

The Battle for Information: Division Reconnaissance in Large-Scale Combat Operations

A Monograph by

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Abstract

The Battle for Information: Division Reconnaissance in Large-Scale Combat Operations. By MAJ Bradley J. Rakoce 53 pages.

With the focus of the force returning to large-scale combat operations, the Army must evaluate whether the current force structure can support large-scale combat. US Army divisions no longer have the capability organic to the division headquarters to conduct reconnaissance, surveillance, or security operations in support of its subordinate headquarters, and to make matters worse, the environment that division commanders must operate in is continuously growing more complex. Currently, division commanders are forced to either rely on national level assets to answer commander's critical information requirements, or task organize their subordinate formations, and weaken their ability to conduct offensive and defensive operations, to conduct reconnaissance, surveillance, and security operations. In future large-scale combat operations in a multi-domain environment, divisions must be able to conduct reconnaissance, surveillance, and security operations across all domains, the cyber-electromagnetic spectrum, and the information environment. Not addressing this gap could result in failure to achieve the tactical, operational, and strategic objectives required of the US Army in future large-scale combat operations in a multi-domain environment.

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Abbreviations

ABCT	Armor Brigade Combat Team
ACR	Armored Cavalry Regiment
ADA	Air Defense Artillery
ADAM-SAE	Air Defense Airspace Management and Squadron Aviation Element
AH	Attack Helicopter
AoE	Army of Excellence
ARFORGEN	Army Force Generation
ARPANET	Advanced Research Program Agency Network
ARS	Attack Reconnaissance Squadron
ARSST	Army Space Support Team
ASB	Aviation Support Battalion
BCT	Brigade Combat Team
BLOS	Beyond Line Of Sight
BSB	Brigade Support Battalion
CAV	Cavalry
CCA	Combat Command A
CCB	Combat Command B
CCIR	Commanders Critical Information Requirement
CCR	Combat Command R
CEMA	Cyber-Electro-Magnetic Activities
CRS	Cavalry Reconnaissance Squadron
DCO	Defensive Cyber Operations
DCO-IDM	Defensive Cyber Operations-Internal Defense Measures
DoD	Department of Defense

EA	Electronic Attack
EAB	Echelons Above Brigade
EMS	Electro-Magnetic Spectrum
EP	Electronic Protection
ES	Electronic Warfare Support
EW	Electronic Warfare
FOUO	For Operational Use Only
FSC	Forward Support Company
GPS	Global Positioning System
HHT	Headquarters and Headquarters Troop
HQ	Headquarters
ICBM	Inter-Continental Ballistic Missile
IE	Information Environment
ISR	Intelligence, Surveillance, and Reconnaissance
LRBM	Long-Range Ballistic Missile
LRS-D	Long-Range Surveillance Detachment
LSCO	Large-Scale Combat Operations
MDO	Multi-Domain Operations
MLRS	Multiple-Launch Rocket System
OCO	Offensive Cyber Operations
OH	Observation Helicopter
RSO&I	Reception, Staging, Onward movement and Integration
S1	Personnel Staff Section
S2	Intelligence Staff Section
S3	Operations Staff Section
S4	Logistics Staff Section

S6	Signal Staff Section
SRBM	Short-Range Ballistic Missile
SSE	Space Support Element
SOF	Special Operations Force
TAA	Tactical Assembly Area
TRADOC	Training and Doctrine Command
UAS	Unmanned Aerial System

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Chapter 1 Introduction

In war nothing is more important to a commander than the facts concerning the strength, dispositions, and intentions of his opponent, and the proper interpretation of those facts.

—President Dwight D. Eisenhower, Laying the
Cornerstone for the CIA Building

Background of the Study

Until the advent of the United States Army Force Generation (ARFORGEN) process as a means to efficiently train and equip forces for rapid deployment to Iraq and Afghanistan, and the restructuring of the Army to focus the tactical echelon of the force around the brigade combat team, the US Army Corps was the senior tactical headquarters, and the Division was the primary maneuver headquarters.¹ When this was the case, the preponderance of reconnaissance, surveillance and security capability and capacity resided at echelons above brigade (EAB). However, the Army stripped the echelons above brigade headquarters to ensure the brigade combat team (BCT) had the modularity necessary to deploy year on, year off, without their division headquarters and conduct independent, or semi-independent operations.

With the focus of the force returning to large-scale combat operations (LSCO), the Army must evaluate whether the current force structure can support large-scale combat. US Army divisions no longer have the capability organic to the division headquarters to conduct reconnaissance, surveillance, or security operations in support of its subordinate headquarters, and to make matters worse, the environment that division commanders must operate in is

¹ Major General Flem B. Walker Jr., “Building and Sustaining Readiness across Forces Command Formations,” army.mil, accessed January 20, 2020, https://www.army.mil/article/166101/building_and_sustaining_readiness_across_forces_command_formations.

continuously growing more complex. The division must now contend with space, cyberspace, and the electromagnetic spectrum, and these domains now greatly influence the assets the division will utilize on the ground, in the air, and from the maritime domain. The reduction in manned reconnaissance, surveillance, and security assets at the division has left the US Army's primary maneuver headquarters dependent on national level assets to answer commander's critical information requirements, and incapable of gathering information for, or providing security to, their subordinate headquarters.

Statement of the Problem

The division is the senior maneuver headquarters (HQ) in the US Army during LSCO, and an integral ingredient in the land component command's arsenal in achieving tactical and operational objectives. The US Army Division used to have the preponderance of its resources organized for the division commander to use, or task organize as he saw fit, to support and shape the battlefield for his subordinate commanders. The development and implementation of the ARFORGEN process and the modularization of the force to develop a brigade centric army led to most of the capabilities organic to the division HQ to be reorganized under the BCT. This has left the division unable to conduct independent reconnaissance, surveillance, and security operations without tasking a subordinate, or taking capabilities from a subordinate to conduct these operations. This limits the division's ability to fight for information and provide their forces with the security they require and diminishes their subordinate's ability to do the same.

The increasing complexity of the future LSCO environment only exacerbates this problem. Since World War I, the division has had to fight in and understand the land and air domains, but the future LSCO division will need to understand, and to one degree or another, operate in the cyber-electromagnetic spectrum and space domains as well. This will require looking at the capability gap in the division through a new lens and recommending new capabilities, capacities, and potentially authorities to be resident at the division level. The Army must address this issue,

because the future LSCO division will fight an advanced adaptive enemy that utilize capabilities resident in these domains. The division will need to be able to see and understand what the enemy is doing in these domains, and more importantly, what the enemy is preparing to do in these domains. This will allow the division to effectively maneuver their forces to defeat the enemy and achieve their objective. If they are left blind to the enemy's actions, or unable to counter the enemy's actions because of a lack of capability, the division will lose battalions, BCTs, or their entire force.

Scope

This study addressed the Army's decisions to move the preponderance of reconnaissance, surveillance, and security assets out of the US Army Division and to BCT and the ramifications of those decisions to the senior maneuver commander in LSCO. This study examined how division commanders are overcoming the fact that they no longer have the organic capability and capacity within their HQ to conduct reconnaissance and surveillance operations or to provide security for their organizations.

This study briefly examined how division level reconnaissance, surveillance, and security forces operated in previous LSCO, and how those forces changed throughout time to combat emerging threats. It analyzed the effect of divisions relying on unmanned aerial systems (UAS) and subordinates to conduct reconnaissance, surveillance, and security missions has on the conduct of LSCO, and how this affects the commander's understanding of the operational environment and the ability to answer commander's critical information requirements (CCIR) to facilitate timely and effective decision making.

The study also examined the time requirements involved in the training of reconnaissance, surveillance, and security forces, as a means of illustrating the difficulty of quickly training these forces to operate in LSCO.

Finally, this study addressed the capabilities required in near future LSCO at the US Army Division, and a possible organizational design to provide division commanders with those capabilities and capacities organic to their HQ.

Assumptions, Limitations, and Delimitations

The main assumption of this monograph is that in the three BCT organizational construct of the US Army Division today, it is not possible, or practical, to utilize a BCT or BCT's assets to conduct reconnaissance, surveillance, and security operations without jeopardizing the success of combat operations.

Several facts constrain this monograph. Time is the first factor that limited the monograph. The duration of the Advanced Military Studies Program is approximately 10 months, which places a limitation on the amount and detail of the research for this monograph.

Classification limited this monograph. This monograph only used unclassified information. Since much of the information surrounding cyber, electro-magnetic warfare, and space operations is classified for operational use only (FOUO) and higher, much of the information in this study was direct from doctrine and open source material. This means that, though the information is accurate, it may only paint a portion of the picture.

For the purposes of this monograph, this study examined the US Army Division's conduct of reconnaissance, surveillance, and security operations in LSCO independent of any potential higher-level reconnaissance assets, special operations assets, and national assets. This is because there are no higher-level reconnaissance assets in the regular army except UAS, and because the US Army Division cannot rely on special operations forces (SOF) or national assets to support their reconnaissance, surveillance, and security needs.

The Research and Subordinate Questions

The primary research question is, can the US Army Division, without an organic task organized cavalry squadron conduct reconnaissance, surveillance, and security operations in LSCO in the multi-domain environment of the future?

This primary research question suggests several other questions that require answers to understand fully this issue. First, what are LSCO in a multi-domain environment? Second, how does the multi-domain environment change the requirements for the US Army Division? Third, what forces does the US Army Division need to conduct reconnaissance, surveillance, and security operations in LSCO? Finally, can US Army Divisions conduct reconnaissance, surveillance, and security operations with unmanned assets?

When the subordinate research questions are answered, it facilitated the answering of the primary research question. It is anticipated that answering these questions showed that the reduction in cavalry, reconnaissance, and surveillance forces at the US Army Division has rendered the senior maneuver headquarters reliant on national level assets to answer commander's critical information requirements and dependent on subordinates to provide security for the division. This renders subordinates unable to conduct their own reconnaissance, surveillance, and security operations, and leaves the division commander waiting on national level assets to provide the information necessary for him to make decisions.

Now, and in the future, LSCO in a multi-domain environment will require divisions to conduct reconnaissance, surveillance, and security operations in multiple domains. This is due to the rapid proliferation of the cyber-electro-magnetic and space domains as spaces to exercise military capability against an adversary. This will require an organization with the capability to maneuver in the physical domains, and in the space and cyber-electro-magnetic spectrum domains as well. This will require more than UAS and space-based reconnaissance and will require

dedicated forces to conduct reconnaissance, surveillance, and security operations in support of division maneuver.

Significance of the Study

The research presented in this study is significant because reconnaissance, surveillance, and security operations set the conditions for all other operations. They provide commanders and leaders with the information, intelligence, and security necessary to plan and make timely and accurate decisions for the application of combat power against enemy forces. Without the ability to develop these plans or to conduct these operations, commanders cannot provide security for their forces. This forces commanders to act with less information, and to be more susceptible to enemy deception operations. This could have catastrophic consequences to their forces and result in calamitous and avoidable loss of life. This is avoidable if the US Army addresses the reconnaissance, surveillance, and security capability and capacity gaps prior to the outbreak of LSCO. Addressing these gaps must be a priority or combat forces will incur a heavy cost on the field of battle.

Chapter 2 Background

Key Definitions

To understand the current state of reconnaissance, surveillance, and security forces, it is important to clearly define the current and future operational environment. This allows the reader to understand the importance of these forces and help to inform what capabilities and capacities they require in future conflict. To describe future conflict, this study must understand the two main terms or concepts that describe future conflict. Large-scale combat operations (LSCO) and Multi-Domain Operations (MDO) are the two terms or concepts currently used to describe future conflict.

LSCO is a term used by the US Army, and defined in *Army Doctrine Publication 3-0*, to describe joint combat operations conducted to achieve strategic and operational level objects where the size and scope of the forces committed to the operations is extensive.² For the purposes of this study, *LSCO* is defined as joint combat operations conducted to achieve strategic and operational level objectives with a multi-corps Army or multiple Armies subordinate to an Army Group and equivalent Air Force and Navy components against a peer or near-peer adversary.

Within *LSCO* it is important to identify three areas of concern to the commander. First, the US Army defines the *deep area* as the area where the commander uses his assets or requests assets from his higher headquarters to set the conditions for success in future close combat operations.³ Second, the US Army defines the *close area* as the area where the majority of the

commander's subordinate maneuver forces are engaged in close combat.⁴ Finally, the support area that is designated to facilitate the positioning, employment, and protection of base sustainment assets required to sustain, enable, and control operations.⁵

MDO is the Army's way of describing how it conducts operations in multiple domains, against a peer or near-peer adversary who has the capability and capacity to contest those domains worldwide. The Army conducts these operations to present the adversary with multiple dilemmas at the operational and/or tactical level, allowing the Army as a member of the Joint

² US Department of the Army, *Army Doctrine Publication 3-0 Operations* (Washington DC: Government Printing Office, 2019). 1-5.

³ US Army, *ADP 3-0*, Glossary-3.

⁴ US Army, *ADP 3-0*, Glossary-2.

⁵ US Army, *ADP 3-0*, Glossary-8.

Force to exploit windows of opportunity to achieve operational and strategic objectives.⁶ The US Army MDO concept is a description of how the US Army, in 2028, intends to conduct LSCO as a contributing member of the Joint Force. The concept entails operations in all domains, the electromagnetic spectrum (EMS), the information environment (IE), and describes operations to deter and defeat our adversaries in both competition and conflict.⁷

This means that LSCO in the MDO environment of the future conducted by the US Army will be fought across multiple domains, the EMS, and the IE by an Army or Army Group as a component of the Joint Force to present the adversary with multiple dilemmas at the operational and/or tactical level. These dilemmas create windows of opportunity to exploit and achieve operational and strategic objectives allowing the Army and Joint Force to deter or defeat our adversaries in both competition and conflict.

History

In World War II (WWII) the US Army organized itself to conduct LSCO in multiple domains. During this time there was no cyber or space domain to contend with, but the land, maritime, and air domains were active domains for combat, and the EMS was beginning to become a player on the field of battle. The IE has always existed, but technological advances have only increased the size and scope of the environment. In 1944, the IE was limited to word of mouth, newsreels at the cinema, newspapers, and the radio. Televisions did exist, but to support

⁶ US Department of the Army, *Training and Doctrine Command Pamphlet 525-3-1, The US Army in Multi-Domain Operations 2028* (Washington, DC: Government Printing Office, 2018) GL-7.

⁷ US Army, *TRADOC PAM 525-3-1*, 5.

the war effort, manufactures halted their production during the war. This limited the television's ability to spread information. Broadcasting did continue, but only on a limited basis.⁸ These domains and sub-components of these domains made up the operational environment in World War II.

In the operational domains present during World War II the US Army placed an emphasis on reconnaissance and security operations. US Army doctrine of the time stated that the mission of mechanized cavalry units was to perform reconnaissance missions to provide security to the main body by identifying enemy forces and giving early warning of ground and air attacks. They could also protect the exposed flanks of the unit or they could maintain liaison with adjacent units.⁹

In 1944, infantry divisions in the US Army consisted of three infantry regiments, the division artillery regiment, an engineer battalion, a medical battalion, the headquarters and special troops battalion, and a mechanized cavalry troop. The mechanized cavalry troop was the only mechanized force in the entire division. The troop consisted of a troop headquarters and three

reconnaissance platoons. (see Figure 1) They were the only dedicated mobile reconnaissance element available to the division commander.

⁸ "Television During World War Two," Early Electronic Television, last modified unknown, accessed March 16., 2020, https://www.earlytelevision.org/ww2_history.html.

⁹ US War Department, *Field Manual 100-5, Operations* (Washington, DC: Government Printing Office, 1944) 9-10.

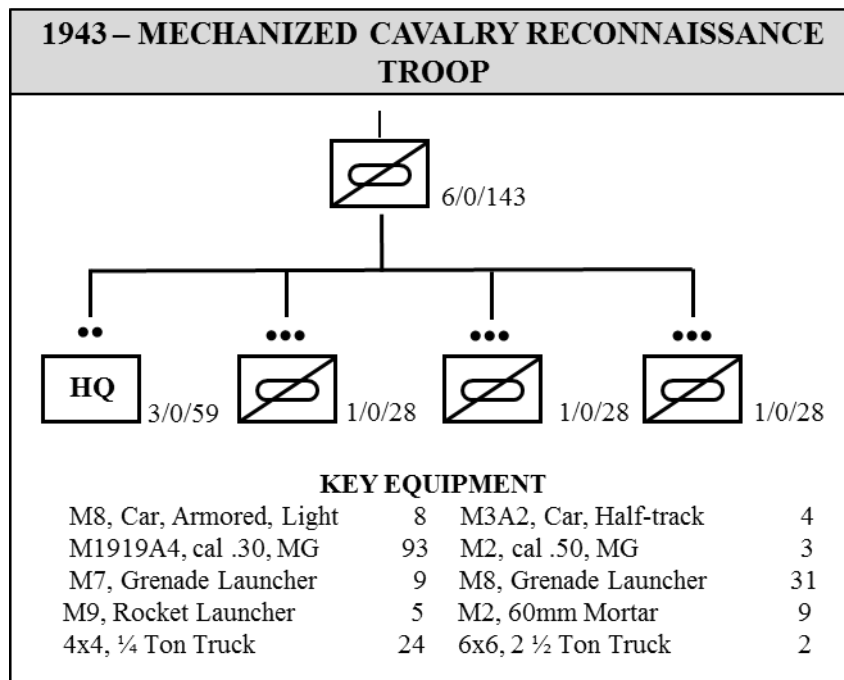


Figure 1. 1943 - Mechanized Cavalry Reconnaissance Troop. Source: Created by author using data from: US War Department, *Table of Organization and Equipment No. 2-27, Cavalry Reconnaissance Troop, Mechanized* (Washington, DC: Government Printing Office, 1943) 1-4.

Accessed March 16, 2020.

What made the mechanized cavalry troop so valuable to the division commander was that the troop had more vehicles and more weapons carrier platforms, or fighting vehicles, than an infantry battalion. The troop almost had more than an entire infantry regiment.¹⁰ This allowed them to have incredible range, speed, and maneuverability, not to mention an incredible amount of firepower for the size of the unit. Their mission was to conduct zone, area, and route

¹⁰ US War Department, *Table of Organization and Equipment No. 2-27, Cavalry Reconnaissance Troop, Mechanized* (Washington, DC: Government Printing Office, 1943) 1-4. US War Department, *Table of Organization and Equipment No. 7-11, Infantry Regiment* (Washington, DC: Government Printing Office, 1943) 1-2.

reconnaissance to gain information and allow the division commander to make timely decisions and develop plans.¹¹

The US Army in World War II had two types of armored divisions. There were “light armored divisions” and “armored divisions.” They were distinct from one another in size, not in the type of equipment they had in their formations. The “light armored divisions” had 263 tanks and approximately 11,000 personnel. They also did not have regimental structures in the “light armored divisions.” Their principle formation was the battalion, of which they had thirteen. There were three tank battalions, three infantry battalions, and three artillery battalions, one reconnaissance squadron, and one engineer, medical, and maintenance battalions. This allowed the “light armored divisions” to have a huge amount of flexibility in how they task organized their formations into combat commands and task forces.¹²

Combat commands were subordinate headquarters to the division and were resident in “light armored divisions” and “armored divisions.” These subordinate commands allowed the division commander to task organize his formations for specific missions and operations. The combat commands could further task organize their formations into task forces. “Armored divisions” had two combat commands beneath the division, combat command A (CCA) and combat command B (CCB). The “light armored divisions had three combat commands, CCA, CCB, and combat command R (CCR). Because the “light armored divisions” had no regimental

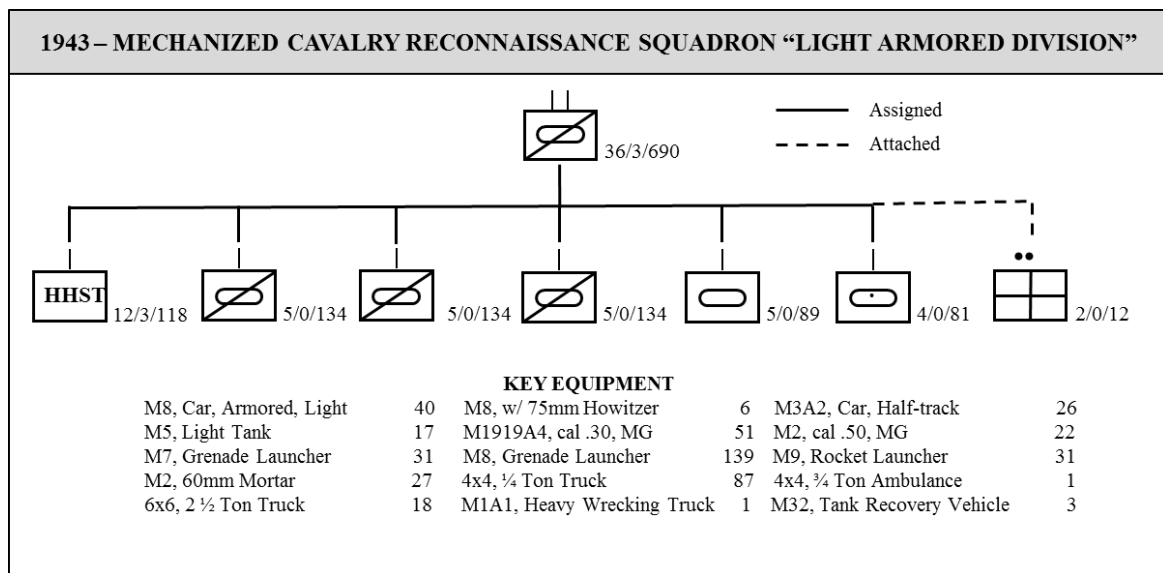
¹¹ US War Department, *Field Manual 2-20, Cavalry Reconnaissance Troop Mechanized*, (Washington, DC: Government Printing Office, 1944) 1-18.

¹² Robert S. Cameron. *Mobility, Shock, and Firepower. The emergence of the U.S. Army's Armor Branch, 1917-1945* (Washington DC: Center of Military History, 2008) 445-446.

headquarters, they established CCR to be a skeleton staff to those battalion and below sized elements not assigned to CCA and CCB.¹³

“Light armored divisions,” as stated above, had a mechanized cavalry reconnaissance squadron assigned as their division reconnaissance unit. The squadron was composed of a headquarters and headquarters service troop, three reconnaissance troops as described above, an assault gun troop, a light tank company, and a medical detachment. (see Figure 2)

“Armored divisions,” as stated before, had two combat commands, but they retained the regimental structure. The “armored divisions” had two tank regiments, each with two medium tank battalions and a light tank battalion, an armored infantry regiment, an artillery regiment, a support regiment, reconnaissance, engineer, and medical battalions, and a signal company. In total, they had 390 tanks and nearly 14,500 personnel.¹⁴



¹³ Cameron, *Mobility, Shock, and Firepower*, 375, 383.

¹⁴ Cameron, *Mobility, Shock, and Firepower*, 445.

Figure 2. 1943 - Mechanized Cavalry Reconnaissance Squadron “Light Armored Division.”
 Source: Created by author using data from: US War Department, *Table of Organization and Equipment No. 2-25, Cavalry Reconnaissance Troop, Mechanized* (Washington, DC: Government Printing Office, 1943) 1-3.

The “armored division’s” mechanized cavalry reconnaissance battalion differed from the “light armored division’s” mechanized cavalry squadron in that it had an additional reconnaissance troop and an additional platoon in the assault gun troop.¹⁵ (See Figure 3) The mission and methods of employment for the battalion are identical to that of the squadron, they are just larger to facilitate supporting the additional armor regiment resident in the “armored division.”

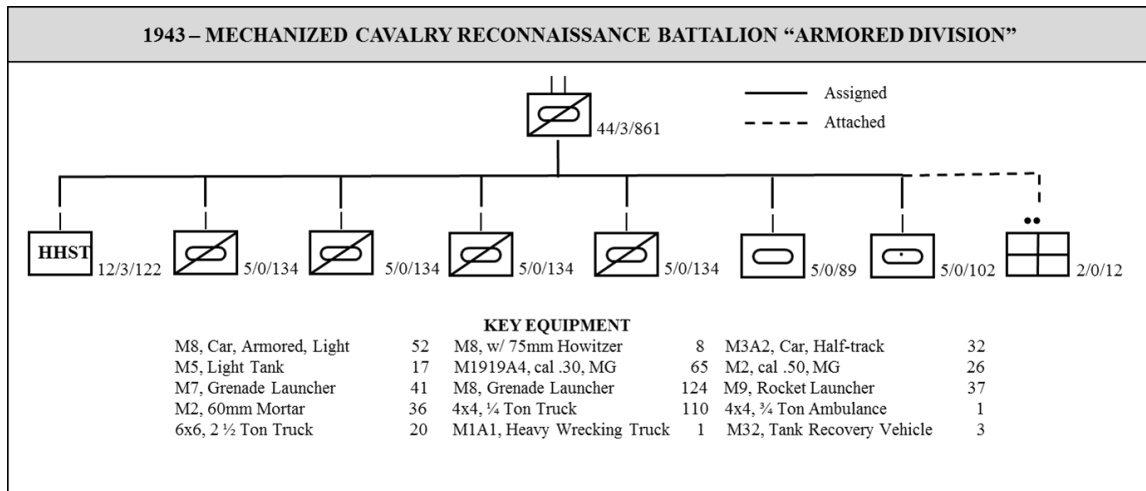


Figure 3. 1943 - Mechanized Cavalry Reconnaissance Battalion “Armored Division.” Source: Created by author using data from: US War Department, *Table of Organization and Equipment No. 2-25, Cavalry Reconnaissance Troop, Mechanized* (Washington, DC: Government Printing Office, 1943) 1-3.

¹⁵ US War Department, *Field Manual 2-30, Cavalry Reconnaissance Squadron Mechanized* (Washington, DC: Government Printing Office, 1944) 1-2.

An example of the employment of a mechanized cavalry reconnaissance squadron in World War II can be found in the IV Corps' spring offensive in the Po River Valley in 1945. 91st Cavalry Reconnaissance Squadron (CRS) was assigned to the 10th Mountain Division in the IV Corps as their reconnaissance unit. During the offensive, on 22 April 1945, the 91st CRS was detached to the 10th Mountain Division to IV Corps to conduct security operations in the form of screening IV Corps' right flank. This allowed IV Corps relative freedom of maneuver during their advance through the Po River Valley.¹⁶

On 23 April the 91st CRS was tasked to conduct reconnaissance of the Po River to identify crossing sites, routes to those crossing sites, and to classify any existing bridges found. They then secured the crossing sites and conducted a zone reconnaissance of the far side of the Po River to facilitate the continued offensive. Next, the 91st CRS was tasked to screen the left flank of the 10th Mountain Division to facilitate their offensive maneuver north of the Po River.¹⁷ The Po Valley offensive is an example of how a mechanized cavalry reconnaissance squadron facilitated division or corps maneuvers and allowed for the identification and exploitation of enemy forces in an area of operations.

The 91st CRS was one of thirteen division mechanized cavalry reconnaissance squadrons, two mechanized reconnaissance battalions and forty-two mechanized cavalry reconnaissance troops that deployed to the Mediterranean theater between June of 1944 and May of 1945.¹⁸ The

¹⁶ LTC H. Bruss, *Operations of 91st Cavalry Reconnaissance Squadron, Mechanized in the Po Valley Offensive* (Italy, European Theater: HQs, 91st Cavalry Reconnaissance Squadron, 1945) 1-3.

¹⁷ Bruss, *Operations of 91st Cavalry Reconnaissance Squadron*, 3-6.

¹⁸ Robert S. Cameron. *To Fight or Not to Fight? Organizational and Doctrinal Trends in Mounted maneuver Reconnaissance for the Interwar Years to Operation IRAQI FREEDOM* (Fort Leavenworth, KS: Combat Studies Institute Press, 2010) 71.

amassing of this number of reconnaissance organizations illustrates the importance of the reconnaissance and security fight and an emphasis placed on it from US Army senior leaders.

Between World War II and the Persian Gulf War, there were extensive technological advances that expanded capabilities in warfare. Emerging technology opened or expanded the domains in which Nation-states competed. Computers advanced far beyond their simplistic forms in World War II, and computing capacity increased exponentially. The internet allowed computers everywhere to connect to one another for the sharing of data. This allowed the nation

state actors to begin competing with one another in the cyber domain.¹⁹ For the purposes of this study the cyber domain was becoming a domain of maneuver for near-peer and peer nation states during this period.

Space became a domain for those states capable of operating in it. The US landed astronauts on the moon and established space-based capabilities. Global Positioning System (GPS) satellites were launched and allowed for the real time knowledge of the exact location of personnel and equipment. The combination of GPS and advances in missile technology led to the development of the precision guided munitions like the Tomahawk Land Attack Missile (TLAM), as well as other Short-Range Ballistic Missiles (SRBM), Long-Range Ballistic Missiles (LRBM), and Inter-Continental Ballistic Missiles (ICBM). At the time, the adversaries of the US only had terminally guided munitions that were capable and accurate, but not as effective as the precision guided munitions of the US military.

Another technological advancement that occurred post-World War II can be found in the advancement of the helicopter. While helicopters existed in World War II, the advancement in rotary wing aviation in the post-World War II era led to the development of attack and scout

¹⁹ Fred Kaplan's book *Dark Territory* explains, in detail, the who, what, when, where, and why of the establishment, and proliferation of the cyber domain.

helicopters in addition to transport helicopters. This expanded the capabilities that the airframe brought to the battlefield and would allow for a great expanse in their use. The last technological advancement discussed in this period is beyond line of sight (BLOS) communications. This was accomplished with the use of satellite communications and through ionospheric propagation or bouncing radio waves off the ionosphere.

Apart from the advancement in the cyber domain, all these technologies benefited the reconnaissance fight, and brought capability to forces on the battlefield. Inserted by helicopters, small dismounted teams of reconnaissance soldiers could be delivered deep in enemy territory.

Scout aviation platforms could conduct reconnaissance from the air, and attack aviation could support both the scout helicopters and the reconnaissance soldiers on the ground. Cavalry and reconnaissance soldiers could now communicate back to higher headquarters and target high value enemy targets with precision guided munitions to bring devastating effects on the enemy.

These advances in technology and the threat of LSCO in Europe against the Soviet Union led to the development of new US Army Doctrine. In the latter part of the 20th century, the US Army developed both attrition and maneuver-based doctrine. These are the primary theories that predominate the analysis of warfare and drive the development of the doctrine to fight it.²⁰

Attrition warfare focuses on the physical destruction of the enemy's personnel and equipment. The destruction degrades the enemy's will to fight because of the rising cost of the conflict.²¹ In contrast, maneuver warfare seeks to present an enemy with multiple dilemmas and overwhelm his ability to react to the situation. The result is the enemy's dislocation or defeat.²²

In 1976 the US Army Training and Doctrine Command (TRADOC) published an updated FM 100-5, Operations. This doctrine was referred to as "active defense." The basis of active defense was, as the name implies, defensive. Active defense was doctrine inspired by the concepts of attrition theory. Active defense doctrine specifies throughout the manual that the intent of operations is to destroy the enemy's military forces.²³ The doctrine focuses on firepower

²⁰ Richard E. Simpkin, *Race to the Swift: Thoughts on Twenty-First Century Warfare* (London: Brassey's Defence Publishers, 1985) 19-23.

²¹ US Marine Corps. *Marine Corps Doctrine Publication 1, Warfighting* (Washington, DC: Government Printing Office, 1997) 36.

²² USMC. *USMC PUB 1*, 73.

²³ US Department of the Army, *Field Manual 100-5, Operations* (Washington, DC: Government Printing Office, 1976) 1-2, 4-1, 5-3.

US Army, *FM 100-5*,

rather than maneuver.²⁴ FM 100-5 went so far as to argue that in the defense, the US Army would

have every advantage but one – the initiative.²⁵ The active defense doctrine writers, whether intentionally or not, took Clausewitz to heart in his belief that the defense was superior to the offense.²⁶

While Clausewitz may have agreed with active defense's belief in the superiority of the defense, the doctrine did have its critics. Some believed that the doctrine relied too heavily on the belief that the enemy would mass and attempt to penetrate US defenses.²⁷ If the enemy maneuvered to the flanks and encircled friendly forces, the results could be catastrophic.²⁸ The mounting concerns about the doctrine and a change in leadership at TRADOC led to development of AirLand battle. AirLand battle was a maneuver focused doctrine that emphasized firepower as a means of enabling maneuver.²⁹ The AirLand Battle doctrine also emphasized the importance of reconnaissance in planning and conducting campaigns and operations. This doctrine also stated that commanders must continuously conduct reconnaissance and security operations as they are chief concerns to large-unit commanders.³⁰

The AirLand Battle doctrine also emphasizes the integration of air cavalry forces and Air

²⁴(1976): 3-3 to 3-5.

²⁵ US Department of the Army, *Field Manual 100-5, Operations* (Washington, DC: Government Printing Office, 1976) 5-2.

²⁶ Carl Von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1989), 84.

²⁷ John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine, 1973-1982* (Washington, DC: Government Printing Office, 1984) 16-17.

²⁸ Romjue, *From Active Defense to AirLand Battle*, 17-19.

²⁹ US Department of the Army, *Field Manual 100-5, Operations* (Washington, DC: Government Printing Office, 1986) 12.

³⁰ (1986): 28.

US Army, *FM 100-5*,

Force aviation as integral components to the reconnaissance, surveillance, and security missions. Air assets can conduct reconnaissance and surveillance operations over larger areas, but for shorter durations. They can screen and reconnoiter forward of and to the flanks of security

operations providing additional security for moving and stationary forces.³¹ AirLand Battle also specifies that surveillance operations are continuous and collected on from multiple domains, while reconnaissance operations are focused on a specific target.³² Both are utilized in tandem to gain understanding of the operational environment and provide commanders with timely information on the composition, disposition, and intent of adversary forces.

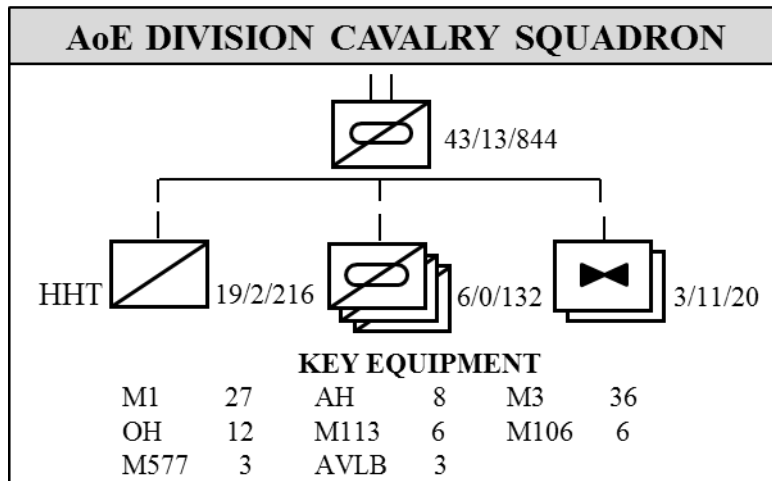


Figure 4. Army of Excellence Division Cavalry Squadron. Source: Created by author using data from: US Department of the Army, *Field Manual 17-95-10, Armored Cavalry Regiment and Squadron* (Washington, DC: Government Printing Office, 1993) 1-3. US Department of the Army, *Field Manual 17-95, Cavalry Operations* (Washington, DC: Government Printing Office, 1996) 1-20.

³¹ US Army, *FM 100-5*, (1986): 43.

³² (1986): 50.

US Army, *FM 100-5*,

AirLand Battle doctrine brought with it an effort to restructure the Army to be able to maximize the capabilities and capacities of the US Army. This restructuring was known as the Army of Excellence (AoE). In the AoE, brigades, divisions, and corps all had dedicated reconnaissance and security forces. The divisions and corps had an additional force dedicated to surveillance. This study focused on the forces the AoE assigned to the division. The AoE

division's reconnaissance force structure consisted of a division cavalry squadron (see Figure 4) and a long-range surveillance detachment (LRS-D) (see Figure 5). The LRS-D was generally assigned to the division military intelligence battalion, but some divisions would task organize it to the division cavalry squadron.

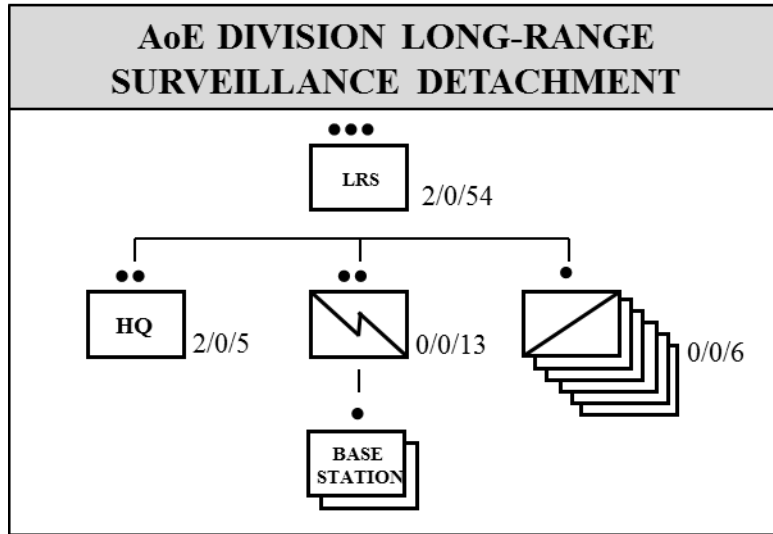


Figure 5. Army of Excellence Division Long-Range Surveillance Detachment. Source: Created by author using data from: US Department of the Army, *Field Manual 3-55.93, Long-Range Surveillance Unit Operations* (Washington, DC: Government Printing Office, 2009) 1-3 thru 1-7. US Department of the Army, *Table of Organization and Equipment Number 07209L000, LongRange Surveillance Detachment* (Washington, DC: Government Printing Office, 1993) 1-17.

This force structure with the AirLand Battle doctrine was the doctrine used by the US Army to fight the Iraqi Army during the Persian Gulf War in 1991. The 24th Mechanized Infantry Division Combat Team was the right flank of the XVIII Airborne Corps and shared a boundary with VII Corps during the Persian Gulf War. 2-4 Cavalry (CAV) Squadron was the 24th

Mechanized Infantry Division Combat Team's.³³ Division Cavalry Squadron. During Operation DESERT SHIELD, the Division's mission had three parts. First, the division had to defend

against and if required defeat Iraqi forces. Second, on order, the division would counterattack to destroy the lead Iraqi division of the Iraqi second operational echelon. This mission assumed that the first operational echelon would attack and be defeated prior to the order to counterattack.

Finally, the 24th ID had a "be prepared to" mission to continue the offensive beyond destroying the lead Iraqi division of the second operational echelon, and on to the destruction of all Iraqi military forces.³⁴

In Operation DESERT STORM, the division's mission was to strike deep swiftly and decisively into the rear and flanks of the enemy's positions and block the Euphrates River Valley to deny the Iraqi Army the ability to escape the theater of operations. The 24th also had the mission to continue the attack towards Basrah to destroy the Iraqi Republican Guard Forces Command.³⁵ Once the 24th ID had completed their reception, staging, onward movement and integration (RSO&I), 2-4 CAV, who was task organized the division's chemical reconnaissance platoon, and an attack aviation battalion led the division to their forward tactical assembly area (TAA). Once in their tactical assembly area, 2-4 CAV established a screen line between the division TAA and the line of departure. The screen line included ten battle positions and multiple listening and observation posts forward of the battle positions.³⁶

³³ During Operation DESERT SHIELD/DESERT STORM, the 24th Mechanized Infantry Division Combat Team used this long name to describe their organization. From this point on for the purposes of this study they are referred to as the 24th Infantry Division or 24th ID.

³⁴ Major Jason K. Kamiya, *History of the 24th Mechanized Infantry Division Combat Team During Operation DESERT STORM "The Attack to Free Kuwait" (January through March 1991)* (Fort Stewart, GA: Government Printing Office, 1992) 3.

³⁵ Kamiya, *History of the 24th Mechanized Infantry Division Combat Team During Operation DESERT STORM "The Attack to Free Kuwait,"* 6.

³⁶ Kamiya, 9-18.

During this early time in the operation, the division commander's number one priority was security. 2-4 CAV maintained their screening operations and conducted 24-hour surveillance of the border berm. The division inserted their LRS-D teams to monitor actions of the Iraqi forces at their border patrol posts forward of 2-4 CAV, and 2-4 CAV's Attack Helicopter (AH)-64 Apache helicopters and Observation Helicopter (OH)-58D Kiowa Warrior helicopters began conducting day and night reconnaissance missions to confirm enemy composition and disposition in the vicinity of the border. This was all deemed passive reconnaissance and security operations. G-Day was the designation for the anticipated start of land combat operations. One week prior to G-Day, the division began conducting intrusive reconnaissance operations, or reconnaissance operations across the line of departure. Two days prior to G-Day, the division inserted LRS-D Teams deep behind enemy lines in vicinity of the first major division objectives.³⁷

When 24th ID commenced offensive operations, LRS-D maintained observation of key objectives, helicopter reconnaissance assets conducted forward reconnaissance, and 2-4 CAV conducted security operations. 2-4 CAV established and maintained a screen along the division's left flank to provide early warning of enemy movement towards the division from the 101st Airborne's area of operations.³⁸ Lastly, brigade scouts operating forward of the division conducted route reconnaissance along their respective axis of advance, allowing the division to bypass poor terrain on the attack.

After successfully and rapidly attacking and seizing the division's first three major sets of objectives, XVIII Airborne Corps gave operational control of the 3rd Armored Cavalry Regiment (ACR) to the division for the push to phase line victory. This happened at 270600FFEB1991, and

³⁷ Kamiya, 20-21.

³⁸ Kamiya, 22-25.

3d ACR assumed the role of rounding out the screen of the division's rear and right flank and maintaining contact with the VII Corps forces on the division's right flank.³⁹ As the division transitioned into its next attack toward Basrah, 3d ACR maintained its position along the division right flank and conducted an attack along the right flank to provide security for the division's main attack. After the attack, 3d ACR re-established their screen on the division's right flank. 2-4

CAV maintained the screen of the division's left flank during the attack, and transitioned to providing the division a screening force to the rear once the attack was successful.⁴⁰

Shortly after the successful attack towards Basrah and the defeat of the Republican Guard Forces Command divisions in sector, offensive operations were suspended when notice of the Presidential cease fire reached the division. While offensive operations stopped, security operations continued until the 24th ID left the theater and 2-4 CAV provided that security.⁴¹ Operation Desert Shield/Desert Storm provided great examples of the importance of cavalry, reconnaissance, and security operations. The 24th ID and 2-4 CAV were selected because of the diversity of the missions and personnel who conducted the missions. There were examples of division cavalry, brigade scouts, attack and scout rotary wing aviation, LRS-D, and Corps cavalry in the form of 3d ACR's augmentation of the division's cavalry forces. They conducted reconnaissance, surveillance, security, and offensive operations in support of the division, and helped provide the division commander with the information and security he needed to make timely decisions in the conduct of LSCO against a near-peer adversary.

³⁹ Kamiya, 30.

⁴⁰ Kamiya, 31-32 & 52.

⁴¹ Kamiya, 32-39.

Current and Emergent Technology

During its inception, the internet, then known as Advanced Research Program Agency Network (ARPANET), was a Department of Defense (DoD) sponsored project designed to interconnect multiple heterogeneous systems and facilitate file sharing and communication among members of the scientific community and the DoD. The immense success of ARPANET led to the National Science Foundation's construction of the internet in 1995 bringing this technology to the civilian market. In 1995, the internet connected about five million computers, workstations,

and mainframes⁴²- today there are approximately thirty point seven billion devices connected with that number expected to more than double in the next five years.⁴³ Previously this technology was solely used by the DoD and the scientific community, now the entire world is interconnected in ways that boggle the mind. Kids today can video teleconference with thirty of their friends at a single time – a feat that even the highest levels of government workers would not have been able to do a short time ago. The speed and advancement of technology in and around the internet is growing at an exponential rate, making the cyber domain an ever-growing threat for exploitation by nation states and non-state actors. The Internet is not the only technology that proliferated since its inception and migrated to have both military and civilian applications.

⁴² Jean Walrand and Pravin Varaiya, “Chapter 4: The Internet and TCP/IP Networks” in High-Performance Communication Networks (Second Edition) (San Francisco, CA: Morgan Kaufman Publishers, 2000), accessed March 16, 2020, <https://www.sciencedirect.com/topics/computerscience/internet-today>.

⁴³ “Internet of Things – number of connected devices worldwide 2015-2025,” statista, last modified November 14, 2019, accessed March 16, 2020, <https://www.statista.com/statistics/471264/iotnumber-of-connected-devices-worldwide/>.

Satellite technology, too, has grown and expanded exponentially in the military and civilian market over the past few decades. Since the launch of Sputnik, the first satellite launched into outer space, there have been 8,378 satellites launched into space according to the United Nations Office of Outer Space Affairs.⁴⁴ 2,437 of these have launched since 1990.⁴⁵ We now live in a world where everyone has access to GPS, satellite imagery, and satellite communications via cell phones. This technology was previously only available to the governments of great power nation states, but now, the civilian market has taken this technology to the masses. Today, google

can provide users with clear imagery of nearly the entire planet, which they update monthly, and over the course of one to three years, they update the entire imagery of the world.⁴⁶ The proliferation and accessibility of this technology levels the playing field and puts our forces at risk of jamming and manipulating the GPS and imagery data we receive. This, potentially, limits the effectiveness and accuracy of GPS data and GPS guided munitions on the battlefield.

Other technological advancements are under development now that have potentially greater impacts on the future of warfare. Quantum computing, for one, has the potential to do tremendous good in the world, or tremendous evil. Quantum computing could potentially find the cure for cancer, or it could be used to break even the most secure encryption available to US government today, or develop devastating new weapons. Our adversaries could also use quantum

⁴⁴ Aditya Chaturvedi, “Do you know how many satellites are currently orbiting around the Earth?,” Geospatial World, accessed January 20, 2020, <https://www.geospatialworld.net/blogs/do-you-know-how-many-satellites-earth/>.

⁴⁵ “Number of satellites launched from 1957 to 2019,” statista, last modified January 7, 2020, accessed March 16, 2020, <https://www.statista.com/statistics/896699/number-of-satellites-launched-byyear/>.

⁴⁶ Carol Finch, “How Often Does Google Maps Update Satellite Images?,” Techwalla, accessed January 20, 2020, <https://www.techwalla.com/articles/how-often-does-google-maps-update-satelliteimages>.

computing to create an unbreakable encryption that could be used in coordination with cyberattacks to lock us out of even our own systems.⁴⁷

It is impossible to forecast the technological breakthroughs that will happen in the next five years, let alone out to 2040. Technology is growing and adapting at incredible rates, that is why these technological examples are not all encompassing, and are not meant to be. They are meant to be an illustration of the exponential growth of technology that have both military and civilian applications. They are also technologies that are relevant in the all domains that military conflict takes place. While the US Army breaks down the spaces in which conflict takes place and calls them domains, technological advancement has created an interconnected world where domains are enmeshed in conflict. This is why reconnaissance, surveillance, and security must be

present in all domains for our tactical and maneuver headquarters to be successful in all other forms of military activity in LSCO in an MDO environment.

⁴⁷ Bernard Marr, “15 Things Everyone Should Know About Quantum Computing,” Bernard Marr and Co., accessed January 20, 2020, <https://www.bernardmarr.com/default.asp?contentID=1193>.

Chapter 3 Future Division Reconnaissance

As the Army transitions from a focus on counterinsurgency to a division and corps-level maneuver against near-peer military forces, it is imperative we build the capability to fight for information for those echelons of command.

—MG Ryan F. Gonsalves, Forward to CALL Newsletter 18-19
Reconnaissance and Security Brigade Combat Team Excursion

Historical doctrine and past LSCO show that reconnaissance and security operations were very important to the US Army. Current doctrine and efforts to identify, understand, and potentially influence the future force structure of reconnaissance and security forces illustrates that winning the fight for information is still important. The US Army, however, has a gap in capability at the division – a previously filled gap that the Army could fill for the division again to ensure that the division HQ has the organic ability to fight for information.

To fill this gap and ensure that the US Army's divisions are prepared to fight and win the nations wars, it is important to take lessons learned from the past and anticipate the needs of the future. The Army cannot just take the division cavalry squadron from AirLand Battle and expect that formation will solve all the division's problem in LSCO in an MDO environment.

The threats posed in multiple domains by near-peer competitors now, provides them with the ability to force the US Army division to fight its way through a multi-faceted array of standoff measures before ever getting to the main battle. Emergent technologies, such as artificial intelligence, machine learning, hypersonic munitions, and robotics, have the potential to greatly increase the lethality and complexity of the battlefield.⁴⁸ To ensure that the division has the capability and capacity to counter the adversary's complicated array of actions, and maintain the

⁴⁸ US Army, *TRADOC PAM 525-3-1*, i.

combat power to engage in close combat, the division must have an organic ability to fight for information and secure their forces across all domains of conflict.

Therefore, the division cavalry squadron from the Army of Excellence is merely the starting point for the division reconnaissance, surveillance, and security organization of the future. To ensure that the division can compete, penetrate, dis-integrate, and exploit our adversaries, the Army must ensure that the division can fight for information and maneuver in all domains. This requires more capability and capacity than that which resided in the division cavalry squadron from Army of Excellence.

As shown in chapter three, the division cavalry squadron from Army of Excellence had organic to it a headquarters troop, three armored cavalry troops, and two aviation troops. The LRS-D had a headquarters section, communications section and six LRS teams. This study used this as the starting point for shaping an organization that could potentially fill the gaps existing and emerging in the division force structure. This was done because these organizations have proven successful in conducting reconnaissance, surveillance, and security operations in the land and air domains, and with increased capability can successfully conduct multi-domain reconnaissance, surveillance, and security operations for the division in future LSCO.

Maneuver

The foundation of the division cavalry squadron of the future is the armored cavalry troop. Three armored cavalry troops conducting reconnaissance and security operations are the base of this organization. These troops have 125 personnel assigned to them, consisting of six officers and 119 non-commissioned officers and soldiers' man each troop. (See Figure 6) The troop consists of a headquarters section, a mortar section, and four platoons. There are two scout platoons with six cavalry fighting vehicles, manned by one officer and thirty-five scouts, and two tank platoons consisting of four main battle tanks manned by one officer and fifteen

noncommissioned officers and soldiers. Lastly, the mortar section is manned by nine noncommissioned officers and soldiers and has two self-propelled mortar carriers.⁴⁹

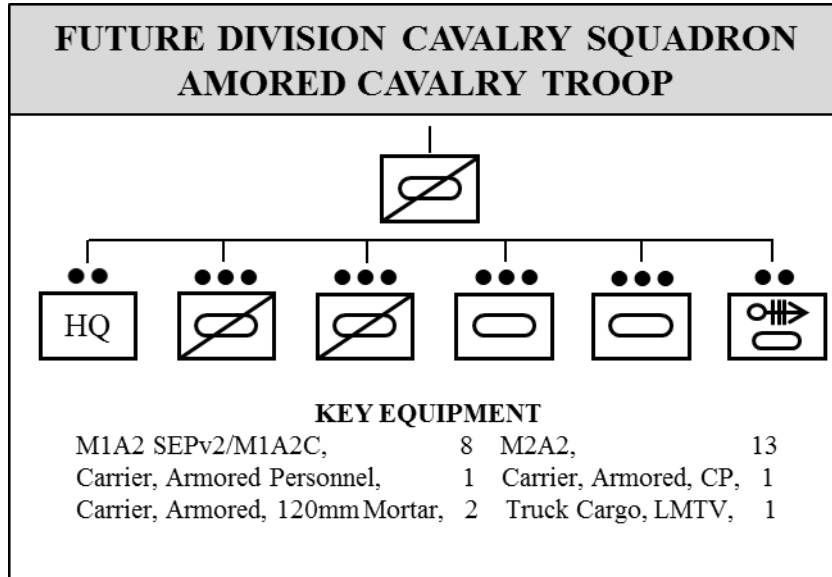


Figure 6. Future Division Cavalry Squadron Armored Cavalry Troop. Source: Created by author using data from: US Department of the Army, *Table of Organization and Equipment 17315K000, Armored Cavalry Squadron* (Washington, DC: Government Printing Office, 2015) 1.

An additional ground maneuver element found in the division cavalry squadron of the future is the LRS-D. (See Figure 7) LRS-D conducts four primary missions on behalf of the division. Their primary missions are surveillance, zone and area reconnaissance, target acquisition, and target interdiction. They also have the inherent capability to conduct combat assessment and battle damage assessment should that be required of them.⁵⁰ Two officers, the

⁴⁹ US Department of the Army, *Table of Organization and Equipment 17315K000, Armored Cavalry Squadron* (Washington, DC: Government Printing Office, 2015) 1.

⁵⁰ US Department of the Army, *Field Manual 3-55.93, Long-Range Surveillance Unit Operations* (Washington, DC: Government Printing Office, 2009) 1-4.

detachment commander and the executive officer, and fifty-four non-commissioned officers and soldiers man the LRS-D. There are six, six man, LRS teams in the detachment each lead by a sergeant first class, a communications section manned by thirteen non-commissioned officers and soldiers, and the detachment headquarters, which is manned by seven personnel, two officers and five non-commissioned officers and soldiers.⁵¹ These soldiers support the division commander's deep fight and set conditions for the armored cavalry troops to conduct reconnaissance and security operations.

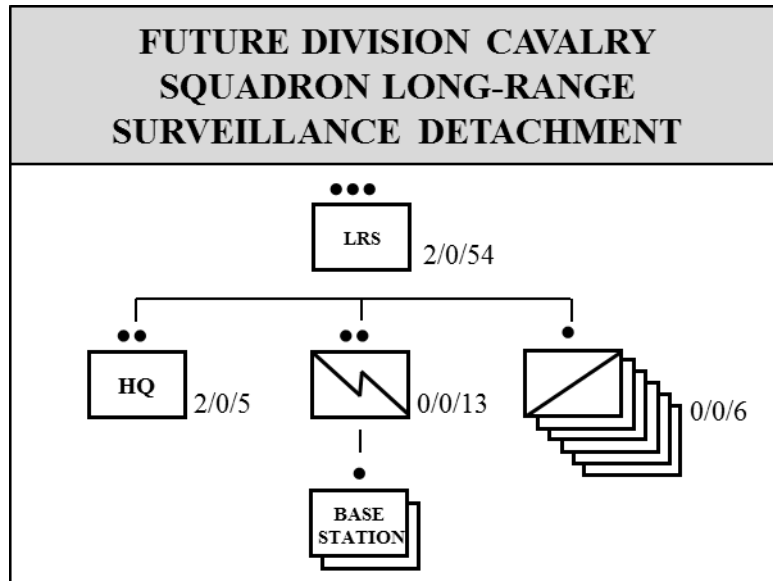


Figure 7. Future Division Cavalry Squadron Long-Range Surveillance Detachment. Source: Created by author using data from: US Department of the Army, *Field Manual 3-55.93, Long-Range Surveillance Unit Operations* (Washington, DC: Government Printing Office, 2009) 1-3 thru 1-7. US Department of the Army, *Table of Organization and Equipment Number 07209L000, Long-Range Surveillance Detachment*. Washington, DC: Government Printing Office, 1993) 1-17.

⁵¹ US Army, *FM 3-55.93, Long-Range Surveillance Unit Operations* 1-3 thru 1-7. US Department of the Army, *Table of Organization and Equipment Number 07209L000, Long-Range Surveillance Detachment* (Washington, DC: Government Printing Office, 1993) 1-17.

Fires

The division cavalry squadron of the future requires an organic or direct support battery of long-range fires. This battery must have the ability to support the armored cavalry troops, air cavalry troops, and the LRS teams engaged in the deep fight conducting surveillance and target acquisition missions. This requires both cannon and rocket artillery, to ensure that fire support can range the deep fight. The battery also requires an organic air defense (Avenger) platoon. Additionally, due to the diversity of the equipment recommended for this organization, the fires battery would require an organic support platoon with an ammunition section, system maintenance section, and maintenance section. (See Figure 8) Having these capabilities organic to the division cavalry squadron would provide maneuver units with long-range fires support, and the security and protection from enemy aviation assets.

Nine officers, one warrant officer, and 150 non-commissioned officers and soldiers man this organization, totaling 160 personnel in the battery. Two officers, a first sergeant and three soldiers make up the battery headquarters. Two officers and forty non-commissioned officers and soldiers are in each of the two 155mm self-propelled artillery platoons. This includes the platoon headquarters, fire direction center, howitzer sections, and the ammunition section for each platoon.⁵² One officer, a platoon sergeant, and twenty-six non-commissioned officers and soldiers make up the multiple-launch rocket system platoon. These soldiers form the platoon headquarters, four multiple launch rocket system crews, and an ammunition section.⁵³ One officer, a platoon sergeant and twenty-two non-commissioned officers and soldiers make up the air defense artillery

⁵² US Department of the Army, *Table of Organization and Equipment 06385K000, Field Artillery Battalion, 155SP* (Washington, DC: Government Printing Office, 2015) 1.

⁵³ US Department of the Army, *Table of Organization and Equipment 06465K000, Field Artillery Battalion, Multiple Launch Rocket System (MLRS)*. (Washington, DC: Government Printing Office, 2017) 1.

platoon. These soldiers combine to make the platoon headquarters, and two squads with three air defense crews.⁵⁴ Finally, one officer, one warrant officer, a platoon sergeant and fifty-five non-

commissioned officers and soldiers make up the support platoon. This platoon consists of an ammunition section, maintenance section, and a system maintenance section.⁵⁵

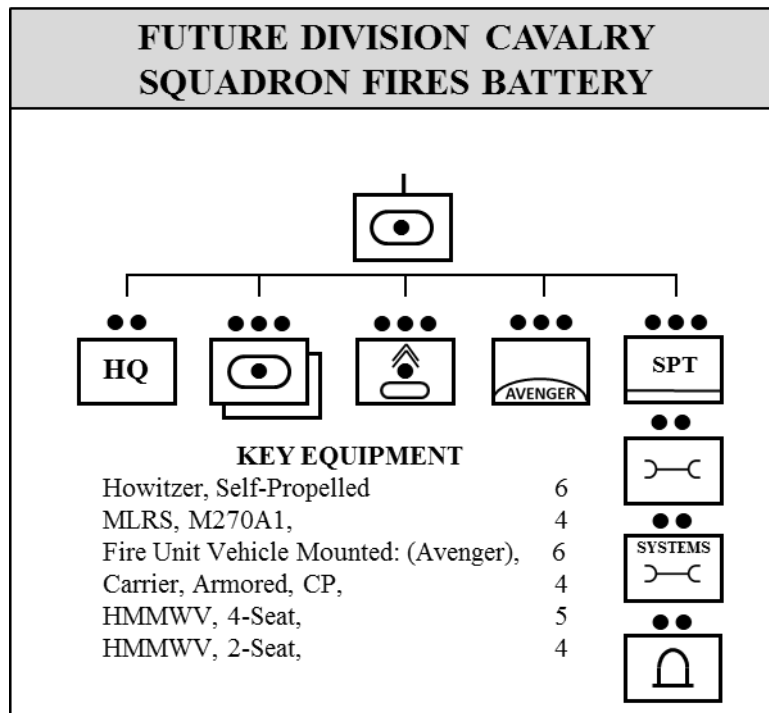


Figure 8. Future Division Cavalry Squadron Fires Battery. Source: Created by author using data from: US Department of the Army, *Field Manual 3-09, Field Artillery Operations and Fire Support* (Washington, DC: Government Printing Office, 2014) 1-30 thru 1-40. US Army, *TO&E 06385K000, FA BN, 155SP*, 1. US Army, *TO&E 63025K000, BSB, ABCT*, 1. US Army, *TO&E 44655K000, ADA BN (IFPC/Avenger)* 1. US Army, *TO&E 06465K000, FA BN, MLRS*, 1. US Army, *TO&E 06465K000, FA BN, MLRS*, 1.

⁵⁴ US Department of the Army, *Table of Organization and Equipment 44655K000, Air Defense Artillery Battalion (IFPC/Avenger)* (Washington, DC: Government Printing Office, 2017) 1.

⁵⁵ US Department of the Army, *Table of Organization and Equipment 63025K000, Brigade Support Battalion (BSB), Armor Brigade Combat Team (ABCT)*. (Washington, DC: Government Printing Office, 2018) 1. US Army, *TO&E 44655K000, ADA BN (IFPC/Avenger)* 1. US Army, *TO&E 06465K000, FA BN, MLRS*, 1.

Aviation

The division cavalry squadron of the future would not change significantly with regards to aviation. There would, however, be some slight changes and a small addition. First, since the

Army has retired the Kiowa Warrior, or the OH-58, platform, the two assigned aviation troops would be attack-reconnaissance troops equipped with eight AH-64 Apache helicopters. The second difference between the Army of Excellence aviation assets and the future aviation assets would be the addition of UAS platoon assigned to each of the attack reconnaissance troops equipped with four RQ-7 Shadow platforms - this is modeled after the current structure of the troops in the attack reconnaissance squadron (ARS). These assets would support reconnaissance, surveillance, and security operations with overlapping and gap filling coverage. The final difference would be, similar to the fires battery, the addition of an organic support platoon with an ammunition section, fuel section, and an aviation maintenance section. (See Figure 9)

Four officers, twenty warrant officers, and 124 non-commissioned officers and soldiers make up an Attack Reconnaissance Troop, totaling 148 personnel per troop in the future division cavalry squadron. The troop headquarters has a commander, four warrant officers, a troop first sergeant, and four soldiers. A platoon leader, five warrant officers, a platoon sergeant, and eight crew chiefs make up each reconnaissance platoon. A chief warrant officer two leads the UAS Platoons and is supported with one additional warrant officer and twenty-seven noncommissioned officers and soldiers.⁵⁶ Lastly the support platoon is a slice of the maintenance company and forward support companies in the attack reconnaissance squadron.

⁵⁶ US Department of the Army, *Table of Organization and Equipment 01285K000, Attack Reconnaissance Squadron (ARS) (Heavy) Combat Aviation Brigade* (Washington, DC: Government Printing Office, 2015) 1.

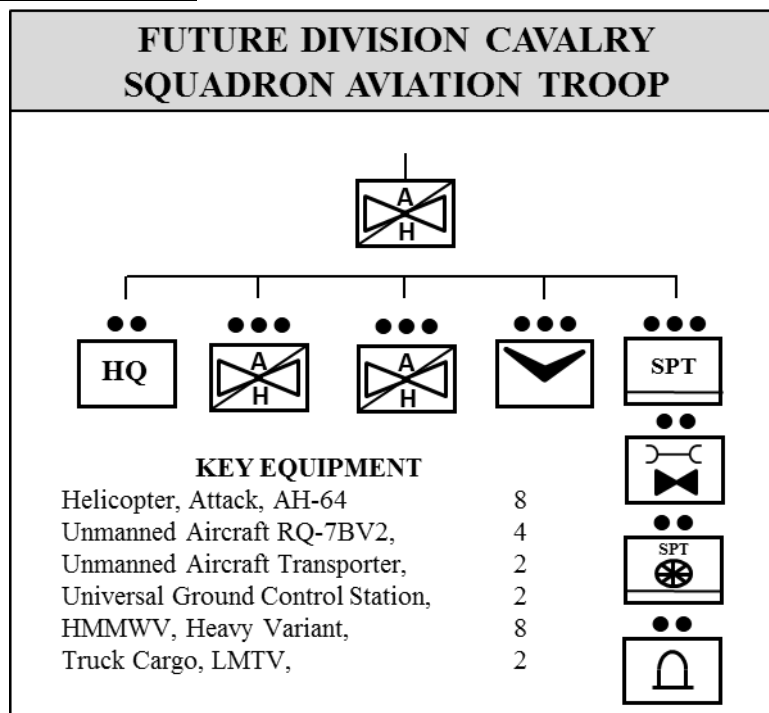


Figure 9. Future Division Cavalry Squadron Aviation Troop. Source: Created by author using data from: US Department of the Army, *Field Manual 3-04, Army Aviation* (Washington, DC: Government Printing Office, 2015) 2-6 thru 2-7. US Army, *TO&E 01285K000, ARS (Heavy) CAB, 1*. US Army, *TO&E 63375K000, ASB CAB, 1*.

An officer is the platoon leader of the support platoon and the platoon headquarters has an aviation maintenance officer who is a warrant officer, an ammunition warrant officer, and a platoon sergeant. The maintenance section is relatively robust, but focuses only on aircraft maintenance, leaving personnel weapons maintenance and vehicle maintenance to the squadron's

support company. Two warrant officers and fifty-two non-commissioned officers and soldiers make up the section and focus on structure, powerplant, powertrain, pneudraulics, electrical, armament, avionics, and parts. The ammunition section has six non-commissioned officers and soldiers, and the fuel section has fifteen non-commissioned officers and soldiers.⁵⁷ This provides

the ability for each attack reconnaissance troop to take care of most of their own maintenance and lighten the load on squadron's forward support company. These are estimates based off current force structure and discussions with active duty aviation officers on what the requirements would be to provide internal support to the attack reconnaissance troops. The aviation center of excellence would need to analyze these estimates before they could be determined adequate.

Headquarters and Headquarters Troop

The Headquarters and Headquarters Troop (HHT) would maintain the staff sections found in any battalion level headquarters – S1 (Personnel), S2 (Intelligence), S3 (Operations), S4 (Logistics), S6 (Signal), and Special staff (Chaplain, Surgeon, Staff Judge Advocate, Chemical, Fire Support, etc.), – but there would be some additional sections or capabilities to support the MDO nature of this organization and to combat those emerging threats. (See Figure 10)

The HHT for the future division cavalry squadron would be slightly larger than a traditional cavalry squadron, which is approximately 117 personnel with nineteen officers and ninety-eight non-commissioned officers and soldiers. Some staff sections would be increased to compensate for the wide range of capabilities resident in this formation and the command group would include four chief warrant officers four based on the attack reconnaissance aviation troops in the squadron. The increased size requires an increase to the size of the S-1 and the S-4. The

⁵⁷ US Department of the Army, *Table of Organization and Equipment 63375K000, Aviation support Battalion (ASB) Combat Aviation Brigade* (Washington, DC: Government Printing Office, 2017) 1.

diversity and quantity of communications equipment requires an increase in personnel and capability in the S-6. The additional troops in the squadron requires an increase in the size of the medical platoon. The aviation troops require the addition of an aviation liaison element, and the diversity of the fires capability requires a more robust fires cell. The last section of the existing staff to grow would be the operations section. They would require two additional assistant operations officers and four additional assistant operations sergeants, plus the addition of a fire direction cell to support fires planning and operations.

External from the normal squadron staff structure, the additional staff sections discussed below would increase the staff size and likely include additional officers, warrant officers, and soldiers. The first section we will discuss is the cyber-electromagnetic activities (CEMA) section. This section would at a minimum have an officer-in-charge, an officer assigned as a deputy, a warrant officer or two, and two soldiers. This estimate is based off the two specialties that reside in the CEMA section, cyber and electronic warfare.⁵⁸ It is possible that with the diverse nature of the cyber field that this section could be more robust, but that determination would need to be made by the cyber branch based on their requirements and availability of personnel.

The next section needing discussion is the Army space support team (ARSST). An ARSST is six total personnel – lead by a space operations ⁵⁹officer, with an additional space operations officer, and four soldiers with varying specialties. The last section needed as an addition to the HHT is the air defense airspace management and squadron aviation element (ADAM-SAE). Doctrinally, the ADAM-SAE is thirteen total personnel with six personnel in the ADAM element, and seven personnel in the SAE. The ADAM element is led by an air defense artillery (ADA) major, with an ADA captain as his assistant, three operations/assistant operations

⁵⁸ US Department of the Army, *Field Manual 3-12, Cyberspace and Electronic Warfare Operations* (Washington, DC: Government Printing Office, 2017) 3-6 thru 3-8.

⁵⁹ US Department of the Army, *Field Manual 3-14, Space Operations* (Washington, DC: Government Printing Office, 2014) 6-7.

sergeants, and one early warning system operator. The SAE is led by an aviation major, assisted by an aviation captain, and supported by aviation and UAS warrant officers, two operations sergeants, and an UAS operator.

Cyber-Electromagnetic Activities

The first addition is a Cyber-Electromagnetic Activities (CEMA) section to the staff. This section would be focused on defensive cyber operations (DCO), and more specifically, on DCO internal defense measures (DCO-IDM), cyber security, Electronic Warfare (EW), and a

cyberspace intelligence, surveillance, and reconnaissance (ISR). DCO are defined as passive and active operations intended to preserve the ability to utilize friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems.⁶⁰

DCO-IDM are focused on the protection of data, networks, net-centric capabilities, and other designated systems. Passive and active defensive operations as well as offensive cyber operations (OCO) require authorities and permissions that will reside echelons above division.

Cyberspace ISR is defined in doctrine as activities in cyberspace conducted to gather intelligence required to support future OCO or DCO. These activities support planning and execution of current and future cyberspace operations. Cyberspace ISR focuses on tactical and operational intelligence and on mapping enemy and adversary cyberspace to support military planning.⁶¹ These cyberspace ISR missions would require direction and authorization from echelons above division to ensure deconfliction in and out of cyberspace.

EW is military action involving the use of electromagnetic and directed energy to control the EMS or to attack the enemy.⁶² These actions consist of electronic attack (EA), electronic protections (EP), and electronic warfare support (ES). EA are actions that involve the use of energy, electromagnetic or directed, or anti-radiation weapons to attack the enemy. These means can target personnel, equipment, or facilities achieving various effects.⁶³ EP encompasses the protection of friendly personnel, equipment, and facilities from the effects of friendly and enemy EA.⁶⁴ ES involves actions to search for, intercept, identify, and locate or localize sources of

⁶⁰ US Army, *FM 3-12*, (2017): Glossary-2.

⁶¹ US Army, *FM 3-12*, (2017): 1-9.

⁶² US Army, *FM 3-12*, (2017): Glossary-4.

⁶³ US Army, *FM 3-12*, (2017): 1-26.

⁶⁴*FM 3-12*, (2017): 1-28.

intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition, targeting, planning, and conduct of future operations.⁶⁵

These combined capabilities allow the division cavalry squadron of the future to defend against enemy CEMA capabilities, but also allows them to conduct reconnaissance and surveillance in these domains providing the division commander with great fidelity on the enemy's composition, disposition, and strength. This allows for greater security prior to and during maneuver, and an improved ability to plan for and request offensive effects to support maneuver and convergence on the battlefield.

Space Support Team

The next addition to the division cavalry squadron would be an Army Space Support Team (ARSST). An ARSST provides the squadron with trained and ready soldiers to conduct SATCOM, satellite operations, missile warning, and space control, though some of the authorities for these operations will be retained at division or higher headquarters. It also gives the commander the organic knowledge to conduct planning and integration with the division staff's space support element (SSE) which has far greater capacity and knowledge, and the ability to make space support requests thru division to echelons above division.⁶⁶

Air Defense Airspace Management – Squadron Aviation Element

The last addition to the HHT would be an ADAM-SAE. The ADAM-SAE is commonly found at brigade and higher echelons, but because of the diverse nature of the units in the future division cavalry squadron, and the necessity to integrate air ground integration in coordination with

⁶⁵ US Army, *FM 3-12*, (2017): 1-30.

⁶⁶ US Army, *FM 3-14*, (2014): 1-7.
US Army,

ADA, it is a necessity in this formation. ADAM-SAE supports planning, integration, and deconfliction of the squadron's ADA platoon, the attack reconnaissance aviation, and external

friendly aviation assets.⁶⁷ The ADAM-SAE can also support the squadron fire support officer in deconflicting cannon and rocket artillery assets with organic and friendly aviation assets.

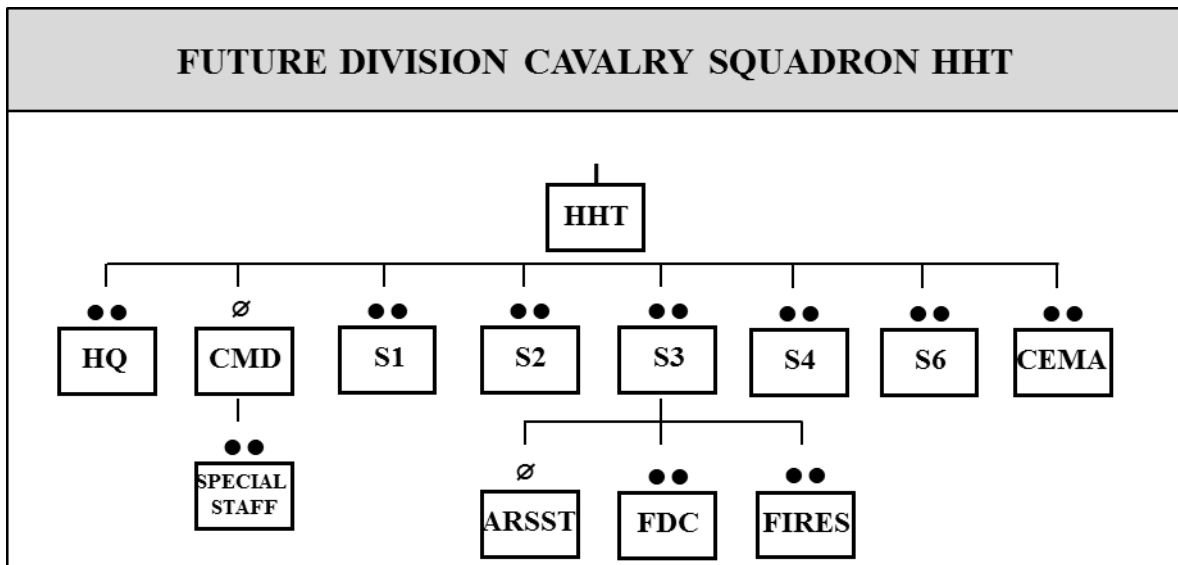


Figure 10. Future Division Cavalry Squadron HHT. Source: Created by author using data from: US Army, *FM 3-09*, (2014): 1-7. US Army, *FM 3-12*, (2017): 1-9 thru 1-30. US Army, *TO&E 17315K000, ACS*, 1. US Army, *TO&E 06385K000, FA BN, 155SP*, 1. US Army, *TO&E 63025K000, BSB, ABCT*, 1. US Army, *TO&E 44655K000, ADA BN (IFPC/Avenger)*, 1. US Army, *TO&E 06465K000, FA BN, MLRS*, 1.

Forward Support Company

The last addition to the future division cavalry squadron is a robust forward support company (FSC). The diversity of equipment in this organization requires an immense maintenance

⁶⁷*FM 3-09*, (2014): 2-6.

capability. A normal FSC has a company headquarters, a distribution platoon, a maintenance platoon, an ammunition platoon, and a field feeding section. The FSC for the future division cavalry squadron would require augmentation of multiple platoons from the standard FSC. (See Figure 11)

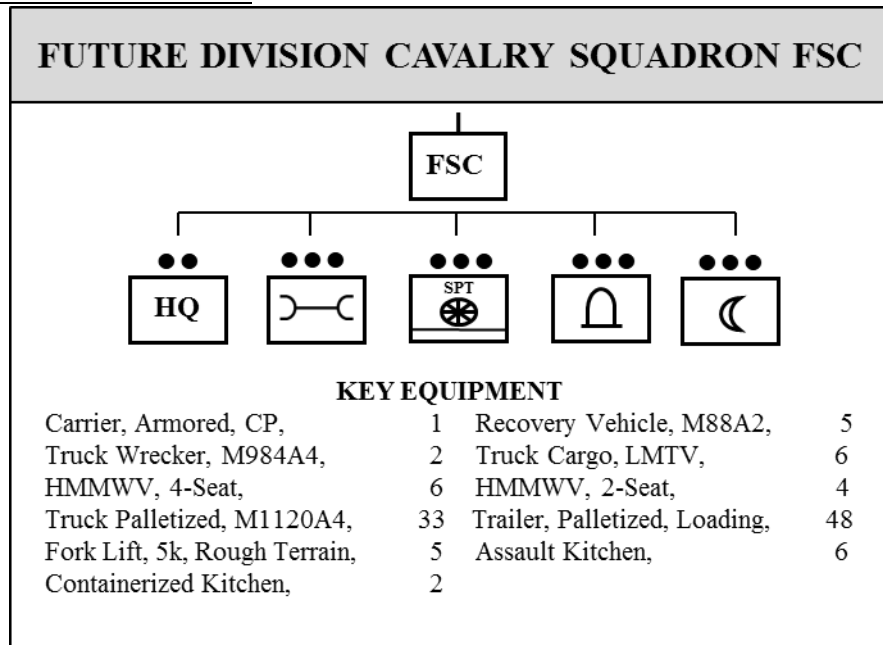


Figure 11. Future Division Cavalry Squadron FSC. Source: Created by author using data from: US Department of the Army, *Field Manual 4-0, Sustainment Operations* (Washington, DC: Government Printing Office, 2019) 2-54 thru 2-56. US Department of the Army, *Table of Organization and Equipment 63025K000, Brigade Support Battalion (BSB), Armor Brigade Combat Team (ABCT)* (Washington, DC: Government Printing Office, 2018) 1.

To mitigate the span of control issues in having an FSC of that magnitude, as shown above, three support platoons, one each, are assigned to the field artillery battery and the aviation troops. This allows those maintenance, distribution, and field feeding sections to train and support those company sized formations directly. It also allows the FSC maintenance platoon to focus on the cavalry troops and standardized equipment across the squadron. This would alleviate some of the US Army,

issues of having such a diverse equipment set across the squadron. The additional support sections and ammunition sections help to alleviate some of the stresses of ammunition and bulk fuel transportation and distribution.

The FSC is commanded by an officer, assisted by an executive officer, and has a first sergeant and three soldiers supporting the troop. The field feeding section would become a field feeding platoon, consisting of two sections. This platoon would have an officer platoon leader, a platoon sergeant, and two sections formed by a section sergeant, four culinary non-commissioned officers, and ten culinary specialists, totaling thirty-four personnel. The distribution platoon has a platoon leader, platoon sergeant, and three distribution sections capable of moving general supply and bulk petroleum. Each section has a section sergeant, four petroleum heavy vehicle drivers, and four heavy vehicle drivers, totaling twenty-nine personnel. The ammunition platoon has a platoon leader, platoon sergeant, and two modular ammunition transportation sections. The modular ammunition transportation sections have a section chief, three ammunition sergeants, and twelve ammunition specialists, totaling thirty-four personnel. The maintenance platoon for the FSC has a platoon headquarters, a maintenance control/parts section, a maintenance section, two systems maintenance section, and two recovery/field maintenance sections. There are two officers in the platoon, the platoon leader and the maintenance control officer. A warrant officer, who is the maintenance warrant, a platoon sergeant, six section sergeants, and eighty-six noncommissioned officers and soldiers ranging from staff sergeant to private of varying specialties that support the maintenance of the tanks, armored personnel carriers, wheeled vehicles, and other standardized pieces of equipment in the squadron. In total, the FSC is 200 personnel with seven officers, one warrant officer, and 192 non-commissioned officers and soldiers.⁶⁸

⁶⁸*TO&E 63025K000, BSB, ABCT, 1.*

The Future Division Cavalry Squadron

To summarize of the above sections, the future division cavalry squadron organization needs to be able to conduct reconnaissance surveillance in all domains. Utilizing the armored cavalry troops and the LRS-D, supported by the fires battery, the future division cavalry squadron conducts reconnaissance, surveillance, and security operations in the land domain. The attack reconnaissance troops conduct reconnaissance, surveillance, and security tasking in the air

domain, where and when applicable in the maritime domain, and in support of the land domain.

(See Figure 12)

The CEMA section allows the future division cavalry squadron the ability to defend, protect, develop through reconnaissance and surveillance the cyber electromagnetic spectrum domain. The ARSST allows the future division cavalry squadron to maintain situational awareness of the space domain, while conducting effective planning for the application of spacebased asset in support of division reconnaissance, surveillance, and security operations. Finally, the squadron headquarters performs all the necessary administrative support for the squadron, and the FSC supports operations and conducts maintenance allowing for continuous operations in support of multi-domain maneuver.

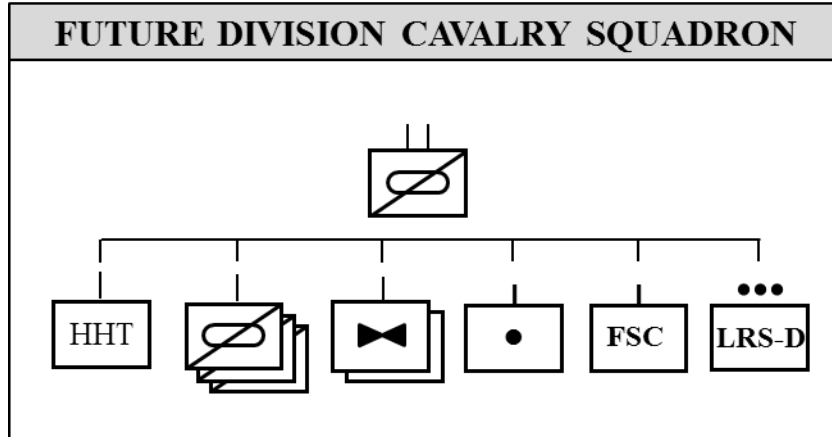


Figure 12. Future Division Cavalry Squadron. Source: Created by author using data from: US Department of the Army, *Field Manual 4-0, Sustainment Operations* (Washington, DC: Government Printing Office, 2019) 2-54 thru 2-56. US Army, *FM 3-09*, (2014): 1-30 thru 1-40. US Army, *FM 7-93*, (1995): 1-8. US Department of the Army, *Field Manual 17-95-10, Armored Cavalry Regiment and Squadron* (Washington, DC: Government Printing Office, 1993) 1-3.

The capabilities and size of this organization allow the future division cavalry squadron the ability to provide a division of 10,000 to 16,000 personnel with the security and information they require to conduct tactical operations in support of the corps. In total, this squadron, as

recommended, has 1,296 total personnel, with eighty-one officers, fifty-four warrant officers, and 1,161 non-commissioned officers and soldiers. All of the personnel and capability resident in the future division cavalry squadron discussed above leads to the question of command and control. The responsibility and span of control of this organizations at every echelon begs the question, is this a large squadron with big troops, or a small brigade with small squadrons? The answer presented here is a large squadron, but the size and scope of the organization requires considering a recommendation that the commander of this organization be a senior lieutenant colonel on his second command, or that the maneuver branches hand picks the most capable incoming “battalion” commanders for assignment in these organizations. Primary staff officers should also be considered for assignment in this organization only after successfully completing a year in a battalion or squadron in a BCT. This assignment should be a way for the division to highlight and reward those officers in their divisions that have proven themselves to be exemplary officers with high potential for promotion and selection to positions of increased responsibility.

At the troop/battery/company/detachment level, the commanders would have to be senior captains or junior majors who had successfully completed a command in a brigade combat team. The span of control and responsibility in the company sized organizations is far and beyond that of a conventional O-3 level command. Executive officers at the troop/battery/company/detachment level should be handpicked to interview by their brigade commanders, and platoon leader positions should be second platoons, or post-executive officer positions for lieutenants who show exceptional promise for continued service and command at the company level.

Chapter 4 Conclusion

Throughout all of history, spies, scouts, cavalry, and other like forces have provided commanders with information on the battlefield. As technological capability has increased, so have the methods and means of gathering information, and of providing security for our armies.

As we move into the next decade with technology, and our understanding of the future battlefield matures, we must analyze and grow to counter the complexities of the emerging operating environment.

Division commanders must have the ability to understand the entirety of the environment in which they are expected to operate. They need to have that understanding to maneuver their forces and achieve objectives in support of the strategic aims. Without the force structure organic to their organizations to conduct reconnaissance, surveillance, and security across all domains, they cannot be able to make timely, accurate decisions, or to provide security for their formations from the multitude of threats that currently exist and those that will emerge in the near future.

An organization organic to the division that has the capability and capacity to provide division commanders with reconnaissance, surveillance, and security capability across all domains is crucial to future LSCO. A division cavalry squadron augmented with space, cyberelectro-magnetic warfare, and aviation reconnaissance, surveillance, and security capabilities with the armor and long-range fires to support these operations is a starting point. From this point the Army would have the flexibility to shift to address future emergent threats presented on the battlefield.

The force structure described in chapter 3 may be vast and aspirational, but without ACR organic to the US Army Corps, it is a starting point for the discussion of how to provide division commanders with the organic ability to conduct reconnaissance, surveillance, and security operations in the complex operational environment of the future. Perhaps, absent an ACR, vast and aspirational is exactly the right concept for a division cavalry squadron. Whether vast or scaled-down, a division cavalry squadron is necessary in LSCO, and failing to address this issue will result in advanced and adaptive enemies utilizing capabilities in space and the cyberelectromagnetic spectrum against them. Without the organic ability to see, understand, and anticipate these actions, divisions will fall prey to their enemies, and battalions, BCT, and even

entire divisions will be destroyed before they ever reach the fight. This will result in failure to achieve the tactical, operational, and strategic objectives required of the US Army in future LSCO in an MDO environment.

Recommendations

The future division cavalry squadron described in chapter 3 is large and focused towards the mechanized infantry division and armored division.⁶⁹ Additionally, the size of this organization would require a restructuring of the current Army structure, or a congressional action to grow the active duty force. Below, options are presented to describe potential solutions to this problem.

The first option would be for the Army to lobby congress to increase the active duty force cap to allow for the development of a future division cavalry squadron. This option is unlikely to be viable because of the political risk involved in asking congress to increase the size and cost of maintaining the active duty force.

The second option would be to decrease the BCT cavalry squadrons to brigade reconnaissance troops and to utilize the space in the force cap to build this organization. The problem with this option is that reducing the cavalry squadron to a brigade reconnaissance troop

reduces the number of lieutenant colonel command opportunities for infantry and armor officers by twenty to thirty-one positions depending on whether seventh infantry division gets a division cavalry squadron, whether or not this formation is a first or second command opportunity, and whether or not this or a lighter version of this organization is created to support the 10th

⁶⁹ This implies that light-infantry and stryker divisions require a different organization of different design to avoid the mobility differential described in Chapter 2 in WWII divisions.

Mountain, the 25th infantry, the 82nd Airborne, and the 101st Airborne (Air Assault) Divisions. This would have a large impact on the number of maneuver officers that can become branch qualified for promotion to colonel, and would likely meet strong resistance from the maneuver community.

The third option would be to task the reserve or national guard to organize an armor brigade combat team, such as the 155th BCT out of Mississippi, to create division cavalry squadrons that have a habitual relationship with 1st Cavalry Division, 1st Armor Division, and 3rd Infantry Division. Potentially, task the 56th BCT out of Pennsylvania, to task organize into a Stryker division cavalry squadrons and habitually align with the 2nd Infantry Division, and the 4th Infantry Division. This option would require additional analysis on how a Stryker version of the division cavalry squadron would be organized. This option would require additional studies and discussions with the national guard bureau to ascertain its viability and whether the disparate equipment requirements could be accommodated.

The fourth option would be to use option two, but only in the 1st Cavalry Division, 1st Armor Division, and 3rd Infantry Division, and leave the remaining divisions as currently organized. This allows the armor divisions to be organized in such a way that allows them to fight as the lead division in three corps in LSCO against a peer adversary with comparable armor forces. This option still reduces the number of lieutenant colonel command opportunities for infantry and armor officers, but drops the number to six to nine positions. This is a much more palatable number than twenty to thirty-one.

The last option presented in this study would be to re-flag a division to 2nd Cavalry Division, or to re-structure an existing division, perhaps 1st Cavalry Division, and build three cavalry regiments in this division with division cavalry squadrons. These division cavalry squadrons could have habitual relationships with the existing divisions or in the event of a LSCO

conflict, the division commander of this division could be the vanguard of an Army or Army Group and lead either the United States Armed Forces, or a coalition force, into combat.

All the options presented within this section present obstacles to implementation. The most acceptable option presented is option 4. Reorganizing the armor divisions to be the lead divisions in LSCO in an MDO environment makes the most sense. In a LSCO conflict against a near-peer adversary with capable armor, these divisions would have to lead the US Army's corps into combat. This option would minimize the impact of re-organizing the army, and create capability and capacity where most required. The remaining divisions would still require MDO capability and capacity in their HQ, and an additional study should be undertaken to identify how best to do this, if not in a division cavalry squadron, then potentially in additional enablers and capabilities resident in the existing staff section structure.

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