, 05ACH/Army/Modularity.

129. General Officers Reconnaissance Integrated Concept Team Briefing, CAC, CDD, Subj: Operational Concept for Employment of BFSB/Implied Reconnaissance Tasks from Modular Force Concept, 24 August 2005, Armor Branch Archives, paper, 2005 Annual Command History files.

130. Major Jaren K. Price, "The Battlefield Surveillance Brigade: The Future of Division-Level Intelligence, Surveillance, and Reconnaissance," *Armor* CXVII, no. 6 (November–December 2008): 34.

131. Reconnaissance Summit Briefing, Mr. Benn, Subj: Division/Corps Reconnaissance Discussion, 13 December 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

132. Ibid.

133. Ibid.

134. Price, "The Battlefield Surveillance Brigade: The Future of Division-Level Intelligence, Surveillance, and Reconnaissance," 36–39; Reconnaissance Summit Briefing, Lieutenant Colonel Ted R. Stuart and Pete Rose, Subj: 2008 Recon Summit, BFSB Mission and Organization Overview, 13 November 2008, Armor Branch Archives, electronic, 08ACH/TDCD/Recon Summit 2008/Read Ahead files.

135. Price, "The Battlefield Surveillance Brigade: The Future of Division-Level Intelligence, Surveillance, and Reconnaissance," 34.

136. Reconnaissance Summit Briefing, Stuart and Rose, Subj: 2008 Recon Summit, BFSB Mission and Organization Overview, 13 November 2008.

137. Reconnaissance Summit Briefing, Lieutenant Colonel Kenny D. Harper and Bill Betson, Subj: BFSB Brigade Computer Assisted Map Exercise, 13 November 2008 (FOUO), Armor Branch Archives, electronic, 08ACH/TDCD/Recon Summit 2008/Read Ahead Files.

138. Ibid.

139. Memorandum, Lieutenant Colonel C. Thomas Burgess, Subj: 2008 USAARMC Recon Summit, 21 November 2008, Armor Branch Archives, paper, 2008 Annual Command History files.

140. Colonel Peter C. VanAmburgh, "The Battlefield Surveillance Brigade in the Attack? 560th Battlefield Surveillance Brigade Lessons from Exercise North Wind 2008, Iwate, Japan, and Employment of Attached Maneuver Forces," *News From the Front*, 2008, http://call.army.mil (accessed 9 March 2009).

141. Memorandum, Burgess, Subj: 2008 USAARMC Recon Summit.

142. Recon Summit Briefing, Lieutenant Colonel Ted R. Stuart, Subj: 2008 Recon Summit Due-outs and BFSB Update (FOUO), 19 November 2009, Armor Branch Archives, electronic, 09ACH/TDCD/Recon Summit.

143. Ibid.

144. Ibid.

145. Ibid.

146. Ibid.

147. Ibid.

148. Recon Summit Briefing, Subj: Recon and Surveillance Support to Stability Operations—A Vignette (FOUO), 19 November 2009, Armor Branch Archives, electronic, 09 ACH/TDCD/Recon Summit.

149. Ibid.

150. Recon Summit Briefing, Colonel Mike Smith, Subj: Backbrief to CG TRADOC, 20 November 2009, Armor Branch Archives, electronic, 09 ACH/TDCD/Recon Summit.

151. Ibid.

152. Recon Summit Briefing, Subj: Enhancing the Battlefield Surveillance Brigade (FOUO), 18 November 2009, Armor Branch Archives, electronic, 09 ACH/TDCD/Recon Summit; Recon Summit Briefing, Subj: Division/Corps PIR Development (FOUO), 18 November 2009, Armor Branch Archives, electronic, 09 ACH/TDCD/Recon Summit.

153. Major General Terry L. Tucker, "Managing and Developing Tankers and Scouts," *Armor* CXII, no. 6 (November–December 2003): 4; Command Sergeant Major George DeSario Jr., "A Soldier's Path to Success," *Armor* CXII, no. 6 (November–December 2003): 5.

154. Colonel James K. Greer and Command Sergeant Major David L. Morris, "3d Battalion, 81st Armor Regiment: A New Source of 19D Cavalry Scouts," *Armor* CXIII, no. 6 (November–December 2004): 53.

155. Colonel James K. Greer and Command Sergeant Major David L. Morris, "Resequencing Training for More Battle Focus: The Transformation of 19D OSUT," *Armor* CXIII, no. 2 (March–April 2004): 51.

156. Captain William F. Shakespeare and Captain Wes Loyd, "Training the Next 'Old Bill' for the Contemporary Operating Environment," *Armor* CXVI, no. 3 (May–June 2007): 12–16; Armor Warfighting Conference Briefing, Subj: Initial Entry Training (IET) for an Army at War, 30 April 2007, Armor Branch Archives, electronic, 07ACH/Armor Conference 07/IET Briefing.

157. Staff Sergeant Brendan F. Kearns, "The Future of the Reconnaissance Professional," *Armor* CXIII, no. 3 (May–June 2004): 24–25.

158. Staff Sergeant Matthew H. Johnson, "Scouts Lead the Way!" *Armor* CXIV, no. 3 (May–June 2005): 3, 49.

159. Major General Terry L. Tucker, "The Armor Officer Education System Expands to Include 'Reconnaissance-Centric Training,'" *Armor* CXIV, no. 4 (July–August 2005): 3, 48.

160. Captain Mark Belinsky and Lieutenant Colonel Steven Duke, "Armor Basic Officer Leaders Course III," *Armor* CXV, no. 4 (July–August 2006): 33–35, 40.

161. Ibid., 33–35, 40.

162. Armor Warfighting Conference Briefing, TDCD&E, Subj: Institutional Course Update, 6 May 2008, Armor Branch Archives, electronic, 08ACH/Armor Warfighting Conference.

163. Major General Robert M. Williams, "U.S. Army Armor School: Building New Leaders," *Armor* CXV, no. 1 (January–February 2006): 4.

164. Tucker, "The Armor Officer Education System Expands to Include 'Reconnaissance-Centric Training,'" 3, 48; Armor Warfighting Symposium Briefing, 16th Cavalry Regiment, Subj; Maneuver Captains Career Course Information Brief, 18 May 2006, Armor Branch Archives, electronic, 06ACH/DAS/Armor Conference/Boudinot 122/18 MAY SME/1500-1530.

165. Lieutenant Colonel Patrick A. Clark and Major Edward Hayes, "Maneuver Captains Career Course," *Armor* CXV, no. 5 (September–October 2006): 18–22, 47; Armor Warfighting Symposium Briefing, 16th Cavalry Regiment, Subj; Maneuver Captains Career Course Information Brief, 18 May 2006.

166. Major John Grantz and Lieutenant Colonel John Nagl, "Teaching and Learning Counterinsurgency at the Armor Captains Career Course," *Armor* CXVI, no. 1 (January–February 2007): 15–17.

167. "The New Cavalry Leaders Course," *Armor* CXIV, no. 2 (March–April 2005): 52; Williams, "U.S. Army Armor School: Building New Leaders," 4.

168. Armor Warfighting Conference, USAARMC, Subj: Core Competency Task Analysis, 8 May 2008, Armor Branch Archives, electronic, 08ACH/Armor Warfighting Conference/Briefing Slides.

169. Major General Robert M. Williams, "Maintaining Armor Core Competencies," *Armor* CXVI, no. 1 (January–February 2007): 4; Armor Warfighting Conference Briefing, Lieutenant Colonel Shane E. Lee, Subj: Core Competency Work Group, 1 May 2007, Armor Branch Archives, paper, 2007 Annual Command History files.

170. Williams, "Maintaining Armor Core Competencies," 4; Armor Warfighting Conference Briefing, Lee, Subj: Core Competency Work Group; Captain Irvin Olivier Jr., "Short-term Focus at the Expense of Long-Term Technical Competency," *Armor* CXVI, no. 3 (May–June 2007): 3.

171. Matt M. Matthews, The Long War Series Occasional Paper 26, *We Were Caught Unprepared: The 2006 Hezbollah-Israeli War* (Fort Leavenworth, KS: Combat Studies Institute Press, 2008), 49. This reference is an excellent overview of tactical issues facing the Israeli Defense Forces and highlights readiness issues.

172. Williams, "Maintaining Armor Core Competencies," 4.

173. Armor Warfighting Conference Briefing, Lee, Subj: Core Competency Work Group.

174. Armor Warfighting Conference, USAARMC, Subj: Core Competency Task Analysis, 8 May 2008.

175. Brigadier General Donald M. Campbell, "Counterinsurgency and Core Competencies," *Armor* CXVII, no. 5 (September–October 2008): 4.

176. Armor Warfighting Conference Briefing, TDCD&E, Subj: Institutional Course Update, 6 May 2008.

177. Armor Warfighting Conference Briefing, Lee, Subj: Core Competency Work Group.

178. Brian Robinson, "FCS Cancellation Confirmed, Army Modernization Changes Course," *Federal Computer Week*, 24 June 2009; Sandra I. Erwin, "Army's Next Combat Vehicle: New Beginning or FCS Sequel?" *National*

Defense, August 2009; Megan Scully, "Army Making Progress on Plan for Next Combat Vehicle," *National Journal's Congress Daily AM*, 20 October 2009.

179. Reconnaissance Summit Briefing, Colonel Mike Smith, Subj: Combat Developments Update, 19 November 2009, Armor Branch Archives, electronic, 09ACH/TDCD/Recon Summit.

180. Department of the Army, FM 3-20.971, *Reconnaissance and Cavalry Troop* (Washington, DC: Headquarters, Department of the Army, 2009), final draft for approval (FOUO), 1-2 to 1-3, 1-7, Armor Branch Archives, electronic, 09ACH/TDCD/Doctrine.

181. Ibid., 1-8.

182. Ibid., chapter 5.

183. Ibid., 1-22.

184. Ibid., xv, 1-3, 1-5 to 1-7.

185. Ibid., xv.

186. Ibid., 3-1 to 3-2.

187. Ibid., chapter 3.

188. Department of the Army, FM 3-20.98, *Reconnaissance and Scout Platoon* (Washington, DC: Headquarters, Department of the Army, 2009), final draft for approval (FOUO), Armor Branch Archives, electronic, 09ACH/TDCD/Doctrine.

189. Ibid., xx.

190. Ibid., 3-8.

191. Ibid., 3-4 to 3-5.

192. Ibid., 3-20.

193. Ibid., chapter 3.

194. Ibid., chapters 3 and 5.

195. Briefing, 3/16 Cavalry, Subj: Army Recon Course: Pilot Design, 27 January 2009, (FOUO), Armor Branch Archives, paper, 2009 Annual Command History Files; Reconnaissance Summit Briefing, Lieutenant Colonel Scott D. King, 14 November 2008, Armor Branch Archives, paper, 2008 Annual Command History files.

196. Briefing, 3/16 Cavalry, Subj: Army Recon Course: Pilot Design; Reconnaissance Summit Briefing, Lieutenant Colonel Scott D. King.

197. Ibid.

Conclusion

The 80-year period between the interwar era and Operation IRAQI FREEDOM witnessed the emergence of new mounted reconnaissance types, the frequent reconfiguration of some, and the demise of others. Technological advances became particularly manifest in the evolution of reconnaissance platforms and communications. These developments necessarily impacted training and doctrine, while the capabilities of specific materiel at times triggered organizational restructuring. The evolving nature of the battlefield threat exerted a similar influence on reconnaissance trends that reflected the differing information requirements associated with conventional warfare, counterinsurgency, and stability operations.

The conceptual framework in which these changes occurred remained largely unaltered. The Army retained its tiered reconnaissance echelons from the corps down to the battalion, and information collection remained the primary function of all reconnaissance assets. The manner in which information collection occurred, however, remained a controversial issue throughout the period addressed. Differing schools of thought existed and their ability to influence doctrine, organization, training, and materiel development rose and fell over the decades. Yet within discord lay constancy. The reconnaissance debate remained rooted in a fundamental disagreement over the basic mission and nature of reconnaissance assets. Should they possess a robust organization with sufficient combat power to fight for information, perform an economy of force role, and execute security operations that entailed combat, or should their nature and employment principles embrace stealthy operations and combat avoidance? Was the scout a fighter or an observer?

The answer to these questions proved anything but simple. In its effort to determine one, the Army proved indecisive, alternatively favoring stealthy or fighting reconnaissance. The resultant swings from one school of thought to the other generated turbulence in reconnaissance organizations, usage, and materiel development. Training and readiness bore the cost. The shifts in emphasis often coincided with changes in the nature of the anticipated threat or battlefield. Hence, they appeared on the surface to be legitimate responses to an alteration of the operational environment. In fact, they reflected somewhat illogical attempts to resolve the reconnaissance dilemma by superimposing one set of ideas on another. This approach did not foster an effective resolution, because the competing schools of thought each had proven merit. Emphasizing one over the other often had the contradictory effect of accentuating the strengths of the sidelined view. Debate ensued and helped to precipitate the next shift

in emphasis. The cyclic nature of this process made the reconnaissance debate remarkably stable—the fundamental issue did not change.

In the interwar years, the establishment of the 7th Cavalry Brigade (Mechanized) challenged the horse cavalry's monopoly on mounted reconnaissance. The cavalry mission set embraced a wide range of operations, but its doctrine governing reconnaissance favored stealth. The vehicle-based mechanized cavalry developed employment principles designed to facilitate a high operational tempo and rapid, decisive action. Its reconnaissance elements relied on armed and armored platforms with the capacity for much greater combat power than the horse. This combination resulted in an emphasis on aggressive reconnaissance that accepted the likelihood of combat and the need to fight for information.

In 1940, the Armored Force assumed responsibility for the development of mechanized combat organizations. The 7th Cavalry Brigade (Mechanized) experience constituted its doctrinal foundation, and further reconnaissance development followed the pattern set by that unit. The cavalry retained responsibility for horse organizations and reconnaissance within the corps and infantry division. Motorization of support assets in horse cavalry units resulted in the use of the jeep as a scout platform. The latter's vulnerability encouraged the avoidance of combat and reliance on undetected observation. Reconnaissance developed in a bifurcated fashion until subjected to Lieutenant General Lesley J. McNair's Army-wide organizational rationalization. Standardization of reconnaissance units and the demise of the horse cavalry followed. McNair's functional approach to Army organization translated into mechanized cavalry reconnaissance units oriented on the singular mission of information collection. They supported army, corps, and division operations; but doctrine and training encouraged reconnaissance via observation and stealth rather than combat.

The reality of combat operations in North Africa and the European Theater of Operations forced mechanized cavalry units to perform a much broader mission set than intended. Pure reconnaissance operations became exceptional. Instead, most units performed the full range of activities once associated with the cavalry mission. Information collection proved inherent to these other roles. Large-scale improvisation in the combat theaters ensued to boost the overall capability of the mechanized cavalry, but a discrepancy remained between established doctrine and organization on one hand and battlefield reality on the other. The war's end generated a consensus within the mounted community to restructure reconnaissance organizations with more combat power and a stronger dismount capability.

Both trends became evident in the establishment of the armored cavalry regiment and the universal combined arms reconnaissance platoon.

The trend toward greater robustness and combat power reflected the wartime reality of a broad mission set and the necessity of combat. Units often fought for information and in the performance of other roles, but direct engagement of enemy forces was not the only or the most successful method of understanding the battlefield. Stealthy reconnaissance associated with the undetected establishment of an observation post on a strategic location often provided critical information that facilitated command decisions and maneuver. However, in the immediate postwar years, the inadequacy of mechanized cavalry organizations to perform a broader mission set dominated discussion of future reconnaissance needs.

Nevertheless, the universal reconnaissance platoon did not last long. The platoon's versatility and combat power came at the cost of reduced coverage. The mobility differential between its wheeled and tracked vehicles complicated maneuver, while the variety of weapons, military occupational specialty (MOS) types, and platforms posed training challenges for an Army suffering with readiness issues before and after the Korean War. The desired characteristics of reconnaissance units also varied, suggesting the validity of different organizations. The combined arms platoon suited the armored cavalry regiment and remained a staple element of that organization into the 1970s. The utility of this platoon organization for the mounted maneuver battalion proved less clear. The latter employed scouts to gather information, assist movement, and provide early warning of a hostile presence. Hence, the first battalion reconnaissance platoons in World War II included a handful of jeeps. The vulnerability of this platform resulted in the ad hoc reconfiguration of the platoon to include light tanks to provide some degree of armored firepower and protection. The combined arms platoon replaced this improvisation, but after the Korean War the platoon's organization reverted to an all-jeep configuration. In the early 1960s, the platoon regained its combined arms nature. This transition accompanied implementation of the Reorganization Objective Army Division (ROAD) with its emphasis on greater combat power.

This change marked the fourth reorganization since World War II. It reflected the meandering nature of reconnaissance concepts that bounced back and forth between light units intended for information collection via stealth and more robust organizations capable of additional missions and combat. Armored cavalry remained largely free from this confusion, partly because their mission set consistently included reconnaissance, security, and economy of force roles. Intended to operate independently, tactical

units down to the platoon level required a degree of self-sufficiency and combat capability. Hence, the armored cavalry regiment remained a powerful combined arms force and influenced the transition of the armored division reconnaissance battalion into a division cavalry squadron. The squadron possessed characteristics similar to those of the regiment albeit on a smaller scale. Both organizations further increased their versatility through the integration of organic aviation assets.

Maneuver battalion reconnaissance lacked this clarity of purpose. Fighting reconnaissance necessitated armed and armored platforms, but few suited this requirement. The Army's abandonment of the armored car after World War II and the slow development of a fully tracked replacement to the halftrack left few vehicle options for scouts. Light tanks possessed desirable qualities but possessed minimal dismounted capability and compromised all chance of undetected observation. The jeep posed the only viable platform for a light organization intended for reconnaissance and observation. Yet it offered minimal survivability and its cross-country mobility proved inferior to the tracked platforms of its parent armor or mechanized infantry battalion. A combined arms platoon, in addition to sacrificing coverage, posed a training challenge, since it constituted the only mixed organization in the battalion. Yet a lighter, pure organization required augmentation if employed in missions with a likelihood of combat. Instead of freeing combat assets for other missions, the reconnaissance platoon in this case forced their commitment to actions for which they were not optimized. Hence, the materiel, training, and capability tradeoffs necessary to establish a clear mission set and organization for battalion reconnaissance posed a dilemma that defied simple resolution. The nature of each tradeoff ensured that any final decision would not be met with unanimous consent.

Platform development offered the prospect of reducing these tradeoffs and combining desirable qualities in a single vehicle. The fielding of the M114 as a replacement to the jeep provided scouts with a full-tracked, armored vehicle. It offered increased mobility, better firepower, greater stowage capacity, and survivability. Another reorganization of battalion reconnaissance followed, resulting in a platoon equipped almost entirely with the M114. Unfortunately, the failure of this vehicle to meet its expectations undermined the effectiveness of this organization. It certainly did not become the definitive platoon structure.

Operations in Vietnam suggested the need for a more versatile organization. There scouts employed the larger and more reliable M113, modified to enhance firepower and survivability. Reconnaissance, however, proved

only one of many missions performed. Route security, convoy escort, base security, and conventional combat operations became standard activities in addition to information collection. Reconnaissance units found themselves employed as maneuver units by formations lacking sufficient manpower for their area of operations. The elusiveness of the Vietcong thrust scouts not only into the role of locating hostile forces but of immediately engaging them to prevent their escape. Consequently, the Vietnam experience shifted the nature of reconnaissance from stealthy information collection to a much more combative stance. The regular attachment of surveillance devices and the availability of aviation support for reconnaissance organizations established a pattern of interaction that lasted beyond the war. These developments suited the versatility of armored cavalry organizations, which helped to pioneer the principles governing mounted force use in a counterinsurgency role.

After Vietnam, the Army's focus shifted back to Central Europe, where it faced the armored threat of the Warsaw Pact. The 1973 Arab-Israeli War further underscored the increased lethality of new Soviet combat vehicles and the effects of large-scale armored combat. Consequently, the armor and antitank capabilities of US forces in Europe, including those dedicated for reconnaissance, increased. The armored cavalry platoon lost its combined arms nature in favor of a mix of main battle tanks, M113s, and Improved TOW Vehicles (ITV). The division cavalry squadron similarly increased its complement of tanks and missile launchers. Increased combat capability came at the cost of information collection and dismounted operations. These developments made cavalry appear little different from a mounted maneuver force and critics quickly called into question the need for any cavalry force at all. In the interest of countering the Soviet mechanized threat, cavalry organizations lost some of the versatility and combined arms quality that made them unique and desirable within the Army force structure.

Maneuver battalion scout platoons were not immune from this trend. They gradually transitioned to a mix of M113s and ITVs. The platoon shrank in personnel and vehicles, but its antitank capability improved. These changes encouraged mounted operations at the expense of stealth and dismounted capabilities. In the wake of the aggressive reconnaissance conducted in Vietnam, both cavalry and battalion scout organizations were demonstrating a similar trend toward mounted combat to counter a conventional mechanized threat.

This confluence of development found further expression in the M2/M3 Bradley Fighting Vehicle. This platform reflected the 1970s emphasis

on a powerful armament capable of destroying tanks and enhanced armored survivability. Intended to operate with the M1 Abrams tank on the armor-dominated battlefields of Central Europe, the Bradley's fielding to maneuver battalion scout platoons and armored cavalry organizations constituted a major increase in combat power to reconnaissance units. Moreover, by the early 1980s, all scout platoons were transitioning to a pure configuration based on this vehicle. The specter of a standard platoon organization once again arose, this time inspired not by previous combat experience but by the threat of a new war against a mechanized enemy.

Ironically, the division cavalry squadron's combat power and capability diminished with the M3's fielding. The unit lost its tanks and the last vestiges of combined arms capability in its subordinate troop and platoon organizations. Plans to offset this loss through the addition of brigade reconnaissance units and additional sensors at the division level never materialized. Hence, the division's cavalry component by default became restricted to reconnaissance and limited security missions. Its alignment also moved from the formation commander's direct control to subordination within the aviation brigade. Collectively, these actions restrained the squadron largely to reconnaissance activities and lowered its visibility within the division. They also triggered criticism of the trend in cavalry organizations, which seemed to stray from their traditional versatility, combined arms nature, and capacity to perform reconnaissance, security, and economy of force operations. Only the armored cavalry regiment retained these basic qualities. While its platoons converted to pure M3 organizations, it did not lose its tank component. Indeed, the fielding of the Abrams tank resulted in a troop structure that included both tank and scout platoons for task organization.

For the maneuver battalion scout platoons, their adoption of the pure M3 configuration marked the apex of the trend toward fighting reconnaissance. Whether or not heavy armament encouraged scouts to engage in combat at the expense of their reconnaissance duties became the subject of a study at the National Training Center (NTC) in the 1980s. Analysts perceived a direct correlation between scout direct fire engagement and access to heavy weapons. Too often, such combat resulted in the scout's simulated destruction, leaving the parent battalion to maneuver blindly or divert combat assets to resume the scout's mission. A reaction against the M3 scout platoon and its combat orientation ensued that resulted in changes to doctrine, training, and organization. Information collection without combat became the central focus of the platoon in an effort to promote reconnaissance success at the NTC and scout survival. A doctrinal consolidation merged employment principles for cavalry and battalion

scout platoons in favor of the latter. Institutional training increased the attention given to dismounted operations, stealth, and infiltration in lieu of fighting for information. Finally, organizational experimentation resulted in the 1990 adoption of the pure high-mobility, multipurpose wheeled vehicle (HMMWV) scout platoon for the maneuver battalion. Yet the unarmored, wheeled vehicle possessed lethality and survivability problems once associated with the jeep. Scouts had little option but to observe and collect information while avoiding battle, because they no longer possessed the means for combat.

In the space of a decade, the maneuver battalion scout platoon moved from one organizational extremity to another. In lieu of heavily armed and armored platforms, scouts maneuvered in unprotected vehicles. Reconnaissance coverage and attention to stealth increased at the expense of combat capability, survivability, and versatility. These extremes suited neither Army needs nor operational reality. Stealth, infiltration, and dismounted operations required time to plan and execute. Even at training centers, this time often proved unavailable, forcing scouts into hasty operations and a faster tempo. Such conditions increased the likelihood of detection and sudden contact with an enemy force for which they were not configured to overcome. The linkage between time, tempo, and reconnaissance method (aggressive or stealth) was not a new discovery in the 1980s. It had been understood since the interwar era and constituted part of the justification for providing scouts a degree of protection and combat capability. Unfortunately, in the adoption of the HMMWV scout platoon, survivability considerations took second place to the avoidance of combat. Too much of this decision rested on analysis of operations in an artificial training environment rather than the accumulated operational experience of previous reconnaissance organizations similarly equipped.

Operation DESERT STORM quickly demonstrated the importance of lethality and survivability in combat against a conventional force. The HMMWV scout platoon's battlefield debut proved inauspicious. Survivability concerns led battalion commanders to marginalize their employment to preserve the lives of their scouts. HMMWV vulnerability made commanders reluctant to employ the platoons in situations that might result in enemy contact, effectively nullifying their primary role. Ad hoc combined arms teams resulted in some cases to perform the type of aggressive reconnaissance desired. The short conflict provided a justification for the M3's capabilities, even if scouts equipped with this platform operated under the same restrictive doctrine as their HMMWV counterparts. Generally, combat operations proved a boon for cavalry organizations, confirming the versatility and effectiveness of the armored cavalry

regiment while generating powerful support for the return of tanks to the division cavalry.

Nevertheless, the decade following Operation DESERT STORM did not reverse the trend toward stealthy reconnaissance. Instead, the end of the Cold War removed the threat of combat with a major mechanized power. Regional threats necessitating intervention came to dominate the 1990s, but these operations underscored the need for rapid deployment. Downsizing and demobilization tended to erode heavy force strength, ultimately leaving only one heavy armored cavalry regiment in the Active Component. A second regiment converted to a light, HMMWV-based configuration. Despite survivability issues, the HMMWV remained the principal scout platform, with the M3 restricted to the reduced number of armored cavalry organizations. In stability and contingency operations, the HMMWV proved adequate and did not intimidate local populations, but survivability concerns remained, driven by the results of combat operations in Somalia and the threat of mines in the Balkans. Development of an up-armored HMMWV began, but the number fielded remained small. Among field units, interest in a mixed scout platoon of HMMWVs and M3s revived, but no institutional change occurred.

In the peace and stability operations undertaken in the Balkans, interaction with civilian populations proved critical to mission success. Only through discussions with individuals could scouts assess the problems, prevailing attitudes, and social climate of an area. Interpersonal relationships rather than technology proved the most important tools during these operations. Indeed, by the decade's end doctrine embraced the cultural aspects of information collection within the term multidimensional reconnaissance. The expansion of a scout's purview beyond hostile forces and terrain considerations to include a broad range of demographic and social data suited an Army confronted with a high likelihood of urban operations.

The explosion of information technology that characterized the 1990s and constituted the central focus of the Army's Force XXI initiative offered new opportunities for scouts. Through connection to a digital communications network, they could benefit from automated battle tracking of friendly units and easier access to a broad range of fire support, aviation, and intelligence assets to better understand and influence the battlefield. Information dominance and the sustainment of situational understanding became central goals of reconnaissance. Indeed, information became associated with survivability. Armed with a more comprehensive understanding of their environment, scouts were to evade hostile contact while collecting

critical information for their parent organization. The development of the long range advanced scout surveillance system (LRAS3) offered the scout the ability to observe hostile forces and report on their activities without entering direct-fire range. The combination of these developments seemed to address scout survivability. They also reinforced doctrinal emphasis on stealth, dismounted operations, and infiltration.

Reconnaissance techniques and doctrine became more reliant on technology. This became evident in the growing dependence on digital communications and devices to achieve unprecedented levels of situational awareness without having to fight for information. The Future Scout and Cavalry System (FSCS) was expected to end dissatisfaction with scout platforms. Plans for this vehicle included a host of sensors, digital communications, and the LRAS3. However, technology came at an escalating cost. Fielding plans for the FSCS envisioned a reduction in scout platoon size with a corresponding loss in manpower. The latter reduced a dismounted capability already considered inadequate. The end of the FSCS program did not end overreliance on technology. Instead, technology dependency dramatically increased with the development of the Future Combat System (FCS), a collection of networked manned and unmanned ground and aerial systems with a reduced human footprint.

The acquisition of new technology and organizational alterations proved a zero-sum game. More technology meant fewer platforms and personnel. The LRAS3 provided a considerable boost to scout capabilities. Yet its emergence in the scout platoons of a new division design encouraged vehicle and personnel strength reductions. This shrinkage permitted realization of another organizational goal: the fielding of a brigade reconnaissance troop. This digital unit filled the gap in information collection that existed between the division cavalry and the maneuver battalion. Little more than a collection of two reduced HMMWV scout platoons equipped with LRAS3, its contribution to combat operations remained limited to observation. It possessed the same vulnerabilities as every other HMMWV scout platoon.

By 2000, the ability to fight for information was becoming irrelevant in reconnaissance doctrine. An emphasis on unprecedented situational awareness and understanding achieved through reliance on advanced sensors, radars, unmanned aerial systems, and scouts equipped with LRAS3 led to the adoption of a new contact paradigm. It anticipated a vast increase in the information available to scouts, permitting them to locate enemy forces, track them, and continuously update their status without directly engaging them. Maneuver assets then prepared a response based on a

time, location, and manner of their choosing. Combat in the classical sense would not occur before this critical point of decision.

These concepts together with multidimensional reconnaissance pushed reconnaissance doctrine toward an extreme emphasis on information collection that necessarily affected organizational trends. Army Transformation resulted in the creation of the Stryker Brigade Combat Teams (SBCTs). Each one included a reconnaissance, surveillance, and target acquisition (RSTA) squadron devoted to building situational awareness. Digital communications, unmanned aerial systems, radar, and sensors complemented the reconnaissance platoons that included counterintelligence personnel. The combat capability of this organization, however, remained limited. It was designed to collect and assess information from multiple sources, including civilians. The unit leveraged intelligence available within its chain of command to avoid direct contact with hostile forces. In the event of a chance encounter, it employed indirect fires to disengage.

The noncombatant nature of the RSTA squadron went further with the development of the battlefield surveillance brigade (BFSB). This organization possessed a mix of military intelligence personnel, long-range surveillance teams, and a HMMWV-based scout organization. It possessed unique capabilities for information collection and evaluation, but none for combat. Designed for attachment to a division, the BFSB was intended to establish observation posts throughout the battlespace, in particular covering those areas not addressed by brigade reconnaissance. It relied on a digital network to access indirect fires and support from unmanned aerial systems, aircraft, or aviation to influence enemy action.

The model of building situational understanding without actually engaging the enemy did not survive combat operations in Iraq. There the initial drive to Baghdad proved a series of movements to contact that entailed combat. The combined arms nature and armored combat vehicles of the division cavalry squadron made it effective in these actions. Conversely, survivability concerns again limited the employment of HMMWV platoons. Maneuver battalions employed their scouts in roles other than reconnaissance, reequipped them with armored vehicles, or kept them close to combat units.

Subsequent counterinsurgency operations similarly belied reliance on technology to identify terrorists from standoff distances, particularly in urban areas. The most successful reconnaissance operations tended to be those that placed scouts in close proximity to both the civilian population and enemy fighters. In the former instance, the civilians became sources of intelligence and the focus of the multidimensional reconnaissance called

for in doctrine. In the latter case, the ability of insurgents to blend into the demographic landscape necessitated seeking them in city streets.

Maneuver battalion scout platoons also found they did not have the luxury of focusing entirely on information collection. Their activities included a broad range of missions common to most units in Iraq, including combat. Unfortunately, performance of these operations quickly revealed the unsatisfactory nature of the HMMWV, whose vulnerabilities were highlighted by hostile improvised explosive device (IED) use. Efforts to improve their protection and the accelerated fielding of an up-armored version helped to save lives, but degraded the vehicle's mobility and overall utility as a scout vehicle. The survivability issue triggered a shift in platoon configuration from a pure HMMWV to a HMMWV/M3 mix. The mixed platoon marked a step back from the inflated expectations once associated with information technology, standoff devices, and higher headquarters intelligence assets. It increased platoon combat power and offered some armored protection. It proved nearly identical to the solution adopted by tank battalions in World War II faced with a similar scout survival problem.

Counterinsurgency operations underscored the strengths and weaknesses of the RSTA squadron. The squadron proved highly effective in gathering information and in the execution of multidimensional reconnaissance. Its armored platform gave its reconnaissance platoons a degree of protection superior to that of the HMMWV, while its mobility permitted a high level of responsiveness. However, it did not have the luxury of focusing its activities on information collection. RSTA squadrons performed a much broader range of missions, including urban combat. Their efforts to build and sustain situational understanding depended less on technology than on the ability of their reconnaissance platoons to interact with the civilian populace.

Operations in Iraq also witnessed the emergence of a new reconnaissance organization: the brigade reconnaissance squadron. This unit resulted from the Army's transition to a modular force based on brigade combat teams that incorporated assets traditionally controlled by division and corps headquarters. Combined arms battalions matched with a reconnaissance squadron provided the principal means of influencing the battlefield. The squadron paralleled the RSTA squadron's reconnaissance orientation. It was not designed to fight for information, perform economy of force missions, or execute security operations other than observation. Still, its capabilities surpassed those of the brigade reconnaissance troop, which it replaced. The squadron's mixed HMMWV/M3 platoons also proved more robust.

Modularity increased the number of brigades available to provide a force pool better suited to sustain Army combat deployments over a long period, but each brigade combat team proved smaller than previous brigade organizations. In Iraq, the smaller size of the brigade combat teams, coupled with large areas of operation, resulted in the use of the reconnaissance squadron as another maneuver unit. This employment created challenges and necessitated squadron improvisation to satisfy its expanded mission set—a situation not unlike that faced by mechanized cavalry in World War II.

The combined arms division cavalry squadron became a casualty of modularity. The assets of this unit were absorbed in the process of expanding the number of brigade combat teams. This development left the armored cavalry regiment as the sole representative of cavalry organizations configured to perform reconnaissance, security, and economy of force roles. The enabling capabilities for this mission made the armored cavalry regiment an effective counterinsurgency instrument—reaffirming a similar conclusion drawn in Vietnam. The unit's combined arms nature gave it a versatility and tactical agility that permitted ready adaptation to most tactical environments. These qualities also made the armored cavalry regiment anomalous. It contradicted the prevalent trend in mounted reconnaissance toward organizations optimized for the singular purpose of stealthy information collection. Similarly, the regiment's retention of organic aviation ran counter to Army-wide efforts to consolidate aviation assets in specialized brigades. Pressure to dismantle the cavalry regiment organization mounted and resulted in the restructuring of the light regiment into another SBCT. The last Active Component heavy cavalry regiment avoided a similar fate through operational effectiveness in Iraq. In 2009, this reprieve came to an end with the Army's announcement of its intent to convert the 3d Armored Cavalry Regiment into an SBCT.

In the modular force structure, the absence of organizations with the combined arms qualities once associated with armored cavalry created new problems. Within the heavy brigade combat team (HBCT), the reconnaissance squadron's orientation toward information collection reduced its ability to perform fighting reconnaissance forward of the parent brigade or undertake security operations likely to require combat. It could not expect significant augmentation from the parent brigade, whose two maneuver battalions lacked the means to reinforce the squadron without significant reduction in their own capabilities. In the absence of a division cavalry squadron, the brigade could expect little assistance from its parent division unless a BFSB augmented the latter. The BFSB offered unique information collection and observation abilities to enhance maneuver and

assist in the effective employment of fire or aerial support. It could not fight for information, conduct security missions, or execute economy of force missions. If performed at all, these missions had to be undertaken by combat assets drawn from shrunken brigade combat teams. While modularity offered brigade commanders powerful new tools represented by unmanned aerial systems, digital networks, and reachback capabilities, it also tended to reduce ground reconnaissance capability throughout the division—particularly the ability to fight for information and assess enemy intent and disposition through direct contact.

Yet the continued development of mounted maneuver reconnaissance was not a fixed course. Change proved possible, especially when operations demonstrated the need for adjustment. The publication of new doctrinal manuals in 2009, for example, retained much of the prior emphasis on information collection and situation development without engaging hostile forces. However, they also acknowledged the periodic necessity to fight for information and likely employment of reconnaissance organizations in a broader mission set than preferred. Security missions began to receive greater emphasis in training and doctrine. Similarly, a number of recommended organizational modifications sought to make reconnaissance units more effective through additional dismounted scouts, increased firepower, and greater responsiveness to varied tactical conditions. Training improvements focused on the development of scout commanders whose demonstrated competency in critical skill areas made them readily adaptable to most operational environments.

All of these actions remained works in progress. Collectively, they reflected a step back from the extreme reliance on technology and the avoidance of combat that prevailed prior to Operation IRAQI FREEDOM. Combat operations pushed the emphasis in reconnaissance development back toward a middle ground that favored stealthy information collection and the enabling capabilities of new technology while simultaneously acknowledging the utility of more aggressive reconnaissance and security measures. Whether this acceptance would extend to include economy of force operations or result in the rebirth of a division reconnaissance unit with qualities similar to those of the division cavalry squadron remained unknown.

The trends outlined in these pages, however, are not. Mission assignments for reconnaissance units determine their organization, materiel, and training requirements. They need to embrace more than one principal activity. Units optimized for a single function invariably are thrust into additional roles for which they are not configured, forcing

improvised solutions and the invalidation of much of their related training and doctrine. These occurrences reflect not poor command judgment but operational realities. The Army has never possessed sufficient resources to permit the proliferation of highly specialized organizations with only one purpose. Therefore, the mission set for a reconnaissance organization must reflect its roles in major conventional wars, counterinsurgency, and stability actions. In the past, such operations necessitated security, administrative, and liaison duties in addition to information collection. Although the required roles will vary by command echelon, there is little reason to assume that future demands on reconnaissance units during the conduct of these operations will be any less than in the past.

Rejection or acceptance of the economy of force function requires attention. In the modular force structure, this issue becomes especially relevant at the brigade and division levels, because it influences decisions regarding the configuration of the brigade reconnaissance squadron and BFSB. Traditionally, the division cavalry squadron performed this role as necessary, but the absence of this unit and the smaller size of the modular brigades make its execution problematic at best. If it is no longer required, current unit configurations will suffice. If—as in Iraq—a requirement to perform economy of force operations does exist, organizational change will either be required at the division or brigade level.

Doctrine must embrace the value of both fighting and stealthy reconnaissance. Failure to do so will continue to push reconnaissance down a meandering path. The ability to fight for information or collect a steady stream of intelligence from an undetected observation post are both valid methods of securing details on threat activities. They are not mutually exclusive but complementary. Together they constitute options for a commander seeking information dominance. Similarly, reconnaissance and security operations need to be seen as integral elements that cannot be readily separated. Separation of the two generally results in the neglect of the latter and the adoption of an organization too light for any but the most permissive environment. Older doctrine routinely saw each reconnaissance mission as an implicit security mission and vice versa. This linkage needs to be reaffirmed and the related organizational and training implications accepted.

The doctrinal combination of a broader mission set, different styles of information collection, and the interrelated nature of reconnaissance and security underscore the importance of mental mobility. This term, once associated with horse cavalry, expresses the scout's ability to adjust, assess, and function in diverse operational settings. It is a critical requirement

for individuals charged with making rapid assessments in highly complex situations to assist decision making by commanders. Technology can assist but not replace the human brain's ability to analyze and apply intuition. Reconnaissance doctrine must provide a realistic framework of principles readily adaptable to different circumstances. Concepts designed for a single operational environment possess little resilience or longevity for the globally oriented US Army.

Multidimensional reconnaissance makes sense. It fits global urbanization trends and the likelihood of future operations among a civilian population. While its basic concepts may not be new, its codification within doctrine ensures a degree of visibility otherwise dependent entirely on a unit commander. However, emphasizing the importance of gathering social information in addition to more traditional intelligence on hostile forces and terrain requires commanders to provide a clear focus to their scouts. Information requirements must be readily understood and achievable to prevent the accumulation of a laundry list of situational data that does not facilitate rapid decision making.

Reconnaissance organizations require versatility to adapt to ever-evolving tactical situations and operational realities. Versatility without survivability and combat power has little relevance. Reconnaissance units unable to survive contact with an enemy and incapable of overcoming even light resistance tend to be marginalized either by a threat or by their own commanders. Even stealthy reconnaissance requires an ability to survive a chance contact or an ambush that may occur with little warning, particularly in an urban environment or during counterinsurgency and stability actions.

Units dependent on regular augmentation to perform their missions are improperly designed. Organizational capabilities must reflect unit specific missions and requirements. Necessarily this will result in different types of reconnaissance units, but this variance provides the Army with a mix of capabilities. Standard organizations generally have not lasted long precisely because they did not address the differing reconnaissance needs of the battalion, regiment, brigade, and division.

Organizational designs reflect a series of tradeoffs among capabilities. While combined arms reconnaissance organizations offer the most combat power and versatility, they do so at the expense of coverage. Similarly, more vehicles increase manning requirements and reduce the scouts available for dismounted operations. Determination of the optimum capability mix reflects the intended mission and the framework within which the unit will operate. Will it, for example, remain in close proximity to a combat

organization, thereby permitting more information collection capability at the expense of some combat power? Failure to appraise realistically how the unit will be employed or likely budget and manpower constraints will generate unbalanced organizations that struggle to execute missions.

Reconnaissance organizations require a robust dismount capability. The ability to dismount ensures a degree of stealth capability even for heavily armed and armored reconnaissance organizations. It also facilitates multidimensional reconnaissance, urban operations, and any activity that requires interaction with a civilian population. Technology enhances the scout's ability but cannot replace him. Moreover, machines have little value in situations requiring interpersonal relations with non-Western cultures. At the platoon level, it makes little sense to design organizations that substitute technological devices for scouts. Such a path reduces versatility, requires special diversions of manpower to protect the machines, and undermines overall operational effectiveness.

The proven value of aviation and unmanned aerial support to reconnaissance organizations demands clear policies regarding their distribution and usage. With the demise of the armored cavalry, reconnaissance units must seek such aviation support from external organizations—a process that does not promote close teamwork among air and ground cavalry. Unmanned aerial systems provide a viable but less capable alternative. Should they become organic to most reconnaissance units, and if so, at what level? No support is a step back from the demonstrated value of integrated air-ground reconnaissance established in the 1950s.

No definitive set of requirements exist for a reconnaissance vehicle that will satisfy all. This state reflects the inability to merge multiple capabilities onto a single platform. Heavily armed and armored vehicles tend to be tracked and possess a high noise signature and silhouette. These qualities preclude stealth and infiltration against an alert foe. Conversely, light, quiet platforms tend toward minimal survivability and lethality but compromise the safety of their passengers. Neither vehicle is optimal for all circumstances. Hence, a mix of vehicles is required, although this mix need not occur within a single organization. Pure platoons that can be task organized at the troop level will suffice. Each platform needs a baseline level of ballistic protection to make survival viable in the event of ambush or sudden contact. It also needs a weapon that not only facilitates disengagement but gives the scout the option of employing reconnaissance by fire or initiating a direct fire engagement with some chance of success. Experience with the jeep and HMMWV underscores the importance

of survivability and lethality. Stealth alone will not ensure survival. All reconnaissance vehicles need mobility equal to or preferably superior to their parent organization if they are to operate forward. They also require digital communications and the best optical devices available to identify and acquire targets both night and day.

Doctrine, materiel, and organization mean little without a capable scout to apply and employ them. Training, therefore, must reflect a fundamental skill set applicable to most operational environments. A definite requirement remains for such specialized training, given the unique and multifaceted nature of mounted maneuver reconnaissance. However, training rooted in rote, mechanical drills will not help the scout on the complex battlefields of tomorrow. Instead, training needs to instill not only the ability to execute specific tasks but also the ability to think through problems and solve them with a minimum of guidance. Teaching scouts how to think rather than what to do are central to building mental mobility and ensuring the ability to function in any operational environment.

The historical record from which these basic conclusions are drawn provides a rich tapestry of experience based on actual operations and real world events. It is a tool with which to address current and future reconnaissance challenges. Historical experience offers an alternative to exclusive reliance on current events, computer modeling, and simulations analysis. Moreover, its focus lies on the activities and accomplishments of individuals. This human emphasis reflects the most important asset in any reconnaissance organization—the individual scout, who must make the determination to fight or not.

Glossary

AAR	after action review
AC3	Armor Captains Career Course
ACAV	Armored Cavalry Assault Vehicle
ACR	Armored Cavalry Regiment
ACT	armored cavalry trainer
AGF	Army Ground Forces
AGS	Armored Gun System
ALB	AirLand Battle
AM	amplitude modulation
ANCOC	Advanced Noncommissioned Officers Course
AOAC	Armor Officer Advanced Course
AOBC	Armor Officer Basic Course
APC	armored personnel carrier
ARVN	Army of the Republic of Vietnam (South Vietnam)
ASRV	Armored Scout and Reconnaissance Vehicle
ATGM	antitank guided missile
AUV	armored utility vehicle
AVLB	armored vehicle launch bridge
AWC	Army War College
AWOL	absent without leave
BCT	brigade combat team
BFSB	battlefield surveillance brigade
BFV	Bradley Fighting Vehicle
BOLC	Basic Officer Leadership Course
BRAC	Base Realignment Commission
BRDM	literally “Combat Reconnaissance Patrol Vehicle”
BRP	Blue Ribbon Panel
C2	command and control
CAC	Combined Arms Center
CALL	Center for Army Lessons Learned
CAS3	Combined Arms and Services Staff School
CAV	cavalry
CCH	Close Combat Heavy
CCIR	commander’s critical information requirement
CDC	Combat Development Command
CEWI	Combat Electronic Warfare Intelligence
CFV	Cavalry Fighting Vehicle
CINCOS	change in NCO structure
CLC	Cavalry Leaders Course
CMTC	Combat Maneuver Training Center
COIN	counterinsurgency
COLT	combat operations lasing team
CONARC	Continental Army Command

CONUS	continental United States
COP	common operational picture
CROWS	crew remotely operated weapon system
CVC	combat vehicle crewman
DA	Department of the Army
DOD	Department of Defense
DTIC	Defense Technical Information Center
e.g.	for example
ETO	European Theater of Operations
EXFOR	Experimental Force
FAA	Functional Area Assessment
FBCB2	Force XXI Battle Command Brigade and Below
FCS	Future Combat System
FDU	force design update
FEBA	forward edge of battle area
FLIR	forward looking infrared
FM	field manual; frequency modulation
FORSCOM	Forces Command
FOUO	For Official Use Only
FSCS	Future Scout and Cavalry System
GCM	George C. Marshall Foundation
GHQ	General Headquarters
GPS	global positioning system
HBCT	heavy brigade combat team
HHC	headquarters and headquarters company
HHT	headquarters and headquarters troop
HIMARS	High Mobility Artillery Rocket System
HMMWV	high-mobility multipurpose wheeled vehicle
HQ	headquarters
HUMINT	human intelligence
HUMRRO	Human Resources Research Organization
IBCT	Infantry Brigade Combat Team
IDF	Israeli Defense Forces
IDIV	interim division
IED	improvised explosive device
IET	initial entry training
IPR	In-Process Review
IR	infrared
ISR	intelligence, surveillance, and reconnaissance
ITV	Improved TOW Vehicle
JRTC	Joint Readiness Training Center
JSTARS	Joint Surveillance and Target Attack Radar System
LACR	light armored cavalry regiment
LAV	light armored vehicle
LAW	light antitank weapon

LCR	light cavalry regiment
LRAS3	long range advanced scout surveillance system
MACOV	Mechanized and Armor Combat Operations in Vietnam
MACV	Military Assistance Command–Vietnam
MC3	Maneuver Captains Career Course
MEDEVAC	medical evacuation
MELIOS	mini eye-safe laser infrared observation set
MGS	mobile gun system
MHI	Military History Institute
MICV	Mechanized Infantry Combat Vehicle
MILMO	military motorcycle
MLRS	multiple launch rocket system
MOS	military occupational specialty
MTOE	modified table of organization and equipment
NARA	National Archives and Records Administration
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, and chemical
NCO	noncommissioned officer
NLOS	non-line-of-sight
NTC	National Training Center
NVA	North Vietnamese Army
O&O	organizational and operational
OCAFF	Office of the Chief of Army Field Forces
ODS	Operation DESERT STORM
OEF	Operation ENDURING FREEDOM
OIF	Operation IRAQI FREEDOM
OOTW	operations other than war
OP	observation post
OPFOR	opposing force
PIR	priority information requirement
PSYOP	psychological operations
REMBASS	remotely monitored battlefield sensor system
RG	Record Group
ROAD	Reorganization Objective Army Division
ROCAD	Reorganization of the Current Armored Division
RPG	rocket propelled grenade
RSTA	reconnaissance surveillance and target acquisition
S2	intelligence officer
S3	operations and training officer
S5	civil affairs officer
SAC	Strategic Air Command
SAMS	School of Advanced Military Studies
SBCT	Stryker Brigade Combat Team
SEATO	Southeast Asia Treaty Organization
SEP	System Enhancement Program

SIMNET	Simulations Network
SPLC	Scout Platoon Leaders Course
SSCO	small scale contingency operations
SUSV	Small Unit Support Vehicle
TF	task force
TOE (TO&E)	table of organization and equipment
TOW	tube-launched, optically-tracked, wire-guided
TRAC	TRADOC Analysis Center
TRACER	Tactical Reconnaissance Armored Combat Equipment Requirement
TRADOC	Training and Doctrine Command
UAV	unmanned aerial vehicle
UN	United Nations
URS	Unit Reference Sheet
US	United States
USAARMC	US Army Armor Center
USAARMS	US Army Armor School
VC	Viet Cong
WMD	weapon of mass destruction

Bibliography

Archival Sources

George C. Marshall Library (GCM), Lexington, VA
National Archives Project.
Personal Papers and Manuscript Collections: Paul M. Robinett.

National Archives and Records Administration, Washington, DC
Record Group 177, Office of the Chief of Cavalry, General Correspondence.
Record Group 337, Headquarters, Army Ground Forces and General Headquarters.

Patton Museum of Cavalry and Armor, Fort Knox, KY
Personal Papers and Manuscript Collections: Falkovich.

US Army Armor Branch Archives, Fort Knox, KY
2d Cavalry Regiment files.
9th Infantry Division, Motorized files.
Annual Command History files, 1995–2009.
Army Transformation files.
Cavalry History files.
Evolution of Armor files.
Operation IRAQI FREEDOM files.
Operation IRAQI FREEDOM interview transcripts.
Strike Force files.
Vietnam files.

US Army Armor School Research Library, Fort Knox, KY
Tactical Notebook, May 1993.
US Army Armor School. Armored Division Organization Charts, 15 September 1943. Reprint.

US Army Heritage and Education Center, Military History Institute, Carlisle, PA
Personal Papers and Manuscript Collections: 11th Armored Cavalry Regiment, Company Command in Vietnam, Willis D. Crittenberger, Alvan C. Gillem Jr., Robert W. Grow, Leon B. Kromer, Henry C. Newton, Wallace H. Nutting, Mechanized Operations in Vietnam, Donn A. Starry.
US Army War College Curricular Archives.
Transcripts of Lectures and Content Discussion.
Student Committee Reports.
Miscellaneous Reports.
World War II: US Army, War Game Maneuvers.
Library: Government Reports, Studies, and Training Materials.
Lynch, George A. "Final Report of Major General George A. Lynch: A Summary of Infantry Developments during His Term of Office," 30 April 1941.

US Army Ground Forces, Observer Board, European Theater. "Reports of Observers, ETO 1944–1945," 6 vols.

US Army Ground Forces, Observer Board. "Report of Observers: Mediterranean Theater of Operations," 4 vols.

Government Publications

Department of the Army. FM 1, *The Army*. Washington, DC: Headquarters, Department of the Army, 2005.

———. FM 3-20.96, *Reconnaissance Squadron*. Washington, DC: Headquarters, Department of the Army, 2006.

———. FM 3-20.971, *Reconnaissance Troop: Recce Troop and Brigade Reconnaissance Troop*. Washington, DC: Headquarters, Department of the Army, 2002.

———. FM 3-20.971, *Reconnaissance and Cavalry Troop*. Washington, DC: Headquarters, Department of the Army, 2009 (FOUO).

———. FM 3-20.98, *Reconnaissance Platoon*. Washington, DC: Headquarters, Department of the Army, 2002.

———. FM 3-20.98, *Reconnaissance and Scout Platoon*. Washington, DC: Headquarters, Department of the Army, 2009 (FOUO).

———. FM 3-21.31, *The Stryker Brigade Combat Team*. Washington, DC: Headquarters, Department of the Army, 2003.

———. FM 17-1, *Armor Operations*. Washington, DC: Headquarters, Department of the Army, 1963.

———. FM 17-1, *Armor Operations*. Washington, DC: Headquarters, Department of the Army, 1966.

———. FM 17-15, *Tank Units: Platoon, Company, and Battalion*. Washington, DC: Headquarters, Department of the Army, 1966.

———. FM 17-15, *Tank Units, Platoon, Company and Battalion*. Washington, DC: Headquarters, Department of the Army, 1966. Change 2, 15 December 1972.

———. FM 17-22, *Reconnaissance Platoon and Reconnaissance Company*. Washington, DC: Government Printing Office, 1950.

———. FM 17-30, *The Armored Division Brigade*. Washington, DC: Headquarters, Department of the Army, 1961.

———. FM 17-33, *Tank Battalion*. Washington, DC: Government Printing Office, 1949.

———. FM 17-35, *Reconnaissance Battalion, Armored Division*. Washington, DC: Government Printing Office, 1951.

———. FM 17-35, *Armored Cavalry Units, Armored and Infantry Divisions*. Washington, DC: Headquarters, Department of the Army, 1957.

———. FM 17-35, *Armored Cavalry Platoon, Troop, and Squadron*. Washington, DC: Headquarters, Department of the Army, 1960.

———. FM 17-36, *Divisional Armored and Air Cavalry Units*. Washington, DC: Headquarters, Department of the Army, 1968.

———. FM 17-36, *Armored Cavalry Platoon, Troop, and Divisional Armored Cavalry Squadron.* Washington, DC: Headquarters, Department of the Army, 1973.
———. FM 17-95, *The Armored Cavalry Regiment and the Armored Cavalry Reconnaissance Battalion*. Washington, DC: Government Printing Office, 1951.
———. FM 17-95, *The Armored Cavalry Regiment*. Washington, DC: Headquarters, Department of the Army, 1960.
———. FM 17-95, *The Armored Cavalry Regiment*. Washington, DC: Headquarters, Department of the Army, 1966.
———. FM 17-95, *Cavalry*. Washington, DC: Headquarters, Department of the Army, 1977.
———. FM 17-95, *Cavalry Operations*. Washington, DC: Headquarters, Department of the Army, 1991.
———. FM 17-95, *Cavalry Operations*. Washington, DC: Headquarters, Department of the Army, 1996.
———. FM 17-97, *Regimental Armored Cavalry Troop*. Washington, DC: Headquarters, Department of the Army, 1988.
———. FM 17-97, *Cavalry Troop*. Washington, DC: Headquarters, Department of the Army, 1995.
———. FM 17-98, *The Army 86 Scout Platoon*. Washington, DC: Headquarters, Department of the Army, 1985.
———. FM 17-98, *Scout Platoon*. Washington, DC: Headquarters, Department of the Army, 1987.
———. FM 17-98, *Scout Platoon*. Washington, DC: Headquarters, Department of the Army, 1994.
———. FM 17-98, *Scout Platoon*. Washington, DC: Headquarters, Department of the Army, 1999.
———. FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force.* Washington, DC: Headquarters, Department of the Army, 1977.
———. FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force.* Washington, DC: Headquarters, Department of the Army, 1988.
———. FM 71-100, *Armored and Mechanized Division Operations*. Washington, DC: Headquarters, Department of the Army, 1978.
———. FM 100-5, *Operations*. Washington, DC: Headquarters, Department of the Army, 1976.
———. FM 100-5, *Operations*. Washington, DC: Headquarters, Department of the Army, 1982.
———. FM 100-5, *Operations*. Washington, DC: Headquarters, Department of the Army, 1986.
———. Table of Organization and Equipment No. 17-26N, Headquarters, Headquarters and Service Company, Medium Tank Battalion, 5 April 1948.
———. Table of Organization and Equipment 17-55, Reconnaissance Battalion, Armored Cavalry Regiment (Light), 7 October 1948.

———. Table of Organization and Equipment No. 17-57N, Reconnaissance Company, 23 January 1948.

Office of the Army Chief of Staff. *Louisiana Maneuvers: The First Year*. Fort Monroe, VA, 1994.

US Army. "United States Army 2002 Posture Statement," 2002.

———. "2002 Army Modernization Plan," undated.

US Army Adjutant General's Office. *Official Army Register*. Washington, DC: Government Printing Office, 1931.

US Army Training and Doctrine Command. TRADOC Pamphlet 525-5, *Military Operations: Force XXI Operations, A Concept for the Evolution of Full-Dimension Operations for the Strategic Army of the Early Twenty-First Century*. Fort Monroe, VA: US Army Training and Doctrine Command, 1994.

———. TRADOC Pam 525-7-9, *The United States Army's Concept Capability Plan: Intelligence, Surveillance, and Reconnaissance, 2015–2024*. Fort Monroe, VA: US Army Training and Doctrine Command, 2008.

US Army Transportation Museum. "Highway Operations." http://www.transchool.eustis.army.mil/museum/KoreaHighway.htm (accessed 24 January 2008).

US Congress, House. Subcommittee of the Committee on Appropriations. *War Department Appropriation Bill for 1933 Military Activities, Hearings*. 72d Congress, 1st Session, 1932.

———. Subcommittee of the Committee on Appropriations. *War Department Appropriation Bill for 1935 Military Activities, Hearings*. 73d Congress, 2d Session, 1934.

———. Subcommittee of the Committee on Appropriations. *War Department Appropriation Bill for 1936 Military Activities, Hearings*. 74th Congress, 1st Session, 1935.

———. Subcommittee of the Committee on Appropriations. *War Department Appropriation Bill for 1937 Military Activities, Hearings*. 74th Congress, 2d Session, 1936.

US War Department. *Cavalry Field Manual*, 3 vols., Washington, DC: Government Printing Office, 1938.

———. FM 2-5, *Cavalry Field Manual, Horse Cavalry*, Washington, DC: Government Printing Office, 1940.

———. FM 2-10, *Cavalry Field Manual, Mechanized Elements*. Washington, DC: Government Printing Office, 1941.

———. FM 2-15, *Cavalry Field Manual, Employment of Cavalry*. Washington, DC: Government Printing Office, 1941.

———. FM 2-30, *Cavalry Field Manual, Cavalry Mechanized Reconnaissance Squadron*. Washington, DC: Government Printing Office, 1943.

———. FM 2-20, *Cavalry Reconnaissance Troop Mechanized*. Washington, DC: Government Printing Office, 1944.

———. FM 2-30, *Cavalry Mechanized Reconnaissance Squadron*. Washington, DC: Government Printing Office, 1944.

———. FM 17-5, *Armored Force Field Manual, Armored Force Drill*. Washington, DC: Government Printing Office, 1942.
———. FM 17-20, *Employment of Armored Units, Reconnaissance Platoon and Company*. Washington, DC Government Printing Office, 1942.
———. FM 17-33, *Armored Force Field Manual, The Armored Battalion, Light and Medium*. Washington, DC: Government Printing Office, 1942.
———. FM: 100-5, *Field Service Regulations: Operations*. Washington, DC: Government Printing Office, 1941.
———. FM 100–5, *Field Service Regulations: Operations*. Washington, DC: Government Printing Office, 1944.
———. *National Defense Act Approved June 3, 1916 as Amended by Act Approved August 29, 1916; Act Approved July 9, 1918; Act Approved February 28, 1919; Act Approved July 11, 1919; Act Approved September 29, 1919; Act Approved June 4, 1920*, 1920.

Government Studies

2d Squadron, 1st Cavalry Regiment. "The Blackhawk Journal: Operation Iraqi Freedom 2007–2008." Unit history, 2008.
3d Armored Cavalry Regiment. "Regimental History." http://www.hood.army.mil/3d_acr/regimental_history.aspx (accessed 3 February 2009).
3d Brigade, 2d Infantry Division. After Action Review notes, 1 April 2005.
Baker, Robert A. "A Survey of Problems in the Tactical Training of Armor Units." Human Resources Research Organization Report. Fort Knox, KY, December 1961.
BDM International, Inc. "Armor 2000 Study Synopsis." Report, 31 January 1991.
Biddle, Stephen. "Afghanistan and the Future of Warfare: Implications for Army and Defense Policy." Strategic Studies Institute. US Army War College, 20 October 2002.
Bowman, Lieutenant Colonel (Promotable) Stephen L., Lieutenant Colonel John M. Kendall, and Lieutenant Colonel James L. Sauders (eds.). "Motorized Experience of the 9th Infantry Division, Fort Lewis, Washington, 1980–1989." Unpublished manuscript, 9 June 1989.
Bratisax, Captain Roland J. "Reconnaissance Vehicle." Student Report No. 50-26. US Army Armor School, Fort Knox, KY, undated.
Burns, Captain Bob. "Reconnaissance: Task Force Scouts—Tactics, Techniques, and Procedures." Combat Training Centers Bulletin No. 93-4 (July 1993): 1–5.
Cameron, Robert S. Interview with Colonel William R. Betson, 25 March 1998.
———. Briefing, Subj: There and Back Again: Constabulary Training and Organization, 1946–1950, 2000. Armor Branch Archives, electronic, Hist/Hist Ref/Evolution of Armor/Constabulary.
———. End of tour interview with Major General George H. Harmeyer, 1999.
———. "United States Army Armor Center and Fort Knox 1996 Annual Command History." Report, 11 March 1998.

———. "United States Army Armor Center and Fort Knox 1997 Annual Command History." Draft report, undated.

Cook, Arthur B. "Report of Combat Action," 1 September 1968. http://www.bobcat.ws/cor1.htm (accessed July 2008).

Cook, John G. "A Survey of Problems in the Tactical Training of Armored Cavalry Platoons." Human Resources Research Organization report. Fort Knox, KY, January 1963.

Cranston, John W. "Assessment by Major General Thomas H. Tait of his Tenure as Commanding General, US Army Armor Center and Fort Knox, June 1986–August 1988." End of tour interview, 18 August 1989.

———. "Final Interview, Brigadier General Dennis V. Crumley." End of tour interview, 20 June 1989.

———. "Final Taped Interview with Brigadier General Paul E. Funk." End of tour interview, 15 October 1987.

———. "Interview with Major General Thomas C. Foley," 20 July 1991.

———. "US Army Armor Center and Fort Knox Annual Command History CY87." Fort Knox, KY.

———. "US Army Armor Center and Fort Knox Annual Command History CY88." Fort Knox, KY.

———. "US Army Armor Center and Fort Knox Annual Command History CY89." Fort Knox, KY.

———. "United States Army Armor Center and Fort Knox 1994 Annual Command History." Report, undated.

Cunningham, Major Robert F., Captain Robert S. Smith Jr., Captain Warren G. Gossett, Captain George F. Hoge, and Captain Roy L. Liles. "Ontos in the Reconnaissance Platoon." Student paper 45.4-19. US Army Armor School, Fort Knox, KY, 1953.

Department of the Army. "Tank Panel Final Report," May 1953.

Department of the Army Armored Panel. "The Report of Department of the Army Armored Panel," 1 July 1950.

Department of Defense. "Modular Army Brigades Prepare for Deployment," 22 November 2004. www.defenselink.mil/transformation/articles/2004-11/ta112204e.html (accessed 26 February 2009).

Dixon, Captain Willard Jr. "Are the Missions the Same?" Student paper 46-53. Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, c. 1963.

Feickert, Andrew. "U.S. Army's Modular Redesign: Issues for Congress." Congressional Research Service Report, 19 July 2004.

———. "U.S. Army's Modular Redesign: Issues for Congress." Congressional Research Service Report, 6 January 2005.

Fitzgerald, Captain William A. Jr. "Bring Back the Scout Platoon." Student paper 50-72. Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1964.

Foley, Thomas C. End of tour interview, 8 July 1992.

Gingrich, Karl, and Lawrence G. Vowels. "Interim Cavalry Regiment Analysis." Report, 1 June 2001.

Goldsmith, Martin. *Battalion Reconnaissance at the National Training Center*. Santa Monica, CA: RAND, 1996.

Graves, Captain Gary P. "Ground Reconnaissance for the Tank Battalion—Now." Student paper 46-73. Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1963.

Harrell, Lieutenant General Ben. "Evaluation of U.S. Army Mechanized and Armor Combat Operations in Vietnam (MACOV)," 15 May 1967.

Harju, Major (Promotable) Craig S. "White Paper—A Study of the Maneuver Battalion Reconnaissance or Scout Platoon." US Army Armor School, Fort Knox, KY, 18 September 1989.

Hickey, Major Christopher M. "Heavy Brigade Offensive Reconnaissance Operations: A Systems Perspective." Student report. School of Advanced Military Studies, Fort Leavenworth, KS, 18 December 1997.

Historical Section, Army Ground Forces. Study No. 27, "The Armored Force, Command and Center," 1946.

House of Commons Library. "Research Paper 01/81: Operation Enduring Freedom and the Conflict in Afghanistan—An Update," 31 October 2001.

K Troop, 11th Armored Cavalry. After Action Report, 21 May 1967. http://www.ktroop.com/bandana.htm (accessed July 2008).

Krause, Colonel Michael D. "The Battle of 73 Easting, 26 February 1991: A Historical Introduction to a Simulation." Report, 2 May 1991.

Lindholm, Captain Tom L. "What Do We Have for Recon?" Student paper 50-113. Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1964.

McCarthy, Lieutenant Colonel Thomas C. "U.S. Army Heavy Brigade Reconnaissance During Offensive Operations." Student report. School of Advanced Military Studies, Fort Leavenworth, KS, 1994.

Mullins, Major J. Bryan. "Defining the Core Competencies of U.S. Cavalry." Student report. School of Advanced Military Studies, Fort Leavenworth, KS, 2004.

National Training Center. "National Training Center Commander's Memorandum: Lessons Learned." Report, 20 November 1985.

Parkins, James F., Harry W. Morse, George E. Armstrong, David B. Humphrey, and Albert C. Smith Jr. "The Heavy Reconnaissance Vehicle for the Reconnaissance Platoon." Student report N-2/46.87. US Army Armor School, Fort Knox, KY, April 1953.

Rago, Major Louis B. II. "Cavalry Transformation: Are We Shooting the Horse Too Soon?" Student report. School of Advanced Military Studies, Fort Leavenworth, KS, 2002.

Robbins, Captain Douglas C. "Operation Desert Storm: Battle of Norfolk—Scout Platoon, Task Force 5-16, 1ID." Personal experience monograph, April 1991.

Rosenberger, Major John D. "An Assessment of Reconnaissance and Counterreconnaissance Operations at the National Training Center." Report, February 1987.

Rosenberger, John D., and Jerry P. Schulz. "White Paper: Cavalry Operations." Draft, version 6.0, 20 November 2002.

Secretary of Defense. *Annual Report to the President and Congress*, 2002.

Shields, Captain Harry H. Jr., Captain James L. Andrews, Captain Carroll M. Cook Jr., Captain Loren E. Davis, and Captain Kenneth W. Fisher. "Employment of Armor in Korea, Vol. II: The Second Year." Student report No. 45.4-35. US Army Armor School, Fort Knox, KY, 1953.

Smith, Seward, Thomas J. Thompson, and Alexander Nicolini. "Human Factors and Training Evaluation of the Improved TOW Vehicle (ITV) during OT/DT III." Report, August 1980.

Smith, Captain Stephen H., Captain James R. Booth, Captain Robert H. Harrington, Captain Glenwood W. Flint, and Captain Charles C. Ross. "The Need for a Lightly Armored Vehicle in US Reconnaissance Units." Student paper 2/46.102. US Army Armor School, Fort Knox, KY, 1952.

Stawasz, Major John M. "Light Divisional Cavalry and Low-Intensity Conflict Reconnaissance." Student report. School of Advanced Military Studies, Fort Leavenworth, KS, 13 December 1991.

Stone, Captain Gordon L. "More for Your Money," Student paper 50-178. Armor Officer Advanced Course, US Army Armor School, Fort Knox, KY, 1964.

Tait, Major General Thomas H. "Evolution of Armor." Armor Conference Report to Force, 10 May 1989.

Taylor, Major Curtis D. "The Transformation of Reconnaissance: Who Will Fight For Information on the Future Battlefield?" Master's thesis. US Army Command and General Staff College. Fort Leavenworth, KS, 2005.

Thompson, Captain Milton R., Captain Harry B. Hardy, Captain Kibbey M. Horne, Captain Kenneth W. Koch, and First Lieutenant Jack F. Matteson. "Employment of Armor in Korea, Vol. I: The First Year." Student report 45.3-11. US Army Armor School, Fort Knox, KY, May 1952.

Tullar, Captain Thomas A. "From Reconnaissance to Scouts." Student paper 45.6-142. US Army Armor School, Fort Knox, KY, c. 1962.

"Unit History for Task Force 3-69—Operation Enduring Freedom and Operation Iraqi Freedom," 2003.

US Army Armor Branch History Office. Operation Enduring/Iraqi Freedom Experience Survey. Executive Summary, 2 May 2006.

US Army. "Concepts for the Objective Force." White paper, 2001.

US Army Armor Center. "Advanced Warfighting Experiment Operation Desert Hammer VI: Final Report," 28 July 1994.

———. "Desert Shield and Desert Storm Emerging Observations." Report, 7 October 1991.

———. FKSM 71-8, *Close Combat Heavy (CCH) Maneuver Organizations*. Fort Knox, KY: US Army Armor Center, 1989.

———. FKSM 71-8, *Armor/Cavalry Reference Data*. Fort Knox, KY: US Army Armor Center, 1995.
———. FKSM 71-8, *Armor/Cavalry Reference Data*. Fort Knox, KY: US Army Armor Center, 1999.
———. FKSM 71-8, *Armor Cavalry Reference Data: Armored Cavalry Regiment*. Fort Knox, KY: US Army Armor Center, 2008.
———. FKSM 71-8, *Armor/Cavalry Reference Data: Ground Cavalry and Reconnaissance Organizations*. Fort Knox, KY: US Army Armor Center, 2007 (FOUO).
———. "Heavy Brigade Combat Team (HBCT) Reconnaissance Squadron Experiment." Technical Report. Draft version 2.0, 28 September 2007 (FOUO).
———. ST 3-20.983, *Reconnaissance Handbook*. Fort Knox, KY: US Army Armor Center, 2002.
US Army Armor Combat Developments Agency. "The Role of Armored Cavalry in Counterinsurgency Operations." Fort Knox, KY, October 1962.
US Army Armor School. *Armor Reference Data*. 2 vols. Fort Knox, KY: US Army Armor School, 1974.
———. *Armor Reference Data*. 2 vols. Fort Knox, KY: US Army Armor School, 1976.
———. *Armor Reference Data*. 2 vols. Fort Knox, KY: US Army Armor School, 1977.
———. *Armor Reference Data*. 2 vols. Fort Knox, KY: US Army Armor School, 1978–79.
———. *Armor Reference Data*. 2 vols. Fort Knox, KY: US Army Armor School, 1979.
———. *Armor Reference Data*. 3 vols. Fort Knox, KY: US Army Armor School, 1981.
———. "Cavalry/Reconnaissance Net Assessment-Master Plan," 31 August 1988.
———. "Proponent Evaluation Report for the Concept Evaluation of the Maneuver Battalion Scout Platoon." Fort Knox, KY, 12 March 1990.
———. Special Text 17-1-3, *Armor in Vietnam*. Fort Knox, KY: US Army Armor School, 1970.
———. *Vietnam Battle Tricks*. Fort Knox, KY: US Army Armor School, 1973.
———. TC 17-36-2, *Armored Cavalry Platoon: Organization and Techniques of Movement*. Fort Knox, KY: US Army Armor School, 1975.
US Army Cavalry School. *Mechanized Cavalry*. Fort Riley, KS: Cavalry School, 1932–33.
———. *Cavalry Reconnaissance Number One: Operations of the 81st Armored Reconnaissance Battalion in Tunisia*. Fort Riley, KS: Cavalry School, c. 1943.
———. *Cavalry Reconnaissance Number Two: Operations of the 81st Armored Reconnaissance Battalion in Tunisia, Part III: Kasserine—El Ma El Abiod*. Fort Riley, KS: Cavalry School, c. 1943.

———. *Cavalry Reconnaissance Number Three: Operations of the 91st Cavalry Reconnaissance Squadron, Mechanized, From El Abiod to Mateur (Northern Tunisia).* Fort Riley, KS: Cavalry School, c. 1943.

———. *Cavalry Reconnaissance Number Four: Operations of the 91st Cavalry Reconnaissance Squadron, Mechanized, From Mateur to Bizerte (Northern Tunisia).* Fort Riley, KS: Cavalry School, c. 1943.

———. *Cavalry Reconnaissance Number Five: Operations of the 3d Cavalry Reconnaissance Troop, Mechanized, Part I: Sicily*. Fort Riley, KS: Cavalry School, c. 1943.

US Army Center for Army Lessons Learned. *Compendium*. Fort Leavenworth, KS: Center for Army Lessons Learned, 1988.

———. *CTC Trends: National Training Center*. No. 03-10. Fort Leavenworth, KS: Center for Army Lessons Learned, 2003.

———. *CTC Trends: National Training Center*. No. 03-11. Fort Leavenworth, KS: Center for Army Lessons Learned, 2003.

———. "Initial Impressions Report No. 06-10: 3ID Modular Force Assessment," March 2006.

US Army Combat Developments Command. "Review and Analysis of the U.S. Army Mechanized and Armor Combat Operations in Vietnam." Report, 15 May 1967.

US Army Concept Team in Vietnam. "Final Report: Optimum Mix of Armored Vehicles for Use in Stability Operations." 3 vols, 27 January 1971.

US Army Field Forces. "Report of Army Field Forces Advisory Panel on Armor to Chief of Staff of the Army." 2 vols, 18 February 1949.

US Army Test and Experimentation Command Close Combat Test Directorate. "Bradley Fighting Vehicle System-A3 (BFVS-A3)." Report, December 1998.

US Army TRADOC System Manager XXI. "FBCB2/BFT-A After Action Review Packet," 2003.

US Army Training and Doctrine Command. "The Cavalry/Scout Study." 4 vols, 4 July 1974 (SECRET).

———. "Land Combat in the 21st Century," 1995.

———. "The United States Army Heavy Force Modernization Plan." Report, 1998.

US Army Training and Doctrine Command Analysis Center. "Interim Division Design Analysis Final Report," July 2001.

US Army Vietnam. "Mechanized and Armor Combat Operations in Vietnam." Report, 28 March 1967.

US Forces, European Theater. "The General Board, Study No. 48: Organization, Equipment, and Tactical Employment of the Armored Division," 1945.

———. "General Board, Study No. 49: Tactics, Employment, Technique, Organization, and Equipment of Mechanized Cavalry Units." Washington, DC: US Army Center of Military History, 1945.

———. "The General Board, Study No. 50: Organization, Equipment, and Tactical Employment of Separate Tank Battalions," 1945.

US General Accounting Office. "Staff Study of the Armored Reconnaissance Scout Vehicle." Report, February 1975.

US Government Accountability Office. "Force Structure: Capabilities and Cost of Army Modular Force Remain Uncertain." GAO Report No. 06-548T, 4 April 2006.

VanAmburgh, Peter C. "The Battlefield Surveillance Brigade in the Attack? 560th Battlefield Surveillance Brigade Lessons from Exercise North Wind 2008, Iwate, Japan, and Employment of Attached Maneuver Forces." US Army Center for Army Lessons Learned. *News From the Front*, 2008.

Wager, Captain Harold R., Captain William A. West, Captain John E. Bailey, Captain William A. Brinkley, Captain James H. Bradley, and Captain James P. Feistner. "Reconnaissance/Scout Vehicle." Student paper no. 58-25. US Army Armor School, Fort Knox, KY, 11 December 1967.

Warnick, William L., and Robert A. Baker. "Determination of Combat Job Requirements for Armored Cavalry Platoon Personnel." Human Resources Research Organization Report. Fort Knox, KY, December 1964.

Whelden, Lieutenant Colonel Craig B. "Light Cavalry: Strategic Force for the Future." Student paper. US Army War College, 3 January 1992.

White, Captain Robert N. "A Reconnaissance Vehicle." Student paper no. 45.60-150. US Army Armor School, Fort Knox, KY.

Wolff, Major Terry A. "Tactical Reconnaissance and Security for the Armor Battalion Commander: Is the Scout Platoon Combat Capable or Combat Ineffective?" Student report. School of Advanced Military Studies, Fort Leavenworth, KS, 27 December 1990.

News Media

Aerospace Daily, March 2004.
American Forces Press Service, July–August 2002.
Anniston Star, September 2004.
Army Magazine, June 2003.
Army News Service, September 2002, January 2004, December 2006.
Army Times, August 2002, November 2004, February 2005.
Atlanta Journal-Constitution, January 2004.
Arkansas Democrat-Gazette, April 2004.
Birmingham (AL) News, April 2002.
Christian Science Monitor, August 2002.
Colorado Springs Gazette, April 2004.
Defense News, June 2002, September 2004, February 2006, October 2009.
European Stars and Stripes, February 2004, April 2004, August 2004.
Federal Computer Week, June 2009.
Honolulu Advertiser, July 2002.
Inside the Army, July–October 2002, January 2004.
Inside the Pentagon, January 2004, February 2005.
Jane's Defence Weekly, August 2002.
Jerusalem Post, April 2004.

London Times, September 2002.
Los Angeles Times, August 2002.
Mideast Stars and Stripes, May 2005.
National Defense, August 2009.
National Journal's Congress Daily AM, April 2004, October 2009.
New York Times, June 2002, September 2002, November 2002, January 2004, April 2004, April 2007, March 2008.
Norfolk Virginian-Pilot, August 2002.
Savannah Morning News, November 2002.
Stars and Stripes, March 2006.
Tacoma News Tribune, February 2002.
TRADOC News Service, June 2002.
USA Today, July 2006, October 2006.
Wall Street Journal, December 2002, March 2004.
Washington Post, November 2000, April–May 2002, December 2002, May 2004, March 2005, February 2006, February 2007.
Washington Times, February 2007, June 2007.

Other Works

"2d Armored Cavalry Regiment: Back from Haiti, Then on to Bosnia, the Army's 'Light ACR' Remains 'Always Ready.'" *Armor* CVI, no. 6 (November–December 1997): 23–24.

"2d Cavalry Regiment." http://www.globalsecurity.org/military/agency/army/2acr.htm (accessed 9 October 2008).

"3d Armored Cavalry Regiment: From Bliss to Carson's Canyons." *Armor* CVI, no. 6 (November–December 1997): 19–20.

"The 11th Armored Cavalry Regiment: NTC's 'Home Team' Battles with the Best." *Armor* CVII, no. 6 (November–December 1998): 43–44.

Aitken, Major Mark J. "Hunter-Killer Teams." *Armor* CXVII, no. 1 (January–February 2008): 18–20.

Allenby, E.H.H. Letter to the Editor. *Cavalry Journal* XXX, no. 122 (January 1921): 1–2.

"AH 64 Apache." http://www.fas.org/man/dod-101/sys/ac/ah-64.htm (accessed 29 September 2008).

"Armor—Where Are We Going?" *Armor* LXVI, no. 6 (November–December 1957): 22–23.

"The Armored Gun System." *Armor* CI, no. 2 (March–April 1992): 13–14.

Ashworth, Major Servetus T. III. "Armor Can Operate in the Delta." *Armor* LXXVI, no. 2 (March–April 1967): 6–8.

Bacevich, A.J. *The Pentomic Era: The U.S. Army Between Korea and Vietnam*. Washington, DC: National Defense University Press, 1986.

Badsey, S.D. "The American Experience of Armour." In *Armoured Warfare,* edited by J.P. Harris and F.H. Toase, 124–144. New York, NY: St. Martin's Press, 1990.

Baggot, Lieutenant Colonel Chris. "Executing the Defensive Counterreconnaissance Fight." *Armor* CVII, no. 2 (March–April 1998): 8–9.

Bahnsen, Brigadier General John C., Colonel Arthur L. West III, and Lieutenant Colonel Douglas H. Starr. "Attacking Dismounted Infantry with Armored Cavalry." *Armor* XCV, no. 5 (September–October 1986): 8–15.

Baker, Robert A., and Lieutenant Colonel (Retired) John G. Cook. "ACT I, the Armored Cavalry Trainer." *Armor* LXXVI, no. 2 (March–April 1967): 38–43.

Baker, William C. "The Anatomy of an Ambush: Small Kill Teams in the Contemporary Operating Environment." *Armor* CXVIII, no. 4 (July–August 2009): 5–9.

Barco, Ernest T. Jr. "Light Aviation Joins Armored Cavalry." *Armored Cavalry Journal* LVIII, no. 3 (May–June 1949): 2–5.

Barteky, Sergeant First Class Andrew L. "The Stryker-Equipped Cavalry Squadron in an Urban Environment." *Armor* CXII, no. 4 (July–August 2003): 28–36.

Barto, Major Joseph C. III. *Task Force 2-4 Cav—"First In, Last Out": The History of the 2d Squadron, 4th Cavalry Regiment, During Operation Desert Storm*. Fort Leavenworth, KS: US Army Command and General Staff College, 1993.

Battreall, Lieutenant Colonel Raymond R. Jr. "Cavalry Operations IV—Reconnaissance." *Armor* LXXVIII, no. 2 (March–April 1969): 39–41.

Battreall, Major Raymond R. Jr. "Armor in Vietnam." *Armor* LXXV, no. 3 (May–June 1966): 4–9.

———. "Is Cavalry Really AWOL?" *Armor* LXII, no. 3 (May–June 1963): 11–12.

———. "The Regimental Armored Cavalry Squadron in Area Security." *Armor* LXXIV, no. 1 (January–February 1965): 42–43.

Beall, Colonel John A. Jr. "Revision of the Armored Cavalry Regiment." *Armor* LXVIII, no. 3 (May–June 1959): 5–7.

———. "Revisions to ROCAD." *Armor* LXVIII, no. 2 (March–April 1959): 48–51.

Belinsky, Captain Mark, and Lieutenant Colonel Steven Duke. "Armor Basic Officer Leaders Course III." *Armor* CXV, no. 4 (July–August 2006): 33–35, 40.

Bell, Major General B.B. "Armor Branch's 'Way Ahead' Advances on Four Thrust Lines." *Armor* CX, no. 4 (July–August 2001): 5–6.

———. "Manuscript's Tone Raised Editing Questions." *Armor* CIX, no. 1 (January–February 2000): 5, 47.

Bell, First Lieutenant Raymond E. Jr. "Re-Equip the Scout Section." *Armor* LXX, no. 4 (July–August 1961): 52–53.

Belonus, Sergeant First Class Frank R. "Building on Force XXI Task Force and Brigade Recon Troop Scout Platoons." *Armor* CIX, no. 6 (November–December 2000): 7–15.

Belonus, Staff Sergeant Frank R. "Dismounted Scouts in Mechanized Cavalry Operations." *Armor* CIV, no. 5 (September–October 1995): 3, 49.

Benson, Lieutenant Colonel Kevin C.M. "Armor's Role in the Future Combined Arms Team." *Armor* CVII, no. 2 (March–April 1998): 48–49.

———. "A Report From Haiti: Cavalry in Peacekeeping Operations." *Armor* CIV, no. 6 (November–December 1995): 15–17.

———. "Whither the 2d Cavalry?" *Armor* (January–February 1997): 20–21.

Benson, Captain William E. "The Cavalry Paradigm: 'We Aren't Training as We Intend to Fight.'" *Armor* CX, no. 4 (July–August 2001): 8–9.

Bighouse, Sergeant First Class William. "Scout Vehicles: Still No Good Answer." *Armor* CIV, no. 5 (September–October 1995): 49.

Blome, Captain Matthew L. "The Stryker Cavalry Reconnaissance Troop." *Armor* CXV, no. 4 (July–August 2006): 26–32.

Blumenson, Martin, ed. *The Patton Papers*, 2 vols. Boston, MA: Houghton Mifflin Company, 1972.

Bolté, Brigadier General Philip L. "Full Circle: The Armored Cavalry Platoon." *Armor* CIII, no. 5 (September–October 1994): 36.

Boltuc, Captain Doug, and Captain Scott Efflandt. "Counterreconnaissance: Taking the Fight to the Enemy." *Armor* CV, no. 6 (November–December 1996): 31–35.

Boschma, Captain James H. "The Case for Ground Scouts." *Armor* LXXXIII, no. 3 (May–June 1974): 4.

Boudinot, Burton S. "Stealth in Scouting Requires Small, Quiet Vehicles, Not Guns." *Armor* CVIII, no. 6 (November–December 1999): 3.

Boudinot, Captain Burton S. "Armed Reconnaissance—Tactical Integration of Aerial Elements." *Armor* LXX, no. 5 (September–October 1961): 6–10.

Boudinot, Lieutenant Colonel Burton S. "An Approach to the Scout Dilemma." *Armor* LXXIX, no. 5 (September–October 1970): 44–45.

———. "The Case for an Armored Dune Buggy." *Armor* LXXX, no. 3 (May–June 1971): 22–24.

Boyle, Captain Christopher. "The 3d Armored Cavalry Regiment's Tactical Command Post: An Alternative Command and Control Facility." *Armor* CV, no. 4 (July–August 1996): 32–35.

Boyle, Captain William P. "M-114 The Scout's New Vehicle." *Armor* LXXII, no. 6 (November–December 1963): 43–46.

Brennan, First Lieutenant Thomas P. Jr. "Scout-COLT Integration in the Brigade Reconnaissance Troop." *Armor* CVIII, no. 4 (July–August 1999): 35–36, 40.

Broadwater, Lieutenant Colonel Jeff. "Reorganizing the Recon Squadron to Enhance Heavy Brigade Combat Team Capabilities." *Armor* CXVI, no. 5 (September–October 2007): 37–41.

Brown, Captain Robert B. "Kill OPFOR: The 3d Armored Cavalry Regiment at the NTC." *Armor* CVII, no. 2 (March–April 1998): 14–15.

Brown, Lieutenant Colonel Ross A. "Commander's Assessment: South Baghdad." *Military Review* (January–February 2007): 27–34.

Bunce, Staff Sergeant Peter L. "Appalled." *Armor* LXXXVIII, no. 6 (November–December 1979): 3.

———. “Cavalry Platoon Organization.” *Armor* LXXXIV, no. 4 (July–August 1975): 2.

———. “The Reconnaissance Dilemma.” *Armor* LXXXV, no. 2 (March–April 1976): 18–20.

Burke, Lieutenant Colonel James T. “Armored Infantry and Recon Unit Organization.” *Armor* LXV, no. 4 (July–August 1956): 15–17.

Burton, James G. *The Pentagon Wars: Reformers Challenge the Old Guard*. Annapolis, MD: Naval Institute Press, 1993.

Bush, Major Robert P. “The Division Commander’s Eyes and Ears.” *Armor* XCII, no. 4 (September–October 1983): 16–17.

Byrom, First Lieutenant Jonathan C. “Up-Armored HMMWVs: The Answer for Peacekeeping Operations.” *Armor* CVII, no. 1 (January–February 1998): 35–36.

Campbell, Brigadier General Donald M. “Counterinsurgency and Core Competencies.” *Armor* CXVII, no. 5 (September–October 2008): 4.

Candler, Harry W. “91st Reconnaissance Squadron in Tunisia.” *Cavalry Journal* LIII, no. 2 (March–April 1944): 14–22.

Capobianco, Captain Jim, and First Lieutenant John Dickson. “Be There: A Case Study in Counterinsurgency Warfare.” *Armor* CXVII, no. 4 (July–August 2008): 42–44.

Cardine, Christopher V. “At Least in the Near Future, Today’s Scouts Will Use Bradleys and HMMWVs.” *Armor* CVIII, no. 1 (January–February 1999): 3–4.

Cason, Duane S. “Introduction to the New Armored Division.” *Armor* LXVI, no. 6 (November–December 1957): 4–11.

“The Cavalry Maneuvers at Fort Riley, Kansas, 1934.” *Cavalry Journal* XLIII, no. 6 (July–August 1934): 5–14.

Chaffee, Adna R. “The Seventh Cavalry Brigade in the First Army Maneuvers.” *Cavalry Journal* XLVIII, no. 6 (November–December 1939): 450–461.

Chakwin, Captain Mark B. “Cavalry and the Light Division.” *Armor* XCVI, no. 1 (January–February 1987): 36–37.

Chapman, Anne W. *The National Training Center Matures 1985–1993*. Fort Monroe, VA: US Army Training and Doctrine Command Military History Office, 1997.

———. *The Origins and Development of the National Training Center 1976–1984*. Washington, DC: Center of Military History, 1997.

Cheney, Corporal Gary. “Keeping the Scout Alive.” *Armor* LXXXVI, no. 1 (January–February 1977): 4.

Chesney, Major Edward J. “The 11th Armored Cavalry Regiment In Vietnam, January 1969 Through June 1970.” Master’s thesis, US Army Command and General Staff College, Fort Leavenworth, KS, 2002.

Chiarelli, Major General Peter W. “Winning the Peace: The Requirement for Full Spectrum Operations.” *Military Review* (July–August 2005): 4–17.

Clark, Lieutenant Colonel Patrick A., and Major Edward Hayes. “Maneuver Captains Career Course.” *Armor* CXV, no. 5 (September–October 2006): 18–22, 47.

Clarke, Lieutenant General Bruce C. "Armored Cavalry Regiments Along the Iron Curtain." *Armor* LXVII, no. 3 (May–June 1958): 22–23.

———. "The Designing of New Divisions for Our Army." *Armor* LXIV, no. 3 (May–June 1955): 22–25.

Cobb, Colonel William W. "11th Cavalry Report." *Armor* LXXVI, no. 2 (March–April 1967): 30–31.

Cole, Hugh M. *U.S. Army in World War II: The Lorraine Campaign*. Washington, DC: US Army Center of Military History, 1997.

———. *United States Army in World War II: The European Theater of Operations: The Ardennes: Battle of the Bulge*. Washington, DC: Center of Military History, 1993.

Connolly, Major Christopher. "Reconstructing the Cavalry Force." *Armor* CXIII, no. 5 (September–October 2004): 16–19.

Cook, Brainard S. "Vehicular Reconnaissance." *Cavalry Journal* LII, no. 1 (January–February 1943): 51–59.

Cook, Lieutenant Colonel (Retired) John G., and Robert A. Baker. "The Armored Cavalry Platoon Combat Readiness Check." *Armor* LXXVI, no. 1 (January–February 1967): 18–23.

Cornell-d'Echert, Captain Blaise Jr. "Counterreconnaissance: Defining the Nature of Security Area Operations." *Armor* CII, no. 5 (September–October 1993): 5.

Cowan, First Lieutenant David R. "The Company Intelligence Section." *Armor* CXVII, no. 4 (July–August 2008): 19–22, 50.

Cramer, L.W. "Portee Cavalry: An Experiment with Commercial Trucks." *Cavalry Journal* XLIX, no. 3 (May–June 1940): 254–255.

Crawford, Lieutenant Colonel James F. "Reviving Old Concepts." *Armor* CII, no. 6 (November–December 1993): 3, 50.

Crist, Stanley C. "Best 'Global Cavalry' Mounts Are M113s, Not LAVs." *Armor* CVII, no. 4 (July–August 1998): 53–54.

———. "The Case for an Airmobile, Amphibious Scout Vehicle." *Armor* CVIII, no. 4 (July–August 1999): 30–32.

———. "We Already Have Light Armor: It's Called an M113." *Armor* CIX, no. 2 (March–April 2000): 3.

Criswell, A. William. "LAV III Fails to Meet the Army's Own Requirements." *Armor* CX, no. 4 (July–August 2001): 3.

Crouch, Colonel William W. "Soviet Reconnaissance Operations." *Armor* XC, no. 6 (November–December 1981): 28–29.

Cruikshank, J.R.H. "From Acre to Aleppo with Allenby." *Cavalry Journal* XXXIII, no. 134 (January 1924): 52–62.

Cruz, Cesar A. "More on Hunter-Killer Technique." *Armor* CII, no. 6 (November–December 1993): 3.

Currie, Staff Sergeant Thomas P. "CFV Not For Scouts." *Armor* LXXXIX, no. 2 (March–April 1980): 2.

Dager, Howard J. "A New Deal for Division Reconnaissance." *Armor* LXIII, no. 6 (November–December 1954): 18–20.

Dameron, First Lieutenant Greg W. "Training Killers." *Armor* CXI, no. 2 (March–April 2002): 5, 47.

Davis, Major Daniel L. "Fighting for Information." *Armor* CXVII, no. 3 (May–June 2008): 26–35.

Davis, Edward. "The British Cavalry in Palestine and Syria." *Cavalry Journal* XXXI, no. 127 (April 1922): 123–129.

———. "The British Cavalry in Palestine and Syria." *Cavalry Journal* XXXII, no. 130 (January 1923): 56–65.

———. "The British Cavalry in Palestine and Syria." *Cavalry Journal* XXXII, no. 132 (July 1923): 286–295.

———. "The British Cavalry in Palestine and Syria." *Cavalry Journal* XXXII, no. 133 (October 1923): 435–444.

———. "The British Cavalry in Palestine and Syria." *Cavalry Journal* XXXIII, no. 134 (January 1924): 47–51.

Davis, First Lieutenant Geoffrey C. "The Three D's of Reconnaissance." *Armor* XCI, no. 1 (January–February 1982): 24.

Davis, Ken A. "Better Security—Better Reconnaissance." *Armor* LXIII, no. 4 (July–August 1954): 2–3.

Deal, Captain Kenneth L. Jr. "The Counterreconnaissance Battle: Managing the Monster." *Armor* CI, no. 6 (November–December 1992): 22–25.

DeSario, Command Sergeant Major George Jr. "A Soldier's Path to Success." *Armor* CXII, no. 6 (November–December 2003): 5.

Dials, Major Thomas A. "Economy of Force—the Cavalry Connection." *Armor* XCII, no. 4 (July–August 1983): 45–46.

Disney, Major Paul A. "Reconnaissance Units Training Test, 2d Armored Division." *Cavalry Journal* L, no. 5 (September–October 1941): 68–72.

Dodd, Joseph G. Jr. "The 2d Armored Cavalry Regiment: A Force for Peace Enforcement Operations." *Armor* CIV, no. 2 (March–April 1995): 48–49.

Donaldson, Captain Charles W. "The Cavalry—Air Cavalry Team." *Armor* LXXVIII, no. 5 (September–October 1969): 23–25.

Doneski, First Lieutenant Christopher M. "Challenges of the 'Three By Five' Platoon." *Armor* CIII, no. 2 (March–April 1994): 3–4.

Doyle, Brigadier General David K. "The Indispensable Scout." *Armor* LXXXVI, no. 5 (September–October 1977): 10–12.

Dozier, Lieutenant Colonel James L. "Comments on Commander's Hatch." *Armor* LXXXIV, no. 6 (November–December 1975): 2.

Dunn, Captain Jonathan. "Mounted Security Procedures in Iraq." *Armor* CXIV, no. 4 (July–August 2005): 11–14.

Editorial. *Armor* LXX, no. 5 (September–October 1961): 22–23.

Farley, Colonel Roy W. "Blackhorse Report II." *Armor* LXXVII, no. 2 (March–April 1968): 5–11.

Feltey, Captain Thomas M. "The Brigade Reconnaissance Troop: Profiling a New Kind of Unit." *Armor* CVII, no. 5 (September–October 1998): 26–27, 55.

Feltey, Captain Thomas M., Major Brian K. Serota, and Captain Erick W. Sweet II. "Air-Ground Integration: Proven TTPs." *Armor* CXI, no. 4 (July–August 2002): 22–25, 50.

Fickett, Richard K. "Wiesel-Mounted Scouts." *Armor* CII, no. 1 (January–February 1993): 2–3.

Fisher, Major Paul M., and Captain George C. Hoffmaster Jr. "Armored Division Organization and Doctrine." *Armor* LXVII, no. 5 (September–October 1958): 7–11.

Flint, Glenwood W., and Lewis B. Tixier. "The M59." *Armor* LXIII, no. 2 (March–April 1954): 6–9.

Flynn, Lieutenant Colonel Henry L. "The Part Played by the 6th Cavalry in the Infantry School Maneuvers." *Cavalry Journal* XLV, no. 5 (September–October 1936): 365–376.

Flynn, Captain Karl S., and First Lieutenant Joseph Miller. "Hunter-Killer Operations." *Armor* CII, no. 4 (July–August 1993): 48–50.

Foley, Major General Thomas C. "An Armored Force for the Future: 2000 and Beyond—Technology." *Armor* C, no. 5 (September–October 1991): 4–6.

———. "An Armored Force for the Future: 2000 and Beyond—Technology." *Armor* C, no. 6 (November–December 1991): 4–6.

Fontenot, Colonel (Retired) Gregory, Lieutenant Colonel E.J. Degen, Lieutenant Colonel David Tohn, and the Operation Iraqi Freedom Study Group. *On Point: The United States Army in Operation Iraqi Freedom*. Fort Leavenworth, KS: Combat Studies Institute Press, 2004.

"Fourth Cavalry (H-Mecz) in Fourth Army Maneuvers." *Cavalry Journal* XLIX, no. 5 (September–October 1940): 444.

Funk, Lieutenant Colonel David L. "ARSV Task Force Briefing." *Armor* LXXXIV, no. 6 (November–December 1975): 26–27.

Funk, Lieutenant Colonel David L., and Captain Donald C. Snedeker. "Armored Reconnaissance Scout Vehicle Test." *Armor* LXXXIV, no. 5 (September–October 1975): 37–42.

Gabel, Christopher R. *The U.S. Army GHQ Maneuvers of 1941*. Washington, DC: Center of Military History, 1991.

Gameros, First Lieutenant (Promotable) Charles W. Jr. "Scout HMMWVs and Bradley CFVs: Gulf War Provides a Comparison of Scout Vehicles and MTOEs." *Armor* C, no. 5 (September–October 1991): 21–25.

Gantert, First Lieutenant Michael. "Checkpoint and Traffic Control Point Operations." *Armor* CXIII, no. 5 (September–October 2004): 38–40.

Garcia, Captain Rafael G. "The Reconnaissance Platoon—What Will It Be Like Tomorrow?" *Armor* LXXIV, no. 1 (January–February 1965): 55–57.

Gentile, James. "Enhancing the Recce Troop's Lethality." *Armor* CXVIII, no. 4 (July–August 2009): 10–13.

Gifford, Captain John L. "Fundamentals of Air-Ground Integration in Division Cavalry Operations." *Armor* CIII, no. 4 (July–August 1994): 15–16.

Gillespie, Captain Robert B. "Route Ownership Versus Route Concession." *Armor* CXIV, no. 5 (September–October 2005): 18–20.

Glilkes, Lieutenant Colonel Richard J., and Major Rolland V. Heiser. "Dynamic 3-Dimensional Mobility." *Armor* LXX 1 (January–February 1961): 7–9.

Goldin, Major Andrew D. "Ruminations on Modular Cavalry." *Armor* CXV, no. 5 (September–October 2006): 13–17.

Goodfriend, Captain Jason, and Captain David Levasseur. "An Armored Task Force Approach to Civil-Military Operations." *Armor* CXIV, no. 4 (July–August 2005): 28–32.

Grantz, Major John, and Lieutenant Colonel John Nagl. "Teaching and Learning Counterinsurgency at the Armor Captains Career Course." *Armor* CXVI, no. 1 (January–February 2007): 15–17.

Grasser, Peter G. "Reconnaissance Future." *Armor* LXX, no. 2 (March–April 1961): 4–8.

Green, Captain Cecil A. "Motorcycle Scouts." *Armor* LXXXIV, no. 2 (March–April 1975): 22–26.

Greenfield, Kent Roberts, Robert R. Palmer, and Bell I. Wiley. *United States Army in World War II: The Army Ground Forces: The Organization of Ground Combat Troops*. Washington, DC: Department of the Army, Historical Section, 1947.

Greer, Colonel James K., and Command Sergeant Major David L. Morris. "3d Battalion, 81st Armor Regiment: A New Source of 19D Cavalry Scouts." *Armor* CXIII, no. 6 (November–December 2004): 53.

———. "Resequencing Training for More Battle Focus: The Transformation of 19D OSUT." *Armor* CXIII, no. 2 (March–April 2004): 51.

Grow, Major General (Retired) Robert W. "A Lesson in Mobile History." *Armor* LXIII, no. 2 (March–April 1954): 3.

———. "New Developments in the Organization and Equipment of Cavalry." *Cavalry Journal* XLVIII, no. 3 (May–June 1939): 204–207.

———. "ROAD Flexibilty." Editorial. *Armor* LXX, no. 6 (November–December 1961): 2.

Gunderman, Captain George L. "Ambush!" *Armor* LXXVI, no. 3 (May–June 1967): 16–19.

Guzman, Captain Philip C. Letter to the Editor. *Armor* LXXV, no. 5 (September–October 1966): 2–3.

Hammer, Staff Sergeant Junius B. III. "Ground Cav 'Lost in the Shuffle'?" *Armor* SCIV, no. 6 (November–December 1985): 3.

Haponski, First Lieutenant William C. "Which Method?" *Armor* LXVIII, no. 3 (May–June 1959): 10–13.

Harju, Lieutenant Colonel Craig S. Sr., Sergeant First Class David F. Wilson, and Richard B. Armstrong. "Tactical Employment of the Military Motorcycle." *Armor* CI, no. 3 (May–June 1992): 18–20.

Harmeyer, Major General George H. "19D and 19K Training in 1st Armor Training Brigade." *Armor* CVI, no. 6 (November–December 1997): 5, 56.

———. "The Armor Force: A Pre-conference Overview." *Armor* CVIII, no. 2 (March–April 1999): 6.

———. "The New Heavy Division: It's More Deployable and Just as Deadly." *Armor* CVII, no. 4 (July–August 1998): 7–8, 46.

Hartline, Captain Franklin Y. "Route Security in the Central Highlands." *Armor* LXXVIII, no. 6 (November–December 1969): 21–24.

Hartline, Colonel Franklin Y. "AGS Questions." *Armor* CII, no. 2 (March–April 1993): 2–3.

Haworth, W. Blair Jr. *The Bradley and How It Got That Way: Technology, Institutions, and the Problem of Mechanized Infantry in the United States Army*. Westport, CT: Greenwood Press, 1999.

Heavey, Major Thomas J. "The Horse-Mechanized Regiment." *Cavalry Journal* XLIX, no. 5 (September–October 1940): 424–428.

Hegadush, Master Sergant John. "A Better Recce Troop." *Armor* CXV, no. 5 (September–October 2006): 38–39.

Helmer, Captain Daniel. "The Poor Man's FBCB2: R U Ready 4 the 3G Celfone?" *Armor* CXV, no. 6 (November–December 2006): 7–10.

Herbert, Major Paul H. *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations*. Fort Leavenworth, KS: Combat Studies Institute, 1988.

Herrera, Ricardo A. "Brave Rifles at Tall 'Afar, September 2005." In *In Contact! Case Studies from the Long War. Vol. I,* edited by William G. Robertson. Fort Leavenworth, KS: Combat Studies Institute Press, 2006.

Hickerson, First Lieutenant Gregory S. "Reconnaissance Patrols in Baghdad." *Armor* CXIII, no. 5 (September–October 2004): 35–37.

Hiestand, Major Harry H. "Rapid Reconnaissance, Now!" *Armor* LXVIII, no. 1 (January–February 1959): 46–49.

"High Mobility Multipurpose Wheeled Vehicle (HMMWV)." http://www.globalsecurity.org/military/systems/ground/hmmwv.htm (accessed 19 September 2008).

Hillen, First Lieutenant John. "2d Armored Cavalry: The Campaign to Liberate Kuwait." *Armor* C, no. 4 (July–August 1991): 8–12.

"HMMWV History." http://www.olive-drab.com/od_mvy_hmmwv_history.php (accessed 19 September 2008).

Hofmann, Captain Ronald A. "The Affray at Slope 30." *Armor* LXXVII, no. 1 (January–February 1968): 13–18.

Holmes, Lieutenant Colonel Jeffrey. "The Cavalry Model In Iraq: Right Time, Right Place." *Armor* CXV, no. 1 (January–February 2006): 12–14.

Howard, Captain Bart. "The HMMWV Scout Platoon." *Armor* XCVIII, no. 4 (July–August 1989): 3, 53.

Howard, Lieutenant Colonel Bart, and Captain Jeff Ramsey. "Employing the Brigade Reconnaissance Troop." *Armor* CXI, no. 2 (March–April 2002): 17–19.

Howe, George F. *United States Army in World War II: The Mediterranean Theater of Operations: Northwest Africa: Seizing the Initiative in the*

West. Washington, DC: Department of the Army, Office of the Chief of Military History, 1957.

Hoy, Charles J. "Reconnaissance Lessons from North Africa." *Cavalry Journal* LII, no. 6 (November–December 1943): 16–20.

Hulse, Allen D. "Principles and Modern Methods of Reconnaissance." *Cavalry Journal* LII, no. 4 (July–August 1943): 66–70.

Hunnicutt, R.P. *Bradley: A History of American Fighting and Support Vehicles*. Novato, CA: Presidio Press, 1999.

———. *Half-Track: A History of American Semi-Tracked Vehicles*. Novato, CA: Presidio Press, 2001.

Hyatt, First Lieutenant John A. "The LAV-25 in the Scout Role." *Armor* C, no. 5 (September–October 1991): 32–33.

Ives, First Lieutenant John M. "Armored Cavalry Mortars: Operations and Myths." *Armor* CX, no. 6 (November–December 2001): 22–26.

Ivy, Captain Robert G. "A Cavalry Experience in Bosnia." *Armor* CVII, no. 3 (May–June 1998): 26–28.

"Jeep." http://www.globalsecurity.org/military/systems/ground/jeep.htm (accessed 28 November 2007).

Jeffery, Sergeant First Class Harald. "CSS and the Battalion Scout Platoon." *Armor* CX, no. 3 (May–June 2001): 37–39.

Jeszenszky, John F. "Send Out the Scouts." *Armor* LXXV, no. 2 (March–April 1966): 43–44.

Johnson, Lieutenant Colonel Charles S. Jr. "One of Our Units is Missing." *Armor* LXXU, no. 5 (September–October 1962): 18–21.

Johnson, Staff Sergeant Matthew H. "Scouts Lead the Way!" *Armor* CXIV, no. 3 (May–June 2005): 3, 49.

Johnson, Captain T.J. "The HMMWV Storage Rack." *Armor* CVIII, no. 3 (May–June 1999): back cover.

———. "TOW-HMMWV's Thermal Sight Works Fine for Light Cavalry." *Armor* CXI, no. 1 (January–February 2002): 3–4.

Johnston, Sergeant Richard G. "Flaws Seen in Light Scout Concept." *Armor* XCVIII, no. 5 (September–October 1989): 3.

Jones, Captain Michael, and Sergeant First Class Christopher Wagner. "Long Range Scout Surveillance System (LRAS3)." *Armor* CVII, no. 6 (November–December 1998): 22–24.

Kalb, Colonel John F. "Seeking Alternatives to 'Scouting in a Winnegabo.'" *Armor* CVIII, no. 2 (March–April 1999): 3–4.

Kasales, Major Michael C. "Reconnaissance and Security Forces in the New Heavy Division Structure." *Armor* CIX, no. 2 (March–April 2000): 26–29.

Kasales, Major Michael C., and Chief Warrant Officer 2 Matthew E. Gray. "Leveraging Technology: The Stryker Brigade Combat Team." *Armor* CXII, no. 1 (January–February 2003): 7–13, 24.

Kearns, Staff Sergeant Brendan F. "The Future of the Reconnaissance Professional." *Armor* CXIII, no. 3 (May–June 2004): 24–25.

———. "Scout Platoons Need Snipers." *Armor* CXII, no. 6 (November–December 2003): 51.

Keith, Major J.D. "3d Squadron, 7th U.S. Cavalry Up Front: Operation Iraqi Freedom Lessons Learned." *Armor* CXII, no. 5 (September–October 2003): 26–31.

Killblane, Richard E. Global War on Terrorism Occasional Paper 13, *Circle the Wagons: The History of US Army Convoy Security*. Fort Leavenworth, KS: Combat Studies Institute Press, 2005.

Kindsvatter, Major Peter S. "The Army-of-Excellence Divisional Cavalry Squadron—A Doctrinal Step Backward?" Masters thesis. School of Advanced Military Studies, Fort Leavenworth, KS, 2 December 1985.

King, James I., and Melvin A. Goers. "Modern Armored Cavalry Organization." *Armored Cavalry Journal* LVII, no. 4 (July–August 1948): 47–50.

King, Captain Marc A. "The Battalion Scout Platoon is Alive and Well." *Armor* LXXXVII, no. 5 (September–October 1978): 35–37.

King, Major Marc A. "2X2: The Regimental Cavalry Troop." *Armor* XC, no. 2 (March–April 1981): 12–13.

———. "Time to Get on Board." *Armor* LXXXIX, no. 2 (March–April 1980): 3.

Kirby, Lieutenant Colonel Michael A. "Find the Enemy." *Armor* CII, no. 3 (May–June 1993): 20–21.

Kojro, Lieutenant Colonel (Retired) Chester A. "Restructuring the Cavalry Force: Has the Armor Center Missed its Mark?" *Armor* CXIV, no. 1 (January–February 2005): 3.

Kolenda, Captain Christopher D. "Reconnaissance in the Offense: 'Command Push' vs. 'Recon Pull.'" *Armor* CV, no. 4 (July–August 1996): 45–46.

———. "Screen In Depth." *Armor* CII, no. 3 (May–June 1993): 14–15.

Lacey, Jim. *Takedown: The 3rd Infantry Division's Twenty-One Day Assault on Baghdad*. Annapolis, MD: Naval Institute Press, 2007.

Lady, Command Sergeant Major David L. "The Conservative Heavy Division: Enlisted Impact." *Armor* CVII, no. 5 (September–October 1998): 7.

Lartigue, Captain Louis J. "Fixing the Scout Platoon." *Armor* CIV, no. 1 (January–February 1995): 51.

Lawrence, Sergeant First Class James C. "The Plight of the Scout Vehicle." *Armor* CIII, no. 2 (March–April 1994): 4.

Lehner, Charles. "Bosnia Report: Task Force Eagle's Armor and Cavalry Operations in Bosnia." *Armor* CV, no. 3 (May–June 1996): 9–10, 45–47.

Leslie, Major Mark S. "The HMMWV is an Effective Option in COIN Operations." *Armor* CXVI, no. 4 (July–August 2007): 3.

Loughlin, Don. "M113's Versatility Meets Test for Lighter Force Initiative." *Armor* CIX, no. 2 (March–April 2000): 3–4.

Lozano, Frank. "The Six-Bradley Scout Platoon in Bosnia." *Armor* CV, no. 5 (September–October 1996): 36–37.

Lynch, Lieutenant Colonel Rick, and Captain Steve Cichocki. "Training the Task Force Scout Platoon." *Armor* CV, no. 4 (July–August 1996): 42–44.

"The M113 Armored Personnel Carrier." *Armor* LXVIII, no. 3 (May–June 1959): 8–9.

"M113A2 Armored Personnel Carrier." http://www.globalsecurity.org/military/systems/ground/m113a3.htm (accessed 8 October 2008).

"M1114/XM1114 HMMWV Up-Armored Armament Carrier." http://www.globalsecurity.org/military/systems/ground/m1114.htm (accessed 24 November 2008).

"M2A2ODS/M3A2ODS (Operation Desert Storm) Bradley." http://www.globalsecurity.org/military/systems/ground/m2a2ods.htm (accessed 20 October 2008).

"M2A3 and M3A3 Bradley Fighting Vehicle Systems." http://globalsecurity.org/military/systems/ground/m2a3.htm (accessed 20 October 2008).

"M2 Half Track Car," http://en.wikipedia.org/wiki/M2_Half_Track_Car (accessed 3 March 2008).

"M-39 Armored Utility Vehicle (AUV)." http://www.olive-drab.com/idphoto/id_photos_m39auv.php (accessed 17 March 2009).

"M-75 Armored Personnel Carrier." http://www.olive-drab.com/idphoto/id_photos_m75apc.php (accessed 17 March 2009).

Maggart, Major General Lon E. "Cavalry in Force XXI." *Armor* CV, no. 5 (September–October 1996): 1113.

Mahaffey, Christopher. "Maintaining the ACR and its Capabilities for the Force." *Armor* CXVIII, no. 4 (July–August 2009): 34–43.

Marcantionio, Henry S. "Some Ideas from a Junior Leader." *Armor* LX, no. 6 (November–December 1951): 17.

Marnon, Paul V., and Robert D. Carter. "Manning, Equipping, Training, and Deploying the Brigade Aviation Element." *Infantry Magazine*, September–October 2005. http://findarticles.com/p/articles/mi_m0IAV/is_5_94/ai_n16084363 (accessed 11 March 2009).

Matheny, Lieutenant Colonel Michael. "Growing Scouts." *Armor* CI, no. 5 (September–October 1992): 13.

Matheny, Major Michael R. "Armor in Low Intensity Conflict." *Armor* XCVII, no. 4 (July–August 1988): 9–15.

Matthews, Matt M. Long War Series Occasional Paper 26, *We Were Caught Unprepared: The 2006 Hezbollah-Israeli War*. Fort Leavenworth, KS: Combat Studies Institute Press, 2008.

Maus, Captain Michael L. "Combat Service Support for the Task Force Scout Platoon." *Armor* CII, no. 2 (March–April 1993): 40–41.

Mayo, Staff Sergeant Matthew. "Adjustments to the Task Force Scout Platoon." *Armor* CXIII, no. 2 (March–April 2004): 19–21.

McCrorey, First Lieutenant James K. "One Technique—Support Squad of the Armored Cavalry Platoon." *Armor* LXXIV, no. 5 (September–October 1965): 58–61.

McCurry, Captain William K. Jr., and First Lieutenant Joel R. Phillips. "Brigade Deep Operations: Task Organizing for Victory." *Armor* CII, no. 5 (September–October 1993): 42–45.

McGuire, E.C. "Armored Cars in the Cavalry Maneuvers." *Cavalry Journal* XXXIX, no. 160 (July 1930): 386–399.

"The Mechanized Cavalry Takes the Field." *Cavalry Journal* XLVII, no. 4 (July–August 1938): 291–300.

Melton, Lieutenant Colonel Stephen L. "Heavy Force Emphasis Flirts with Irrelevancy." *Armor* CVII, no. 2 (March–April 1998): 3–4.

Mennix, Captain Wilbert R. "A First Combat Experience." *Armor* LXXVIII, no. 4 (July–August 1969): 9–10.

Meyer, Captain David A. "On a Wing and a Prayer: Reversing the Trend in BCT ISR and Shaping Operations." *Armor* CXII, no. 4 (July–August 2003): 22–25.

Milia, Carmelo P. "Armor Task Force to Khe Sanh." *Armor* LXXIX, no. 3 (May–June 1970): 42–46.

Milikin, Lieutenant Colonel John. "The Fall Maneuvers of the Cavalry School—1934." *Cavalry Journal* XLIV, no. 188 (March–April 1935): 45–52.

Miller, Sergeant First Class Monty A. "Is the New Scout Motto Death Before Dismount?" *Armor* CVII, no. 1 (January–February 1998): 54–55.

Millett, Allan R., and Peter Maslowski. *For the Common Defense: A Military History of the United States of America*. New York, NY: The Free Press, 1984.

Mitchell, George E. "The Rout of the Turks by Allenby's Cavalry." *Cavalry Journal* XXIX, no. 119 (April 1920): 28–43.

———. "The Rout of the Turks by Allenby's Cavalry." *Cavalry Journal* XXIX, no. 120 (July 1920): 174–205.

Mitchell, Captain Gregory R. "Disrupting an Insurgent Bedroom Community." *Armor* CXV, no. 3 (May–June 2006): 16–19.

Mitchell, Captain Rodney B. "Reconnaissance Revisited." *Armor* XC, no. 6 (November–December 1981): 25–27.

Moore, Captain Michael. "Improvement of Armor Employment in Vietnam." *Armor* LXXV, no. 5 (September–October 1966): 4–9.

Moler, Colonel Charles F., and Colonel Richard L. Knox. "AGS Answers." *Armor* CII, no. 2 (March–April 1993): 3–4.

Molino, Colonel Tom. "Don't 'Heavy-Up' the 2d ACR." *Armor* CVI, no. 3 (May–June 1997): 3.

Morton, Matthew D. "Horses for 'Iron Ponies': The Interwar Development of Mechanized Ground Reconnaissance." Master of Arts Thesis, Florida State University, 2001.

———. "Men on 'Iron Ponies': The Death and Rebirth of the Modern U.S. Cavalry." Ph.D. Diss., Florida State University, 2004.

Mosher, Staff Sergeant Craig C. "The CFV as a Scout Vehicle is Questioned." *Armor* XCI, no. 1 (January–February 1982): 3.

Murray, Captain Dale. "Company-Level Cordon and Search Operations in Iraq." *Armor* CXIII, no. 5 (September–October 2004): 26–31.

Myers, Colonel Samuel L. "The Cavalry Regiment of Today." *Armor* LIX, no. 2 (March–April 1950): 58–60.

Nagengast, Captain Paul F. Jr., and First Lieutenant Mack B. Gardner. "3 For 5." *Armor* LXXXIII, no. 1 (January–February 1974): 35–39.

Nagl, Captain John A. "The Armored Gun System: Sheridan Replacement Offers Better Firepower Plus Worldwide Mobility." *Armor* CI, no. 4 (July–August 1992): 26–29.

Nagl, Captain John A., and Captain Tim Huening. "Training A Divisional Cavalry Squadron for Operations Other Than War." *Armor* CV, no. 1 (January–February 1996): 23–24.

Nance, Captain William S. "The Armored Reconnaissance Squadron and the Mechanized Cavalry Group." *Armor* CXV, no. 1 (January–February 2006): 7–11.

Napier, First Lieutenant Todd A. "USAREUR Maneuver Training: Overcoming the Limitations." *Armor* CVII, no. 4 (July–August 1998): 4.

Nevil, Captain Walter H. "Scout and Reconnaissance Platoon Tactics." *Armor* LXXII, no. 1 (January–February 1963): 14–16.

"The New Cavalry Leaders Course." *Armor* CXIV, no. 2 (March–April 2005): 52.

Nolan, Keith W. *Into Laos: The Story of Dewey Canyon II/Lam Song 719; Vietnam 1971*. Novato, CA: Presidio Press, 1986.

Norman, Captain Geoffrey A. "Planning Scout Casualty Evacuation." *Armor* CXII, no. 2 (March–April 2003): 46–49.

Norman, Lieutenant Colonel Kurt D., and Captain George M. Schwartz. "Scout MOUT: Model for Future Cavalry Training." *Armor* CII, no. 5 (September–October 1993): 36–41.

"Notes from the Cavalry Board." *Cavalry Journal* XLVII, no. 6 (November–December 1938): 551.

Nott, First Lieutenant Leif, and First Lieutenant Ryan Popple. "The Cavalry Team: Scout-Tank Integration." *Armor* CXI, no. 5 (September–October 2002): 26–31.

"Officer Training in Reconnaissance." *Armor* XCVII, no. 5 (September–October 1988): 51.

Oh, Amos Y. "Rush Hour: 24 Hours of Route Security Along MSR Tampa." *Armor* CXVII, no. 1 (January–February 2008): 47–49.

Olivier, Captain Irvin Jr. "Short-term Focus at the Expense of Long-Term Technical Competency." *Armor* CXVI, no. 3 (May–June 2007): 3.

Palmer, Captain Bruce. "Mechanized Cavalry in the Second Army Maneuvers." *Cavalry Journal* XLV, no. 6 (November–December 1936): 461–478.

———. "The Bantam in the Scout Car Platoon." *Cavalry Journal* L, no. 2 (March–April 1941): 89–92.

———. "New Battle Lessons on Reconnaissance." *Cavalry Journal* LII, no. 5 (September–October 1943): 36–37.

Patton, George S. Jr. "The 1929 Cavalry Division Maneuvers." *Cavalry Journal* XXXIX, 158 (January 1930): 9–10.

Patton, Major General George S. "In Support of the Scout." *Armor* LXXXVI, no. 2 (March–April 1977): 5.

———. “Pile On.” *Armor* LXXIX, no. 1 (January–February 1970): 25–31.
———. “Pile-On—Part II.” *Armor* LXXIX, no. 2 (March–April 1970): 26–31.
Patton, George S. Jr., and Clarence C. Benson. “Mechanization and Cavalry.” *Cavalry Journal* XXXIX, no. 159 (April 1930): 234–240.
Pickett, George B. Jr. “Eyes and Ears for Tomorrow’s Commanders.” *Armor* LXIV, no. 5 (September–October 1955): 30–31.
Pierce, Major Clinton A. “Armor for Horse Cavalry Reconnaissance Vehicles?” *Cavalry Journal* XLVII, no. 4 (July–August 1938): 327–328.
Posz, Captain Joseph D. “To Train a Cavalryman.” *Armor* LXXIII, no. 4 (July–August 1964): 41–42.
Prevou, Lieutenant Colonel Michael. “HMMWVs Lack the Firepower and Protection for Bosnia Role.” *Armor* CVII, no. 1 (January–February 1998): 36, 56.
Price, Major Jaren K. “The Battlefield Surveillance Brigade: The Future of Division-Level Intelligence, Surveillance, and Reconnaissance.” *Armor* CXVII, no. 6 (November–December 2008): 34–39.
Prill, First Lieutenant Alfred C. “The Medium Weight Force: Reinventing the Wheel?” *Armor* CIX, no. 1 (January–February 2000): 3–4.
Randazzo, Richard. “OPFOR Counterreconnaissance at the National Training Center.” *Armor* CVII, no. 2 (March–April 1998): 12–13.
Rauer, Michael A. “Order Out of Chaos: The United States Constabulary in Postwar Germany.” *Army History*, no. 45 (Summer 1998): 22–35.
Reardon, Lieutenant Colonel Mark J. “Development of Cavalry Reconnaissance Doctrine for the Next Century.” *Armor* CVIII, no. 4 (July–August 1999): 19–20.
Reardon, Mark J., and Jeffery A. Charlston. *From Transformation to Combat: The First Stryker Brigade at War.* Washington, DC: Center of Military History, 2007.
Reed, C.H. “Armored Cavalry Light: Its Organization as Derived From Its Missions.” *Armored Cavalry Journal* LVIII, no. 1 (January–February 1949): 13–16.
Reed, Captain Walt. “Fault Trend Analysis: A Proactive Maintenance Approach.” *Armor* CXIV, no. 4 (July–August 2005): 36–39.
Reeves, Captain Larry. “Light Cavalry Table XII.” *Armor* CVI, no. 3 (May–June 1997): 44–45.
Riggs, Captain William S. “Global Cavalry.” *Armor* CVII, no. 2 (March–April 1998): 23–29.
Robb, Captain Shane. “FBCB2: Past, Present, and Future.” *Armor* CXV, no. 4 (July–August 2006): 15–18.
Robel, Major Michael K. “Keeping OPORDs Simple.” *Armor* CII, no. 6 (November–December 1993): 2–3.
“Roll On! Army Selects LAV III Variants to Equip New Interim Brigades.” *Armor* CX, no. 1 (January–February 2001): 13–15.
Romjue, John L. *American Army Doctrine for the Post-Cold War*. Fort Monroe, VA: US Army Training and Doctrine Command Military History Office, 1997.

———. *The Army of Excellence: The Development of the 1980s Army*. Fort Monroe, VA: US Army Training and Doctrine Command, 1997.

———. *From Active Defense to AirLand Battle: The Development of Army Doctrine 1973–1982*. Fort Monroe, VA: US Army Training and Doctrine Command, 1984.

Rosenberger, Colonel (Retired) John D. "Breaking the Saber: The Subtle Demise of Cavalry in the Future Force." Institute of Land Warfare. Land Power Essay No. 04-1, June 2004. http://www.ausa.org/SiteCollectionDocuments/ILW%20Web-ExclusivePubs/Landpower%20Essays/LPE04-1.pdf (accessed 24 February 2009).

Saindon, Chief Warrant Officer 3 Christopher A. "Targeting and Fire Support with the Brave Rifles Regiment." *Armor* CXI, no. 2 (March–April 2002): 26–27.

Saint, Colonel Crosbie E. "Cavalry Today." *Armor* LXXXVI, no. 4 (July–August 1977): 60–61.

Salas, Captain Mark H. "Who is the OPFOR That We Plan to Fight?" *Armor* CVII, no. 3 (May–June 1998): 3.

Salerno, Captain George. "Repairing the Broken Sabre: Overview of the L-Series Divisional Cavalry." *Armor* CIII, no. 1 (January–February 1994): 29–30.

Schneider, Sergeant Christopher F. "Define the Scout's Mission." *Armor* LXXXIX, no. 2 (March–April 1980): 2.

Scott, Colonel Charles L. "Armor for Cavalry Reconnaissance Vehicles is Essential." *Cavalry Journal* XLVII, no. 5 (September–October 1938): 430–433.

———. "Armored Reconnaissance." *Cavalry Journal* LI, no. 6 (November–December 1942): 20–22.

Scribner, Major Barry. "HMMWVs and Scouts: Do They Mix?" *Armor* XCVIII, no. 4 (July–August 1989): 33–38.

Seagreaves, Captain Ryan. "Transforming the Task Force Scout Platoon." *Armor* CXII, no. 2 (March–April 2003): 40–42.

Seborer, Stuart J. "Brief for a Cavalry Combat Platoon." *Armor* LV, no. 2 (March–April 1946): 55.

———. "Modern Cavalry Organization." *Cavalry Journal* LVI, no. 2 (March–April 1947): 23–25.

Shakespeare, Captain William F., and Captain Wes Loyd. "Training the Next 'Old Bill' for the Contemporary Operating Environment." *Armor* CXVI, no. 3 (May–June 2007): 12–16.

Shambarger, Lieutenant Colonel Bob E. "Eyes and Ears Defended." *Armor* XCIII, no. 1 (January–February 1984): 3.

Sherman, Jason. "Budget Squeeze Drives Army to Terminate Armored Gun System Program." *Inside the Army*. Special report, 26 January 1996.

Silk, First Lieutenant Jonathan. "Light Cavalry Platoon—Armor Team Integration Procedures." *Armor* CXIV, no. 4 (July–August 2005): 6–10.

Sinclair, Captain Nicholas C. "An Approach to Route Security." *Armor* CXVII, no. 2 (March–April 2008): 26–32.

Smith, Captain David J., and First Lieutenant Jeffrey Ritter. "Team Enabler: Combining Capabilities During the Execution of Full Spectrum Operations." *Armor* CXVII, no. 2 (March–April 2008): 43–45.

Sparks, Technical Sergeant Mike. "If M113s Don't Work in Snow, Let's Find Out Why." *Armor* CVI, no. 1 (January–February 1997): 48–49.

———. "LAV Solution Too Vulnerable." *Armor* CIV, no. 3 (May–June 1995): 48–49.

———. "Winning the 21st Century Battle for Reconnaissance." *Armor* CVIII, no. 4 (July–August 1999): 3–4.

St-Pierre, Lieutenant Colonel Henry M., and First Lieutenant Jamie E. Warder. "Team Recon: A New Approach to Armored TF Reconnaissance." *Armor* CVIII, no. 2 (March–April 1999): 24–26, 29.

Stanton, Major Martin N. "Assault Gun Battalion 96." *Armor* CIII, no. 5 (September–October 1994): 38–43.

Stanton, Shelby L. *Vietnam Order of Battle: A Complete Illustrated Reference to U.S. Army Combat and Support Forces in Vietnam 1961–1973*. Mechanicsburg, PA: Stackpole Books, 1981.

———. *World War II Order of Battle*. New York, NY: Galahad Books, 1991.

Starry, Major General Donn A. "The Commander's Hatch." *Armor* LXXXIII, no. 1 (January–February 1974): 4–6.

———. "The Commander's Hatch." *Armor* LXXXIV, no. 2 (March–April 1975): 5.

———. *Mounted Combat in Vietnam*. Washington, DC: Department of the Army, 1989.

Stawowczyk, Major Edward J. "A Combat Multiplier in Iraq: The Long Range Advanced Scout Surveillance System." *Armor* CXIII, no. 2 (March–April 2004): 39–41.

Stewart, Doug. "Hail to the Jeep! Could We Have Won Without It?" *Smithsonian* (November 1992): 61–64.

Strader, Major O. Kent. "Successful Scout Mounted Infiltration." *Armor* CXIII, no. 1 (January–February 2004): 42–45.

"The Stryker 'Reconnaissance Vehicle.'" *Armor* CXII, no. 4 (July–August 2003): 54.

"Stryker 8-Wheel Drive Armoured Vehicles, USA." http://www.army-technology.com/projects/stryker/ (accessed 15 December 2008).

Stubbs, Mary Lee, and Stanley Russell Connor. *Army Lineage Series: Armor-Cavalry Part I: Regular Army and Army Reserve*. Washington, DC: Center of Military History, 1984.

Sullivan, Captain Mike. "Arming the Knight for Dismounted Combat." *Armor* CXIII, no. 3 (May–June 2004): 7–10.

Sullivan, Lieutenant Colonel Roy F. "The APC in ARVN." *Armor* LXXIX, no. 1 (January–February 1970): 36–38.

Swain, Richard M. "AirLand Battle." In *Camp Colt to Desert Storm: The History of U.S. Armored Forces*, edited by George F. Hofmann and Donn A. Starry. Lexington, KY: University Press of Kentucky, 1999.

Tait, Major General Thomas H. "Commander's Hatch: Reconnaissance." *Armor* XCVI, no. 2 (March–April 1987): 5.

———. "Commander's Hatch: Remembering Some Lessons Learned." *Armor* XCVI, no. 4 (July–August 1987): 6–7.

Tatum, Captain Randy D. "Cavalry's Traditional Role Endangered." *Armor* XC, no. 1 (January–February 1981): 3.

Taylor, Curtis D. "Trading the Saber for Stealth: Can Surveillance Technology Replace Traditional Aggressive Reconnaissance?" Association of the US Army, The Institute of Land Warfare. No. 53 (September 2005).

Teegerstrom, First Lieutenant Eric J. "Scout Snipers: One Shot, One Kill." *Armor* CIII, no. 4 (July–August 1994): 20–21.

Thacker, Staff Sergeant Dwayne C. "The 'Recce Stryker'—Making a Good Vehicle Great." *Armor* CXII, no. 3 (May–June 2003): 3.

———. "Scout Vehicle Designs Must Allow for Easy Dismount." *Armor* CVIII, no. 4 (July–August 1999): 18.

Thomas, Timothy L. "Kosovo and the Current Myth of Information Superiority." *Parameters* (Spring 2000): 13–29.

Thomson, Captain Scott K. "Focused Reconnaissance and Developing Battlespace in the Armored Cavalry Troop." *Armor* CXII, no. 2 (March–April 2003): 14–15.

Tolson, Lieutenant General John J. *Vietnam Studies: Airmobility 1961–1971*. Washington, DC: Department of the Army, 1973.

Tosh, First Lieutenant David A. "Engaging the Population and Local Leaders." *Armor* CXIII, no. 5 (September–October 2004): 41–43.

Treese, Lieutenant Colonel (Retired) Charles W. "Taking Another Hard Look at the Combined Arms Cavalry Platoon." *Armor* CXV, no. 5 (September–October 2006): 3.

Troop F, 17th Cavalry Regiment, 196th Light Infantry Brigade. Vietnam 1966–1972. "Campaign CEDAR FALLS." http://www.ftrp17cav196.com/cfalls.htm (accessed July 2008).

Tucker, Major General Terry L. "The Armor Officer Education System Expands to Include 'Reconnaissance-Centric Training.'" *Armor* CXIV, no. 4 (July–August 2005): 3, 48.

———. "Future Cavalry Organization and the Recon Squadron." *Armor* CXIII, no. 4 (July–August 2004): 4.

———. "Managing and Developing Tankers and Scouts." *Armor* CXII, no. 6 (November–December 2003): 4.

———. "Restructuring the Force." *Armor* CXIII, no. 3 (May–June 2004): 5.

Ullman, First Lieutenant Donald F., First Lieutenant Freeman A. Carr, Second Lieutenant Patrick M. Ward, and Second Lieutenant Arthur F. Shilonski. Letter to the Editor. *Armor* LXXV, no. 5 (September–October 1966): 3.

"Up-Armored HMMWV." http://www.globalsecurity.org/military/systems/ground/ hmmwvua.htm (accessed 24 November 2008).

"Up-Armored HUMVEE." http://www.defense-update.com/features/du-3-04/up-armored-humvee.htm (accessed 24 November 2008).

Urbina, Diane L. "'Lethal Beyond All Expectations': The Bradley Fighting Vehicle." In *Camp Colt to Desert Storm: The History of U.S. Armored Forces* edited by George F. Hofmann and Donn A. Starry. Lexington, KY: University Press of Kentucky, 1999.

"U.S. Military Operations November 1990–Present." *Defense 96 Almanc*, no. 5 (1996): 41–42.

Votaw, Captain John F. "The Blackhorse Kicks Back." *Armor* LXXVI, no. 4 (July–August 1967): 38–41.

Vowels, Lawrence G., and Jeffrey R. Witsken. "Peacekeeping with Light Cavalry: the 10th Mountain Division's 3-17 Cav Deploys to Somalia." *Armor* CIII, no. 5 (September–October 1994): 26–27.

Wagner, Captain Robert E. "Cavalry Platoon Operations." *Armor* LXXII, no. 4 (July–August 1963): 32–37.

Wagner, Major General Robert E. "Division Cavalry: The Broken Sabre." *Armor* XCVIII, no. 5 (September–October 1989): 39–40.

Walsh, Major Todd E. "The Fight for Kufa: Task Force 2-37 Armor Defeats al-Sadr's Militia." *Armor* CXIII, no. 6 (November–December 2004): 26–30.

Walker, Colonel Michael M. "Marine Light Armor Tested 'Global Cavalry' Concepts." *Armor* CVII, no. 4 (July–August 1998): 53.

Walters, Captain Keith R. "The RSTA Squadron: Agile and Adaptive, Relevant and Ready." *Armor* CXIII, no. 6 (November–December 2004): 19–21.

Weigley, Russell F. *History of the United States Army*. Bloomington, IN: Indiana University Press, 1984.

West, Major General Arthur L. Jr., and Colonel Donn A. Starry. "Improved Organization and Equipment for Vietnam." *Armor* LXXVII, no. 3 (May–June 1968): 48–51.

Westgaard, First Lieutenant Wayne T. "Will the New Brigade Reconnaissance Troop Be Adequately Protected?" *Armor* CVIII, no. 2 (March–April 1999): 27–29.

White, Lieutenant George M. "Cavalry's Iron Pony." *Cavalry Journal* L, no. 2 (March–April 1941): 85–88.

White, Major I.D. "Reconnaissance Battalion, Armored Division." *Cavalry Journal* L, no. 3 (May–June 1941): 48–49.

Wickline, Captain Jarrod P. "Integrating Dismounts Into Reconnaissance and Security Operations in the Heavy Cavalry Troop." *Armor* CXIII, no. 2 (March–April 2004): 34–36.

Williams, Captain Bill. "The Battalion Scout Troop: A Doctrinal and Organizational Answer to Battalion Tactical Reconnaissance." *Armor* CVIII, no. 4 (July–August 1999): 37–40.

Williams, Major General Robert M. "Maintaining Armor Core Competencies." *Armor* CXVI, no. 1 (January–February 2007): 4.

———. "U.S. Army Armor School: Building New Leaders." *Armor* CXV, no. 1 (January–February 2006): 4.

Williamson, First Lieutenant John. "Ground Cavalry Checkpoint Operations in Somalia." *Armor* CIII, no. 6 (November–December 1994): 20–22.

Wilson, Arthur. "With the Mechanized Force on Maneuvers." *Cavalry Journal* XL, no. 166 (July–August 1931): 5–9.

Wilson, Captain Dale E. "Improving the J-Series HHC." *Armor* XCIV, no. 6 (November–December 1985): 2–3.

Wilson, John B. *Army Lineage Series: Maneuver and Firepower: The Evolution of Divisions and Separate Brigades*. Washington, DC: Center of Military History, 1998.

Wilson, First Lieutenant John S. "CSS for the Scout Platoon—Another Solution." *Armor* CIV, no. 5 (September–October 1995): 46–47.

Wottlin, Major Robert J. "The Case for Light Cavalry." *Armor* C, no. 6 (November–December 1991): 30–32.

Woznick, Lieutenant Colonel John C. "The Scout Vehicle." *Armor* CIII, no. 5 (September–October 1994): 31–34.

Wright, Dr. Donald P., and Colonel Timothy R. Reese. *On Point II: Transition to the New Campaign: The United States Army in Operation IRAQI FREEDOM, May 2003–January 2005*. Fort Leavenworth, KS: Combat Studies Institute Press, 2008.

"XM2 and 3." *Armor* LXXXVIII, no. 3 (May–June 1979): 30–34.

Zaloga, Steven J., and James W. Loop. *Modern American Armor: Combat Vehicles of the United States Army Today*. Harrisburg, PA: Arms and Armour Press, 1982.

———. *Staghound Armored Car 1942–62*. New York, NY: Osprey Publishing Ltd., 2009.

Zeller, Phillip J. Jr. "Leave the Cav Where It Is." *Armor* XCIV, no. 4 (July–August 1985): 2.

Zucchino, David. *Thunder Run: The Armored Strike to Capture Baghdad*. New York, NY: Atlantic Monthly Press, 2004.

Index

About the Author

Robert S. Cameron attended Binghamton University from 1983 to 1987, graduating with a B.A. in both economics and history. He then studied military history under the tutelage of Dr. Russell F. Weigley at Temple University, earning his Ph.D. in the same subject area from that institute in 1994. While still a graduate student, he began teaching as a college instructor and continued to do so on receipt of his doctoral degree. He taught a variety of classes in American, European, and world history for Temple University, Camden County Community College, and Manor Junior College. In 1996, Dr. Cameron began work as the US Army's branch historian for Armor, completing the Armor Officer Basic Course as a civilian that same year. He continues to serve in this capacity and bears responsibility for documenting principal developments in the Armor Branch and Center, providing historical instruction, supporting staff rides, and performing historical research and analysis related to mounted maneuver organizational, doctrinal, and materiel actions. He also has supported the Patton Museum of Armor and Cavalry in a professional capacity. Dr. Cameron has written several articles related to armor developments for military publications and authored the *Staff Ride Handbook for the Battle of Perryville, 8 October 1862* (Fort Leavenworth, KS: Combat Studies Institute Press, 2005), and *Mobility, Shock, and Firepower: The Emergence of the U.S. Army's Armor Branch, 1917–1945* (Washington, DC: Center of Military History, 2008). His professional interests include armored warfare, combined arms development trends, the internal workings of military bureaucracies, and the Civil War in the Western Theater.

Combat Studies Institute

The Combat Studies Institute (CSI) is a military history "think tank" that produces timely and relevant military history research publications and contemporary operational history for the US Army. CSI also conducts battlefield staff rides and provides other types of educational and historical support to Army units and commands on request. CSI consists of six divisions: the Research and Publications Team, the Staff Ride Team, the Contemporary Operations Study Team, the Military History Instructional Support Team, the Combined Arms Center Command History Office, and the Frontier Army Museum.

Other CSI Special Studies

Scouts Out! The Development of Reconnaissance Units in Modern Armies

Over the Beach: US Army Amphibious Operations in the Korean War

Iroquois Warriors in Iraq

Through the Lens of Cultural Awareness: A Primer for US Armed Forces Deploying to Arab and Middle Eastern Countries

Breaking the Mold: Tanks in the Cities

The Brigade: A History, Its Organization and Employment in the US Army

Crossing the Line of Departure: Battle Command on the Move—A Historical Perspective

Military History/Reconnaissance

ISBN: 978-0-9823283-9-2