TRANSFORMING MECHANIZED RECONAISSANCE: HOW THE ARMORED BRIGADE COMBAT TEAM (ABCT) CAVALRY SQUADRON SHOULD BE STRUCTURED FOR RECONAISSANCE AND SECURITY OPERATIONS IN THE NEAR FUTURE

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14. ABSTRACT

This research considers the future of Brigade Combat Team (BCT) Cavalry Squadrons during the upcoming interwar period. This is accomplished by specifically examining the Armored Brigade Combat Team (ABCT) Cavalry Squadron through one primary research question: How should the ABCT Cavalry Squadron be further developed to conduct reconnaissance and security missions in the next 10 years? Developing a Cavalry Squadron that can effectively support the ABCT in the future is a complex problem. This research uses Army Design Methodology (ADM) to examine this complex issue. Design assists in framing the environment, the problem, and creating a problem solving approach. Solutions are then created through applying evaluation and validation criteria developed through ADM. Results suggest that the current Cavalry Squadron is capable of supporting a larger ABCT, however in terms of capability there are other options that provide the ABCT commander with a better reconnaissance and security formation. The research also suggests that ADM can be applied to other organizational issues. Ultimately this work presents an alternative problem solving approach to issues regarding force structure that breaks away from the traditional doctrine, organization, training, material, leadership, personnel, and facilities (DOTMLPF) paradigm.

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

ABSTRACT

TRANSFORMING MECHANIZED RECONAISSANCE: HOW THE ARMORED BRIGADE COMBAT TEAM (ABCT) CAVALRY SQUADRON SHOULD BE STRUCTURED FOR RECONAISSANCE AND SECURITY OPERATIONS IN THE NEAR FUTURE, by Major Todd Landon Poindexter, 143 pages.

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ACRONYMS

ABCT	Armored Brigade Combat Team
ADRP	Army Doctrine and Training Publication
BCT	Brigade Combat Team
BFV	Bradley Fighting Vehicle
BRT	Brigade Reconnaissance Troop
CAB	Combined Arms Battalion
CFV	Cavalry Fighting Vehicle
FM	Field Manual
HUMINT	Human Intelligence
ISR	Intelligence Surveillance and Reconnaissance
LRAS3	Long Range Acquisition and Surveillance Scout Sight
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
PLT	Platoon
ROAD	Reorganization Objective Army Division
SQDN	Squadron
TRP	Troop
UAV	Unmanned Aerial Vehicle

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CHAPTER 1

INTRODUCTION

Broad Statement of the Problem

Militaries generally decrease in size, innovate, and change during interwar periods or in times of limited conflict. In fact, historians have noted that western militaries go through times of violent change followed by relative calm, during which the military adapts to changes in the environment (Knox and Murray 2001). Basically, these periods tend to be times of opportunity and decision for militaries to adapt lessons from previous conflicts and prepare for expected conflicts. Given the conclusion of armed conflict in Iraq and the near future conclusion of combat operations in Afghanistan, the United States Army is presumably beginning to enter another interwar period. Historians emphasize that interwar periods are marked by complexity and ambiguity that is further compounded by the far reaching effects of change that is or is not fostered between major conflicts (Murray and Millet 1998). Today, the United States Army is presented with just such a case regarding force structure change, dictated by budgetary constraints, lessons learned, and predictions of the future within a constantly changing and uncertain global environment. After the introduction of modularity in the early 21st century, the centerpiece of United States Army warfighting capability has been the Brigade Combat Team (BCT), and it will be one of the stages upon which change and innovation during the upcoming interwar period will occur.

The BCT is the Army's premier scalable and tailorable tactical unit. Therefore, the capabilities provided to or taken away from the BCT during the upcoming interwar period will be critical to the pursuit of strategic and operational objectives in the future.

Military innovation or lack thereof, during interwar periods is driven by many factors and variables that are complex in nature (Murray and Millet 1998). Due to the complexity of innovation, decisions to change course in military development can have far reaching and unforeseen effects. A historical example of how innovation in warfare can take very different directions that affected the ultimate outcome of conflict is the German and French development of mechanized forces between World War I and World War II. In this case, the French had far superior armored vehicles and in greater numbers than the Germans. It is how those countries developed mechanized doctrine that determined the difference and eventual outcome. The Germans developed a decentralized maneuver doctrine focused on the offense, whereas the French developed an overly centralized maneuver doctrine, with very deliberate offensive action, that emphasized the strength of the defense (Murray and Millett 1998). The variables that affected how these militaries innovated ranged from military culture, to assumptions regarding threat, to the budgetary and political conditions of the time. The endstate in this case is that in 1940 the German army defeated French and British forces during initial offensive operations in France despite being numerically and technologically outmatched. The operational and strategic success achieved by the Germans can be directly attributed to how they approached and fostered innovation in the interwar period (Murray and Millet 1998). Many BCT capabilities will have to be carefully weighed and measured to meet the demands of the future given current constraints or variables and the far reaching effects of force structure decisions during interwar periods. The BCT's internal reconnaissance and security capability is one such issue.

Background

The Prussian military theorist Carl Clausewitz stated, "war has a way of masking the stage with scenery crudely daubed with fearsome apparitions . . . once this is cleared away the horizon becomes unobstructed" (Clausewitz 1984, 118). His statement was made in the context of intelligence as it pertains to planning and execution; however, one can logically make the connection between reconnaissance and its role in un-masking the stage, or fog, of which Clausewitz speaks. According to Army Doctrine and Training Publication (ADRP) 3-90, *Offense and Defense*:

> Reconnaissance operations are those operations undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy, or to secure data concerning the meteorological, hydrographical or geographical characteristics and the indigenous population of a particular area. (Department of the Army 2012a, 5-1)

In military operations, both historical and current, reconnaissance has played or plays a critical role for military commanders at many levels. A historical example of the impact of reconnaissance on operations is the initial absence of J.E.B Stuart's cavalry at the battle of Gettysburg in July 1863. The absence of Stuart's cavalry denied Robert E. Lee vital intelligence regarding the Union force array and intentions. This greatly affected Lee's decision making, and ultimately resulted in a strategic defeat for the Confederacy (Herr and Wallace 1953). A more contemporary example includes the actions of 2d Squadron 4th Cavalry Regiment during Operation Desert Storm from February to March 1991. This unit conducted a wide variety of reconnaissance and security missions in a very short time period, which shaped the operational and tactical achievement of the 24th Infantry Division's objectives, ultimately leading to United States military success in Operation Desert Storm (Barto 1993). A military's reconnaissance capability is directly

related to its ability to successfully prosecute efforts at the strategic, operational, and tactical levels of war. Therefore, reconnaissance capability or capacity is critical for any military organization from squad to corps.

The ability to conduct effective reconnaissance is a critical capability currently possessed by a maneuver brigade commander, but regardless of its importance, the Army's senior leadership must consider a full range of options with regard to the structure of future BCTs. The ABCT is one type of BCT organization within the Army force structure, and the internal reconnaissance and security capabilities within the ABCT are the focus of this research effort.

At the ABCT level, the Cavalry Squadron, integrated with other capabilities in the brigade, exists to provide the brigade commander with situational understanding and security across the breadth, depth, and context of the operational environment (Department of the Army 2010b). Therefore, examining the Cavalry Squadron and how it can be developed during this upcoming interwar period is at the centerpiece of this research. Developing a more capable reconnaissance and security formation for the ABCT commander can produce an ABCT that is better developed to deal with the challenges of an uncertain future environment and dynamic threat. Change in the Cavalry Squadron may be necessary to provide the BCT commander with a reconnaissance and security formation that has the right capabilities to assist in fulfilling the brigade's doctrinal mission in future conflict:

> [T]o close with the enemy by means of fire and maneuver to destroy or capture enemy forces, or to repel enemy attacks by fire, close combat, and counterattack. The BCT can fight without augmentation, but it also can be tailored to meet the precise needs of its missions. BCTs conduct expeditionary deployment and

> integrate the efforts of the Army with military and civilian, joint and multinational partners. (Department of the Army 2010b, 1-1)

Given the importance of reconnaissance and security operations, the doctrinal ABCT mission, and the many variables that effect organizational change this research effort focuses on the following question: "how should the ABCT Cavalry Squadron be developed to conduct reconnaissance and security missions in the next 10 years?" In order to answer this question there are three distinct secondary questions that are pertinent to provide context and insight. The first is, "how does reconnaissance theory over time, combined with current doctrine, contribute to defining reconnaissance, and what is the modern definition of reconnaissance?" This question is necessary to come to a common combined definition of reconnaissance that accounts for military theory and Army Doctrine, exploring this question provides a theoretical foundation from which the primary research question can be further explored. The second question is, "how did US Army brigade level reconnaissance organizations (or like-type units), missions, and tasks evolve from World War II to today and why?" This provides insight into how battalion sized reconnaissance organizations have adapted over the years to meet what were perceived future challenges. The final question that is necessary for this research effort is, "what capabilities are required of the ABCT Cavalry Squadron in near future conflict given the future operational environment described in contemporary literature?" This question is important to account for the future operational environment so anticipated demands and challenges for reconnaissance organizations can be appropriately captured. The question assists in determining capabilities required in the near future and is not intended to be a prediction of the future operational environment.

The Difference and Significance of this Research Effort

Reconnaissance is by no means a new research topic. Volumes have been written on the subject. As outlined by the secondary research questions, this thesis examines this broad topic by looking back to the past and forward towards the future. The research then draws conclusions from the design process and through a research methodology to identify what is required of the Cavalry Squadron in the next 10 years. The figure below is a depiction of how this effort answers the primary research question.

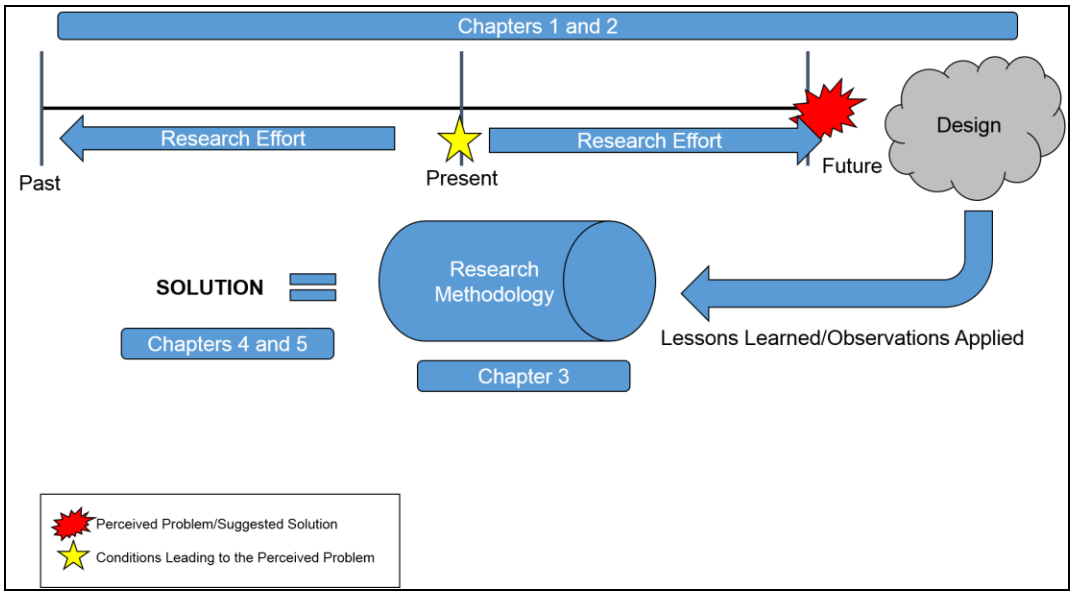


Figure 1. Research Model

Source: Created by author.
Note: This model outlines where research effort will be focused and how that research will be analyzed to seek an organizational solution.

This research examines the organization of the Cavalry Squadron in the ABCT, and attempts to determine whether or not the Cavalry Squadron organization is sufficient to support an ABCT in future conflict. This research effort provides an organizational

solution by exploring historical theory, past organizational solutions, and future demands on reconnaissance to provide informed input into the ongoing force transformation process within the ABCT. This research is similar to many others in topic and emphasis, however it is different because it applies Army Design Methodology to the organizational problem in order to determine the problem solving approach (research methodology) and provide recommended solution(s). The ultimate goal would be that this research assists in providing the ABCT commander with a Cavalry Squadron that is sufficient to enable the ABCT in the execution of its doctrinal mission in future conflicts.

Problem sets such as these have been common in interwar periods. Changes during these periods such the development or adjustment of maneuver doctrine, the reorganization of units, or the infusion of technology can have long lasting second and third order effects. For example, the simple decision by the Germans in the 1930s to put two way radios in their tanks based on the de-centralized nature of their doctrine had an effect on mechanized operations that continues to the present day (Murray and Millett 1998). It is vital as the U.S. Army enters another period of change that professional and academic discourse regarding change assists in making force structure decisions. I intend to provide data that the Armor community, the Maneuver Center of Excellence, and the Army as a whole may find valuable regarding critical force reduction and enhancement decisions in a time of change.

Key Assumptions

This research effort relies on four key assumptions. First, it is assumed that valuable lessons can be learned from past experiences. Given the multiple variables (enemy, operational environment, technology, etc.) that contribute to the ever changing

nature of warfare, it is likely that some past organizational models will not be a valid basis for a future organization. A Second assumption, is how we define the future operational environment. Any prediction of the future, whether it is focused on the operating environment or predictions regarding future capabilities are informed assumptions. The third assumption is that reconnaissance and security missions are not separable. The requirement for reconnaissance units to conduct both reconnaissance and security operations is outlined in Army doctrine (Department of the Army 2009b; Department of the Army 2010a). Although reconnaissance and security operations can be conducted independently, it is also possible for them to be conducted in unison to complement ABCT maneuver transitions within a single mission. This means that a reconnaissance unit could be utilized for either or both during a single ABCT mission. The assumption that reconnaissance and security operations are inseparable implies that any reconnaissance unit should be capable of conducting both, and is necessary since the primary research question is one of capability. Finally, it is assumed that the increase in Combined Arms Battalions (CABs) in the future ABCT structure (see figure 12) requires a change in the organization of the Cavalry Squadron to support the ABCT reconnaissance effort.

Limitations and Delimitations

This research will have limitations, given that reconnaissance is a very broad and greatly researched topic. This research discusses security operations as defined in ADRP 3-90 and Field Manual (FM) 3-90.2, and focuses on four of the five forms of reconnaissance: route, zone, area, and reconnaissance in force (Department of the Army 2012d; Department of the Army 2013a). The fifth form of reconnaissance, special

reconnaissance, is omitted because it is generally executed by special operations forces rather than conventional units (Department of the Army 2012d; Department of the Army 2013a). The security mission of cover is also omitted from this research effort in its discussion of security tasks. Cover is omitted because the mission is not doctrinally designed to be executed by a single battalion or squadron, and would require the entirety of the ABCT to meet the intent outlined in Army doctrine (Department of the Army 2013a). The intent is to address future reconnaissance and security capabilities required of the Cavalry Squadron within the ABCT to enable brigade level operations.

The study of the evolution of mechanized reconnaissance is also limited to the timeframe of 1942 to 2013. This time period was chosen to provide insights into the evolution of US mechanized reconnaissance. This section is further scoped to only account for major organizational shifts during this time period. Literature review in this section is focused on the organizational and doctrinal evolution of US mechanized reconnaissance battalions prior to and after World War II, during and after the Korean War, during Vietnam, prior to and after the Gulf War, prior to and during Operation Iraqi Freedom (OIF), and Operation Enduring Freedom (OEF). Limiting the research in this manner provides focus on the process and reasons for organizational change from a US perspective.

Research of the future is not meant to be a prediction of the future operational environment. It focuses on determining the capabilities required of the future ABCT Cavalry Squadron that can be extrapolated from scholarly determinations regarding the future operational environment. Furthermore, this research effort focuses on the near

future rather than an undetermined period of time. The near future is classified in this work as the next 10 years.

CHAPTER 2

LITERATURE REVIEW

Section I Introduction

This chapter is a comprehensive review regarding the definition of reconnaissance, the organizational and doctrinal evolution of reconnaissance battalions within combat brigades (or equivalent) from 1942 to the present, and the future environment as it applies to reconnaissance at the ABCT level. This chapter begins the process of determining the reconnaissance capabilities the ABCT commander of 2024 requires. The literature review is specifically targeted at answering three key secondary questions that assist in answering the primary research question. These secondary questions are:

1. How does reconnaissance theory over time, combined with current doctrine, contribute to defining reconnaissance, and what is the modern definition of reconnaissance? (Chapter 2 Section III)
2. How did US Army brigade level reconnaissance organizations (or like type units), missions, and tasks evolve from World War II to today and why? (Chapter 2 Section IV)
3. What capabilities are required of the ABCT Cavalry Squadron in near future conflict given the future operational environment described in contemporary literature? (Chapter 2 Section V)

All three questions are designed to facilitate understanding of the problem and visualize a solution to the capabilities required of Cavalry Squadrons in the ABCT of the future. In order to gain understanding of this complex problem, it is necessary to have a method for

visualizing and gaining understanding. The method utilized in this research effort for gaining that understanding, determining the capabilities required, refining the problem, and developing a problem solving approach is Army Design Methodology.

Section II Army Design Methodology Applied to an Organizational Problem

Army Design Methodology provides a method for understanding problems and visualizing solutions. It facilitates understanding, visualization, and description of unfamiliar or complex problems and assists in determining the best approach to solving them (Department of the Army 2012c). The development of the ABCT Cavalry Squadron is not a simple issue and has many second and third order effects. Examining this issue requires a process that allows the researcher to identify the variables that effect the organization in both current and future environments, the ability to reframe the issue by accounting for those variables, and to determine an approach to solving the issue. The three activities within Army Design Methodology are framing the environment, framing the problem, and developing an operational approach (Department of the Army 2012e). This makes Army Design Methodology equally applicable to the issue at the center of this research effort. First, this chapter frames the Cavalry Squadron's organizational environment. Framing of the organizational environment is accomplished through an examination of military theory, the evolution of reconnaissance battalions from the past to the present (current state), and an examination of the future operational environment (future state). Framing of the organizational environment is further focused by the sub questions outlined above. Chapter 3 includes a reframing of the problem outlined in chapter 1 and the development of a problem solving approach (operational approach).

Chapter 4 applies the problem solving approach to the current Cavalry Squadron and two organizational solutions. Chapter 5 records the findings and conclusions based on the application of the problem solving approach created through Army Design Methodology. Figure 3 depicts a model of Army Design Methodology and how it is being applied to the primary research question for this work.

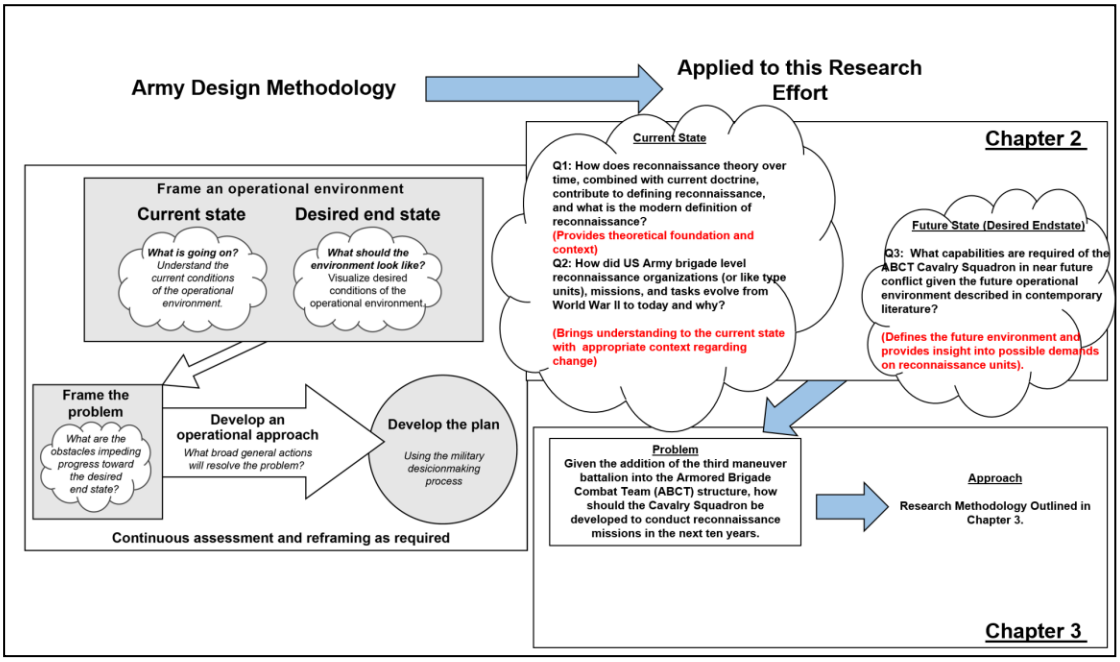


Figure 2. Army Design Methodology Applied to the Literature Review

Source: Created by author, modified from Department of the Army, ADRP 5-0, *The Operations Process* (Washington, DC: Department of the Army, 2012), 2-6.
Note: How design is utilized in this work to examine the problem through secondary research questions and develop a problem solving approach.

Question 1 is focused on exploring theory and doctrine to clarify the definition of reconnaissance and what that means to an organization with the reconnaissance mission. The question further seeks to establish a holistic single definition, from many, to provide

context and a common understanding of the reconnaissance mission. It is already clear that the history of reconnaissance formations has bearing on this problem, so question 2 is formulated to provide insight into change within the mechanized reconnaissance community from World War II to the present day (Current State). Question 2 further provides insights into previous organizational solutions and doctrinal changes in the mechanized reconnaissance community over time. These findings can be compared to foundational theory to see how theory does or does not affect organizational and doctrinal change over time. Finally, question 3 provides a vision of demands upon reconnaissance derived from the future operational environment (Future State or Desired Endstate). Applying Army Design Methodology to the problem facilitates the linkage of ideas, theories, and concepts over time informing the research methodology explained in chapter 3 and applied in chapter 4.

Section III Defining Reconnaissance, a Short Examination of Military Theory and Doctrine

Defining reconnaissance is not as simple as one might think. The definition of reconnaissance has changed over time based on many variables and it is important to note that just defining reconnaissance could be a research product of its own right. However, for the purpose of this research effort, emphasis is placed on the works of Sun Tzu, Alexander the Great, Jomini, Clausewitz, Patton, Rommel, Fuller, Von Seekt, and contemporary theorists to examine reconnaissance theory over time. Theory as well as current United States Army Doctrine is utilized as a basis for a common definition to compliment this research effort. A review of ADRP 1-02, FM 3-90.2, and ADRP 3-90 reveals one complete doctrinal definition and four methods for reconnaissance.

Table 1. Doctrinal Definitions of Reconnaissance

Reconnaissance (DEFINITION)	A mission undertaken to obtain by visual observation or other detection methods information about the activities and resources of an enemy or potential enemy, or to secure data concerning meteorological, hydrographic, or geographic characteristics of a particular area.
Reconnaissance in Force (METHOD)	An offensive operation designated to discover and/or test the enemy's strength or to obtain other information.
Reconnaissance by Fire (METHOD)	Method of reconnaissance in which fire is placed on a suspected enemy position to disclose a presence by movement or return of fire.
Reconnaissance Pull (METHOD)	Reconnaissance that determines which routes are suitable for maneuver, where the enemy is strong or weak, and where gaps exist, thus pulling the main body along the path of least resistance, facilitating the commander's initiative and agility.
Reconnaissance Push (METHOD)	Reconnaissance that refines the operational picture, enabling the commander to plan and support his/her shaping and decisive operations. Utilized once the commander has determined the friendly course of action.

Source: Department of the Army, ADRP 1-02, *Operational Terms and Graphics* (Washington, DC: Department of the Army, 2012); Department of the Army, ADP 3-90, *Offense and Defense* (Washington, DC: Department of the Army, 2012); Department of the Army, FM 3-90.2, *Reconnaissance, Security, and Tactical Enabling Tasks Volume 2* (Washington, DC: Department of the Army, 2013).
Note: Table provides a sampling of how Army Doctrine currently addresses reconnaissance.

Clarifying a combined definition for this research effort requires examining both the role of reconnaissance in military theory over time and current Army Doctrine. Combining doctrine and theory over time to provide a single definition of reconnaissance allows this research to have a strong foundation in military theory and current doctrine. In order to first have an understanding of reconnaissance theory over time one must start at the beginning.

In many instances, the best place to establish a foundation in a line of thought is where it begins. Beginning in the 6th century B.C., the Art of War by Sun Tzu was looked upon as the first true collection of military theory, and addresses reconnaissance in the following context:

> In war it is not numbers that give the advantage. If you do not advance recklessly, and are able to consolidate your own strength, get a clear picture of the enemy's situation, and secure the full support of your men, it is enough. (Sun Tzu and Ames 1993, 144)

Furthermore, in his five factors to anticipating victory, Sun Tzu addresses knowing when to fight, how to deploy forces, and understanding your enemy, ultimately addressing reconnaissance in two of the five factors (Sun Tzu and Ames1993). This establishes the first military theory addressing reconnaissance in the 6th century B.C. Some may argue that these passages are taken out of context and that Sun Tzu was referring to the commander's requirement to understand and know the enemy through study. However, that is exactly why these passages address reconnaissance: because establishing a better understanding of the enemy and the situation is exactly what reconnaissance units do. Given armed conflict during this time was generally smaller in scale, covering a relatively limited area of operations, and were very centralized compared to contemporary operations, it is fair to say that Sun Tzu addresses reconnaissance in his work from his point of view, which is that of the commander.

Cavalry units continued to evolve in the 3rd century B.C. during the campaigns of Alexander the Great. Much as during the time of Sun Tzu, reconnaissance operations were conducted on horseback. However, the mobility and strike capability provided by mounted warriors only work to emphasize Sun Tzu's principles of utilizing reconnaissance units to shape the outcome of a battle. A historical example of how cavalry units evolved occurred during the battle of the Hydaspes (in what is modern day Pakistan) in 326 B.C. At the battle of Hydaspes Alexander utilized his cavalry units to locate key river crossings, reinforce his flanks, and conduct decisive offensive operations against enemy infantry (Warry 1991). The utilization of his reconnaissance assets in this

manner allowed him to use the terrain to gain and maintain the initiative, resulting in the defeat of the much larger force of King Porus (Warry 1991). Indeed, Alexander's utilization of cavalry was noted by the British classical scholar W. W. Tarn in Volume two of his work, *Alexander the Great*:

> Though he expected, and got, some serious infantry fighting in India, he still mainly relied on his cavalry as king of the battlefield; he could, he thought, always outflank enemy infantry. (Tarn 1948, 168)

Provided these insights into the utilization of reconnaissance assets in ancient military theory, one might define reconnaissance as: Reconnaissance—military operations conducted forward or with a main body of soldiers, by a small elite force on horseback, to improve the commander's understanding regarding an enemy force or terrain, secure the flanks of a main body, or to conduct a decisive offensive operation. Though simplistic, this definition is reflective of warfare during that period and most likely be sufficient to support any commander. As new technology is introduced into warfare during the 19th century, military theorists would yet again examine the importance and utilization of reconnaissance units.

Arguably, the two greatest Western military theorists of the 19th century were Carl Von Clausewitz and Baron De Jomini, whose treatises on warfare are written about and argued to the present day. Each noticed a marked change in warfare during the time of Napoleon and each recorded how they saw that change from their point of view (Gray 2006; Boot 2006; Corum 1992; Murray and Millet 1996; Knox and Murray 2001). Due to technological and social changes during the 19th century, such as the advancement of the musket, improvement of field artillery, and nationalism, warfare changed. Armies grew larger and were conducting warfare on a larger scale than in many previous conflicts.

Though scholars see these men as the antithesis of each other (in many ways they are), they both acknowledge reconnaissance in similar manners. Both men address uncertainty in warfare, Jomini as the search for a "decisive point," and Clausewitz's "fog of war" and "friction in war" (Jomini 1862; Clausewitz 1984). In particular to the nature of warfare and fog of war Clausewitz states:

> War has a way of masking the stage with scenery crudely daubed with fearsome apparitions. Once this is cleared away and the horizon becomes unobstructed, developments will confirm his earlier convictions-this is one of the great chasms between planning and execution. (Clausewitz 1984, 118)

Reconnaissance units, specifically cavalry, during this period were employed to "unmask" the stage that Clausewitz speaks of in order to bridge the gap between planning and execution. Both men acknowledge the importance of reconnaissance and the requirement for a dedicated advanced guard (both acknowledge utilizing elite soldiers for these missions) to reduce this friction or to seek out the decisive point along much broader fronts (Jomini 1862; Clausewitz 1984).

Larger armies and the infusion of technology also forced emphasis on organization of forces in order to execute unified campaigns over extended periods, and reconnaissance units were a part of this change. On this point both theorists acknowledged the importance of appropriately organizing forces, Jomini through exhaustive checklists and formation pictures; and Clausewitz through emphasis on the order of battle particularly regarding units that operate as advanced guards (Jomini 1862; Clausewitz 1984). In reference to advance guards Clausewitz stated:

> These days it has justifiably become general usage to assign its task (referring to advance guards) to one or more of the main subunits of the whole army, which are reinforced by part of the cavalry. It will thus consist of a corps if the army is divided into corps, and of one or more divisions if the army is divided into divisions. (Clausewitz 1984, 306)

Here Clausewitz emphasizes the importance of force organization in advance guards to have the right amount of capabilities to address any unknowns and secure the main body.

The shift in operational and tactical focus from singular decisive battles to operations in depth and across broad frontages is also clearly acknowledged by both theorists. Although both theorists acknowledge this shift in operational and tactical focus Jomini still recognizes the utilization of cavalry units in an offensive manner:

> It's (cavalry) chief duty is to open the way for gaining victory, or to render it complete by carrying off prisoners and trophies, pursuing the enemy, rapidly succoring a threatened point, overthrowing disordered infantry, covering retreats of infantry and artillery. An army deficient in cavalry rarely obtains a great victory, and finds its retreats extremely difficult. (Jomini 1862, 304)

Jomini's statement links the offensive utilization of cavalry in the 18th century to how Alexander the Great utilized his cavalry to enhance the mobility, capability, and security of his main body forces.

Based on these observations, one can deduce that there were three "norms" in terms of reconnaissance: the value of information, the need for appropriate organization, and the critical requirement to have a dedicated reconnaissance force separate of the main body. Provided these factors and the theory outlined by Clausewitz and Jomini, the definition of reconnaissance in the 19th century might read as follows: Reconnaissance—military operations conducted forward or with a main body formation, by dedicated and appropriately organized units, specifically to improve the commander's understanding regarding an enemy force, situation, or terrain, secure the flanks of the main body, or conduct limited offensive operations to shape the prosecution of a military campaign.

So in many ways although ideas and technology changed from the 6th century to the 19th century the roles of reconnaissance units did not. Much as in the time of

Alexander the Great cavalry organizations during the 19th century (as noted by Clausewitz and Jomini) were utilized to secure main body flanks, conduct offensive operations to shape a campaign or battle, and gather critical intelligence for commanders. Though Clausewitz and Jomini's observations regarding warfare are profound and still viable and debated today, continued military revolutions and revolutions in military affairs drove other theorists to continue to examine the role of reconnaissance into the 20th century.

The 20th century witnessed the violent fulfillment of theories put forward by Clausewitz and Jomini during World War I and II, and the birth of mechanized warfare. The dawn of mechanized warfare would replace the horse with the internal combustion engine, and although the technology would change, the underlying purposes of reconnaissance units would not. The introduction of tanks, aircraft, and armored cars provided armies with platforms that could further broaden the depth and breadth of the battlefield. These platforms also provided additional speed, protection, and firepower to maneuver units. This inevitably forced theorists to examine the role of reconnaissance in military theory yet again, and although some principles would change the basic functions of cavalry units would fundamentally remain unchanged. This time period is marked by mechanized warfare theorists and practitioners such as Erwin Rommel, Hans Von Seeckt, George S. Patton, and J. F. C. Fuller. All four of these men applied the new technology available to the idea of reconnaissance; however their theories and experiences would revisit observations by Clausewitz, Jomini, Alexander the Great, and Sun Tzu.

Regarding the change in technology, each acknowledged the increased protection that lighter armored vehicles afforded soldiers, the importance of aerial reconnaissance,

and the increased distance that could be covered at greater speed than in previous conflicts (Fuller 1943; Patton 1947; Corum 1992). Fuller emphasized the increased mobility that new technologies, such as the tank, offered the mechanized community:

> [W]hereas a horde army is tied down to road and rail communications, a mechanized army is to a far greater extent free from them, for it can move across country and be supplied by cross-country vehicles. (Fuller 1943, 58)

Along with increased speed, mobility, and firepower new technology such as aircraft and mechanized artillery re-emphasized the proper organization of forces highlighted by Clausewitz and Jomini in the 19th century (Jomini 1862; Clausewitz 1984). However, in the 20th century the concept of proper organization with regards to reconnaissance units would focus on maximizing the advantages provided by new technologies.

This concept would be known as combined arms. Field Marshall Erwin Rommel reinforced the concept of proper organization and combined arms in reconnaissance units during his time as a junior officer during World War I:

> Facing the enemy, the reconnaissance detachment commander becomes conscious of his heavy responsibilities. . . . The detachment should be organized in considerable depth. Before crossing open stretches of terrain fire support must be arranged for. . . . Combat reconnaissance-It is advisable to have strong fire support ready for such a reconnaissance. (Rommel 1979, 7, 55)

While Rommel's observation that reconnaissance operations required the integration of fires and maneuver was not new, it provides an example of the precursor to concepts that would be enabled by new technologies. The concept of fully mechanized combined arms organizations would later be emphasized by Von Seeckt (Corum 1992). Prior to World War II Von Seeckt led a change in the German army that would birth fully mechanized combined arms organizations that would be wildly successful during the invasions of Poland and France at the beginning of World War II (Corum 1992). The concept of

combined arms was the application of new technology to the theory of proper organization put forth by both Clausewitz and Jomini (Jomini 1862; Clausewitz 1984). Furthermore, both Fuller and Von Seeckt recognized that mechanized reconnaissance formations in particular must be small enough to conduct effective reconnaissance yet large enough, with appropriate firepower, to fight for information (Fuller 1983; Corum 1992).

Where these modern theories regarding reconnaissance parallel those of Clausewitz, Sun Tzu, Alexander the Great and Jomini is with regard to the three common roles of reconnaissance organizations. While mechanization emphasized speed, mobility, firepower and combined arms, the roles cavalry units, reconnaissance, security, and limited offensive operations, would remain the same. Patton would re-emphasize the importance of reconnaissance operations in *War as I Knew It*:

> Speed is acquired by making the necessary reconnaissance, providing the proper artillery and other tactical support, including air support. . . . You can never have too much reconnaissance. Use every means available before, during, and after the battle. . . . Reconnaissance must not lose contact. . . . The use of light tanks in night reconnaissance usually induces the enemy to fire and display his position. (Patton, Harkins, and Patton 1947, 349, 400, 414)

His observations are the application of new technology to the most basic theory of reconnaissance operations set forth by Sun Tzu, Alexander, Clausewitz, and Jomini. Patton's observations also highlight the continued role of cavalry organizations in security operations:

> Covering Detachments: Make the maximum use of mechanized and armored reconnaissance and covering detachments. In actual war, these merge into each other. In general they should consist of a reconnaissance troop reinforced by at least a platoon of medium tanks with infantry riding on them. (Patton, Harkins, and Patton 1947, 349)

Once again Patton applies new technology and the concept of combined arms warfare to the traditional security role of reconnaissance organizations. This would continue to be the case for the utilization of reconnaissance organizations in limited offensive operations. Both Patton and Rommel utilized reconnaissance elements in a limited offensive manner to find and exploit weaknesses in enemy positions, or gaps, in order to pull main body forces through to capitalize on the initial exploitation (Patton, Harkins, and Patton 1947; Rommel 1979). Given these thoughts and ideas combined with the technological advancements of the time, "one might define" reconnaissance during this period as follows: Reconnaissance—military operations conducted across the breadth and depth of the area of operations, by mechanized units organized with appropriate speed, firepower, and protection to address gaps in the commander's situational understanding, secure main body movement, or conduct limited offensive actions to shape future operations. This definition of reconnaissance draws parallels to Jomini, Clausewitz, Alexander, and Sun Tzu in that the purpose of reconnaissance is still to conduct reconnaissance, security, and limited offensive operations. Furthermore, this definition highlights Clausewitz's and Jomini's reference to appropriate organization of forces based on the nature of the reconnaissance, security, or offensive operation. It differs in that it addresses the advent of mechanized warfare by addressing speed, protection, and firepower. So although the technology changed, the role of reconnaissance organizations in warfare remained the same. To develop the definition of reconnaissance into one that applies to the modern military, one must also look at contemporary military theory regarding the topic.

The current US Army definition for reconnaissance is found in ADRP 1-02, FM 3-90.2, and ADRP 3-90. The ADRPs and the FM provide one single definition that encompasses the reconnaissance mission, and four specific methods that reconnaissance organizations can utilize (see table 1). Furthermore, Army Doctrine outlines reconnaissance, security, and limited offensive operations as standard roles for reconnaissance organizations in modern warfare (Department of the Army 2009b; Department of the Army 2010a). It is critical that the doctrinal methods and roles are understood in order to synthesize modern doctrine and theory into one definition that defines reconnaissance while implying what capabilities are required of a unit to conduct it.

Now that the definitions of reconnaissance in doctrine are established, it is prudent to look at contemporary theory to arrive at a common definition. Taylor identified two distinct schools of thought in contemporary reconnaissance theory: technologists and traditionalists;

> [T]echnologists, who see great opportunity in modern technology and believe that it has the potential to fundamentally change the problem of friction for the tactical commander. Writing from this camp tends to focus on the future with supporting data drawn from computer simulations or the projected capabilities of emerging weapons systems. In the opposing school are the traditionalists who argue that friction and uncertainty are an intractable reality of combat and technology will never be able to completely free us from it. Traditionalists tend to look to the recent past and draw supporting data from places like Mogadishu and Fallujah. (Taylor 2005, 23-24)

This observation combined with the doctrinal definitions of reconnaissance imply that the infusion of advanced technologies such as signals intelligence, unmanned aerial surveillance systems, and tactical computer networks are once again applying new technology to historical theories. For example, a look into technologist literature unveils a

platform-based approach to reconnaissance where surveillance capability powered by networked technology would provide the military commander with the ability to greatly reduce battlefield friction, and engage larger enemy formations with precision fires versus other tactical maneuver units, further increasing advantage (Alberts, Gartska, and Stein 1999). This school of thought acknowledges the advantage that dedicated and effective reconnaissance provides a commander (Sun Tzu and Ames 1993). However, while acknowledging friction in warfare, technologists largely discount it based on technological overmatch (Clausewitz 1984). This theory gained incredible traction in the early 21st century and it can be seen in application in the Army's move to modularity. One does not need to do much research to acknowledge the fact that unmanned surveillance and attack system development and implementation has increased over the past 12 years. This is just one example of the technologist theory of reconnaissance in the present day. Traditionalists, on the other hand, acknowledge the advantage offered by technological overmatch. However, they also recognize the presence of friction in war. Traditionalists see fault in total reliance on higher echelon, networked surveillance systems to provide timely intelligence at the tactical level (Rosenberger 2004). Furthermore, they take issue with technologist theory in that it somewhat fails to account for enemy innovation and technological countermeasures (McMaster 2003). Though in opposing camps, both of these theories have elements of applicability for a modern definition of reconnaissance.

In order to determine the reconnaissance capabilities required in the ABCT of the future this research suggests that a common modern definition of reconnaissance would be useful. A common definition would provide a single foundational understanding of

what reconnaissance is to further this research effort. One key observation in this research is that none of the theories reviewed discredit each other, rather they build upon each other as the operational environment and technology changes. An example of this would be the constant utilization of reconnaissance organizations for reconnaissance, security, and limited offensive operations from the 6th century B.C. to today. Therefore, it is necessary that a modern definition of reconnaissance also be additive to the body of reconnaissance theory reviewed. A modern definition of reconnaissance might be:

> Reconnaissance: military operations conducted across the breadth and depth of an assigned geographic area, conducted by network enabled-combined arms units, with appropriate surveillance capability, speed, firepower, and protection to address gaps in the commander's situational understanding, secure main body movement, or conduct limited offensive actions to shape operations against an enemy force.

Figure 3 describes how this definition is linked to the various theories discussed above.

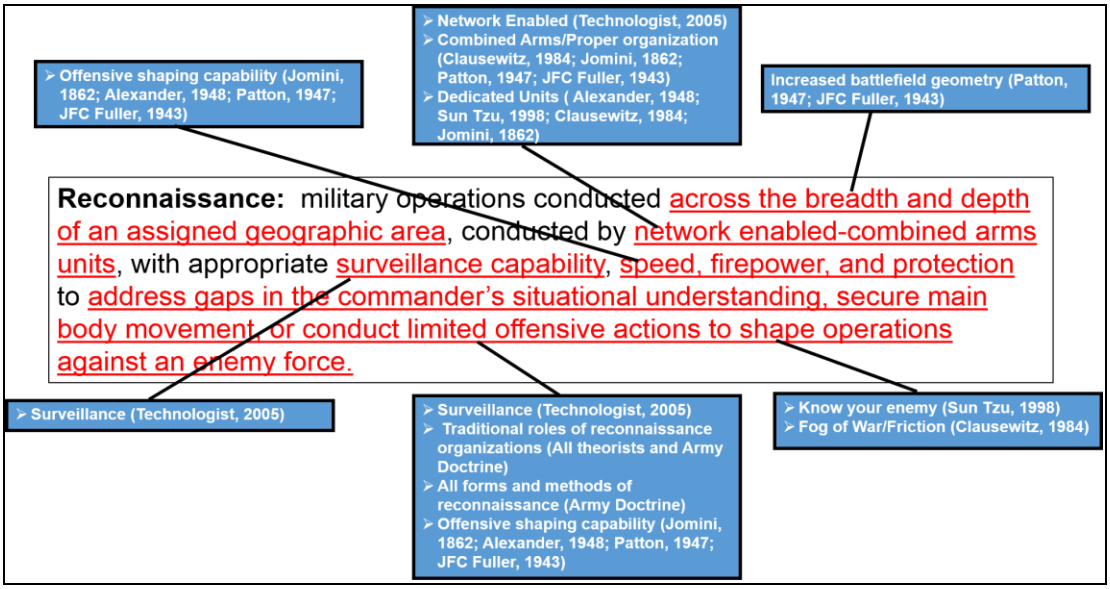


Figure 3. Modern Definition of Reconnaissance Linked to Theories

Source: Created by author.
Note: The figure highlights the linkage between the author's modern definition and reconnaissance theory discussed throughout this section.

Reconnaissance organizations have adapted over the years through changes in the operational environment combined with advancements in technology along with a variety of other factors. Advancements in technology led to greater capability to conduct the three basic operations reconnaissance units have executed since the 6th century B.C. Therefore it is possible to determine that the only change to reconnaissance theory over time has been the infusion of new technology. It also provides evidence to the link between current Army Doctrine and military theory over time. Since technology provides new capability, this definition provides an idea of the general capabilities required of a modern day reconnaissance organization. Therefore, based on this definition, the general capabilities required of a reconnaissance organization in an ABCT are: appropriate mobility, firepower, and protection to conduct limited offensive operations, a networked surveillance capability, and enough assigned combat power to conduct effective reconnaissance and security operations across the breadth and depth of an ABCT's area of operations.

Section IV The Evolution of the Cavalry Squadron: The Past through the Current State

Today, the reconnaissance community and the Army, is facing another period of change that requires rigorous consideration of capabilities that will be required for the wars of the future. In any exploration of what is to be done in the future, it is prudent to look at how an organization has changed in the past. Regarding the Cavalry Squadron, valuable lessons regarding organizational change over time can be gleaned from visualizing how the Army has coped with re-organizing reconnaissance battalions in the past. These lessons, coupled with theory and definitions discussed in the previous section

can assist in further defining the problem and ultimately contribute to answering the question: "how should the Cavalry Squadron in the future ABCT be developed to conduct reconnaissance and security missions in the next 10 years?" Given the large amount of literature in this topic area, this section of the research is significantly focused. It concentrates on the organization and doctrine for reconnaissance battalions (Cavalry Squadrons) from World War II, Korea, Vietnam, Desert Storm, OIF, OEF, and three key transitional periods. This work also looks at United States Army units only. This does not discount the valuable lessons that can be acquired from foreign militaries or sister services however, given that this is a United States Army problem, it is necessary to look at it from an Army perspective. This examination uncovers major shifts in culture, doctrine, and organization rather than focusing on the smaller changes that eventually contributed to the major shift. In order to fully understand the evolution of reconnaissance it is necessary to examine the emergence of mechanized units during the interwar period between World Wars I and II.

Emergence of the Mechanized Cavalry Squadron

The interwar period brought about the emergence of new mechanized units, such as the tank battalion and the retention of the reconnaissance mission by cavalry units (Cameron 2010; Murray and Millet 1998). In regard to the role of reconnaissance units at this time, the Army faced a paradox. With the infusion of new technology (the radio and the tank), there was an open debate over whether reconnaissance units should maintain the ability to conduct deliberate stealthy reconnaissance, or have the capability to conduct limited offensive or defensive operations and complementary reconnaissance to exploit observed enemy weaknesses given greater firepower and protection provided by armored

vehicles (Cameron 2010; DiMarco 1995). Two quotations serve to highlight these divergent schools of thought. First, Major General George S. Patton's quotation upon the conclusion of 2nd Armored Division maneuvers at Fort Benning in the spring of 1941 highlights a more passive school of thought regarding reconnaissance:

> When any of you gets to a place where your experience tells you that there is apt to be an anti-tank gun . . . or some other devilish contrivance of the enemy, don't' ride up in your scout car like a fat lady going shopping, stop your vehicle, take a walk or crawl to get a look . . . you must go well off to a flank probably as much as one thousand yards or so. (Morton 2009, 247)

Passive reconnaissance emphasizes units conducting deliberate and stealthy operations to gain information not seeking direct fire contact with enemy forces. Highlighting a more aggressive employment of reconnaissance assets is Major General Charles L. Scott, after observation of the British 8th Army in Northern Africa, in 1942:

> 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. (Scott 1942, 20)

Major General Scott's observation highlights the need for reconnaissance units to be organized in a manner to conduct limited offensive operations in depth to acquire information and develop the situation. Doctrine from 1941 to 1943 further highlighted this paradox by equally emphasizing offensive, defensive, and reconnaissance operations, exemplifying the uncertain future for the role of mechanized reconnaissance units (War Department 1941; War Department 1943a). This debate, ongoing experimentation with

new technology, continued field maneuvers, and a looming war resulted in the initial organization of the Cavalry Reconnaissance Squadron of 1943.

The Cavalry Reconnaissance Squadron: Mechanization Through World War II

The Cavalry Reconnaissance Squadron introduced to the Army table of organization and equipment in 1943 met the demands of a reconnaissance unit with appropriate reach that could either gain information through deliberate and stealthy means, or fight for information if required (DiMarco 1995; Department of the Army 1943c: War Department 1943a). This mix of capabilities is indicative of the undecided nature of the role of reconnaissance units. Furthermore, it created a standardized battalion level wheeled reconnaissance capability for the armored divisions of the time (DiMarco 1995; Cameron 2010).

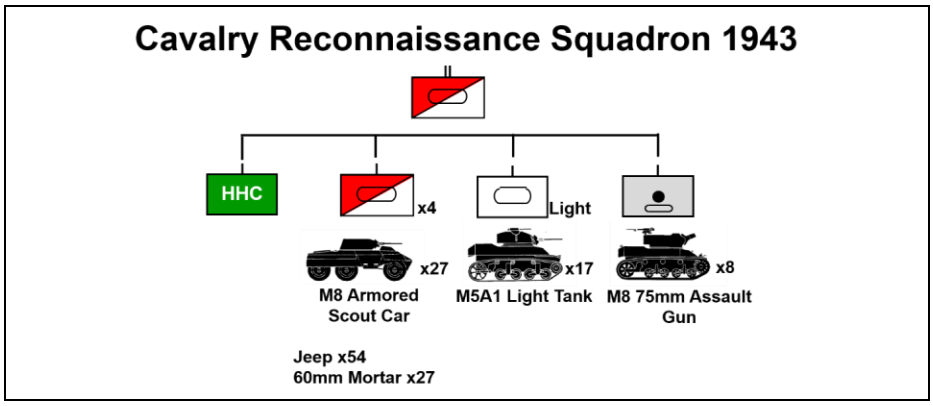


Figure 4. Cavalry Reconnaissance Squadron, 1943

Source: Created by author, modified from War Department, FM 30-40, *Recognition Pictorial Manual on Armed Vehicles* (Washington, DC: War Department, 1943); War Department, *Table of Organization and Equipment*, No. 2-25 (Washington, DC: War Department); War Department, *Cavalry Reconnaissance Squadron, Mechanized* (Washington, DC: War Department, 1943).
Note: This figure highlights the organization of key combat platforms and reconnaissance assets.

Figure 4 depicts a mix of light vehicles in reconnaissance Troops (TRPs) (M8 Armored Scout Car and Jeeps), organic indirect firepower (60mm mortars and the M8 75mm Assault Gun), and light tanks (M5A1) providing the Squadron with the capability to sustain long range reconnaissance or limited offensive or defensive operations on its own. Though published after the introduction of the Cavalry Reconnaissance Squadron in 1943, 1944 cavalry doctrine helps to explain why the unit was organized in this manner. The 1944 manual places heavy emphasis on reconnaissance operations at the tactical, operational, and strategic levels of war and explains reconnaissance conducted through direct fire contact (War Department 1944). Furthermore when explaining offensive operations, the manual's focus is limited to exploitations and pursuits, and explains the need for augmentation to conduct longer duration offensive operations if required (War Department 1944). This combination of organization and doctrinal development provided the Armored Divisions with a Cavalry Squadron capable of pursuing aggressive reconnaissance through stealth, firepower, and maneuver (DiMarco 1995). Based on reports from the period, the Cavalry Reconnaissance Squadron operated mounted and dismounted as intended, given the flexible doctrine and combined arms organization, with success throughout World War II (Gaston 1944; Bridgewater 1944). The organization and doctrinal foundation for Cavalry Squadrons established in 1944, and their relative success in World War II did not facilitate the need to change their doctrine or organization until 1951.

The Reconnaissance Battalion: Post World War II and Korea

The 1951 doctrinal update for the Cavalry Reconnaissance Squadron re-named the organization to "Reconnaissance Battalion, Armor Division" which was reflective of its continued purpose as a divisional reconnaissance asset (Department of the Army 1951). The updated doctrine combined many of the new technologies provided by innovation during World War II with emphasis on lessons learned from the European theater. Additions to this manual from the 1944 version included the addition of security missions, emphasis on the ability to conduct offensive or defensive operations, and a chapter each dedicated to the exploitation and pursuit (Department of the Army 1951; War Department 1944). Both manuals continued to emphasize reconnaissance missions as the primary role of the unit conducted for the tactical, operational, and strategic levels of war through route, zone, or area reconnaissance operations (Department of the Army 1951; War Department 1944).

One additional note regarding the 1951 doctrine is the emphasis to commanders of other combat units on maintaining tactical integrity of reconnaissance units because of their combined arms nature down the Platoon (PLT) level (Department of the Army 1951). For example, according to the 1951 doctrine, a commander of an armor battalion receiving a reconnaissance troop from the division reconnaissance battalion should not have to task organize or augment this unit any further to conduct operations (Department of the Army 1951). This organizational solution that "required" no further refinement was the result of lessons learned from the constant re-task organization of the Cavalry Reconnaissance Battalion by field commanders during World War II (Cameron 2010;

DiMarco 1995). Figure 5 depicts the final organization of the Reconnaissance Battalion in 1951, along with an example of the organic combined arms capability at the PLT level.

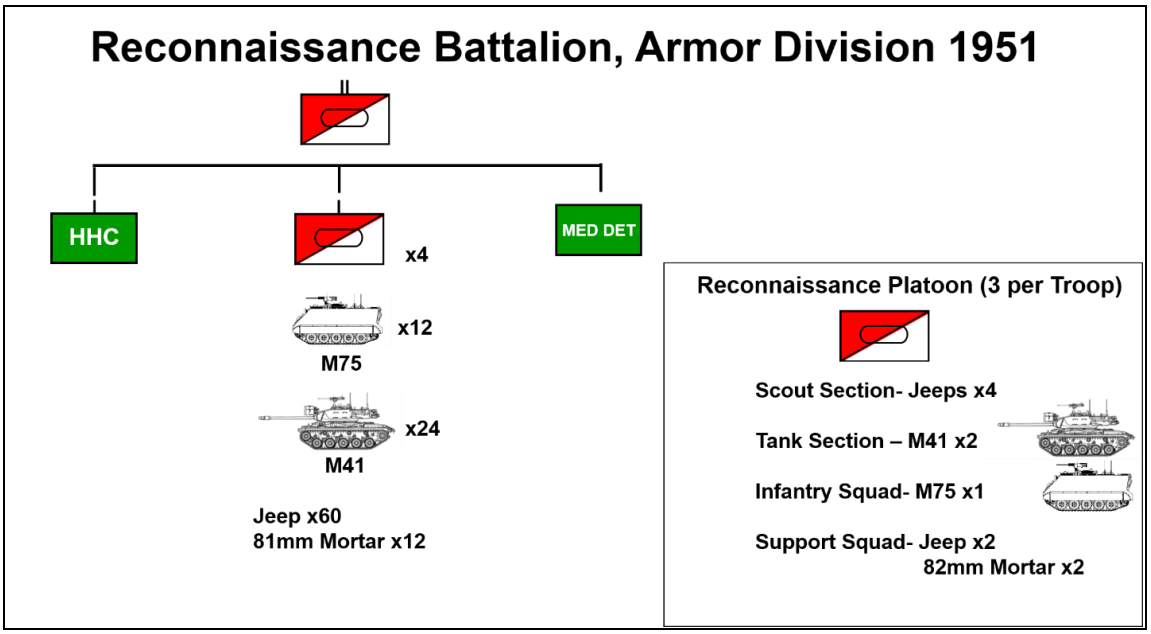


Figure 5. Reconnaissance Battalion, 1951

Source: Created by author modified from Department of the Army, FM 17-35, *Reconnaissance Battalion, Armor Division* (Washington, DC: Department of the Army, 1951); Department of the Army, FM 17-22, *Reconnaissance Platoon and Company* (Washington, DC: Department of the Army, 1950); TRADOC DCSINT Threat Support Directorate, *OPFOR Worldwide Equipment g*uide (Fort Leavenworth, KS: Government Printing Office, 1999).
Note: Reconnaissance and combined arms capability at the platoon and battalion level.

This reconnaissance organization was born from the lessons learned on the battlefields of World War II, however it would be applied to combat in the difficult, compartmentalized, and mountainous terrain in Korea in the 1950s (Cameron 2010). Although reconnaissance battalions were deployed to Korea as pure units, they were often broken down and employed at the PLT level by field commanders. For example,

due to the complex terrain and limited nature of offensive operations the tanks were generally stripped from the reconnaissance battalions for static security positions while the troops and platoons were generally attached to separate battalions (Cameron 2010). The maneuverability of the battalion was largely negated by the terrain, and combined arms firepower and protection was largely negated by how reconnaissance battalions where employed by field commanders in the Korean conflict (Cameron 2010). Though the reconnaissance battalion's employment ran askew of its organization and doctrine, the lessons learned by reconnaissance units in the Korean conflict would assist in bringing the next organizational and doctrinal evolution to the forefront (Department of the Army 1951).

Reorganization Objective Current Armor Division and Reorganization Objective Army Division: The Temporary Death of Wheeled Reconnaissance

In the wake of the Korean conflict, reconnaissance battalions changed both doctrinally and organizationally. Dwight D. Eisenhower's "New Look" combined with the escalating Cold War between the United States and the Soviet Union during the Kennedy era, brought about two distinct programs that acknowledged the lessons learned from Korea and attempted to bring the armor division's reconnaissance battalion into the future (Cameron 2010). The first of these programs was the Reorganization Objective Current Armor Division, introduced in 1957 and intended to improve the armor division for combat on the nuclear battlefield (Cameron 2010). One of the major changes in reconnaissance organizations was the establishment of a wheeled scout PLT added to the combat command (brigade equivalent) table of organization and equipment to provide an echelon of reconnaissance between battalion and division (Cameron 2010). This is the

first appearance of a reconnaissance unit specifically organized for the combat command (brigade) level. There were three major changes to the reconnaissance battalion brought about by Reorganization Objective Current Armor Division. First, the unit designation was changed yet again, from reconnaissance battalion to Armored Cavalry Squadron (Department of the Army 1960). Second, the new Armored Cavalry Squadron provided combined arms platoons within the troop (as in previous organizations), however the troop commander was presented with multiple options for task organizing the troop to facilitate achievement of any given mission (Department of the Army 1960; Cason 1987). Figure 6 shows the 1960 Cavalry Squadron organization and includes the troop commander "task organization options that are highlighted" in the 1960 FM 17-35:

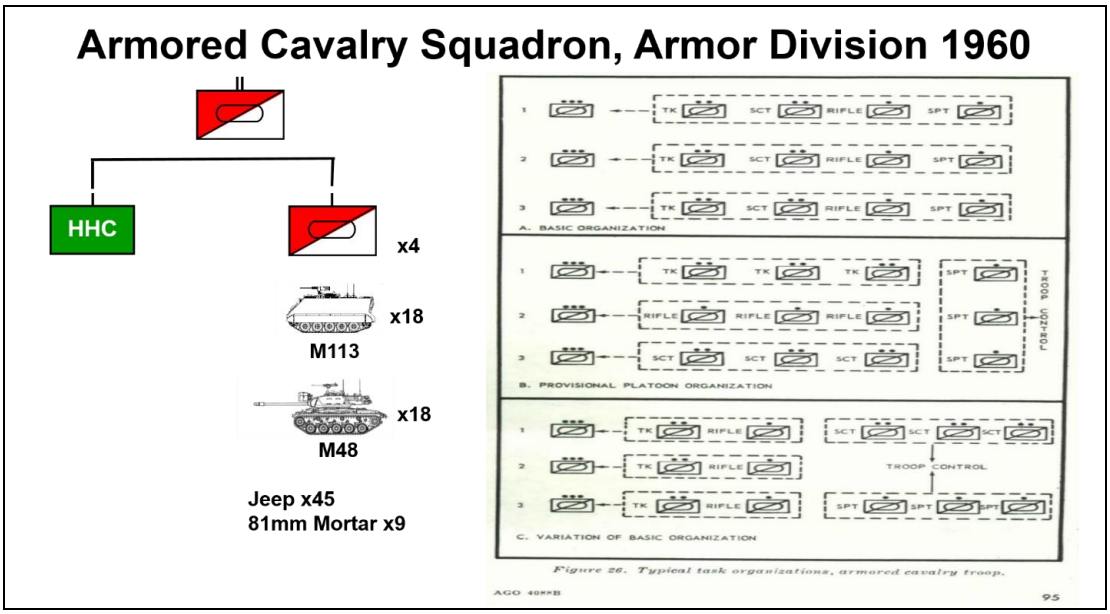


Figure 6. Armored Cavalry Squadron, 1960

Source: Created by author, modified from Department of the Army, *Armored Cavalry Platoon, Troop, and Squadron* (Washington, DC: Department of the Army, 1960), 95. Note: This figure depicts combat and reconnaissance capabilities as well as highlighting the task organization options outlined by the FM 17-95.

Finally, the program added a reconnaissance and surveillance PLT (in the form of ground radar) to the headquarters company, which is the first time that a surveillance capability was added to the Cavalry Squadron since its inception (Department of the Army 1960; Cason 1987). As the cold war progressed, and Vietnam began, the Reorganization Objective Army Division (ROAD) program was initiated.

The ROAD, initiated in 1962 and ending in 1964, further modified how reconnaissance units operated within the armor division as it sought to make the Army as a whole more modular and robust. First, it introduced the brigade to replace the combat command, and then rescinded the wheeled scout PLT, thus eliminating the brigade echelon of reconnaissance between battalion and division (Wilson 1998). Second, it resolved the debate on the relevance of the jeep. One of the major lessons learned from Korea, largely due to how reconnaissance battalions were employed piecemeal, was that the jeep did not provide a survivable enough platform to deliver scouts to where they are needed, nor did it provide them with the capability to effectively fight for information (Cameron 2010). Thus, the debate over passive versus aggressive reconnaissance emerged again. The tone of the debate started at the inception of mechanized reconnaissance units and is highlighted here twenty some odd years:

> 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. (Battreall 1963, 8)

At this point in history, the ability to fight for information won the debate over passive versus aggressive reconnaissance organization and the ROAD program provided scouts with the more survivable M114 armored personnel carriers to replace wheeled capability

in scout platoons, and introduced the M60 tank to all Armored Cavalry Squadron organizations (Cameron 2010). Also of note, ROAD added a rotary wing troop to the Squadron table of organization and equipment to improve reconnaissance capability in depth (Cameron 2010). Finally, after some minor adjustments to equipment and the echeloning of reconnaissance capabilities and units, the ROAD program changed the name of the Armored Cavalry Squadrons to Division Cavalry making this the fourth naming designation change in 20 or so years (Cameron 2010). Many of the changes to force structure across the Army made by ROAD and Reorganization Objective Current Armor Division reflected lessons learned from massive conventional wars fought in Europe and Korea that were further compounded by a global nuclear threat, however, the mechanized community would have to innovate yet again to face the counterinsurgency fight already ongoing in Vietnam.

Mechanized Reconnaissance in the Jungle: Vietnam

The re-organization of forces between conflicts failed to account for the nature of future conflict that mechanized forces would face in the complex terrain of Southeast Asia. The mechanized fight in Vietnam allow for the emergence of more contemporary reconnaissance units and doctrine through practical experience. The conflict was classified as primarily an infantry fight at the outset, the mechanized reconnaissance community did have some time to observe the evolving nature of the conflict prior to commitment (Cameron 2010). The 1966 FM 17-1, *Armor Operations* provided insights to adjustments made to doctrine based off of this observation period. First, it defined reconnaissance as oriented on an objective and achieved through the simultaneous application of ground scouts, surveillance radar, and aerial assets when available

(Department of the Army 1966). Second, it rejected reconnaissance as a standalone mission and accepted the idea of reconnaissance and security missions as inseparable mission sets, which is reflective of the increase security requirements in counterinsurgency operations (Department of the Army 1966). Third, the manual very carefully outlined fighting for information only when necessary, and not jeopardizing attainment of the reconnaissance objective through unnecessary combat (Department of the Army 1966). Finally, it put responsibility for gaining contact with enemy forces on the reconnaissance leader on the ground, but emphasized that reconnaissance leaders were not to break contact with enemy forces without approval from higher headquarters (Department of the Army 1966). To summarize, initial doctrinal changes regarding reconnaissance at this time acknowledged a different operational environment, however it maintained a median position with regard to the passive or aggressive debate.

The first mechanized reconnaissance unit that deployed to Vietnam was the 1st Infantry Division's Division Cavalry Squadron in 1965 (Cameron 2010). The ongoing perception by Army senior leaders of the time that Vietnam was an infantry-centric fight impacted how this unit was employed. Troops were task organized to each brigade in the division and all of the squadron's tanks were removed for static employment in base security roles much like the Korean conflict (Cameron 2010). This method of employment basically emasculated the Division Cavalry Squadron (minus the aviation troop which was also generally task organized to other units) and precluded any employment in accordance with extant doctrine. As mechanized reconnaissance units continued to deploy to Vietnam, the Army senior leadership ordered the Mounted Armor Combat Operations in Vietnam study that was completed in 1967. It debunked the myth

that Vietnam was an infantry centric conflict and provided evidence that tracked vehicles, the M113 and ACRV M113 variant in particular, were effective in providing mobility and protection in complex terrain (Headquarters, United States Army Vietnam 1967). Furthermore, the study also validated the utilization of tanks in complex terrain, actually pointing to several examples where infantry supported by M48s were extremely effective in offensive operations (Headquarters, United States Army Vietnam 1967). Finally and most importantly, the study acknowledged the merging of reconnaissance and combat operations in a counterinsurgency environment. It pointed out that the elusive nature of the enemy required reconnaissance elements to be capable of conducting offensive operations (reconnaissance in force) to answer intelligence requirements, further validating the need for mechanized reconnaissance units to fight for information (Headquarters, United States Army Vietnam 1967). Despite the recommendations offered by the Mounted Armor Combat Operations in Vietnam study, the Army actually adopted little of what was mentioned in the (Cameron 2010).

Despite the consistent discourse regarding mechanized operations in Vietnam, the Division Cavalry organization and doctrine changed little from the beginning of the conflict (figure 7).

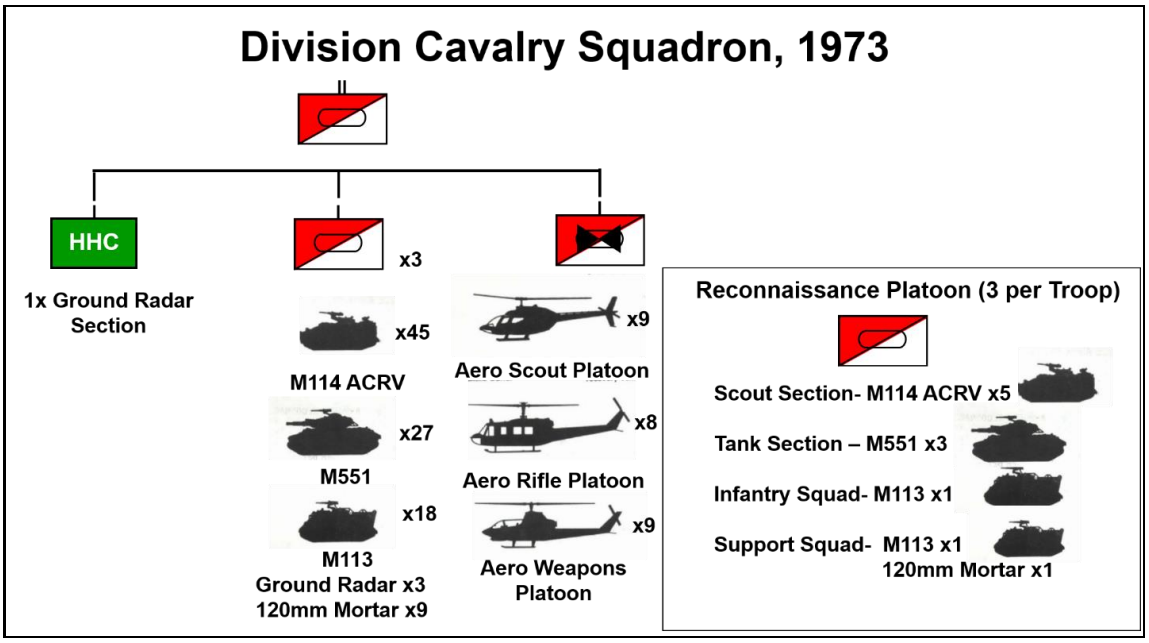


Figure 7. Armored Cavalry Squadron, 1973

Source: Created by Author, modified from Department of the Army, FM 17-36, *Armored Cavalry Platoon, Troop, and Division Armored Cavalry Squadron* (Washington, DC: Department of the Army, 1973).
Note: Figure outlines the organization of the Division Cavalry Squadron and highlights the addition of the air troop, including the continued use of the combined arms platoon.

Minus the addition of the aviation troop and ground radars, the task organization of the troops and platoons remained unchanged since the 1951 reconnaissance battalion other than the integrated new and improved combat platforms (Department of the Army 1973; Department of the Army 1951). However, this similarity was superficial only. The organization was reflective of the operational environment in which the squadron was employed. The large amount of M113s/ACRVs and the re-introduction of a light tank revealed organizational evolution based on the need for protection and mobility in complex terrain (Headquarters, United States Army Vietnam 1967). The introduction of aerial Scout PLT and ground radar sections highlighted the integration of surveillance

technologies to address irregular threats (Cameron 2010). The Armored Cavalry manual of 1973 also addressed some doctrinal norms and new doctrinal concepts. As far as new concepts, it introduced entire chapters dedicated to surveillance planning and employment and stability operations which, although controversial in the mechanized community were reflective of the combat experience of the time and the need for operational reach (Cameron 2010; Department of the Army 1973). Where the manual remained unchanged from the original 1944 publication was in the explanation of types of reconnaissance missions. Both the 1973 and 1944 reconnaissance manuals still classified reconnaissance missions as route, zone, area, and special (War Department 1944; Department of the Army 1973). Additionally, both manuals devoted chapters to offensive operations highlighting exploitation and pursuit (War Department 1944; Department of the Army 1973). Regardless of these minor changes and the information provided by the Mounted Armor Combat Operations in Vietnam study, Division Cavalry Squadrons continued to be task organized and employed in the manner of the 1st Infantry Division Cavalry Squadron in 1965 despite a growing role in offensive operations (Cameron 2010). So, despite the introduction of a new type of conflict in Vietnam, reconnaissance organization and doctrine remained largely unchanged. The only real difference in innovation was the infusion of new technologies based on the operational environment and threat. However, the infusion of these technological advances and the continued debate over whether reconnaissance units should be employed in an offensive manner would lay the groundwork for more contemporary reconnaissance organizations and further change.

Refocus and Desert Storm

The end of Vietnam brought about a shift in focus back to the Cold War and preparing for large scale maneuver warfare with the Soviet Union and Warsaw Pact nations in Europe. This time period leading up to Desert Storm would bring about drastic and broad changes to reconnaissance doctrine, organization, and capability. This shift in focus also resulted in the echeloning of reconnaissance units to the brigade level. The focus of this literature up to this point has been on the Divisional Cavalry squadron as it was the most similar in organization and function to the modern ABCT Cavalry Squadron. However the next section discusses changes in battalion scout platoons and their eventual organizational influence on the brigade level reconnaissance of today. Having an understanding of the battalion scout platoon's influence on what would be brigade level reconnaissance organizations is of importance to answering the primary research question and key to understanding the contemporary ABCT Cavalry Squadron. The transformation of reconnaissance force structure from supporting counterinsurgency operations in Vietnam to supporting an anticipated large scale mechanized conventional fight with the Soviet Union marked another significant change in doctrinal focus for reconnaissance operations. The change began with the 1973 Arab Israeli conflict which showcased the capability of new Soviet man portable and mounted anti-tank missile capability that was viewed as an indicator of a much more lethal battlefield of the future (Cameron 2010).

Within the mechanized reconnaissance community, the 1973 Arab Israeli conflict highlighted increased lethality of enemy weapon systems in the future operational environment, and reignited the aggressive versus passive reconnaissance debate that had

been going on since 1943. An example of the effect of this conflict and the refocus of effort back to the Cold War was exemplified by a statement in a letter from Major General Donn A. Starry, the Armor Center Commanding General from 1973 to 1976, to the Undersecretary of the Army for Operations and Research:

> 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 material, 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. (Starry 1989, 3)

This refocus coupled with the influence of the Arab-Israeli conflict spurred a period of technological and organizational experimentation that brought more firepower and additional equipment to reconnaissance units to meet the perceived challenges of a more lethal battlefield (Cameron 2010). An example of the force's reaction to this sweeping change and the other side of the passive-aggressive debate shows the Chief of Armor and one soldier's perception of organizational change to cope with a more lethal battlefield:

> 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 . . . Radar sets, mine detectors, demolition kits, 55-pound IR alarms, NBC alarms, laser rangefinders, laser target designators, and intricate bulky sights are to be supplied to 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. (Dozier 1975, 2; Bunce 1976, 18)

This transformation and ongoing debate regarding reconnaissance capabilities produced doctrine that was reflective of the focus during this period. For example, the 1981 FM 17-95, *Cavalry Operations* highlighted economy of force missions, the utilization of maneuver, observation, and suppression and destruction of enemy forces for mission accomplishment; it also highlighted reconnaissance units as being capable of fighting to provide commanders time and space to shape the battlefield (Department of the Army

1981). It shifted reconnaissance doctrine to reflect a much more aggressive role in combat operations from previous manuals (Department of the Army 1981; Department of the Army 1973; War Department 1944). However, just as focus on the Arab-Israeli conflict would re-initiate the passive-aggressive debate, ongoing events in the world would continue the debate and result in further change.

The explosion of smaller conflicts such as the Soviet experience in Afghanistan and our experience in Grenada shifted transformation focus away from a larger conflict isolated to Europe towards a much more globally dispersed long-term conflict (Cameron 2010). This shift triggered the transition to the Army of Excellence and Air Land Battle doctrine, which re-organized reconnaissance units to appear more like their Soviet counterparts, despite the strategic shift in focus, and provide further fuel to the passive-aggressive reconnaissance debate (Cameron 2010). Also during this period, observations from the National Training Center on the performance of more robust cavalry organizations, whose transformation was effected by a focus on large scale conventional conflict in Europe, were less than impressive (Cameron 2010).

The previous focus on large scale conflict isolated to Europe created reconnaissance organizations with new and more lethal technology and aggressive reconnaissance doctrine. This resulted in reconnaissance units being reduced to combat ineffectiveness during maneuver training through either overly aggressive actions, or being utilized as another maneuver unit in the offense versus an intelligence gathering entity (Chakwin 1987). These observations would spur further changes to reconnaissance doctrine which would re-emphasize the basic forms of reconnaissance (route, zone, area, and special), caution the utilization of firepower, acknowledge a lack of dismounted

capability due to a larger amount of tracked vehicles, and provide limitations (e.q. frontages and maximum number of observation posts) to the Scout PLT (Department of the Army 1985). These observations, the re-shift in focus to global conflict, and further doctrinal changes back to a less aggressive posture would require re-organization of reconnaissance units in the manner that they would be employed during Desert Storm.

The reconnaissance debate from the close of Vietnam to the mid-1980s resulted in multiple adjustments and readjustments to reconnaissance organizations, however it is only necessary to highlight the end result organizational solutions produced by the Army of Excellence transformation. It was these mechanized reconnaissance organizational solutions that would be tested in Desert Storm. The passive-aggressive debate, the introduction of new combat platforms, and the founding of the Army's Aviation branch in 1983, would all be factors in organizational solutions to the doctrinal debate. These changes would set the tone for the Division Cavalry and eventual brigade reconnaissance units of the future. First, it is necessary to explain the organizational change in the Division Cavalry Squadron brought into being by the Army of Excellence (figure 8).

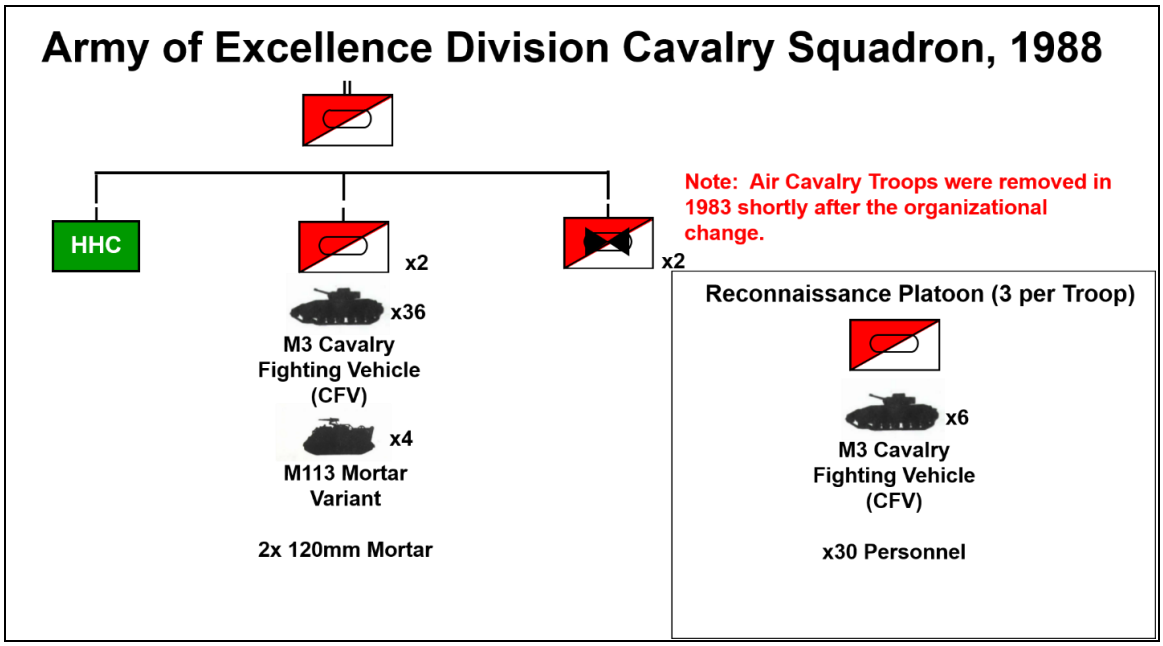


Figure 8. The Army of Excellence Division Cavalry Squadron

Source: Created by author, modified from Peter S. Kindsvattar, "Army-of-Excellence Divisional Cavalry Squadron" (Monograph, School of Advanced Military Studies, Fort Leavenworth, KS, 1985); Department of the Army, FM 17-98, *Scout Platoon* (Washington, DC: Department of the Army, 1994).
Note: This figure depicts the battalion and platoon organization of the Army of Excellence Cavalry Squadron.

The Division Cavalry Squadron experienced several drastic changes under the Army Excellence to fit the organization into a less aggressive reconnaissance doctrine. First, and most noticeably, is the reduction of one maneuver troop and the reduction of armored vehicles within each PLT from ten to six armored vehicles (Kindsvattar 1985; Department of the Army 1973). Second, organic infantry and tank sections were removed entirely and the M113/M114 armored personnel carriers were replaced with the new, much larger, M3 Bradley Fighting Vehicle (BFV) (Kindsvattar 1985). Though limited indirect fire capability was maintained with 120mm mortars, these mortar sections were

moved from PLT to troop control and were reduced in number from nine to two 120mm mortar systems (Kindsvatter 1985; Department of the Army 1973). Third, though depicted in figure 9 the aviation troops were removed from the organizational structure in 1983 and retained at division level because of the founding of the Army's Aviation branch (Cameron, 2010). This reduction of offensive capability was indicative of the less aggressive reconnaissance doctrine outlined in the "Army 86 Scout Platoon" (Department of the Army 1985). It was believed that the 25mm cannon, TOW missile, and optics capability of the BFV, would provide the squadron with just enough antitank capability and surveillance capability to fight for information on a limited basis, while conducting reconnaissance by means of surveillance versus aggressive offensive action (Cameron 2010). There were additional surveillance capabilities and a robust communications capability that were supposed to be fielded to the new organization, however, due to delays in fielding and production most Division Cavalry Squadrons never received the equipment (Cameron 2010).

Though the Army of Excellence Division Cavalry Squadron standardized all mechanized scout platoons to six BFV and 30 man platoons (figure 8) there would be further refinement to reconnaissance units that would impact the future brigade reconnaissance organization. As mentioned above, observations at National Training Center coupled with less aggressive doctrine continued to effect battalion level reconnaissance even after the initial organization shift (Kindsvatter 1985; Cameron 2010). There was a perceived ineffectiveness of the BFV equipped battalion scout platoons based upon a propensity of those units to fight as opposed to perform reconnaissance (Cameron 2010). Further, with the fielding of the new High Mobility

Multipurpose Wheeled Vehicle (HMMWV), there emerged an organizational change back to the wheeled Scout PLT (Cameron 2010).

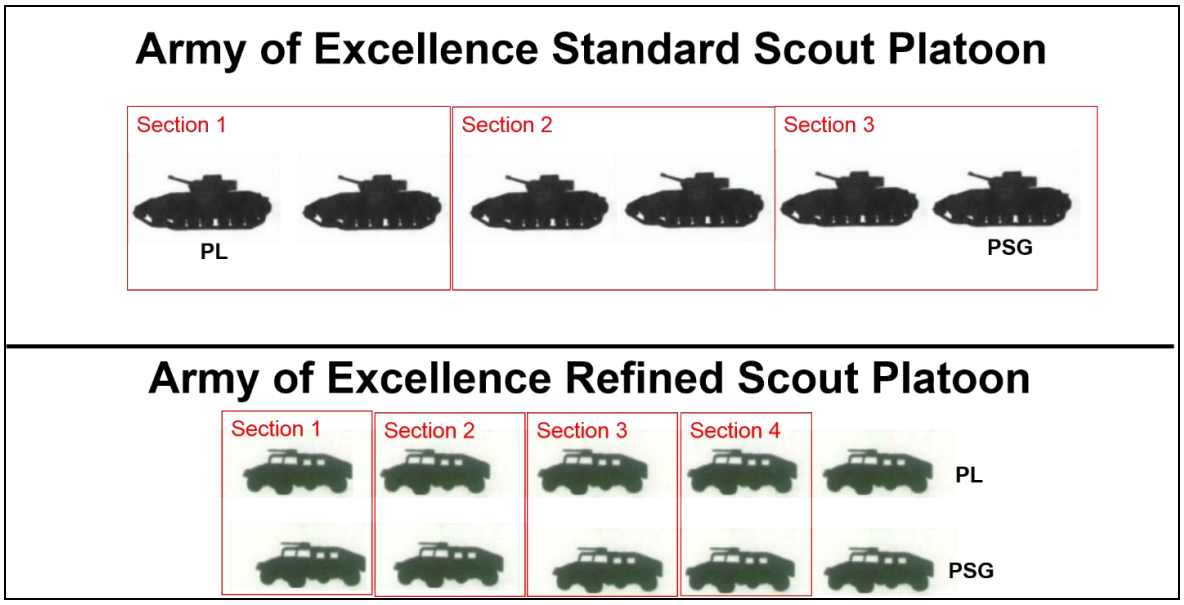


Figure 9. The Army of Excellence Scout Platoon Refined

Source: Created by author, modified from Robert S. Cameron, *To Fight or not to Fight?: Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar Years to Operation Iraqi Freedom* (Fort Leavenworth, KS Combat Studies Institute Press, 2010); Department of the Army, FM 17-98, *Scout Platoon* (Washington, DC: Department of the Army, 1994).
Note: Figure depicts the change in organization from BFVs to HMMWVs to reduce the battalion scout platoon's offensive capability based on National Training Center observations.

This next reorganization greatly reduced the firepower of the PLT by replacing BFVs with HMMWVs. Furthermore, the PLT was provided with increased surveillance capability and man portable anti-tank capability (Cameron 2010). Though this increased the platoon's mobility and lowered their signature, many in the reconnaissance community thought the HMMWV not survivable enough to allow battalion scout

platoons to effectively conduct their mission, although initial training rotation after action reviews provided (of units engaged in "laser tag") information to the contrary (Cameron 2010). The Division Cavalry Squadron organization depicted in figure 8 and the battalion Scout PLT organization depicted in figure 9 would be those responding to the sounds of the guns in Operation Desert Storm.

Desert Storm, not training center rotations, proved to be the true test of newly refined reconnaissance doctrine and organizations. During Desert Storm, the story of 2nd Squadron, 4th Cavalry Regiment, the Division Cavalry Squadron for 24th Infantry Division, provided an example of how new doctrine and organizations performed in combat. The Squadron served multiple roles outside of reconnaissance and security missions; often times they were employed much like any other maneuver units especially for economy of force missions (Barto 1993). Anytime the 2nd Squadron 4th Cavalry was employed in an economy of force role, the unit required heavy augmentation of tanks and aircraft in order to meet mission requirements (Barto 1993). When employed in standard reconnaissance roles, 2nd Squadron 4th Cavalry covered reconnaissance gaps from the corps to the brigade level with which also required varying degrees augmentation (Cameron 2010; Barto 1993). This experience along with others provided the Army with two key observations from Desert Storm: Division Cavalry Squadrons were not robust enough to accomplish their doctrinal range of missions and that there was a distinct need for a reconnaissance unit at the brigade level (Cameron 2010).

Force XXI: Birth of Brigade Reconnaissance

With the end of Operation Desert Storm and the fall of the Soviet Union, the mechanized reconnaissance community went through another transformation to adjust to

changes in the global environment. The ongoing changes in the environment included: the downsizing of the United States Military, an increase in operational tempo with many smaller worldwide military operations requiring a wide variety of military expertise, the shift in the National Military Strategy to forces capable of rapid global deployment, and a rapid increase in information technology (Cameron 2010). This transitional period focused on the importance of information and information collection, putting reconnaissance units in the spotlight yet again, however this time changes to doctrine and organization would be different.

The aftermath of Operation Desert Storm highlighted the effectiveness of BFV and M1 Abrams Tank "hunter/killer" teams during offensive operations, reconnaissance in force, and counter-reconnaissance missions (Cameron 2010). Desert Storm also proved that the lighter battalion scout platoons had sufficient mobility to conduct effective reconnaissance for their parent units despite the increased pace of operations (Cameron 2010). This opened the door to the passive-aggressive debate yet again. As outlined in all the previous sections, the ongoing reconnaissance debate affected the organization of reconnaissance units at all echelons. In this particular case, the Armor community adopted two very different doctrines for Division Cavalry Squadrons and battalion scout platoons that effected differences in their organization (see figures 9 and 10). For example, the 1996 version of FM 17-95 *Cavalry Operation*s expanded the Division Cavalry Squadron's role in security missions, highlighting an aggressive counter-reconnaissance doctrine, and economy of force missions (Department of the Army 1996). However, the 1994 "Scout Platoon" manual indicated a split doctrine. It clearly distinguished roles and capabilities between the BFV mounted Division Cavalry PLT and

HMMWV mounted battalion Scout PLT (Department of the Army 1994a). Though the fundamental reconnaissance missions did not change, the manual went into detail regarding the more stealthy employment of the battalion Scout PLT versus the more aggressive employment of the Division Cavalry PLT during mission execution (Department of the Army 1994a). Along with this doctrinal distinction between light and heavy cavalry units came the reorganization of the Division Cavalry Squadron and the creation of the Brigade Reconnaissance Troop (BRT).

At this point, it is important to understand how the organizational changes in the Division Cavalry Squadron and the creation of the BRT complimented the split nature of this updated reconnaissance doctrine. The Division Cavalry Squadron gained M1 Abrams tanks and regained an air reconnaissance troop, providing it with greater firepower and reach, which is reflective of the more aggressive reconnaissance doctrine for its platoons and the broadening of security and economy of force roles in the 1996 "Cavalry Operations" manual (Cameron 2010; Department of the Army 1996). However, the first "brigade level" reconnaissance organization, the BRT, was based largely on the Battalion Scout PLT (figure 10):

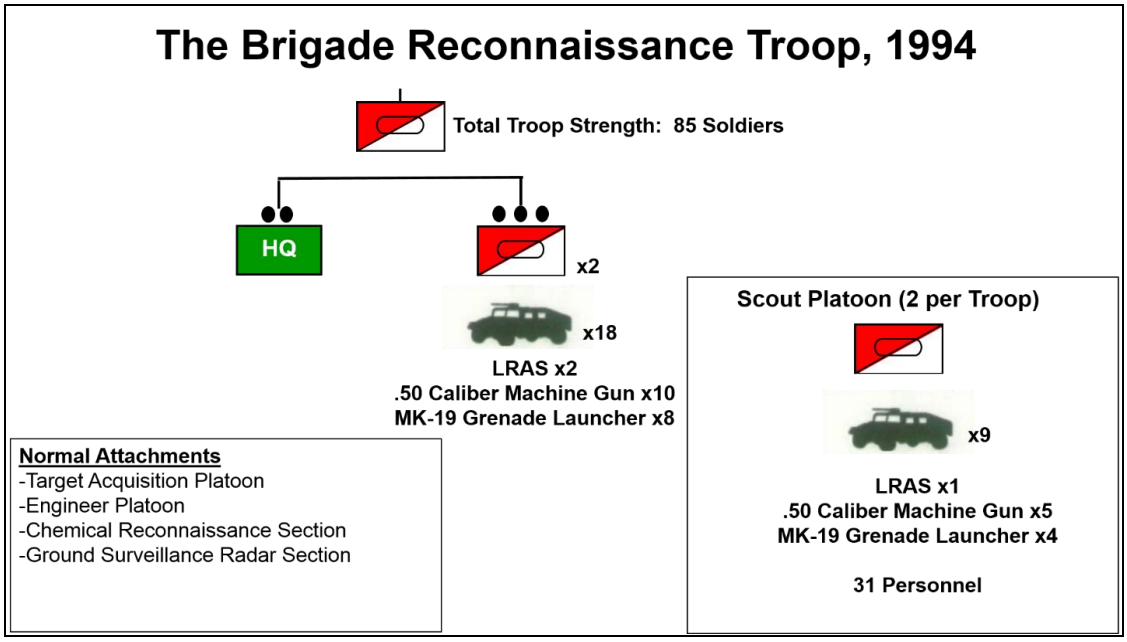


Figure 10. The Brigade Reconnaissance Troop

Source: Created by author, modified from: Robert S. Camerson, *To Fight or not to Fight?: Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar uears to Operation Iraqi Freedom* (Fort Leavenworth, KS Combat Studies Institute Press, 2010); Department of the Army, FM 17-98, *Scout Platoon* (Washington, DC: Department of the Army, 1994); Stephen E. Bruch, "Did Force XXI validate the Brigade Reconnaissance Troop?" (Master's thesis, US Army Command and General Staff College, Fort Leavenworth, KS, 1998).
Note: This figure highlights the light nature of the BRT and provides a list of common attachments that were required to accomplish reconnaissance objectives for the brigade commander.

The BRT was a light reconnaissance organization designed specifically for the passive reconnaissance and surveillance for a brigade consisting two armor battalions and one mechanized infantry battalion. It was a relatively small reconnaissance troop, organized with armored HMMWV's, two long range acquisition and surveillance scout sights (LRAS3s), a robust communications capability, a digital communications capability, and a limited antitank capability with either mounted or dismounted systems

(Cameron 2010). The troop was designed to stealthily maneuver to the reconnaissance objective, acquire and cue other assets onto high value or high payoff targets, and facilitate brigade maneuver through reconnaissance handover with battalion scout platoons and reconnaissance pull (Cameron 2010). The BRT provided a maneuver brigade with what could be an effective reconnaissance capability (when augmented as in figure 11), yet its role was limited by capability in security and economy of force missions (Cameron 2010). This capability gap limited the BRT to surveillance and rapid reporting if assigned either of those mission sets (Cameron 2010). With the emphasis on light reconnaissance based on the need for rapid global employment of forces, the BRT seemed to be the right organization for the brigade at the right time, however it did revisit the question of "how stealthy can a mounted unit really be?"

Army Transformation and the Global War on Terror

In 1999 the Army was seeking to transform to a more modular and deployable force. However, this transformation would be done while facing protracted counterinsurgency operations in two theaters of war. The further development of new surveillance technologies in the early 2000s would spark the birth of the intelligence surveillance and reconnaissance (ISR) doctrine, which would attempt to divorce reconnaissance and security missions, putting the mechanized community at another turning point. The period would change the name of the brigade to BCT and further categorize them as heavy or light (Cameron 2010). Though most of transformation efforts during this period were focused on the Stryker Brigade Combat Team (SBCT), a medium and rapidly deployable unit, this focus would soon effect organization and doctrine of all

mechanized reconnaissance units (Cameron 2010). SBCT reconnaissance doctrine was heavily influenced by ISR doctrine which emphasized the utilization of digital communications to facilitate situational awareness and sensor or surveillance capability to facilitate maneuver and answer a commander's critical information requirements. As the Army stepped into another transformation period, the nation was attacked on September 11, 2001.

The attack on the World Trade Center in 2001 marked the beginning of the Global War on Terror. Ensuing operations in complex mountainous terrain etc., initial offensive actions in Afghanistan were mostly conducted by either special operations forces or light infantry units. However, in 2003 mechanized forces would be employed in Iraq as part of the Global War on Terror to fight terrorism, seize weapons of mass destruction, and force change in a murderous regime. Though the Army was in the midst of a transformation that was fundamentally attempting to divorce reconnaissance and security missions through the infusion of technology, at the time of OIF the mechanized reconnaissance community had not adjusted its doctrine or organization since 1996 (Cameron 2010; Department of the Army 1994a; Department of the Army 1996). According to ISR doctrine, technological overmatch should have provided commanders in OIF with an unprecedented ability to gather information and intelligence to facilitate rapid decision making (Cameron 2010). The reality however, as annotated by a 3rd Infantry Division staff officer, was much different:

> We went in with the assumption that with all the sensors we have like the Joint Surveillance and Target Attack Radar System, the unmanned aerial vehicle 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. (Cameron 2010, 477)

So in essence, it appeared that despite technological overmatch and supporting doctrine Clausewitz's fog of war, still remained a constant (Clausewitz 1984). Most intelligence gathered at the tactical level during OIF was acquired through the conduct of traditional reconnaissance missions (including reconnaissance in force) and human intelligence (HUMINT) gathering conducted in both open and urban terrain (Cameron 2010). As the insurgency in Iraq grew and the Army shifted from offensive and defensive operations to stability, the threat adapted and presented a large divergence of capabilities (Cameron 2010). Also, as combat operations extended from periods of months to years, the military's requirement for rotational units to facilitate this continuous operational tempo would bring establish the concept of modularity. Modularity would identify the BCT as the primary rotational unit to support stability operations in two theaters, and pull resourcing and doctrinal focus from the division as smaller and constant wars were becoming the new norm (Cameron 2010). The concept of modularity categorized BCTs as stryker, infantry, or heavy and designed them to be easily task organized to provide the relevant amount of flexibility required by smaller conflicts that were and are ambiguous at best (Cameron 2010). With regard to the mechanized reconnaissance community, it created the HBCT (now called the ABCT, see figure 12), dissolved the BRT and Division Cavalry Squadron, and created a Reconnaissance Squadron at the brigade level (Cameron 2010).

The contemporary Reconnaissance Squadron (now called Cavalry Squadron) is an organizational merging of ISR doctrine, the BRT, and the traditional Division Cavalry Squadron.

> The fundamental role of the squadron is conducting reconnaissance or security missions in support of its higher headquarters. The squadron progressively builds situational awareness of the operational environment for the higher commander. . . . The squadron employs unique combinations of reconnaissance and security capabilities to successfully meet the information challenges intrinsic to the spectrum of conflict. . . . The squadrons reconnaissance operations yield an extraordinarily high payoff in the areas of threat location, disposition and composition, early warning, and battle damage assessment. . . . Skillful reconnaissance operations allow the commander to shape the battlefield, ideally accepting or initiating combat at times and places of his choosing. (Department of the Army 2010a, 1-3)

The equal emphasis placed on acquisition in ISR doctrine (passive reconnaissance) and the mention of "accepting or initiating combat" (aggressive reconnaissance) in the role of the Cavalry Squadron highlights the merger. This merger was further highlighted by the emphasis placed on sensor and aerial reconnaissance, reconnaissance management, and reconnaissance systems (Department of the Army 2010a). To somewhat confuse the matter, these ISR concepts are stated all while maintaining the fundamental forms of reconnaissance (route, area, zone and special) that have not changed since 1943 (Department of the Army 2010a; Cavalry Reconnaissance Squadron Mechanized, 1943). The contemporary ABCT Cavalry Squadron is indicative of attempts to make an organization that has both the passive capabilities of the former BRT, and the aggressive capabilities of the Division Cavalry Squadron all while adapting to new technology and operational environments (figure 11).

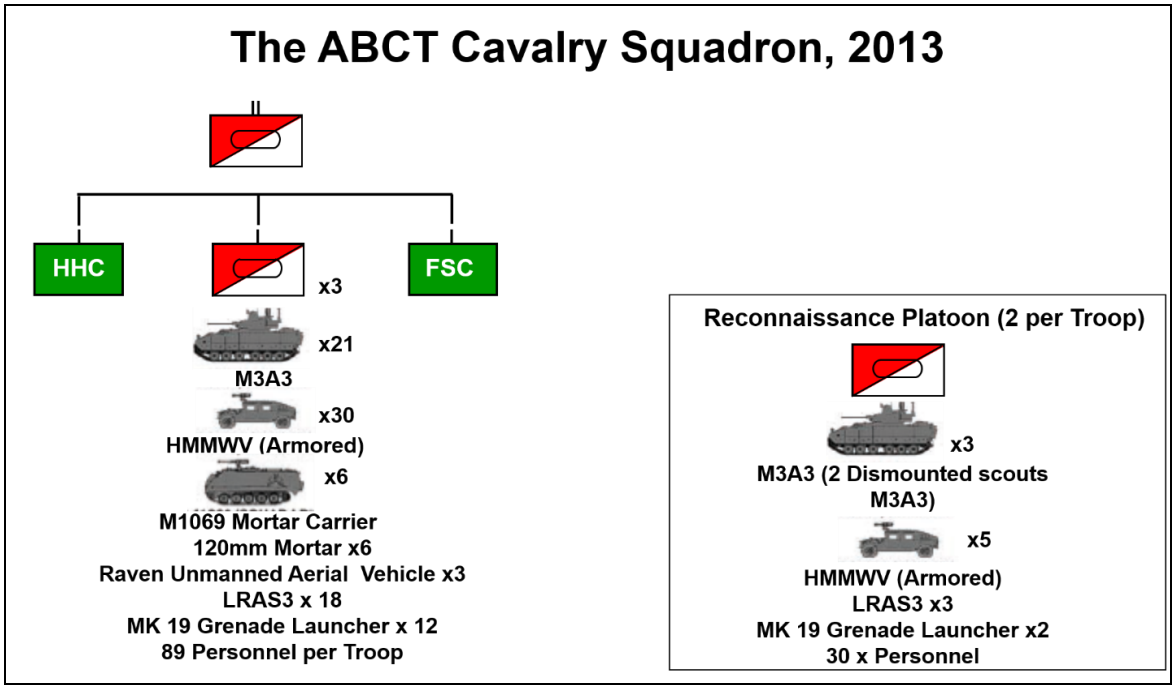


Figure 11. The ABCT Cavalry Squadron, 2013

Source: Created by author, modified from Department of the Army, FM 3-20.96, *Reconnaissance and Cavalry Squadron* (Washington, DC: Department of the Army, 2010); Department of the Army, FM 3-20.971, *Reconnaissance and Cavalry Troop* (Washington, DC: Department of the Army, 2009).
Note: Figure depicts the current Cavalry Squadron organization.

If one compares figures 9 and 10, one can see how the Cavalry Squadron is a mixture of the former BRT and Division Cavalry organizations. The Cavalry Squadron was meant to be capable of addressing the wide divergence of threats recognized in OIF, OEF, and future operations (Cameron 2010).

Since the Cavalry Squadron appears to be a hybrid of past BRT and Division Cavalry organizations its organization and doctrine should be reflective of that hybrid nature. The "mixed nature" of the platoons provides the squadron with both an offensive antitank capability (M3A3), and the ability to conduct more stealthy reconnaissance and

surveillance (HMMWV equipped with LRAS3) (Department of the Army 2010a; Department of the Army 2009b). Capabilities at the troop level provide the squadron with an extended surveillance capability (Raven Unmanned Aerial Vehicles (UAV)) and internal indirect fires (120mm sections) (Department of the Army 2010a; Department of the Army 2009b). Of note, though the troops and platoons possess M3A3 BFVs, doctrine is cautionary regarding offensive action or reconnaissance in force much like the doctrine for the Division Cavalry PLT of the mid 1980s (Department of the Army 2009b; Department of the Army 1985). Furthermore, the doctrine emphasizes reconnaissance and surveillance operations, while only mentioning the capability to conduct offensive operations, reconnaissance in force, economy of force, or security missions (Department of the Army 2009b). The contemporary doctrine actually cautions against aggressive reconnaissance operations without augmentation as only being acceptable against either light or motorized enemy units (Department of the Army 2009b). Table 2 from FM 3-20.96, *Reconnaissance and Cavalry Squadron*, outlines the unit's doctrinal capabilities and limitations based on its organization.

Table 2. ABCT Cavalry Squadron Capabilities and Limitations

Table 1-1. Squadron mission profiles

TYPE OF SQUADRON	ACR CAVALRY SQDN	HBCT RECON SQDN	SBCT RECON SQDN	IBCT RECON SQDN	BFSB RECON SQDN
Reconnaissance Tasks					
Zone Reconnaissance	F	F	F	F	P
Area Reconnaissance	F	F	F	F	F
Route Reconnaissance	F	F	F	F	P
Reconnaissance in Force	F	P	P	P	X
Security Tasks					
Screen	F	F	F	F	P
Guard	F	P	P	P	X
Cover *	X	X	X	X	X
Area Security	F	F	F	F	R
Local Security	F	F	F	F	F
Offensive Tasks					
Attack	F	P	P	P	X
Movement to Contact	F	P	P	P	X
Defensive Tasks					
Area Defense	F	P	P	P	X
Mobile Defense	F	P	P	P	X
Retrograde	F	P	P	P	X
Stability Tasks					
Civil Security	F	F	F	F	R
Civil Control	F	F	F	F	R
Restore Essential Services	R	R	R	R	R
Support to Governance	R	R	R	R	R
Support to Economic/ Infrastructure Development	R	R	R	R	R
Civil Support Tasks					
Support to Disaster/ Terrorist Attack	Capability depends on the specific missions assigned. Depending on the mission, the squadron may require augmentation.				
Support to Civil Law Enforcement					
Other Support					

F – Fully Capable **R** – Capable when reinforced **P** – Capable when enemy capabilities do not jeopardize mission accomplishment (permissive METT-TC) **X** – Not Capable

* ***Note***. Cover is listed as one of the security missions even though the squadron is not doctrinally capable of performing this mission independently. The squadron can perform tactical tasks in support of its higher headquarters executing a cover mission (such as screening for a BCT assigned a cover mission).

Source: Department of the Army, FM 3-20.96, *Reconnaissance and Cavalry Squadron* (Washington, DC: Department of the Army, 2010), 1-4.
Note: HBCT column and "P" classification are highlighted to emphasize the "split" nature of the organization.

The Cavalry Squadron, by doctrine, is fully capable of conducting standard reconnaissance tasks. However, when it comes to offensive or defensive tasks (including

reconnaissance in force) the squadron's capability is annotated as a decision based classification or "P" rating (table 2). This "P" classification is especially interesting. It seems to highlight the continued split doctrinal position of the mechanized community with regards to the employment of aggressive reconnaissance which has been ongoing since the mid-1980s (Department of the Army 1985). Further limitations for the Cavalry Squadron outlined in doctrine include the requirement for augmentation to conduct offensive (reconnaissance in force) or defensive operations, limited dismounted capability, and mix-matched survivability (Department of the Army 2010a). The doctrinal limitations are also interesting because the ABCT retains the mission of closing with enemy forces through fire and maneuver (likely against other armored forces) (Department of the Army 2010b). This is indicative of offensive and defensive operations and appears to highlight a doctrine and capability gap between the Cavalry Squadron and the ABCT it supports.

Army Doctrine approaches tactics and operations through a framework of art and science (Department of the Army 2012d). It is then logical to infer that the Cavalry Squadron must be able to support the ABCT within this framework. The current Cavalry Squadron is designed, and is optimized, to provide reconnaissance and surveillance capability to an ABCT consisting of two CABs, not three as is the future force structure (see figure 12 current structure) (Department of the Army 2010a; Wasserbly 2013).

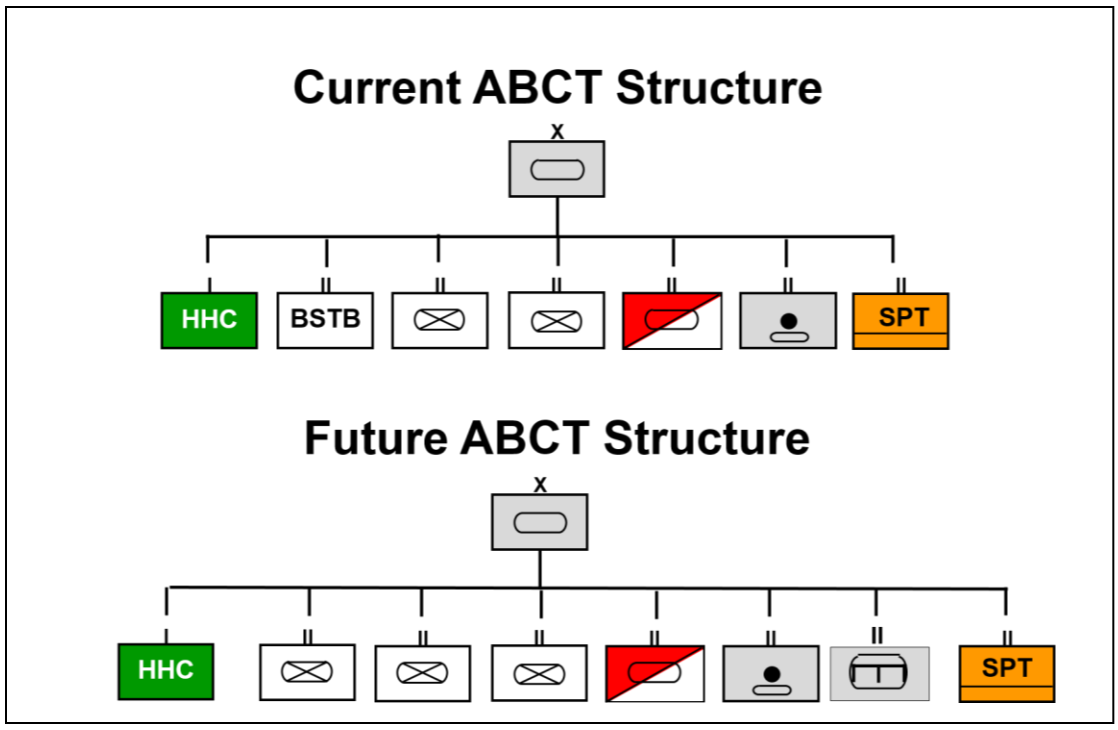


Figure 12. Current and Future ABCT Structure

Source: Department of the Army, *The Modular Force: FY 2020 v.13* (Washington, DC: Government Printing Office, 2013), 47.
Note: This figure depicts the change to ABCT force structure (addition of one Combined Arms Battalion and an Engineer Battalion) announced by Army Senior Leadership.

This begs the question of whether or not the contemporary Cavalry Squadron can support this larger ABCT. To examine this question it is appropriate to look at the problem from an art and science perspective. First, it is necessary to examine the role of the ABCT and how it compares to that of the Cavalry Squadron. Second, it is equally necessary to examine the basic battlefield geometry of the Cavalry Squadron and the future ABCT. The ultimate goal is to determine, to some degree, whether or not the current Cavalry Squadron can support the larger ABCT within the appropriate doctrinal framework.

The art of tactics involves flexible array of means or resources with which the mission can be accomplished (Department of the Army 2012d). Unit roles and missions speak holistically to tactical capabilities and flexibility. Therefore, unit roles and missions are important in the application of military art. The ABCT is a balanced combined arms force that executes operations with shock and speed to close with and destroy enemy forces (Department of the Army 2010b). On the other hand, the Cavalry Squadron's role is to conduct reconnaissance and security missions in support of its higher headquarters, or the ABCT (Department of the Army 2010a). Given both roles, it is logical to infer that the ABCT is capable of conducting offensive and defensive operations against enemy armor formations with speed and audacity. ABCT operations are also enabled by reconnaissance and security provided by a Cavalry Squadron capable of keeping pace with the ABCT and threat. From this general observation it is reasonable to conclude that the ABCT will generally be employed against enemy armor formations. Therefore, the Cavalry Squadron must be capable of conducting both essential security missions (screen and guard) and reconnaissance to provide the relevant amount of tactical flexibility outlined within the ABCTs role. Ideally, the Cavalry Squadron should be capable of accomplishing these tasks without augmentation. However, as outlined by the "P" ratings in table 2, it does not appear that capabilities and roles are aligned.

One may completely refute this argument based solely on the ABCT being a modular organization, and that any capability or resource shortfall within one element of the ABCT can be accounted for by another. Of course, this can only be done to a certain extent before completely affecting the ABCT's capability to accomplish its assigned mission within the bounds of its role. Basically, task organization and augmentation can

solve many tactical problems if prudent risk is accepted (Department of the Army 2010b). It can also be argued that if the ABCT possesses units that are capable of accomplishing missions that complement its tactical role without augmentation, then the ABCT as a whole is a much more flexible combat organization. Most of these conclusions are highly subjective as most things are within the art of tactics. However, they provide some examples of how capabilities, missions, and roles of the ABCT and Cavalry Squadron are somewhat at odds making the "art" equally difficult. It is however important to also examine the scientific side of this particular issue.

The science of tactics is an understanding of military aspects such as capabilities, technology, and procedure (Department of the Army 2012d). In the case of the ABCT and the Cavalry Squadron, the question is one of capability. In 2013 the ABCT increased in size by one CAB giving it a total of four maneuver elements including the Cavalry Squadron (see figure 12) (Wasserbly 2013). This implies that the future ABCT will be responsible for much larger geographic areas and have an increased frontage and depth when conducting offensive or defensive operations. Using this logic, the Cavalry Squadron must then be capable of covering an increased geographical frontage in order to sufficiently accomplish security missions such as screening or guarding. This ultimately begs the question of whether or not the Cavalry Squadron (which has not increased in size) is capable of covering the geographical frontage and depth required by a larger ABCT.

When examining this problem, it was discovered that because of the manner in which contemporary doctrine defines the operational environment, things such as doctrinal frontages and distances are virtually non-existent (Department of the Army

2010a; Department of the Army 2010b; Department of the Army 2009b; Department of the Army 2009a; Department of the Army 2006; Department of the Army 2008; Department of the Army 2002). This lack of scientific planning factors is understandable given the emphasis on flexibility and avoidance of "lock step" methodologies in contemporary military operations (Tedesco 2000). However, removing the science from the doctrine entirely can complicate what would otherwise be basic planning assumptions (Tedesco 2000). Although contemporary doctrine does not address battlefield geometry, past doctrine has. So past tactical science will be applied to this question of battlefield geometry in this research.

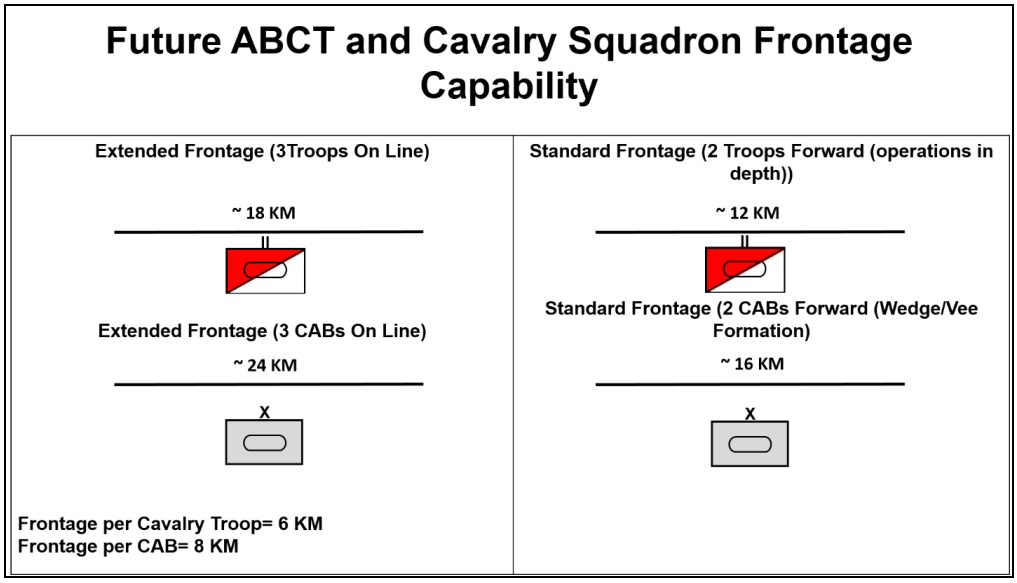


Figure 13. ABCT and Cavalry Squadron Frontage Capability

Source: Created by author, from Department of the Army, ST 100-3, *The Battle Book* (Fort Leavenworth, KS: U.S. Army Command and General Staff College ,1999); Department of the Army, FM 34-130, *Intelligence Preparation of the Battlefield* (Washington, DC: Department of the Army, 1994); Department of the Army, *US Army Weapons Systems* (Washington, DC: Department of the Army, 2009).
Note: This figure suggests that the future Cavalry Squadron may require augmentation to sufficiently conduct screen or guard missions for an ABCT with three maneuver battalions.

Figure 13 was created by referencing doctrinal frontages of like type units to the CAB and Cavalry Squadron outlined in past manuals. Utilizing the baseline cavalry troop frontage of six kilometers and the mechanized task force frontage of eight kilometers, two different scenarios were created to provide a graphic comparison (Department of the Army 1994a; Department of the Army 1999). This scenario is based on open desert terrain and accounts for both an extended ABCT frontage (three battalions abreast), and the much more likely standard ABCT frontage which in turn accounts for most maneuver formations (figure 13). This comparison does not account for varying terrain and is meant to help determine, in a simple manner, whether or not the Cavalry Squadron can support the frontage of a larger ABCT. Based on the research and comparison it can be concluded that the current Cavalry Squadron can support the frontage of an ABCT at standard distance. However, if the ABCT is required to put three CABs on line (i.e. linear defense) the Cavalry Squadron may require augmentation to sufficiently screen or guard the ABCT. It is also important to note that unless terrain enables the Cavalry Squadron to support the ABCT along a much smaller frontage that it will have limited capacity to conduct security operations in depth. It can further be concluded that any organizational solutions to the primary research question must be capable of maintaining a minimum frontage of 16 kilometers and maximum frontage of 24 kilometers to support the ABCT without augmentation. There is a correlation between the increase in size of the ABCT and the need to examine the organization of the current Cavalry Squadron. In addition to the considerations of doctrine, mission, capabilities, and frontages is the further consideration that the current Cavalry Squadron has been combat tested in both OIF and OEF.

Cavalry Squadron performance during OIF and OEF, while suitable as a basis for comparison, should not be the only example for assessing how capable the organization and doctrine are at providing the ABCT commander with an effective reconnaissance organization. The routine employment of Cavalry Squadrons as a land owning unit (rather than in a reconnaissance role) to facilitate ABCT stability operations in OIF and OEF is similar to the experience of the Division Cavalry Squadrons during Vietnam (Cameron 2010). The Cavalry Squadron's doctrine and organization are optimized for reconnaissance operations, so the unit often times requires heavy augmentation from other battalions in the brigade or specialty units to effectively conduct stability operations in OIF or OEF (Cameron 2010; Department of the Army 2010a). Despite unconventional employment to meet the needs of different operational environments and conflicts, there has been significant professional discourse regarding just how capable the Cavalry Squadron is in accomplishing the mission it is organized for in support of ABCT maneuver.

The current professional debate regarding the Cavalry Squadron is pertinent to provide additional points of view to this research effort. The contemporary literature regarding either actual performance or projected capability of the ABCT Cavalry Squadron is reminiscent of the traditional mechanized reconnaissance capability debate; however, an additional emphasis on surveillance has been added to the conversation because of the rapid increase in technology over the past few years (Cameron 2010). The infusion of massive amounts of surveillance technology, such as UAVs, has brought what used to be division capabilities to the ABCT level. This movement of division capabilities to the brigade level caused an ongoing debate regarding whether or not these

capabilities are too numerous to manage at the ABCT level (Dismukes 2009). On the other side of the surveillance debate is the reasoning that the ABCT, and therefore the Cavalry Squadron, requires robust surveillance capability to support larger BCT operations (Simmons 2008; Gonzales 2007). This continual debate occurs regardless of a lack of definitive evidence that increased technological capability increases unit effectiveness in combat operations (Simmons 2008; Gonzales 2007). Somewhat divorced from the surveillance and technology facet of this debate is the much more familiar passive or aggressive topic.

In this particular area, the mechanized community focuses on the basic missions of reconnaissance, security, and economy of force, and has been somewhat outspoken regarding the capabilities, or lack of, in the contemporary Cavalry Squadron. Most professional discourse acknowledges the need for technological overmatch; however, there are numerous critiques of the fact that the modern ABCT Cavalry Squadron is only capable of conducting one of two essential security missions without augmentation (Howell 2009; Mark 2009). Additionally, the mechanized community appears to be increasingly critical of the tendency of modern ISR doctrine to attempt to divorce reconnaissance from security which becomes problematic at a tactical level (Dooley 2006). Provided these different opinions and observations, it is relatively apparent that the debate on the effectiveness of the ABCT Cavalry Squadron is far from over.

Conclusions Regarding the Evolution of Reconnaissance

There are several conclusions which can be drawn from the evolution of the mechanized reconnaissance battalions. Table 3 depicts the size of reconnaissance units

compared to the echelon supported by them, and how that reconnaissance element has been structured throughout each period which is discussed in this portion of the literature review.

Table 3. Reconnaissance Unit Capability by Echelon, by Era

Armored Unit Reconnaissance Capability by Echelon by Era

Era / Echelon	World War II	Korea	ROCAD & ROAD	Vietnam	Desert Storm	Force XXI	Transformation &OIF/OEF
Division	SQDN	SQDN	SQDN	SQDN	SQDN	SQDN	None
Brigade	None	None	None	None	None	TRP	SQDN
Battalion	PLT	PLT	PLT	PLT	PLT	PLT	PLT

Legend

- Combined Arms Organization at Troop Level
- Combined Arms Organization at Platoon Level
- Mixture of Mechanized and Wheeled
- Reconnaissance Pure Organizations (Doctrinally limited in Offensive/Defensive capability)
- Mechanized (Tracked)
- Wheeled

SQDN-Battalion equivalent unit
TRP- Company equivalent unit
PLT-Platoon equivalent unit

**NOTE: Mechanized versus wheeled determination is based upon combat platforms not sustainment platforms.

Source: Created by author.
Note: This table depicts how reconnaissance organizations at the battalion and division level have evolved over time, and how those organizations collided to create the ABCT reconnaissance organization of today.

The global operational environment, either current or expected, is a determining factor regarding change in the mechanized reconnaissance community. For example, reconnaissance capability changes between Vietnam and Desert Storm show the re-focus to cold war deterrence, whereas the change in capabilities from Force XXI to today is congruent with technological advances, the fall of the Soviet Union, the emphasis placed on the power of information, deployment capability, and the emerging role of the BCT in

operations. Although the future operational environment will be addressed in the next section, it is important to note it here as a factor that contributes to change in reconnaissance units over time.

Secondly, it can be observed that capabilities and size of the reconnaissance unit have stayed relatively similar over time based on the size of the supported echelon, with the exception of brigade level reconnaissance organizations (table 3). It can further be observed that slight shifts in reconnaissance capabilities within those organizations over time have been fueled by the ongoing reconnaissance capability debate. Table 3 shows the almost constant combined arms organization of various division reconnaissance units over time, which highlights the more aggressive form of reconnaissance, and the light (or reconnaissance pure) nature of units at the battalion level, which highlights a more passive form of reconnaissance. The simple fact that the Cavalry Squadron is the newer echelon caught between what used to be the more aggressive nature of division reconnaissance units, and the much more passive nature of battalion scouts may actually explain the somewhat "confused" nature of the capabilities the current Cavalry Squadron possesses. This organizational pattern is further exacerbated by the advent of ISR doctrine, and much faster development in information and information sharing technologies. Because of the speed of information technology and surveillance system development, it is quite possible that the Cavalry Squadron of the future may not provide capabilities that either support or refute the passive-aggressive reconnaissance debate.

Finally, and most important, it is apparent that future reconnaissance units must be capable of conducting all forms of reconnaissance (route, zone, area, and in force), economy of force missions, screen and guard missions, and must have the capability to

secure a front at a minimum of 16 kilometers and a maximum of 24 kilometers. An argument that can be made to the contrary of this conclusion is that since the ABCT is a modular organization, the Cavalry Squadron could be augmented with additional capability to accomplish economy of force or security missions. However, that augmentation will come at a loss of capability within a CAB, which may be required for mission accomplishment. Furthermore, the literature review provides concrete examples of how reconnaissance organizations have changed post conflict due to their inability to accomplish economy of force or security missions without heavy augmentation. An example, of how mission capability has driven organizational change is the increase in capability of the Division Cavalry Squadron from the Desert Storm to Force XXI organization (table 3). The squadron did not possess the offensive capability to conduct economy of force or requisite security missions without heavy augmentation, so the organization was changed to be more combined arms in nature (Cameron 2010).

Change based on inability to conduct economy of force or security operations is a distinct pattern of organizational change for reconnaissance units at the conclusion of all of the conflicts covered in this section. Based on the current professional discourse regarding the Cavalry Squadron and the end of two ongoing wars, it is both reasonable and logical to determine that historically it is time for another organizational change in this reconnaissance formation. This observation further supports the question: How should the ABCT Cavalry Squadron be developed to conduct reconnaissance and security missions in the next 10 years?

Section V The Future Operational Environment: the Future State (Desired Endstate)

Determining the reconnaissance capabilities required of the Cavalry Squadron to support the ABCT in the next 10 years requires this research to look towards the future operational environment. To determine future capability requirements, this section addresses the future operational environment and threat in a broad sense; it also covers current guidance from our senior leaders and doctrine, and then draws specific implications regarding demands on the Cavalry Squadron of the future. It is necessary to keep such a review of the future operational environment and threats relatively broad, and guidance from senior leaders rather limited to what is applicable to land forces. This will allow conclusions that will have implications specific to Cavalry Squadron capabilities and unit organization required in the next ten years. First, a general knowledge of the future environment in which the threat will operate is necessary.

This study uses the Clausewitzian trinity as a theoretical basis to frame the future operational environment. Clausewitz concluded that the nature of warfare remains constant while the environment in which warfare exists constantly changes (Clausewitz 1984). He identified the environment in which war is conducted as a trinity, consisting of reason and policy (politics), chance and probability (the people and military), and violence and hatred (passions) (Clausewitz 1984). This trinity provides a logical framework for understanding the future operational environment (Clausewitz 1984). Furthermore, there are three broad trending factors outlined by futurist scholars that will affect the future operational environment: globalization, the diffusion of power, and advancements in communications technology (Cooper 2012; Boot 2006; Gray 2006).

These factors (as applicable) are applied to each part of Clausewitz's trinity in order to broadly outline the operational environment within which future wars might be fought.

"Chance and probability" will be affected by globalization and increased communications technology. The effects these factors will have on populations worldwide are: an increase in global population, urbanization, and enhanced connection between societies through technology (Cooper 2012; Boot 2006; Gray 2006). Furthermore, the diffusion of advanced, sometimes lethal, technologies usually owned by common political powers will proliferate other nation-states and sometimes even down to the individual level (Cooper 2012; Boot 2006; Gray 2006). This portends that many future wars will be fought amongst globally connected populations capable of rapidly mobilizing passions and support far outside the construct of national borders. This also implies that achieving technological overmatch in conflict will be much more difficult. These changes in the global operational environment will likewise have an effect on militaries worldwide.

Militarily, these factors outline a connected and uncertain global operational environment in which no one military is assured technological overmatch. Furthermore, these observations outline a threat that is as equally globally connected as the population (Boot 2006; Gray 2006). This means that although threats may originate from within nation-states they will have an increased ability to possess global nodes capable of conducting operations along the spectrum of conflict (Boot 2006; Gray 2006). This will require militaries to be capable of deploying forces or conducting strikes outside of their territorial borders to properly address threats. Although this is not a new concept, a connected world will require a military with global rather than regional strike and

deployment capability. Militaries will seek this capability through force structure changes, investment in strategic lift assets, cyber capabilities (offensive and defensive), and proliferation of extended range lethal technologies (Boot 2006; Gray 2006).

"Reason and policy" are affected by continued globalization, the diffusion of power, and increased capability to communicate. This could cause a breakdown in political power to non-state actors, multinational corporations, and individuals which will challenge standard governments and political power relationships within societies (Cooper 2012; Boot 2006; Scales 2009; Lyall and Wilson 2009; Gray 2006). This challenge to political norms coupled with competition over land and resources that could be created by population growth, serves as an indicator of multiple, quite possibly simultaneous, smaller civil conflicts throughout the globe in the future (Cooper 2012; Boot 2006; Scales 2009; Lyall and Wilson 2009; Gray 2006).

The factors will have both a limiting and expansive effect on the "passions" of populations and militaries worldwide. Increased social and information technology along with larger urban centers allow people to maintain constant connection, and experience global conflicts in near real time (Cooper 2012; Gray 2006; Schilling 2002; O'Hanlan 2000). This increases communication of opinions to political establishments that ultimately add to the constraints and sometimes the complexity regarding any one given ongoing or future conflict (Cooper 2012; Gray 2006; Schilling 2002; O'Hanlan 2000). An example of this cause and effect relationship is the growing unwillingness of western democracies to accept large scale warfare or increased casualties, thereby placing political and operational constraints in OIF and OEF (Gray 2006). Opposing to this limiting effect is the capability that technology, i.e. social media, provides to quickly

inflame the passions of people globally. Recent protests and ongoing instability in places such as the Ukraine or Egypt highlight the capability of social media to rapidly mobilize entire populations. Therefore, the rapid flow of information can impassion populations; and have a disrupting effect on standard military or government information operations, this has the potential to rapidly escalate conflict just as much as it can limit it, making the scale of future wars increasingly unpredictable (Gray 2006; Schilling 2002; O'Hanlan 2000). Globalization, population growth, and growing information technology define a complex and uncertain future environment and are the stage upon which the threats of the future will emerge.

This complex and connected global environment will be the realm in which our military forces and contemporary threats will seek advantage in conflict. Future warfare will therefore, continue to be a competition between humans seeking asymmetric advantage over opponents (Clausewitz 1984; Boot 2006; Gray 2006). This ongoing competition corresponds to Clausewitz's claim that the nature of warfare remains constant (Clausewitz 1984). It is therefore important to understand that changes in the operational environment will increase the scope and complexity of this competition. The diffusion of power and emergence of new political systems brought about by globalization and an increase in communications technology have created a newer form of hybrid threat (Cooper 2012; Scales 2009; Schilling 2002; Gray 2006; Malik 1997). Hybrid threats occur when an adversary seeks to gain a military advantage through the utilization of regular, irregular, and criminal forces employed in concert to offset a known military disadvantage on their part (Murray and Mansoor 2012). Hybrid threats

are not a new occurrence, this form of warfare has been around for thousands of years (Murray and Mansoor 2012).

A contemporary example of hybrid warfare is Iran and Hezbollah's relationship as a hybrid threat that seeks to offset the technological, political, and economic advantages enjoyed by Israel in the Middle East (Fleming 2011). This ongoing conflict has presented Israeli Defense Forces with a variety of challenges that include having to lethally target individuals in a conflict conducted largely within population centers internal and external to Israel's borders (Fleming 2011; Cooper 2012; Lyall and Wilson 2009; Scales 2009; Schlling 2002; Malik 1997; Schneider 2004). The conflict has also presented area access challenges to Israeli conventional forces through the placement of unconventional Hezbollah threat nodes in complex urban terrain backed by conventional cyber and ballistic missile capabilities from Iran (Fleming 2011; Cooper 2012; Lyall and Wilson 2009; Scales 2009; Schlling 2002; Malik 1997; Schneider 2004). This conflict demonstrates the combining of conventional and unconventional threat models to achieve a desired effect on a superior force, or the constant nature of competition in warfare.

The future will likely present many constant and dispersed global conflicts that will continue this competition among multiple adversaries. This will cause conventional forces to adapt to irregular threats through becoming more irregular, and irregular threats adapting to conventional threats by becoming more conventional (Gray 2006; Boot 2006). Global competition to offset the U.S. military and technological advantage will continue. This will continue to blur our definitions and understanding of regular (conventional) or irregular (unconventional) threats (Boot 2006).

It is likely that future threats will continue to utilize hybrid techniques to offset technological overmatch. Currently, the rapid pace of innovation in digital technology for civilian and military purposes has no foreseeable end, so it is important to discuss how this element will be either adapted or countered by future threats. Most scholars agree on the importance of technology, and the fact that the evolution of technology is a "two way street." However, there is staunch disagreement over the primacy of technology and how its primacy will affect future warfare (Scales 2009; Boot 2006; Schilling 2002; Gray 2006; Malik 1997; O'Hanlan 2000). The role of digital technology in future warfare is a complex and difficult determination to make based on emerging trends. The example provided by threat reactions to our heavy reliance on UAVs outlines a simple threat adaptation to overcome a technological disadvantage. The technological advantage offered by UAVs in recent history has consistently been offset by unconventional forces through simply operating and blending in with local populations (Schneider 2004; Fleming 2011; Scales 2009; Schilling 2002). This limits the capabilities of UAV technology. Unconventional forces blending into large population centers still require either HUMINT, or conventional forces on the ground in close proximity guiding the UAV to the known target to capitalize on the advantage provided by this technology (Schneider 2004; Fleming 2011; Scales 2009; Schilling 2002).

At the opposite end of the spectrum is the adaptation of computers to conduct cyber warfare. Cyber warfare is an emerging and continuously changing domain (Schneider 2004; Fleming 2011; Scales 2009; Schilling 2002). Cyber attacks have been conducted by state and non-state actors, multi-national corporations, and individuals upon other nations with varying degrees of success; however, the potential to have devastating

effects on military and civilian infrastructure through the use of a single computer is a capability that our adversaries are sure to pursue (Schneider 2004; Fleming 2011; Scales 2009; Schilling 2002). The best way to categorize the threat of the future is rapidly adaptive, hybrid in nature, technologically enabled and connected, and capable of global mobilization with or without the support of a nation state. This provides a distinct challenge to the United States Military in the future. This challenge is being categorized and addressed by current doctrine and strategic guidance regarding the future development of land forces.

An understanding of doctrine and senior leader guidance with regard to land forces is necessary in order to address the implications the future operational environment and threat will have on the ABCT Cavalry Squadron. First, it is important to note that there is solid agreement from the military when describing the future operational environment and threat as one that is complex and uncertain with varying, often simultaneous, degrees of severity (Department of the Army 2011a; Department of Defense 2012; Dempsey 2014; Department of Defense 2011). Second, the Army addresses frequent or simultaneous conflicts of varying severity through doctrinally acknowledging that all units must be capable of simultaneously executing offensive, defensive, and stability operations (Department of the Army 2011a). Finally, guidance with regard to capabilities required for the land force of the future to be successful include: low signature ISR, the capability to rapidly seize and exploit enemy forces or terrain to gain access, and rapidly deployable on a global scale (Department of Defense 2012; Department of Defense 2011). Given the description of the future operational environment and threat outlined, the link between academic predictions of future

operations and how those predictions have been applied to contemporary guidance and doctrine can be understood.

Determinations regarding the future operational environment and threat are broad and general with few distinctive conclusions. Just because the future environment is broad and uncertain, does not mean that it is impossible to make determinations about the capabilities required in the future ABCT Cavalry Squadron. Research of the future highlights that the threat, geography, and information environment presents a broad range of challenges to the Cavalry Squadron. It is therefore logical to determine that the Cavalry Squadron requires a broad range of reconnaissance capabilities to support the ABCT operating within this complex and uncertain future environment. Making the determination that the range of capabilities required is broad may appear as a gross over generalization. However, attempting to provide niche capabilities for an uncertain future would be assuming that specific future scenarios can be predicted with some degree of certainty. History has shown that an ability to predict future military scenarios has been limited to non-existent (Gray 2006; Boot 2006).

Despite the ambiguity and lack of certainty in predicting the future, there are some broad insights that can be drawn from the examination of the future environment that have implications for reconnaissance capabilities required of the Cavalry Squadron of the future. First, the Cavalry Squadron must be able to conduct, or enable through reconnaissance and security tasks, offensive, defensive, and stability operations as directed in Army doctrine (Department of the Army 2011a). This further implies that the Cavalry Squadron will at times need to be capable of being employed in a non-reconnaissance role, especially in stability operations. This is proven both through

predictions regarding the fluidity of the future operational environment and lessons learned from past conflicts such as Vietnam (Cameron 2010; Gray 2006).

Second, to meet the demands of technological innovation and countermeasures that will be prevalent in future conflict, the Cavalry Squadron must possess the appropriate balance of surveillance technology and HUMINT collection capability. This is necessary to effectively operate within population centers, locate and possibly fight threats that are hybrid or irregular in nature, nullify the effects of enemy actions to counter precision target acquisition, and provide redundancy within the Squadron to address the issue of a cyber attack on friendly surveillance systems. The future operational environment demands a Cavalry Squadron with a balanced set of capabilities that can be applied to any conflict within which an ABCT would be employed.

Finally, the likelihood remains high that in the foreseeable future, ABCTs will conduct operations in environments where the unit must address hybrid threats. These hybrid threats will not present their components (regular and irregular forces) in isolation, instead both conventional and irregular enemy forces will work together against the future ABCT. Reconnaissance organizations will be called upon to conduct a wide range of missions, such as reconnaissance in force to locate other mechanized units, or surveillance to locate key insurgent leaders in an urban center in this threat environment. Reconnaissance capability must be tailored to meet the unique challenges of both the aggressive and passive nature of the hybrid threat. Therefore, future Cavalry Squadrons must organically possess balanced combat and surveillance capability. This suggests that any organizational option this research effort presents for the future ABCT must be able to conduct both passive and aggressive forms of reconnaissance without significant

augmentation. One would argue that the current organizational model of modularity already provides a Cavalry Squadron that can be augmented from anywhere within the ABCT to meet the needs of any future conflict. History however, indicates that reconnaissance organizations that required heavy augmentation for mission accomplishment during any one conflict (the BRT in OIF) went through significant organizational change, post conflict, to provide it with the right capability set (Cameron 2010).

Section VI Framing the Environment: Conclusions from the Examination of the Past, Present, and Future Environments

This chapter outlined the current and future environment surrounding the primary research question. In keeping with the process of Army Design Methodology it is now necessary to frame the environment in total. Since design is commonly utilized to examine complex operational problems, applying the process to an organizational problem requires a different approach. The examination of current and future environments in this chapter is focused by three secondary research questions:

1. How does reconnaissance theory over time, combined with current doctrine, contribute to defining reconnaissance, and what is the modern definition of reconnaissance? (Chapter 2 Section III)
2. How did US Army brigade level reconnaissance organizations (or like type units), missions, and tasks evolve from World War II to today and why? (Chapter 2 Section IV)

3. What capabilities are required of the ABCT Cavalry Squadron in near future conflict given the future operational environment described in contemporary literature? (Chapter 2 Section V)

The examination of these three secondary questions provides multiple findings in each section of this chapter that speak to capabilities required of the Cavalry Squadron. Given that the primary research question is one of capability, these findings provide valuable input to framing the organizational environment. Table 4 summarizes the findings in each section of chapter 2 with the designated secondary research question and frames the capabilities required of the Cavalry Squadron within the operational environment.

Table 4. Framing the Environment

Secondary Research Question	Capabilities Required based on Framing of the Environment
How does reconnaissance theory over time, combined with current doctrine, contribute to defining reconnaissance, and what is the modern definition of reconnaissance? (Chapter 2 Section III)	1. Must have the appropriate balance of mobility, firepower, and protection 2. Must have limited offensive capability 3. Networked surveillance capability 4. Capable of conducting operations throughout the breadth and depth of the ABCT area of operations
How did US Army brigade level reconnaissance organizations (or like type units), missions, and tasks evolve from World War II to today and why? (Chapter 2 Section IV)	1. Capable of executing all forms of reconnaissance (route, zone, area, and in force) 2. Capable of conducting economy of force missions 3. Capable of screening and guarding 4. Capable of securing a minimum frontage of 16km and maximum frontage of 24km
What capabilities are required of the ABCT Cavalry Squadron in near future conflict given the future operational environment described in contemporary literature? (Chapter 2 Section V)	1. Capable of conducting or enabling offensive, defensive, and stability operations 2. Must possess a balance of surveillance technology and HUMINT collection capability 3. Must possess organic and balanced combat and surveillance capability

Source: Created by author.
Note: This table highlights the results of the first design activity, framing the operational environment, it ties capabilities required of the Cavalry Squadron within the framed environment to the secondary research questions utilized to focus effort.

These findings frame the organizational environment thus completing the first design activity. In keeping with Army Design Methodology, it is now necessary to apply this understanding of the environment to reframe the problem and develop a problem solving approach.

CHAPTER 3

RESEARCH METHODOLOGY

Reframe of the Problem and the Problem Solving Approach

This chapter reframes the problem and outlines the problem solving approach that utilizes critical observations from the current and future environments to answer the primary research question. Reconnaissance shapes operations and supports the maneuver of the ABCT. The research has suggested a listing of capabilities that could be required of the cavalry squadron in the near future. The research also suggests that the Army is entering another interwar period, and that this period is an opportunity to develop reconnaissance and security capability within the ABCT. The findings from the secondary research questions provide some capability gap(s) and paradoxes regarding the current cavalry squadron. This research effort addresses capability gap(s) by applying design, doctrinal principles, and qualitative research to the problem (figure 14).

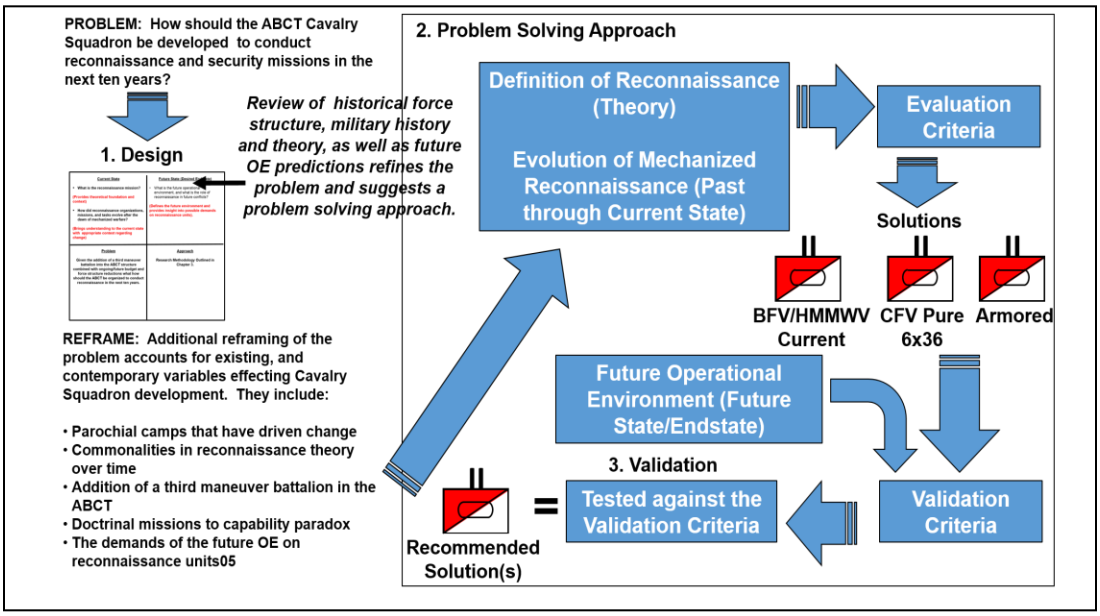


Figure 14. Research Methodology

Source: Created by author.

Note: This methodology consists of three steps. The first step is the examination of the problem through Army Design Methodology. This identifies the variables that effect the problem through research of the past, present and future. These variables are then accounted for through a restatement of the problem (reframe). Next, is the problem solving approach which utilizes reconnaissance theory and history to develop evaluation criteria. Then, basic organizational solutions are compared against the evaluation criteria. Finally, the basic solutions will be validated against capabilities required to operate in the future operational environment (validation criteria) in order to arrive at the final recommendations.

This research uses Army Design Methodology to define the organizational environment (chapter 2), reframe the problem, and develop an approach to solving this current problem. Army Design Methodology is an iterative process that continually reframes the problem and the problem statement in order to determine a viable way to solve a complex problem (Department of the Army 2012e). In this case, Army Design Methodology is used to examine the impact of the ABCT force structure increase on reconnaissance capabilities in the current Cavalry Squadron and to determine if there are

any capability gaps based on an increase in size of the parent organization (the ABCT). First, it examines the history of reconnaissance units and reconnaissance theory to determine current organizational paradigms regarding US mechanized reconnaissance unit missions and capabilities. Next, the future reconnaissance environment is determined using widely respected predictions of warfare in the near future, and the implications these predictions have on required reconnaissance capabilities. Examining the future helps to determine where we can act conceptually to achieve the desired conditions with regard to future recon organization and capability. Finally, Army Design Methodology allows one to determine an approach to solving the problem–what is the best way one can solve the problem? In this case, how should the ABCT Cavalry Squadron be developed to conduct reconnaissance and security missions over the next 10 years?

The first steps in the Army Design Methodology are to understand the current environment in which a problem exists, and then to visualize the desired future environment (Department of the Army 2012e). Understanding areas of tension or competition between the current and desired environments are key to defining the problem, which reflects issues that are keeping us from attaining the desired endstate. In this research effort, the current reconnaissance environment and the desired future environment were examined in the literature review (chapter 2). The original problem was identified in the introduction as the primary research question. However, through examination of the past, present and the future environments the research suggests that the primary research question should be reframed. The research has suggested that multiple variables effect this issue such as: the addition of the third maneuver battalion in the ABCT structure, the paradox between Cavalry Squadron doctrine and capability,

current DoD budgetary constraints, and the ongoing frictions between passive and aggressive or the technologist and traditionalist camps within the reconnaissance community. Some of these variables deserve emphasis in a restatement of the problem. However all of these variables cannot be addressed within the scope of this research project due to the ever changing nature that they possess. It is for that reason that this effort will not address DoD budgetary constraints. Although an important driver of organizational change decisions, the DoD budget fluctuates from fiscal year to fiscal year and does not provide a stable variable from which to determine the best organizational option. In keeping with Design's iterative nature, it is appropriate at this point to review and condense, or re-state, the original problem statement thereby reframing the problem for further application within the research methodology.

> Re-Stated Problem Statement: How does the current Cavalry Squadron organization provide effective reconnaissance and security to an ABCT with three CABs given current doctrine, military theory, lessons learned from the evolution of like-type units since World War II, and the demands on ABCT reconnaissance in the future operational environment?

The ultimate output of the Army Design Methodology is an operational approach, or in this case, a problem solving approach (Department of the Army 2012e). In this research effort, the approach assesses the current Cavalry Squadron, the "Six by Thirty Six Initiative" (described in chapter 4), and an organizational solution deduced from observations during step 1. The current Cavalry Squadron and two alternative options are evaluated against a set of criteria deduced through qualitative research and framing of the operational environment conducted in the previous chapter (table 4, 5, and 6). This approach accounts for potential capability gaps created through the addition of the third maneuver battalion to the ABCT. This problem solving approach ultimately results in

evaluation criteria that help to form basic organizational solutions that account for any current capability gaps and have a strong theoretical and historical foundation. The overall purpose of the problem solving approach in this methodology is to generate viable organizational solutions that may then be validated. Furthermore, the current Cavalry Squadron is examined in the same manner as any basic solution, utilizing the same problem solving approach and validation step, to provide a comparison of the current organization to any recommended solution(s). Addition of the current state into both the problems solving approach and validation step reduces bias in the final recommendation(s) and assists in generating options for further consideration.

Table 5. Evaluation Criteria

Evaluation Criteria Established Through Framing the Organizational Environment
1. Must have the appropriate balance of mobility, firepower, and protection 2. Must have limited offensive capability 3. Networked surveillance capability 4. Capable of conducting operations throughout the breadth and depth of the ABCT area of operations 5. Capable of executing all forms of reconnaissance (route, zone, area, and in force) 6. Capable of conducting economy of force missions 7. Capable of screening and guarding 8. Capable of securing a minimum frontage of 16km and maximum frontage of 24km

Source: Created by author.
Note: This table establishes critical observations regarding the capabilities that have been or are required of the Cavalry Squadron as evaluation criteria to tie observations from the environment frame to the problem solving approach.

All basic organizational solutions generated through the problem solving approach must be validated to be considered as feasible solutions to this problem. This research methodology validates basic organizational solutions by testing those solutions

against capabilities that will likely be required of reconnaissance units in the future operational environment (table 6). These forecasted capabilities, or criteria, are derived from the qualitative research based on future predictions that were examined during the environment frame in the previous chapter. The validation criteria were extrapolated from a review of common themes between academic studies, books, and articles regarding the future operational environment which includes the threat. Analysis of the future environment is not conducted to provide a prediction; it is meant to account for future tactical challenges that reconnaissance organizations may face, and how those challenges can be translated into capabilities. Current strategic guidance regarding land forces and Army Doctrine is also included in the validation criteria to ensure that any validated organizational solutions are feasible. This ensures that any organizational solutions produced account for the challenges of future warfare, strategic guidance for land forces, and are organized within the appropriate doctrinal framework. This part of the research methodology proves the feasibility of basic solutions and also weighs the current Cavalry Squadron against the same validation criteria.

Table 6. Validation Criteria

Validation Criteria Determined Through Framing the Organizational Environment
1. Capable of conducting or enabling offensive, defensive, and stability operations
2. Must possess a balance of surveillance technology and HUMINT collection capability
3. Must possess organic and balanced combat and surveillance capability

Source: Created by author.
Note: This table establishes critical observations regarding the capabilities required of the future Cavalry Squadron as validation criteria to tie observations from the environment frame to the problem solving approach.

This research effort seeks a minimum of two basic organizational solutions to the problem. Both solutions must be validated by the future capabilities required by reconnaissance organizations in order to provide final recommendations that are feasible. Furthermore, this research methodology analyzes the current organization of the Cavalry Squadron in the same manner to provide a capability comparison between the recommended solution(s) and the current organization, which reduces bias and provides a broader range of options.

During the evaluation and validation steps within the problem solving approach, a set of numerical values are assigned to the evaluation and validation criteria. This is done in order to make a final comparison between the current Cavalry Squadron and both recommended options for the final recommendation.

Table 7. Numerical Values

Value	Category	Description (Augmentation required to the Cavalry Squadron or organizational option to provide the capability)
1	Not Capable	Unit cannot accomplish even with augmentation (requires significant change)
2	Less Capable	Requires augmentation of a larger than company element or larger for mission accomplishment (requires some change)
3	Capable	Requires augmentation of a company sized element for mission accomplishment (requires slight change)
4	More Capable	Requires augmentation of a platoon sized element for mission accomplishment (requires minimal change)
5	Fully Capable	Unit can meet criteria without augmentation (no change)

Source: Created by author.
Note: Describes the categorization and description each value utilized to delineate between organizational options and the current Cavalry Squadron.

The values assigned are based on "capability". The numerical values are categorized from "not capable" (1) to "fully capable" (5) and are assigned based on the required level of augmentation to the Cavalry Squadron to possess the critical capabilities outlined in the evaluation and validation criteria. The numerical value is based on the size of the unit required to provide the necessary capability within the Cavalry Squadron (i.e. PLT, CO, etc.). The more augmentation required (the larger the augmenting unit) from the ABCT to the Cavalry Squadron the lower the assigned value, the less augmentation required the higher the value.

The logic behind these numerical values is directly related to the primary research question and the reframe of the primary research question. Reconnaissance operations conducted by CAB scout platoons and the Cavalry Squadron are one aspect of any military mission or operation, and their success or failure does not necessarily equal mission success or failure for the ABCT. However, the more augmentation provided to the Cavalry Squadron by the ABCT to conduct reconnaissance or security operations the less overall combat power the ABCT possess for accomplishment of its primary mission. Although task organizing in this matter is a known risk to any military operation, it is logical to provide the ABCT with a Cavalry Squadron capable of conducting reconnaissance and security operations across the spectrum of conflict without significant augmentation from other elements of the ABCT. Since the primary research question focuses on organizational capability, assigning values based on capability to the evaluation and validation criteria assists in delineating options, and recommending the most capable reconnaissance organization for the future. Though these numerical values provide a level of comparison between the current Cavalry Squadron and recommended

options, it is important to note that they do not account for the inevitable unpredictability in reconnaissance operations. Things such as unique operational environments, or constraints placed on a mission based on international opinion and political objectives are not accounted for by the either the criteria or the numerical values. Accounting for those uncertainties are far outside of the scope of this research effort.

It is important to note that this research effort does not necessarily seek a definitive answer to this complex issue, but the results of this work seek to inform ongoing and future force structure debates within the mechanized reconnaissance community. Utilizing Army Design Methodology to examine this organizational problem has provided this effort with a framed organizational environment, a re-stated problem, and a problem solving approach. The next chapter applies the results of a completed design process through the problem solving approach to the primary research question, and seeks to come to some conclusions regarding development of a Cavalry Squadron in the next ten years to better support the ABCT.

CHAPTER 4

ANALYSIS

Introduction: Application of the Problem Solving Approach

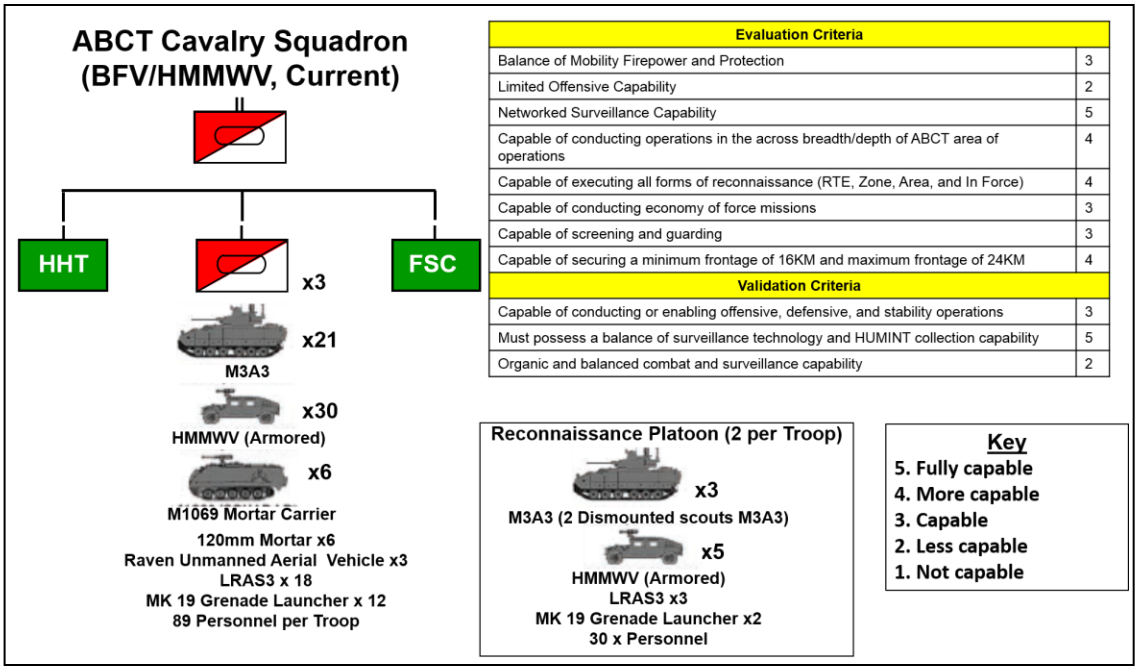
This chapter applies the outputs from the design process started in chapter 2 and completed in chapter 3 to answer the primary research question. The chapter begins by analyzing the current state along with two organizational options against the evaluation criteria utilized in the problem solving approach. Then, the current Cavalry Squadron and both organizational options will be analyzed against the validation criteria, and finally this chapter presents a comparison of all three organizations (current state—option 1—option 2) to answer the primary question: Given the addition of the third maneuver battalion into the ABCT structure, how should the Cavalry Squadron be developed to conduct reconnaissance missions in the next 10 years? However, before attempting to answer this question, it is necessary to explain how each proposed organizational option is presented.

The current state and both organizational options are presented in the same manner. First, is a description of the organization, its capabilities, and equipment. Next, the evaluation and validation criteria is discussed in some detail to outline to what extent the organizational option either meets or falls short of the criteria. Included in this description are the numerical values assigned to each of the criteria. Addressing the Cavalry Squadron and each option in this manner allows for thorough explanation prior to the final comparison.

ABCT Cavalry Squadron (BFV/HMMWV, Current)

Description

The current Cavalry Squadron is the organizational collision of the BRT and Army of Excellence Division Cavalry Squadron (figures 10 and 8) both of which were created to move mechanized reconnaissance units further from fighting for information and closer to a more passive form of reconnaissance (Cameron 2010). Therefore, the contemporary Cavalry Squadron is a robust organization when it comes to passive reconnaissance and surveillance capability. The current organization consists of three reconnaissance troops, a headquarters and headquarters Troop, and a forward support company. Each reconnaissance troop has its own 120mm mortar section (2x M1069), a Raven UAV, and two scout platoons. Each of the battalion's scout platoons consists of thirty personnel and a total of eight vehicles (three BFVs and five HMMWVs). The BFVs provide the scout platoons with additional protection, maneuverability, and anti-tank capability, while the HMMWV's provide a lower signature platform for employment of the LRAS3 system.



Evaluation Criteria	
Balance of Mobility Firepower and Protection	3
Limited Offensive Capability	2
Networked Surveillance Capability	5
Capable of conducting operations in the across breadth/depth of ABCT area of operations	4
Capable of executing all forms of reconnaissance (RTE, Zone, Area, and In Force)	4
Capable of conducting economy of force missions	3
Capable of screening and guarding	3
Capable of securing a minimum frontage of 16KM and maximum frontage of 24KM	4
Validation Criteria	
Capable of conducting or enabling offensive, defensive, and stability operations	3
Must possess a balance of surveillance technology and HUMINT collection capability	5
Organic and balanced combat and surveillance capability	2

Figure 15. ABCT Cavalry Squadron (BFV/HMMWV, Current)

Source: Created by author, modified from Department of the Army, FM 3-20.96, *Reconnaissance and Cavalry Squadron* (Washington, DC: Department of the Army, 2010); Department of the Army, FM 3-20.971, *Reconnaissance and Cavalry Troop* (Washington, DC: Department of the Army, 2009).
Note: The organization of the contemporary Cavalry Squadron and comparison of its organic capabilities against evaluation and validation criteria through assignment of capability values.

Comparison to Evaluation Criteria

When it comes to mobility, protection, and firepower the current Squadron seeks to achieve balance through diversity. The mixture of heavy and light vehicles in the organization restricts its mobility with regards to both speed and maneuverability. Furthermore, this mixture does not offer the unit the protection required to conduct operations against another mechanized force. Though the current organization possess a wide range of weapon systems it has a limited anti-tank capability which would require it

be augmented, typically with a tank company, to conduct some reconnaissance in force missions and any guard mission. Therefore, in the category of mobility, firepower, and protection the current Squadron rates "capable."

The same limitations outlined with regard to mobility, protection, and firepower also limit the Squadron's offensive capability. However, in offensive operations it is likely terrain will have to be either seized or secured. Since offensive operations involve seizure or securing of terrain, the Squadron would require a greater than company sized element to provide it with the required anti-tank and dismounted capability to execute a limited mechanized attack. For that reason it is rated as "less capable" in this category. The current organization ranks fully capable in networked surveillance capability due to the existence of target acquisition systems such as the LRAS3 and Raven UAVs as well as command and control systems such as FBCB2.

The Squadron consists of only three TRPs and a Headquarters and Headquarters Troop with roughly 500 Soldiers (Department of the Army 2010a; Department of the Army 2009b). The fact that it is a mounted organization allows it to operate in larger geographic areas. However, in order to operate within the geographic footprint of an ABCT with an additional maneuver battalion (especially in open terrain) the Squadron will likely require augmentation of a PLT sized maneuver element at a minimum. Therefore it rates as "more capable" when being capable of operating across the breadth and depth of the ABCT area of operations. In accordance with Army Doctrine the Squadron is capable of four of the five forms of reconnaissance and would likely require augmentation of a PLT sized element (armor or mechanized infantry) to conduct basic reconnaissance in force missions against an enemy armor formation (Department of the

Army 2010a, 1-4). Therefore, the Squadron is categorized as more capable of conducting all forms of reconnaissance.

The organization's size also limits its ability to conduct economy of force missions. This has been proven over the last 12 years of conflict as seen through contemporary academic discourse regarding the Cavalry Squadron. In many cases, the Squadron has required the augmentation of a CO sized maneuver element to provide it with the manpower required to operate in an economy of force role (Howell 2009; Mark 2009). This trend classifies the Cavalry Squadron as capable of conducting economy of force missions. The Squadron is also rated as capable in the screening and guarding category due to the augmentation required to conduct guard missions. Army Doctrine states that the Squadron is fully capable of screening but recommends augmentation to conduct guard missions (Department of the Army 2010a, 1-4). The Squadron's limitations in firepower and protection limit its ability to conduct guard missions in support of ABCT maneuver. Guard missions against a mechanized enemy force would require the augmentation of at least a tank company; this augmentation requirement categorizes the Cavalry Squadron as capable of conducting both required security tasks.

Finally, the squadron is capable of securing the front of an ABCT with three maneuver battalions at standard interval (figure 13). However, the contemporary squadron would require the augmentation of a PLT sized element to secure the ABCT at extended interval. For that reason it is categorized as more capable of securing a minimum frontage of 16KM and maximum frontage of 24KM. A review of evaluation criteria indicates that the Cavalry Squadron is effective as organized, or it is perfectly

capable of conducting a more passive form of reconnaissance and surveillance operations.

ABCT Cavalry Squadron (CFV Pure, Six by Thirty-Six Concept)

Description

The first organizational option discussed is a Maneuver Center of Excellence concept that seeks to remedy some of the organizational gaps identified within the current Cavalry Squadron. The Six by Thirty-Six concept is the future Scout PLT designed to provide the Cavalry Squadron with more protection, firepower, and dismounted reconnaissance capability (Maneuver Center of Excellence 2013). This concept has the same fundamental organization as the current Cavalry Squadron except at the PLT level. In the Six by Thirty-Six concept, each PLT consists of six M2A3 Cavalry Fighting Vehicles (CFVs) and thirty six personnel. The PLT retains its long range surveillance capability with LRAS3s, but they would have to be employed in a dismounted mode. This change provides the squadron with common mobility platforms, more firepower, and a greater dismounted reconnaissance capability than the current Cavalry Squadron. This concept is also more organizationally aligned with the more aggressive Army of Excellence Division Cavalry Squadron (c. 1988) vice the more passive BRT (c. 1994).

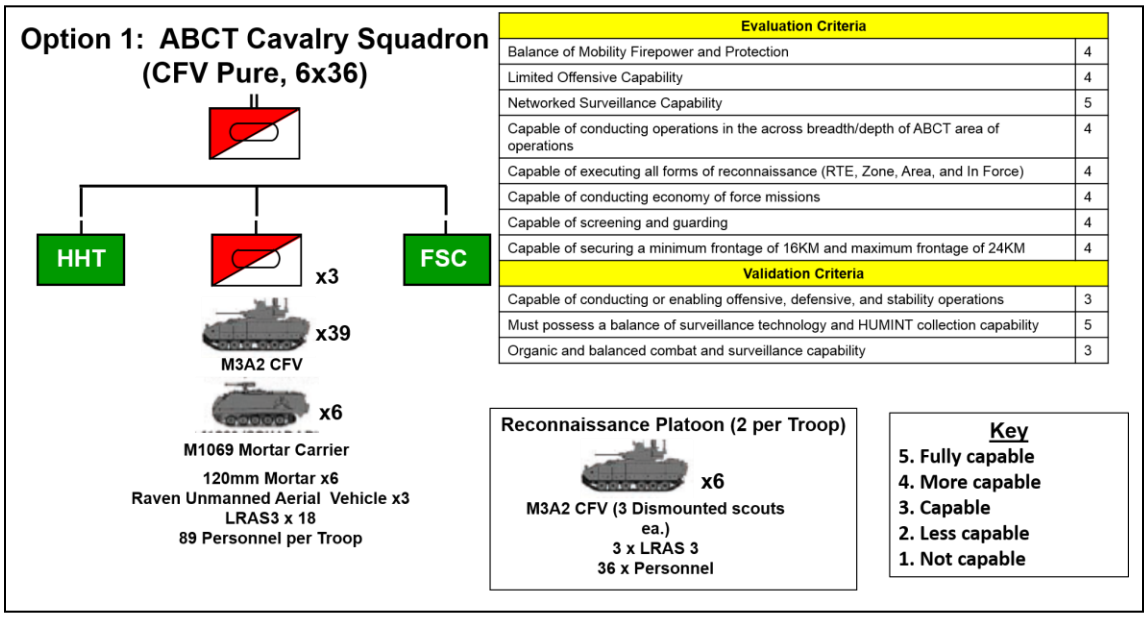


Figure 16. ABCT Cavalry Squadron (CFV Pure, 6x36)

Source: Created by author, modified from Department of the Army, FM 3-20.96, *Reconnaissance and Cavalry Squadron* (Washington, DC: Department of the Army, 2010); Department of the Army, FM 3-20.971, *Reconnaissance and Cavalry Troop* (Washington, DC: Department of the Army, 2009); Maneuver Center of Excellence, "Force Design Update Cycle 13-01: The Standard ABCT Scout Platoon" (Presentation, Fort Benning, GA, 2013).
Note: The organization of the current Maneuver Center of Excellence concept and comparison of its organic capabilities against evaluation and validation criteria through assignment of capability values.

Comparison to Evaluation Criteria

The CFV pure option maintains the same fundamental organization as the current Cavalry Squadron while increasing mobility, protection, dismounted capability, and firepower. The introduction of an all CFV organization provides the squadron with balanced mobility, greater protection and firepower. Though protection is increased by transitioning to all tracked combat platforms and mobility is common throughout the organization, the CFVs still only provide a limited anti-tank capability. This would

require some augmentation (PLT at a maximum) to balance the organization's firepower, especially against an armored threat. Therefore, it is rated as more capable with regard to balanced mobility, firepower, and protection.

The same firepower issues noted above increase yet limit the organization's ability to conduct offensive operations. The inclusion of 36 man platoons provide the Squadron with a much better dismounted capability and would allow it to secure or seize terrain during a mechanized attack. Although the concept has more dismounted capability than the current state it can only seize or secure terrain in a limited geographic area for a limited amount of time. The concept would still require augmentation of a PLT sized armor or infantry unit, based on the nature of the threat or mission to conduct limited offensive operations. It is for that reason that the Six by Thirty-Six concept is rated more capable in its ability to conduct limited offensive operations. This Squadron maintains the same network surveillance and communications systems as the current state such as: FBCB2, LRAS3 (dismounted), and Raven UAVs so it is likewise rated as fully capable in this category.

The Six by Thirty-Six concept slightly increases the size of the organization, and its improved mobility allows it to keep pace with the completely mechanized ABCT. However, in open terrain the larger ABCT will likely occupy a geographic area that is larger than what the squadron is capable of managing without some augmentation. Therefore, based on increases to mobility and manning the concept is rated as more capable of conducting operations across the breadth and depth of the ABCT area of operations.

The CFV pure option is organized along the same lines as the current Cavalry Squadron. Therefore, it is equally capable of conducting three of the four required forms of reconnaissance, and more capable of conducting reconnaissance in force missions. The increase in firepower through the replacement of HMMWVs with CFVs provides the concept with more anti-tank capability, and makes the organization more capable of conducting reconnaissance in force. However, if conducting reconnaissance in force against an armored threat then the squadron will require a tank PLT to enable the organization to do so effectively. This rates the concept as more capable of executing all forms of reconnaissance.

The concept is likewise rated as more capable in its ability to conduct economy of force missions. The increases in manpower and firepower allow the organization to assume non-standard roles more readily than a smaller organization with less firepower. However, this option would still require augmentation of PLT sized maneuver units or low density skilled teams to conduct some economy of force missions, especially during Stability operations. Since the concept is organized similar to the current Cavalry Squadron (the same number of PLTs and TRPs) and has a greater dismounted capability it maintains the ability to conduct screening missions. However, despite the increased firepower provided by additional CFVs the concept still requires augmentation of at least a tank PLT to increase its anti-tank capability, and enable the organization to conduct guard missions in support of ABCT maneuver. Because of this, it is rated as more capable of conducting screen and guard missions.

This option completely equipped with CFVs, and as such, it allows the organization to operate over greater distances despite being organized with the same

amount of TRPs and PLTs as the current Cavalry Squadron. The concept can secure greater distance based on the enhanced range and firepower provided by the CFV. This makes it more than capable of securing a frontage of 16 kilometers, however the concept would still require the augmentation of a PLT to secure a frontage of 24 kilometers (required to secure the frontage of an ABCT with an additional maneuver battalion). This categorizes the Six by Thirty-Six Concept as more capable of securing a minimum frontage maximum of 16 kilometers and maximum frontage of 24 kilometers. In summation, the CFV pure option provides an organization with more firepower and maneuver capability, making it more suitable when conducting more aggressive forms of reconnaissance against enemy armor formations.

ABCT Cavalry Squadron (Armored)

Description

The armored option is constructed to account for both historical and current capability gaps within reconnaissance organizations. It is built to account for both the facets and capabilities required of an ABCT reconnaissance organization determined through the application of Army Design Methodology to this problem. This organizational option seeks to provide a reconnaissance squadron to the ABCT with equal organic passive and aggressive reconnaissance capability. This option seeks to provide the requisite organic capability to conduct reconnaissance and security missions, as well as limited offensive, defensive, and stability operations without significant augmentation from the ABCT. Organizing the Cavalry Squadron along those lines provides the ABCT commander with a reconnaissance organization that incurs minimal force ratio risk. Therefore a reconnaissance squadron with the appropriate organic

capability preserves the increased combat power within the future ABCT. This preservation of combat power through proper organization of the reconnaissance squadron provides the ABCT commander with more task organization options when called upon to conduct decisive action.

This option maintains the core organization of the Six by Thirty-Six concept, adds the offensive capability of a tank company, and additional surveillance assets to the squadron (around 600 soldiers in total). The tank company provides the ABCT with a more complete reconnaissance organization that can guard or conduct reconnaissance in force against enemy armored formations. The addition of surveillance assets such as the UAV PLT and Military Intelligence PLT in the headquarters and headquarters troop provide the squadron with less aggressive surveillance capability that could be utilized for initial or precision targeting of more hybrid threat models in varied terrain. The purpose of this organizational option is to provide the ABCT commander with a mechanized reconnaissance organization that can operate independently without significant augmentation from other ABCT assets.

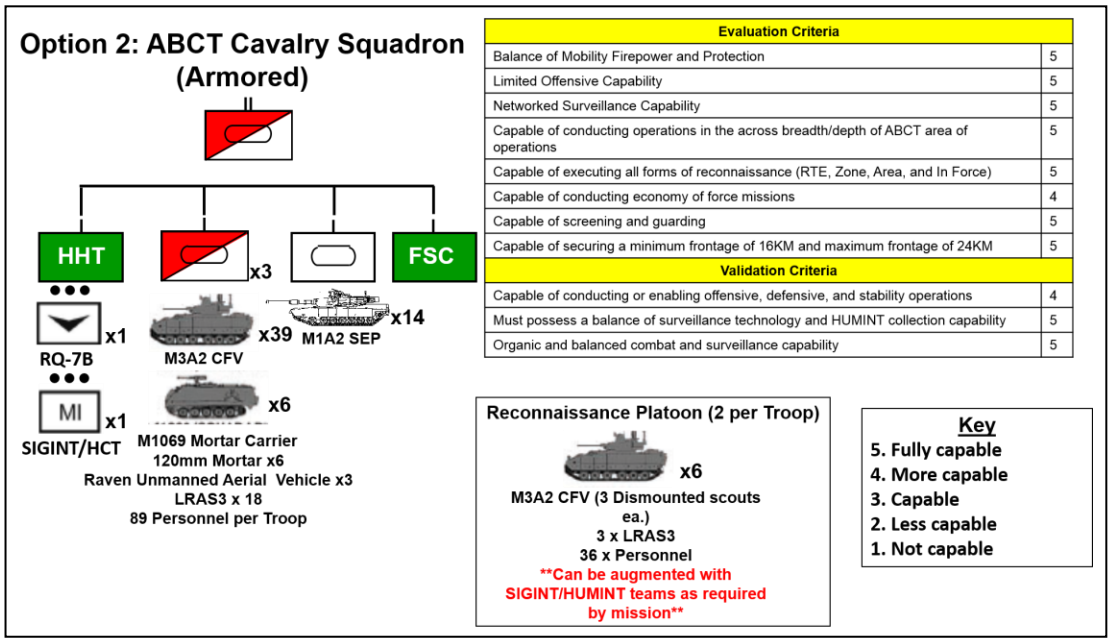


Figure 17. ABCT Cavalry Squadron (Armored)

Source: Created by author, modified from Department of the Army, FM 3-20.96, *Reconnaissance and Cavalry Squadron* (Washington, DC: Department of the Army, 2010); Department of the Army, FM 3-20.971, *Reconnaissance and Cavalry Troop* (Washington, DC: Department of the Army, 2009); Maneuver Center of Excellence, "Force Design Update Cycle 13-01: The Standard ABCT Scout Platoon" (Presentation, Fort Benning, GA, 2013); Department of the Army, *Reconnaissance, Security, and MI Discipline Collection* (Washington, DC: Department of the Army, 2011).
Note: This organizational option improves on the Six by Thirty-Six concept by adding a tank CO along with intelligence and surveillance assets.

Comparison to Evaluation Criteria

When compared to the evaluation criteria the armored option proved fully capable in all but one category due largely to the increased flexibility, firepower, and maneuverability provided by the addition of the tank company. The addition of a tank company greatly increases the squadron's mobility, firepower, and protection especially if operating in an environment with an armor threat. It requires no augmentation in this category and is assessed as fully capable. This increase in mobility, firepower and

protection likewise enables the combined arms reconnaissance organizational option to conduct limited offensive operations against a wide range of threats, also without the need for augmentation. Hence it is categorized as fully capable in limited offensive capability as well.

Since the armored option maintains the CFVs within the Cavalry TRPs it also maintains systems such as FBCB2, LRAS3, and Raven UAVs. Additionally, this option also includes a UAV PLT and Signals Intelligence assets in the Headquarters and Headquarters Troop. These assets provide the ABCT commander with an organization with the requisite networked surveillance capability to conduct operations in a wide range of environments. The combination of additional assets military intelligence assets and assets organic to the Six by Thirty-Six concept makes this organizational option fully capable in the networked surveillance capability.

The addition of a tank company and UAV PLT increase this option's tactical reach. The tank company provides an additional maneuver unit that can either be task organized amongst the Cavalry TRPs or utilized as an independent element to extend the squadron's tactical reach. The UAV PLT allows the squadron to conduct surveillance in a much larger geographic area since the RQ-7B (Shadow) provides a much greater range, and more station time than the Raven UAV. These additional assets make the armored option fully capable of conducting operations across the breadth and depth of the ABCT area of operations with little to no augmentation.

Since the armored option has a similar organization to that of the Six by Thirty-Six Concept, it is equally capable of conducting three of the four required forms of reconnaissance (Route, Zone, Area). The tank company can be employed as tank

platoons task organized to reconnaissance troops or employed by the squadron as a mobile reserve force. Either way it provides the ABCT commander with a Squadron capable of finding enemy armored formations, and developing the situation (through limited offensive action) so the BCT can close with and destroy the enemy force. This description is fundamentally the definition of reconnaissance in force. The armored option is capable of executing reconnaissance in force without augmentation, therefore this option is fully capable of executing all forms of reconnaissance. Although the tank company provides the squadron with increased lethality and the capability to conduct reconnaissance in force missions against armored threats, it is still organized as a mechanized reconnaissance formation and as such, still requires augmentation for some economy of force missions. This option is better organized for limited offensive or defensive operations; however, the squadron would still require augmentation of a PLT sized maneuver or specialty unit to conduct some more "niche" types of economy of force missions (such as in stability operations). For this reason it the armored option is classified as more capable of conducting economy of force missions.

Maintaining a similar organization as the CFV pure option, the armored option has equally capable of conducting screen missions. Once again the addition of the tank company into this option provides it the firepower and protection necessary to conduct guard missions without augmentation. Likewise the increase in size of the organization by one company sized maneuver element increases the frontage that the squadron is capable of securing for the ABCT commander. This makes the armored option fully capable of both the required security missions and capability to secure frontage for the larger ABCT.

Table 8. Organizational Comparison: Evaluation Criteria

Organizational Comparison (Evaluation Criteria)

Evaluation Criteria	Current	CFV Pure	Armored
Balance of Mobility Firepower and Protection	3	4	5
Limited Offensive Capability	2	4	5
Networked Surveillance Capability	5	5	5
Capable of conducting operations in the across breadth/depth of ABCT area of operations	4	4	5
Capable of executing all forms of reconnaissance (RTE, Zone, Area, and In Force)	4	4	5
Capable of conducting economy of force missions	3	4	4
Capable of screening and guarding	3	4	5
Capable of securing a minimum frontage of 16KM and maximum frontage of 24KM	4	4	5
TOTALS	28	33	39

Key
5. Fully capable
4. More capable
3. Capable
2. Less capable
1. Not capable

Source: Created by author.
Note: This table presents a side-by-side comparison of the current state and both organizational options regarding the evaluation criteria and based on assigned numerical capability values.

Table 8 depicts evaluation criteria along with the assigned values for each organizational option. Each organizational option has a maximum of 40 points that can be assigned. With eight total criteria, a raw score of 24 (if each criteria is assigned a rating of 3) indicates a capable organization. It is important to note that capability is directly tied the level of augmentation required to the Cavalry Squadron from the ABCT. Though these numerical values provide a level of comparison between the current Cavalry Squadron and recommended options, it is also important to note that they do not and cannot account for inevitable unpredictability in reconnaissance operations (i.e. various

fluctuations in mission, constraints/limitations, and operational variables). However, since the primary research question is one of capability then utilizing capability based numerical values to calculate a raw score provides a comparison that is within the scope of this research effort. This comparison of organizational options shows that all three options all prove capable based on the assigned values when compared to the evaluation criteria. However, if one was to rank the organizational options from most capable to least capable based on these results the ranking would be as follows: armored, CFV pure, and the current cavalry squadron. This completes the comparison of the current and recommended organizational solutions to the evaluation criteria. It is now necessary to apply the validation criteria to these organizational options.

Comparison to Validation Criteria: ABCT Cavalry Squadron (BFV/HMMWV, Current)

The comparison of the current Cavalry Squadron against the validation criteria shows that it is organized to conduct more passive reconnaissance and surveillance to enable decisive action. Therefore, it requires varying degrees of augmentation to conduct offensive, defensive, or stability operations if required to serve in this capacity vice an enabling reconnaissance role. In this research effort, the squadron is identified as capable in this category due to the wide range of variables that affect the intensity and requirements of decisive action. Due to the organizational focus on passive reconnaissance and surveillance, the squadron is rated fully capable when it comes to maintaining a balance of HUMINT (scouts) and surveillance technology to operate on a future battlefield that demands in-depth reconnaissance and precision.

Although the current Cavalry Squadron is organized well for reconnaissance and surveillance operations, it lacks organic and balanced combat and surveillance capability without significant augmentation. Despite the presence of M3A3's the Squadron's mix matched mobility and firepower do not provide it with enough combat power conduct a reconnaissance in force to locate an enemy mechanized formation. If assigned this mission, it would likely require the augmentation of either a tank or anti-tank company plus aviation to enable to Squadron to successfully gain and maintain contact with another mechanized force. The presence of surveillance capability combined with a lack of sufficient combat capability categorize the Squadron as "less capable" with regard to the final validation criteria. Overall, the current Cavalry Squadron as organized proves to be a valid option for the ABCT. However, it comes with the habitual risk of having to augment the organization with combat power from one of the other three maneuver battalions for more aggressive reconnaissance and security missions.

Comparison to Validation Criteria: ABCT Cavalry Squadron (CFV Pure, Six by Thirty Six Concept)

The CFV pure option would provide a balanced and standardized reconnaissance organization to the ABCT commander at the present time, however the validation criteria in this research effort addresses the future. Because the concept maintains the same fundamental structure (the same number of TRPs and PLTs) of the Cavalry Squadron, albeit with additional firepower, it is therefore properly organized to conduct reconnaissance operations whether in the passive or aggressive form. This allows this option to better enable, through reconnaissance operations, the ABCT to execute offensive, defensive, or stability operations. However, the organization would still require

augmentation of at least a CO sized maneuver element or specialty teams to conduct protracted offensive, defensive, or stability operations if required to act in an economy of force role by the ABCT mission. This augmentation requirement categorizes it as capable of conducting offensive, defensive, and stability operations.

The concept maintains the LRAS3 and Raven UAVs, which along with increased dismounted reconnaissance capability, makes it a balanced organization in terms of surveillance and HUMINT collection capability making it fully capable in this category. When it comes to balanced combat and surveillance capability the CFV pure option retains the surveillance capability of the previous organization (as mentioned above) and increases the firepower of the Cavalry Squadron through the replacement of HMMWVs with M3A2s. Although this organizational concept provides the squadron with increased anti-tank capability the organization would still require the augmentation of at least a tank company to effectively conduct more aggressive forms of reconnaissance against a mechanized adversary. This categorizes the CFV pure option as capable with regards to comparison against the final validation criteria.

Both the current Cavalry Squadron and the CFV pure option are limited in their ability to conduct both passive and aggressive forms of reconnaissance or security missions, and their ability to conduct operations outside of a standard reconnaissance role without augmentation from the parent ABCT. This requirement for augmentation, specifically with regards to these functions, has the potential to remove critical assets and combat power from an ABCT that has been purposefully increased in size to provide it with a more robust combat capability. All military operations incur some amount of tactical risk with regard to force ratio to conduct decisive action. Reconnaissance and

security operations are enabling operations to decisive action. Therefore the organizational limitations of the current Cavalry Squadron and the CFV pure option assume some risk to ABCT enabling operations purely by their constant need for augmentation.

Comparison to Validation Criteria: ABCT Cavalry Squadron (Armored)

As far as validation criteria are concerned, the combined arms option is weighted as more capable of conducting offensive, defensive and stability operations. This assessment is based not only in the additional offensive capability, but the additional surveillance capability posed in this option. Not only is the armored option capable of conducting the requisite amount of reconnaissance and security operations to enable decisive action executed by the ABCT, it can also conduct limited offensive, defensive, and stability operations outside of a standard reconnaissance role. The UAV PLT, signals intelligence, and HUMINT capability provide the squadron with organic surveillance and intelligence assets that would normally have to be either requested or attached during stability operations. However, the organization would still require augmentation of at least a PLT's worth of specialty teams to conduct operations in a protracted stability operation. The armored option does not require continuous augmentation from the ABCT to conduct a wider range of missions outside of the standard reconnaissance and security role.

The addition of more organic surveillance assets improve the squadron's targeting capability by combining intelligence analyzers and collectors with surveillance technology in a single reconnaissance unit. This presents this option as a completely

balanced and fully capable organization with regards to surveillance technology and HUMINT collection capability. The addition of the aforementioned assets plus the tank company balance the organization's combat and surveillance capability. This option provides the ABCT with a reconnaissance organization that, due to increased firepower and surveillance capability, possesses the flexibility to execute both passive and aggressive forms of reconnaissance without augmentation. Therefore, it is categorized as fully capable when providing the ABCT commander a reconnaissance organization with organic and balanced combat and surveillance capability. After addressing these options in detail, it is necessary to compare both organizational options and the current state against the validation criteria.

Organizational Comparison: Validation Criteria

Table 9. Organizational Comparison: Validation Criteria

Organizational Comparison (Validation Criteria)

Validation Criteria	Current	CFV Pure	Armored
Capable of conducting or enabling offensive, defensive, and stability operations	3	3	4
Must possess a balance of surveillance technology and HUMINT collection capability	5	5	5
Organic balanced combat and surveillance capability	2	3	5
TOTALS	10	11	14

Key
5. Fully capable
4. More capable
3. Capable
2. Less capable
1. Not capable

Source: Created by author.
Note: This table presents a side-by-side comparison of the current state and both organizational options regarding the validation criteria and based on assigned numerical capability values.

Table 9 depicts validation criteria along with the assigned values for each organizational option. In this case, each organizational option has a maximum of 15 points that can be assigned. With three total criteria, a raw score of nine (if each criteria is assigned a rating of 3) indicates a capable organization. Capability is directly tied the level of augmentation required to the Cavalry Squadron from the ABCT. This comparison of organizational options also shows that the current organization, the CFV pure option, and the armored option prove capable based on the assigned values when compared to the validation criteria. The ranking of the organizational options from most capable to least capable based on validation criteria results is as follows: armored option, CFV pure, and the current ABCT cavalry squadron. Both comparisons (evaluation and validation) suggest that there are some conclusions that can be rendered from the problem solving approach. A further discussion regarding the conclusions and recommendations that can be made from the comparison of organizational options is warranted and will be continued in the next chapter.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter provides conclusions and findings from this research effort. First, the chapter discusses findings from the comparison of organizational options in order to answer the primary research question, and discuss an additional finding from the research conducted in chapter 2. Second, it addresses four observations that were documented during research that fell outside of the scope of this effort, and recommends opportunities for future research efforts. Finally, the chapter addresses the "so what" behind the methodology, explaining how the approach to this effort enabled a different visualization of this organizational issue. It is necessary to start with a discussion of the initial findings and provide options to answer the primary research question.

The first conclusion determined by this research is that the current state, the Six by Thirty-Six concept, and the Combined Arms Reconnaissance option are all valid and capable of supporting the future ABCT. The differences lie in how much risk with regard to organic capability that the Army intends to take when developing Cavalry Squadrons for the future ABCT. The current organization has less firepower, mismatched mobility, and is organized more for passive reconnaissance and surveillance. The CFV pure option offers more protection and firepower; however, it is fundamentally the Army of Excellence Cavalry Squadron transplanted to the present day, and is likely to encounter the same organizational issues as 2nd Squadron 4th Cavalry Regiment did during Operation Desert Storm (Cameron 2010; Barto 1993). Both the current Cavalry Squadron and the CFV pure option require augmentation from other maneuver units within the ABCT to conduct economy of force, guard, and reconnaissance in force missions against

other mechanized or hybrid threats. This bears emphasis because of the research in chapter 2 regarding reconnaissance theory and the evolution of mechanized reconnaissance units presents three distinct facts that effect the overall recommendation.

First, in every major conflict since World War II, mechanized reconnaissance units have had to conduct aggressive reconnaissance and security operations (Cameron 2012). Second, every time a mechanized unit was incapable of conducting more aggressive forms of reconnaissance the organization was changed to increase its lethality (Cameron 2012). Finally, military theorists highlight flexibility and independent combined arms forces when addressing reconnaissance (Clausewitz 1984; Jomini 1862; Fuller 1943, Sun Tzu 1998; Patton, Harkins, and Patton 1947; Rommel 1979). The research of the past, present, and future seems to indicate that the future ABCT Cavalry Squadron should be the armored option, capable of operating without augmentation from the ABCT, and with enough lethality and flexibility to face an uncertain future operating environment.

The armored option provides the future ABCT with a reconnaissance organization that requires less augmentation from the ABCT to conduct requisite reconnaissance and security missions. This option provides the mobile and standardized firepower of the CFV pure option, along with surveillance capability beyond that of the current organization, and is also equipped, through the addition of the tank company, with additional firepower to conduct more aggressive reconnaissance and security missions. Its organic assets leave ABCT level sensors available to conduct further surveillance ahead of the Cavalry Squadron. The organic capability within the armored option also allows the brigade commander to manage his or her combat power between the three

CABs to concentrate forces towards achievement of the objective. The armored option provides the ABCT commander with a reconnaissance unit that does not require further augmentation to accomplish the array of missions it could be expected to execute. It is established through the examination of the future environment that the intensity and scale of future conflict is uncertain. The armored option is capable of conducting operations that range from general war to protracted stability operations. This is vital because active insurgent groups continue to cause instability throughout the globe and other international actors will "get a vote" with regard to the timing and scale of the next major conflict. This level of uncertainty almost demands that the ABCT requires a Cavalry Squadron with the organic capability to conduct the requisite range of reconnaissance and security missions, in order to consolidate combat power between the three CABs to face challenges in future conflicts.

In many ways this research has provided more questions than definitive answers. How much risk is the Army willing to take with regard to the organic capability resident in mechanized reconnaissance formations? Will the Cavalry Squadron have to constantly rely on their parent ABCT for augmentation to conduct the reconnaissance and security missions required? Will the Army utilize this interwar period to adjust reconnaissance forces back to more robust combined arms organizations to take advantage of the maneuver capabilities offered by a larger ABCT? Despite these questions, the results of this research effort suggest that the combined arms cavalry option is the most capable reconnaissance organization for the future ABCT. However, organizational changes do not occur without resulting in second and third order effects.

The most obvious question revolving around the recommendation to adopt the armored option is where do the additional assets come from and what is the impact? The recent structure change to BCTs across the Army was partially adopted in order to reduce the overall amount of BCTs within the force structure (Wasserbly 2013). The additional tank company could be acquired from the de-activated ABCTs and integrated into cavalry squadrons that have already adopted the six by thirty-six concept. Likewise the UAV platoons, HUMINT, and SIGINT assets could also be acquired from previously de-activated BCTs. The addition of these assets would further have several second and third order impacts to cavalry squadron capabilities. First, adding the tank company and military intelligence assets would require that capability within the squadron's forward support company (FSC) be adjusted to support tank, sensor, and UAV maintenance activities. It is also likely that the fuel and cargo transportation capacity of the FSC would also have to be increased. Second, the cavalry squadron's mission essential task listing (METL) may also have to be adjusted to account for increased offensive and surveillance capabilities. As part of training the squadron would further be required to maintain qualifications across multiple military disciplines (tank proficiency, UAV qualifications, etc.) which may require adjustment to its readiness reporting. Finally, the squadron headquarters would require some additional mission command systems to facilitate command and control of the additional assets (especially the UAV platoon and SIGINT platforms). These impacts likely make the armored option the most costly, however this research suggests that it is the best suited solution for future conflict.

Throughout the course of this project there were multiple observations that fell outside of the scope of this research effort. Although these observations provided

interesting insights into how the current Cavalry Squadron came to be, they deserve further research. Four distinct areas for future research were discovered that were not within the scope of this research effort. First, is an exploration into the Armored Cavalry Regiment's effect on the concept of modularity. Was the combined arms nature of the BCT drawn from the Armored Cavalry Regiment, and has the pursuit of combined arms BCTs ultimately resulted in less capable BCT reconnaissance organizations? The Armored Cavalry Regiment was designed as a Corps level reconnaissance organization, and as such was completely combined arms in nature. This is much like the BCT of today: a combined arms unit capable of a broad range of operations. However, the reconnaissance organizations within the BCT require the capability to conduct reconnaissance and security missions across the full spectrum of conflict, in order to operate within the uncertainty that they are tasked to clarify for the commander. During examination of the evolution of reconnaissance it appeared that the more combined arms and independent brigades became the less complete and capable their reconnaissance units were. If there is any correlation between these points it would be helpful to develop understanding of what could only be categorized as "big" organizational change within the Army.

Second, examining basic reconnaissance doctrine and determining its validity today remains a fertile field of study. Despite the significant change in the operational environment since 1943, reconnaissance doctrine has remained largely unchanged since World War II. Are there facets of reconnaissance doctrine that require updating based on new technology, future conditions, or new theories? With the advent of surveillance technology can reconnaissance and military intelligence doctrine be updated to combine

collector with analyst in a more efficient manner? Doctrine provides a unit its identity (purpose) and largely helps determine its organization. Therefore, it could be assumed that if the doctrine is "right" then the organization is, right. Having the technology and organization without understanding how to employ it diminishes the potential of the technology and organization as a whole. An examination of our current reconnaissance doctrine as compared to the past and future, could further our understanding of what the, right, reconnaissance organizations are for the future.

Third, is an examination of the metrics and method utilized during this research effort. This effort utilized very rudimentary metrics to compare organizational options. Research that develops these metrics to move beyond capability and possibly assist in accounting for some of the "intangibles" inherent in military operations would prove very valuable. It could assist in the art and science of organizational analysis, and could provide the Army with multiple ways of applying metrics to organizational issues outside of DOTMLPF.

Finally, an examination of the contemporary echeloning of reconnaissance and what effect the current echeloning has on future operations would greatly assist an Army staring into an uncertain future operating environment. Battlefield Surveillance Brigades are transitioning to the National Guard and Reserve, so who conducts reconnaissance operations for the active Corps? Why is there no Division level reconnaissance unit, and does this gap have further implications for the Cavalry Squadron at the ABCT or the ABCT itself? Some may argue that this topic is outdated because of the popular opinion among many that large scale warfare is at an end. War is competitive in nature and surprise offers a distinct advantage to the competitor who achieves it (Clausewitz 1984;

Sun Tzu and Ames 1993). Surprise is generally achieved by ensuring your enemy either assumes something will not happen (you will not do it), or is convinced that something of which you are normally capable cannot occur (the environment won't allow you to do it). Provided a future operating environment that is as uncertain and complex as the one we face today, it is necessary to examine how the Army could be called upon to conduct large scale maneuver again and how mechanized reconnaissance units fit within that framework. Though this research effort has posed these four areas for future research and findings with regard to the primary research question, it also had one distinct finding that was not associated with the primary research question. That finding deals with the application of Army Design Methodology to an organizational problem.

Army Design Methodology is traditionally utilized to look at complex operational problems such as "What do we do about 'x' country?" etc. to determine the conceptual plan that will later become the detailed operations order (Department of the Army 2004). The logic utilized in applying design to this effort is that it is a process for solving complex problems (Department of the Army 2004). This issue is a complex organizational problem. Therefore, design methodology can be applied to the primary research question. The process of examining the past through the present environment and framing the future environment allows one to see the problem holistically and how it has existed over a set time span. This method of problem framing makes deeply entrenched debates and biases visible to the researcher, and allows the problem to be seen from multiple points of view. The easiest way to highlight this effect is to provide examples how Army Design Methodology facilitated insights in this research effort.

In the examination of this problem's past and current state, there were two distinctive insights with regard to how mechanized reconnaissance units had evolved. First is the institutional passive or aggressive debate and how it has driven change over time. Dr. Robert Cameron, historian at the Maneuver Center of Excellence, highlights this part of Cavalry culture in his work, "To Fight or Not to Fight?: Organizational and Doctrinal Trends in Mounted Maneuver Reconnaissance from the Interwar Years to Operation Iraqi Freedom." This debate has driven organizational change in the Cavalry community since the tank was introduced into the inventory, and has provided the mechanized community with a reconnaissance unit with either too much capability or too little as is evidenced throughout chapter 2.

The second insight is the presence of technologists and traditionalists within the reconnaissance community. Since the advent of greater surveillance technology and given the pace of technological advancement today, these two schools of thought have also driven organizational change in mechanized reconnaissance (Taylor 2005). Technologists would argue for more surveillance capability and smaller reconnaissance units because of the primacy of US technology. This type of thinking resulted in units such as the BRT. Traditionalists would argue against over-reliance on technology citing that the soldier on the ground is the most versatile sensor, a commonality that has presented itself in some manner throughout most conflicts in recorded history (Taylor 2005). This field of thought has resulted in units such as the highly conventional Division Cavalry Squadron. The other interesting observation is that this debate is intrinsic to schools of thought that have polarized the mechanized reconnaissance community over the years, resulting in varying degrees of mechanized reconnaissance organizations.

These insights were discovered through deliberate examination of the past through the present environments.

Framing the future environment separately greatly assisted in avoidance of academic discussion that is rife with political influence and bias. It resulted in several insights that helped to put the passive or aggressive reconnaissance debate into better context and assisted greatly in determining organizational options. First, it is likely that the type of warfare the US will experience in the future (low versus high intensity) is unpredictable. Next, it is also likely that in that future conflict the threat will vary from conventional to irregular and will continuously evolve to offset our reliance on and supremacy with technology. Finally, it reinforces that the emphasis placed on flexibility within military formations by prominent theorists such as Clausewitz still holds valid. These conclusions suggest that both the passive versus aggressive and the technologist versus traditionalist reconnaissance debates have valid points, and that it could be possible to combine those valid points to form a more holistic reconnaissance organization of the future. Understanding the environment in this manner led to the inclusion of these insights into the problem solving approach. This ultimately resulted in the formulation of the armored option which is reflective of an organizational balance between the competing schools of thought. This organizational option also accounts for the uncertainty of future environment by providing a mechanized reconnaissance formation with enough organic capability to preserve the increased combat power of an ABCT facing unknown and uncertain future threats. Utilizing this research effort as an example, it appears that Army Design Methodology is applicable to more than just operational problems.

When design is applied to an organizational problem, it allows the researcher to see the problem holistically over time. It assists in answering the bigger "why" while avoiding intense focus on facets such as "current" budgeting, which though important and a strong driving force, should probably not dictate a solution. It assists in developing a problem solving approach to seek the best possible answer to the question while taking into account all points of view. This research effort identifies a perceived problem, utilizes Army Design Methodology to examine that problem and develop a problem solving approach, and based on that problem solving approach presents several possible solutions to the issue. It provides the reconnaissance community with options to a complex issue. This was done in hopes that the insights presented can give an academic perspective to an ongoing debate within the Cavalry community by examining the organization of reconnaissance units from a different perspective. Ultimately, it presents a different approach to examining organizational problems, and like many research efforts provides more questions than conclusive results.

GLOSSARY

Aggressive Reconnaissance. Reconnaissance operations deliberately seeking direct fire contact with the enemy (i.e. reconnaissance in force).

Area of Operations. n operational area defined by the joint force commander for land and maritime forces that should be large enough to accomplish their missions and protect their forces. Also called AO (Department of the Army 2012b, 1-3).

Area Reconnaissance. A form of reconnaissance that focuses on obtaining detailed information about the terrain or enemy activity within a prescribed area (Department of the Army 2012b, 1-3).

Cavalry Squadron. The dedicated reconnaissance unit for the ABCT, the squadron is organized, manned, and equipped to provide timely and relevant combat information in complex, dynamic operational environments. This information in turn, enables the higher commander to make rapid, well informed decisions. The squadron is organized with five troops: a headquarters and headquarters troop, three cavalry troops, and a forward support company (Department of the Army 2010a, 1-1).

Commander's Critical Information Requirements. An information requirement identified by the commander as being critical to facilitating timely decision making. Also called CCIR (Department of the Army 2012b, 1-8).

Conventional Threats. Threat forces that have a recognized military structure, are hierarchical in nature, and that conduct operations through complex fire and maneuver (i.e. the Russian Army).

Counter-Reconnaissance. A tactical mission task that encompasses all measures taken by a commander to counter enemy reconnaissance and surveillance efforts. Counterreconnaissance is not a distinct mission, but a component of all forms of security operations (Department of the Army 2012b, 1-10).

Cue. The integration of one or more types of reconnaissance or surveillance systems to provide information that directs follow-on collecting of more detailed information by another system (Department of the Army 2013a, 1-12).

Economy of Force. Measures used by a commander in areas that do not involve the decisive operation or main effort to mass forces in the decisive area (Department of the Army 2012d, 4-10).

Forms of Reconnaissance. Types of reconnaissance operations; there are five: Route, Zone, Area, Reconnaissance in Force, and Special (Modified from: Department of the Army 2012d, 5-2).

Guard. A security task to protect the main force by fighting to gain time while also observing and reporting information and to prevent enemy ground observation of and direct fire against the main body. Units conducting a guard mission cannot operate independently because they rely upon fires and functional and multifunctional support assets of the main body (Department of the Army 2012b, 1-18).

Heavy. Military organizations that conduct operations with a heavy reliance on armored vehicles (i.e. 1st Cavalry Division).

Hybrid Threat. The diverse and dynamic combination of regular forces, irregular forces, terrorist forces, and/or criminal elements unified to achieve mutually benefitting effects (Department of the Army 2012b, 1-19).

Irregular Threats. Threat forces that adopt a non-military structure, are cellular versus hierarchical in nature and intentionally blend with local populations (i.e. Al Qaida).

Light. Military organizations that conduct operations with little to no reliance on armored vehicles (i.e. 82nd Airborne Division).

Mechanized. Military organizations predominately consisting of tracked vehicles (i.e. tanks).

Mechanized Reconnaissance. Reconnaissance organizations that conduct operations predominately on tracked vehicles. Mechanized reconnaissance organizations are equipped with equal speed and firepower to their parent organization to address a common threat, in this case the ABCT.

Motorized. Military organizations predominately consisting of wheeled vehicles (i.e. Strykers or HMMWVs).

Operational Environment. A composite of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander. Also called OE (Department of the Army 2012b, 1-28).

Passive Reconnaissance. Reconnaissance operations conducted in a manner that does not seek direct fire contact with the enemy forces (i.e. surveillance via UAV).

Reconnaissance. A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographical or geographical characteristics and the indigenous population of a particular area (Department of the Army 2012d, 5-1).

Reconnaissance by Fire. A technique in which a unit fires on a suspected enemy position to cause the enemy forces to disclose their presence by movement or return fire (Department of the Army 2013a, 1-14).

Reconnaissance Handover. The process of planning, preparing, and executing transfer of responsibility and information from one element to another to facilitate continued observation or surveillance of enemy contact or an assigned area. RHO may cover an area/zone—such as an AO, NAI, or target area of interest (TAI)—and/or enemy elements (Department of the Army 2009b, 3-28).

Reconnaissance in Force. A deliberate combat operation designed to discover or test the enemy's strength, dispositions, and reactions or to obtain other information (Department of the Army 2012b, 1-31).

Reconnaissance Objective. A terrain feature, geographical area, enemy force, adversary, or other mission or operational variable, such as specific civil considerations, about which the commander wants to obtain additional information (Department of the Army 2012b, 1-31).

Reconnaissance Pull. Reconnaissance that determines which routes are suitable for maneuver, where the enemy is strong and weak, and where gaps exist, thus pulling the main body toward and along the path of least resistance. This facilitates the commander's initiative and agility (Department of the Army 2013a, 1-12).

Reconnaissance Push. Reconnaissance that refines the common operational picture, enabling the commander to finalize the plan and support shaping and decisive operations. It is normally used once the commander commits to a scheme of maneuver or course of action (Department of the Army 2013a, 1-12).

Route Reconnaissance. A directed effort to obtain detailed information of a specified route and all terrain from which the enemy could influence movement along that route (Department of the Army 2012b, 1-32).

Screen. A security task that primarily provides early warning to the protected force (Department of the Army 2012b, 1-33).

Security Operations. Security operations are those operations undertaken by a commander to provide early and accurate warning of enemy operations, to provide the force being protected with time and maneuver space within which to react to the enemy, and to develop the situation to allow the commander to effectively use the protected force (Department of the Army 2012b, 1-33).

Situational Awareness. The product of applying analysis to relevant information to determine the relationship among the operational and mission variables to facilitate decision making (Modified from: Department of the Army 2012b, 1-33).

Special Reconnaissance. Includes reconnaissance and surveillance actions conducted as a special operation in hostile, denied, or politically sensitive environments to collect or verify information of strategic or operational significance, employing military capabilities not normally found in conventional forces (Department of the Army 2012d, 5-3).

Task Organization. A temporary grouping of forces designed to accomplish a particular mission (Department of the Army 2012b, 1-36).

Zone Reconnaissance. A form of reconnaissance that involves a directed effort to obtain detailed information on all routes, obstacles, terrain, and enemy forces within a zone defined by boundaries (Department of the Army 2012b, 1-39).

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