

THE REQUIREMENT FOR CORPS ARTILLERY IN FUTURE LARGE-SCALE COMBAT OPERATIONS

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General Studies

by

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ABSTRACT

THE REQUIREMENT FOR CORPS ARTILLERY IN FUTURE LARGE-SCALE COMBAT OPERATIONS, by MAJ Donald R. Auray III, 126 pages.

The transition to a modular unit structure during the mid-2000s brought the deactivation of Corps Artillery and Division Artillery to meet the operational requirements of counter-insurgency operations being conducted in Afghanistan and Iraq. Division Artillery was re-activated in 2013, but Corps Artillery remains a relic of history. The purpose of this study is to analyze the history of the US Army Corps Artillery Headquarters as it pertains to large-scale combat operations and if there is a necessity to permanently re-establish this headquarters for large-scale combat and future multi-domain operations.

This study was conducted by analyzing the history and doctrine of US Corps Artillery during World War I, World War II, and Operation Desert Storm utilizing the framework of the principles of fire support planning and the role of the force field artillery headquarters. This thesis concludes that there is an operational need to reintroduce corps artillery headquarters into the force structure because without this, it is impossible to synchronize and control fires at the corps level on behalf of the force commander.

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ACRONYMS

ATP	Army Technique Publication
FAB	Field Artillery Brigade
FFA HQ	Force Field Artillery Headquarters
FSCOORD	Fire Support Coordinator
FM	Field Manual
MLRS	Multiple Launch Rocket Systems

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CHAPTER 1

INTRODUCTION

Background

Over the past nineteen years, the United States Army has been focused on fighting wars at the tactical level in which a platoon in sustained direct fire contact is seen as a significant event. That platoon is given every fire support asset to complete their mission and resolve the direct fire contact. This will not be the case in large-scale combat operations. Large-scale combat operations will involve division and brigade level engagements in which battalion and below contact will seem as only minor incidents. As the Army refocuses on large-scale combat operations, it has adjusted the structure of the field artillery community with the reestablishment of Division Artillery and reorganized the Fires Brigade to the Field Artillery Brigade (FAB) at the Corps level. The FAB is currently the de facto Corps Artillery, but there is no headquarters at the Corps level to coordinate multiple FABs and provide adjustments in missions, organization, and relationships to be successful.

The field artillery provides the Force Field Artillery Headquarters (FFA HQs) for the next highest echelon. The Field Artillery Battalion is the FFA HQs for the Brigade, the Division Artillery is the FFA HQs for Division, and the FAB is the FFA HQs for Corps or Corps Artillery. The role is currently being fulfilled by the FAB, but not in a large-scale combat operation in which there are more than five FABs providing fires for a Corps, there is no single headquarters to provide unity of command on behalf of the Corps, and there is not a set organization for the FABs.

Currently, there is a mismatch in the Field Artillery Organization for combat at FAB level. The three major US Army Corps: I Corps, III Corps, and XVIII (ABN) Corps all have a FAB organized beneath them but each FAB is organized differently. I Corps has two Divisions assigned and is supported by 17th FAB with two rocket battalions, III Corps has four Divisions assigned and is supported by 75th FAB with 5 rocket Battalions, and XVIII (ABN) Corps with four Divisions and supported by 18th FAB with two rocket Battalions. III Corps and 75th FAB is the only organizational structure that provides a general support rocket Field Artillery Battalion to each division and maintains a rocket FAB in a general support re-enforcing role.

The issue with this organization is that the 75th FAB should not have another battalion size element attached because that would exceed the recommended five subordinate units. If the United States enters a war and the Army is required to conduct large-scale combat operations, the United States Army National Guard will mobilize with eight rocket battalions and additional cannon battalions. The majority of the cannon battalions currently are assigned to brigade combat teams in the National Guard. The rocket battalions require a higher headquarters and the FABs cannot provide this level of support. The re-establishment of Corps Artillery would facilitate the ability to carry out the roles and responsibilities required of an FFA HQs during large-scale combat operations.

Historically, the design for the field artillery organization for combat has been based on a ratio of artillery systems to the number of combat personnel assigned to the supported maneuver force. This ratio has fluctuated throughout history and very rarely has there been more personnel than artillery systems. In history the vast amount of

artillery systems in the battlespace has required a corps level artillery headquarters capable of providing command and control. Developments of technology in the ability to mass fires using precision and near precision munitions no longer requires large numbers of artillery systems to achieve the desired effects, but still requires an adequate number of systems. Technology has allowed the total number of systems to be reduced but still requires a corps level artillery headquarters due to the increased ranges that artillery can achieve and the distributed nature of the systems on the modern battlefield. There is currently a gap in doctrine defining the appropriate ratio of field artillery systems to personnel and the command and control structure required to facilitate fires at the corps level.

Primary Research Question

As the United States Army returns its focus to Large-Scale Combat Operations does the Army require the re-establishment of the Corps Artillery?

Secondary Research Questions

How has the role of the Force Field Artillery Headquarters evolved since World War I?

How have the principles of field artillery planning changed since World War I?

How does the Army integrate non-division artillery provided from the United States Army National Guard during Large-Scale Combat Operations?

Assumptions

The following assumptions were made to enhance the relevance of this study. The changes to the domain's doctrine, organization, material is not limited by the current

Department of Defense budgeting and manning restrictions. This study is purely to understand if there is a need to re-establish Corps Artillery headquarters and solutions to meet the requirements of a FFA HQ for Corps during large scale combat operations. If the United States was involved in future large-scale combat operations many current limitations would probably be removed to fight and win. A key assumption for the purpose of this study is that if the United States is involved in large-scale combat operations that the United States Army National Guard would be mobilized. These forces would be integrated into the total Army structure and expected to fight alongside the active-duty force.

Definitions

Command and Control: The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission.¹

Counter-fire: Counterfire is fire intended to destroy or neutralize enemy weapons. Includes counterbattery and countermortar fire.²

Destruction: In the context of the computed effects of field artillery fires, destruction renders a target out of action permanently or ineffective for a long period, producing at least 30-percent casualties or materiel damage.³

Direct Support: the most decentralized tactical mission. An FA unit in Direct Support of a maneuver unit is concerned mainly with the Fire Support needs of only that unit. A support relationship requiring a force to support another specific force and authorizing it to answer directly to the supported force's request for assistance.⁴

Field Artillery: The equipment, supplies, ammunition, and personnel involved in the use of indirect fire cannon, rocket, or surface-to-surface missile launchers. Field artillery cannons are classified according to caliber as:

Light—120-mm and less.

Medium—121 to 160-mm.

Heavy—161 to 210-mm.

Very heavy—greater than 210-mm.⁵

Fire Support: Fires that directly support land, maritime, amphibious, space, cyberspace, and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives.⁶

Fire Support Coordination: The planning and executing of fire so that targets are adequately covered by a suitable weapon or group of weapons.⁷

Force Field Artillery Headquarters (FFA HQ): If designated by the supported commander, is normally the senior field artillery headquarters organic, assigned, attached, or placed under the operational control of that command. The supported commander specifies the commensurate responsibilities of the FFA HQs and, if necessary, the duration of those responsibilities.⁸

General Support: That support relationship is given to the supported force as a whole and not to any particular subdivision thereof.⁹

General Support Reinforcing: A support relationship assigned to a unit to support the force as a whole and to reinforce another similar-type unit.¹⁰

Indirect Fire: (1) Fire delivered at a target not visible to the firing unit. (2) Fire delivered to a target that is not itself used as a point of aim for the weapons or the director.¹¹

Large Scale Combat Operations: Large-scale occur in the form of major operations and campaigns aimed at defeating an enemy's armed forces and military capabilities in support of national objectives.¹²

Massed Fire: (1) The fire of the batteries of two or more ships directed against a single target. (2) Fire from several weapons directed at a single point or small area.¹³

Neutralization: In the context of the computed effects of field artillery fires renders a target ineffective for a short period of time, producing at least 10-percent casualties or materiel damage.¹⁴

Neutralization Fire: Fire delivered to render the target ineffective or unusable.¹⁵

Preparation Fire: Normally a high volume of fires delivered over a short period of time to maximize surprise and shock effect. Preparation fire includes electronic attack and should be synchronized with other electronic warfare activities.¹⁶

Reinforcing: support relationship requiring a force to support another supporting unit.¹⁷

Scheme of Fires: The detailed, logical sequence of targets and fire support events to find and engage targets to accomplish the supported commander's intent.¹⁸

Suppress: A tactical mission task that results in temporary degradation of the performance of a force or weapons system below the level needed to accomplish the mission.¹⁹

Suppression: In the context of the computed effects of field artillery fires, renders a target ineffective for a short period of time producing at least 3-percent casualties or materiel damage.²⁰

Suppressive Fire: Fires on or about a weapons system to degrade its performance below the level needed to fulfill its mission objectives during the conduct of the fires..²¹

Synchronization: The arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time..²²

Target Acquisition: The detection, identification, and location of a target in sufficient detail to permit the effective employment of weapons..²³

Task Organizing: The act of designing an operating force, support staff, or sustainment package of specific size and composition to meet a unique task or mission..²⁴

Unmanned Aircraft: An aircraft that does not carry a human operator and is capable of flight with or without human remote control..²⁵

Unmanned Aircraft System: That system whose components include the necessary equipment, network, and personnel to control an unmanned aircraft..²⁶

Scope

This study will be limited to the timeframe between World War I and Operation Desert Storm. The reason for beginning this study during the conflict of World War I is that this was the first major conflict in which Field Artillery was employed as an indirect fire weapon system on a large-scale. The study will end with Operation DESERT STORM because it was the last large-scale combat operation in which Field Artillery fires were planned and executed at the Corps echelon. This study will not focus on the Vietnam War because the majority of the Field Artillery was employed in the form of batteries in direct supporting roles to maneuver battalions.

Limitations

This study will rely solely on the examination of unclassified documents through public records, online data sources, and historical records to identify the history of Corps Artillery and the need for it to be re-established. The US Army has currently undergone a large change in the structure of written doctrine and force design. The two domains of force design and published doctrine are not always in synchronization. The current doctrine has yet to establish the roles and responsibilities of the FAB since it was converted from the Fires Brigade. This study will also be limited to publications and documents published in English. Many resources are detailing the effectiveness of Corps Artillery developed by our adversaries and observers, but I do not possess the capability to comprehend languages other than English.

Delimitations

This study is limited to US Army cannon and rocket Field Artillery systems. The origins of Field Artillery employed as an indirect fire weapon system centrally controlled at echelons above brigade started with the Germans in World War I. The study of German Artillery during World War I will be the only non-US Army study during this exercise. The changes that this study will identify will be focused on the domains of doctrine, organization, and material. Acknowledging to certain domains of doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy would affect other domains in the force management system, but they will not be discussed or analyzed in this study.²⁷

¹ Chairman of the Joint Chiefs of Staff, Joint Publication (JP) 1-0, *Doctrine for the Armed Forces of the United States* (Washington, DC: Government Printing Office, March 2013), GL-V.

² Chairman of the Joint Chiefs of Staff, Joint Publication (JP) 3-09, *Joint Fire Support* (Washington, DC: Government Printing Office, December 2014), GL-6.

³ Department of the Army, Field Manual (FM) 3-09, *Field Artillery Operations and Fire Support* (Washington, DC: Government Printing Office, March 2020), Glossary-5.

⁴ Ibid.

⁵ Ibid., Glossary-6.

⁶ Chairman of the Joint Chiefs of Staff, JP 3-09, *Joint Fire Support*, GL-7.

⁷ Ibid.

⁸ Department of the Army, FM 3-09, *Field Artillery Operations and Fire Support*, Glossary-8.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid., Glossary-9.

¹² Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, October 2017), 1-1.

¹³ Department of the Army, FM 3-09, *Field Artillery Operations and Fire Support*, Glossary-9.

¹⁴ Ibid., Glossary-10.

¹⁵ Ibid.

¹⁶ Ibid., Glossary-11.

¹⁷ Ibid., Glossary-12.

¹⁸ Ibid.

¹⁹ Ibid., Glossary-13.

²⁰ Ibid.

²¹ Ibid.

²² Chairman of the Joint Chiefs of Staff, Joint Publication (JP) 2, *Joint Intelligence* (Washington, DC: Government Printing Office, 2013), GL-11.

²³ Department of the Army, FM 3-09, *Field Artillery Operations and Fire Support*, Glossary-14.

²⁴ Department of the Army, Army Doctrine Publication (ADP) 3-0, *Operations* (Washington, DC: Government Printing Office, July 2019), 5-7.

²⁵ Chairman of the Joint Chiefs of Staff, Joint Publication (JP) 3-30, *Command and Control of Air Operations* (Washington, DC: Government Printing Office, February 2014), GL-7.

²⁶ Ibid.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study is to analyze the history of the US Army corps artillery headquarters as it pertains to large-scale combat operations and to determine if there is a necessity to permanently re-establish such headquarters for large-scale combat and future multi-domain operations. This chapter is organized by reviewing chronological the US Army doctrine, scholarly journals, and historical accounts of the US Army corps artillery. The US Army doctrine researched consists of field artillery doctrine and its relation to US Army operational doctrine. The historical accounts consist of primary and secondary sources. These documents and articles were analyzed using the principles of fire support planning as well as the roles and responsibilities of the FFA HQs and the fire support coordinator (FSCOORD) at the corps level as outlined in Field Manual (FM) 3-09, *Fire Support and Field Artillery Operations*.

The groups of relevant literature written covering the history and doctrine of US Army corps artillery are US doctrine, historical studies, journal articles, and literature. These groups each have unique perspective on the history and employment of corps artillery. The doctrine throughout the time period covered during this study has evolved based on technology development, strategic guidance, and force structure. The historical studies include a Master of Military Art and Science thesis. Journal articles provide a unique perspective because these articles discuss from a primary source perspective the employment of corps artillery utilizing doctrine and the force structure, what short falls existed, and probable solutions could be implemented. The literature spans the period during which corps artillery was developed and employed throughout the time-period

covered in this study. The literature within the scope of this study has provided analysis on the effects of corps artillery.

The doctrine that has been written on corps artillery within the scope and limitations of this study can be divided into two categories: operations and field artillery. The operational doctrine discusses the framework which the US Army uses to plan, synchronize, and execute operations. The field artillery doctrine examines how field artillery or fires is implemented to support the operational doctrine. These two categories can then be sub-divided into time periods based on the scope of this study: World War I, World War II, 1940 specifically, and AirLand battle during Operation DESERT STORM.

Doctrine

The United States entered World War I with little to no existing doctrine on how to employ field artillery assets as an indirect fire weapon system. The US previously had been employing artillery as a direct fire weapon system similar to most Western armies prior to World War I. Static trench warfare and improvements of the machine gun had made the use of artillery as a direct fire weapon system unfeasible and had increased the number of artillery pieces on the battlefield. The British and French armies, with influence from their adversaries particularly the Germans, had developed new doctrine and techniques for employing a large quantity artillery as an indirect fire weapon system. The US quickly learned this doctrine from the allies and implemented it as their own. The US field artillery community published the new doctrine in the form of artillery notes. During World War I there were over twelve different artillery notes published covering a variety of topics from the organization of field artillery to detailed gunnery solutions for firing. This study focused on *Field Artillery Notes One, Four, Nine*, and the *General*

Notes published between May 1917 and April 1918. These *Field Artillery Notes* were selected for study because of the topics covered in these notes are relevant to the organization, structure, and employment of corps artillery during World War I.

Field Artillery Note One was published in May 1917 and was taken primarily from the British Army. *Field Artillery Note One* set the foundations of the way US corps artillery would be organized and the roles and responsibilities for the organization, as well as the initial development of the principles for planning fire support. The primary role for corps artillery would be counter-battery or counter-fire. This was because of the extended range of the artillery assets controlled by corps artillery, the ability to coordinate with adjacent artillery for immediate support, and to shape the battlefield for the subordinate divisions by allowing the divisional artillery to engage on targets in support of the infantry.

A general officer was to command the corps artillery due to the vast amount of artillery within the corps, but also to establish an effective artillery chain of command.¹ The divisional artillery and non-divisional artillery brigades or groups would be commanded by a colonel or lieutenant colonel. This structure provided a single commander and headquarters responsible for planning, allocating, and sustaining all the artillery within the corps area. The corps artillery commander would also be able to centralize the control of all the artillery allocated to the corps operating area during operations to mass the corps on targets dictated by the corps commander. The corps artillery commander had the responsibility of allocating non-divisional artillery to divisions for an operation.

Non-divisional artillery was usually comprised of a battalion or larger artillery organization that was not organic to a division. The corps artillery commander would place the non-divisional artillery into groups for a specific time or operation, but always retained artillery at the corps level to provide counter-fire or engage targets critical to the corps commander. These groups would be constructed based on the mission that the artillery was to conduct in support of the division, rather than the caliber or type of howitzer.² The support relationship between the allocated artillery group and the division artillery would be typically be general-support-reinforcing or reinforcing. The corps artillery commander would allocate artillery to the divisions based on the tactical situation.³ The corps main effort for an operation would receive most of the non-divisional artillery and the supporting efforts would receive an allocation to allow immediate field artillery support to the committed units. The non-divisional artillery were groups of artillery not assigned to the corps, but could be reallocated between corps based on the direction of the Army commander. The quantity of ammunition by type is the largest limiting factors in developing a field artillery plan. The corps artillery commander and headquarters were responsible for developing a feasible corps artillery fire plan for all field artillery assets and ammunition available, not only for the initial operation, but for future operations that were to be conducted by the corps. The last major principle for planning field artillery in support of operations dictated in *Field Artillery Note One* was never place artillery in reserve.⁴ An infantry unit may be placed in reserve to support an operation, but the artillery organic to that infantry organization is never in reserve. The doctrine required its continuous employment to support the operation, even if its organic unit is not employed.⁵

Field Artillery Notes Number Four was published in July 1917 and was primarily taken from the French Army. It codified the organization tables for the corps artillery, the organization of artillery under corps artillery, and refined the development of artillery groups. *Field Artillery Notes Number Four* codified the organization structure of the corps artillery headquarters and was in effect upon publication. The codification of the structure of corps artillery official organization the chain of command for artillery. The rank of the corps artillery commander was specifically annotated because that commander must be able to take command of the reinforcing artillery, when it is allocated to the corps.⁶

The artillery command structure provided subordinate organizations a single commander and headquarters from which to receive orders.⁷ This was significant to the American artilleryman serving in France under French corps artillery. The French Army did not have a single commander and headquarters to which the artillery was responsible for reporting. At times in France during the war, American artillerymen attached to the French Army would receive multiple orders from various French headquarters creating confusion, while denying the ability to centralize control and mass field artillery fires.⁸ A single artillery headquarters was needed that could centralize control and mass fires at the decisive point in support of the commander's guidance.

Field Artillery Notes Number Four also continued to build on the foundations of the principles of field artillery planning and the FFA HQs. The development of non-divisional artillery and groups of artillery became more refined with the publication of *Field Artillery Notes Number Four*. The purpose of these groups was to provide rapid reinforcing fires and adequate fire support to committed units, as well as immediate fire

support to the commander to influence the operation. The corps artillery headquarters began to develop into the FFA HQs and plan using the current principles of fire support. The corps artillery headquarters organized the field artillery for combat based on missions to shape the battlefield for subordinate divisions by retaining heavy and long-range artillery for counter-fire and allocated groups of non-divisional artillery to divisions based on the tactical situation. The allocation of groups to divisions was not fixed organizationally. The corps artillery commander was responsible to develop a field artillery plan that was mutual supporting between divisions and provided immediate fire support to the subordinate commanders of committed units.⁹ The allocation of assets into groups of artillery provided flexibility to the maneuver commander to adjust the plan based on the mission, enemy, and terrain.

The *Field Artillery Notes* were published in April 1918 and they were a collection of edited and reprinted British documents. These documents primarily discussed the topic of counter-battery or counter-fire operations. “The destruction of the enemy’s artillery was identified as the most important factor of success.”¹⁰ Counter-fire was a constant battle regardless the type of operation being conducted. Counter-fire was not just directed at the cannons or howitzers, but also at the command and control systems used by the artillery. The planning and execution of the counter-fire plan was a corps commander and corps artillery commander responsibility. Counter-fire required centralization at least at the artillery brigade level, and then synchronized and massed to avoid sporadic fire from a single battery of artillery that would have little effect and potentially provoke the enemy artillery to counter-fire on a single battery.¹¹ The corps artillery counter-fire plan must also destroy, or at a minimum, neutralize enemy artillery in the corps area, but also be

flexible enough to provide general support reinforcing artillery fire to the adjacent corps. The corps artillery commander and headquarters were required to develop counter-fire areas in which adjacent corps artillery to conduct counterfire and provide mutual support. The counter-fire areas would be overlapping along the flanks to not provide the enemy with an area where there was minimal artillery coverage also reduced the amount of coordination required to conduct cross-boundary fire.¹² The only restriction on firing into the counter-fire areas in front of adjacent corps was the allocation of ammunition to support counter-fire in that area. The allotment of artillery that comprised the counter-battery group was the responsibility of the corps artillery commander.

Field Artillery Notes Nine outlined the principles of counter-fire as the destruction of the enemy batteries and artillery personnel, disrupt the ammunition support system, and neutralization of the enemy's artillery network.¹³ The effect of neutralization during this time period would be defined as suppression in current doctrine. *Field Artillery Notes Nine* emphasized that counter-fire was a corps artillery mission and discussed the planning and execution of conducting counter-fire operations.

General Notes on the use of artillery was translated and published in November 1917. The *General Notes* is focused on the organization and missions of artillery at the Army, corps, and division levels, as well as defining the roles and responsibilities of the commanders. The corps artillery commander exercised direct control over all the artillery in corps and would allocate portions of the corps artillery to the divisions based on the tactical situation.¹⁴ The artillery allocated from corps artillery to division artillery would serve in a general support reinforcing role and artillery could not be re-task organized below the battalion level. The corps artillery commander also serves as the corps fire

support coordinator (FSCOORD) and is responsible for recommending to the corps commander any changes to the field artillery organization for combat, as well as call for a division artillery to re-enforce an adjacent division. The corps artillery commander was also responsible for developing zones of fire for the subordinate divisions. Each division would be given a zone in the direct front of the division, which was controlled by the division commander and the division artillery commander, as well as a contingent zone of action. The contingent zone of action provided re-enforcing artillery fire to an adjacent division.¹⁵ The coordination to fire into a contingent zone of action was between divisions with a reporting requirement to the corps artillery.

General Notes on the use of artillery re-emphasized the importance of counter-fire and that destruction was the desired effect. It was the corps artillery's responsibility to develop the daily counter-fire scheme and schedule to mass the artillery on the desired enemy batteries. Massing artillery fire on the desired enemy batteries was of great importance because of the enormous quality of ammunition required.

General Notes on the use of artillery defined the roles of artillery in offensive and defensive operations. Elements of the current principles of planning fire support and the roles and responsibilities of a FFA HQs are beginning to be codified in US Army doctrine. The purpose of artillery in offensive operations was to facilitate the seizure of objectives by maneuver forces, deny the enemy's ability to counter-attack, and to support in exploitation.¹⁶ During the preparation phase, the artillery was tasked to destroy the enemy artillery and neutralize (suppress) the enemy artillery when the attack was commenced, destroy defensive battle positions, and conduct interdiction fire on enemy reinforcements, command posts, and sustainment locations. During the attack, the

artillery was to provide immediate and constant fire on targets that the maneuver units acquired. To achieve these tasks the artillery plan of action—currently known as the scheme of fires—for each phase of offensive operations consisted of eleven principles: organization of the command, designation of the targets, allotment of artillery to the attacking units, formation of unattached artillery into organized units, position, grouping into commands, zones of actions, liaisons, observation, movement of the artillery both echeloned and continuous, and ammunition supply.¹⁷

Defensive operations during World War I were complex and the artillery was a major element of a successful defense. The plan of action for the artillery or scheme of fires consisted of eight principles; plan of action of the artillery defense, organization of the commands, distribution of missions among units, role of heavy artillery and organization of the counter-batteries, offensive counter-prep, plan for barrages, fire for reprisal, table of concentrations of fire, and plan of observation and of liaisons.¹⁸

Planning artillery for both the offensive and defensive operations was conducted at the corps level by the corps artillery headquarters to shape the operation for the subordinate divisions. The corps artillery commander and the artillery headquarters had overall responsibility for the scheme of fires to facilitate massing of all artillery in the corps area and to ensure there were no dead-space in artillery coverage across the corps boundary and with adjacent corps.

World War II Doctrine

During World War II, the US Army published two versions of FM 6-20, *Field Artillery Field Manual, Tactics and Technique*, the first in 1940, and the second in 1944. This study focused on the 1940 version because the case study for World War II is the

Battle of Anzio, 22 January 1944 to 22 June 1944, which occurred before the publication of the 1944 version of the manual. The primary role of corps artillery was to conduct counter-fire along with the neutralization of command posts and enemy troop concentrations, interdiction along logistics routes and avenues of approach, and the destruction of obstacles and defensive positions.¹⁹ The corps artillery was flexible with a large pool of weapon systems and units to provide general support to the corps. Portions of the organization could provide general support or direct support to divisions based on the tactical situation or corps artillery commander's guidance.²⁰ This provided the corps commander with flexibility in the use of artillery because of its ability to provide a large amount of firepower across the width and depth of the battlefield without repositioning. Large numbers of non-divisional artillery provided this flexibility because artillery organizations could be quickly re-allocated to subordinate units.

There was a significant change in the command structure between World War I and World War II and in the development of the FSCOORD role. The corps artillery commander would no longer have direct command of the division artillery. Any direction of the division artillery by the corps artillery was made through the corps commander.²¹ The corps artillery commander was called the corps artillery officer. The corps artillery officer preformed the duties of a special staff officer to advise and assist the corps commander in all matters regarding artillery, as well as commanding all the artillery organic and attached to the corps, which was not allocated to subordinate units.²² The corps artillery officer was primarily responsible for designating allocated zones of fire for the subordinate divisions and coordinating artillery fire across the corps area. The corps artillery officer had eight primary duties: recommend and prepare plans for employment

of the artillery with the corps which also included the allotment of reinforcing artillery to subordinate divisions, temporary control to be exercised over division artillery for the preparatory phase of an operation and reinforcing the counterbattery fire of the corps, positions and observation for the artillery retained by corps, assigning missions and zones of fire to corps and the subordinate division artilleries, facilitate the coordination between any artillery units operating in the corps area, control the corps counter-fire, and control displacement of artillery with the corps area to ensure they was always artillery fire available. The corps artillery officer also was required to prepare the artillery annex to corps orders, regulate combat of the artillery with the corps according to instructions of the corps commander, organize corps artillery for combat so as to prescribed for efficient execution of counterbattery and other special missions, a range with the Army artillery and with the artillery of adjacent corps for mutual reinforcement and coordination of fires, coordinate the fire of the artillery with the combat aviation and tanks assigned missions in the corps of action, allocate artillery ammunition to the divisions and to the corps artillery and to supervise its distribution, and submit recommendations regarding artillery personnel, materiel, and methods.²³

The corps artillery officer's headquarters remained the corps artillery headquarters. The headquarters was staffed to facilitate the duties the corps artillery officer and preform the roles of a corps level artillery. The intelligence section was responsible to receiving information regarding enemy artillery locations and disposition to enable effective counter-fire.²⁴ The operations section prepared detailed tactical plans of organization and the employment of the artillery within the corps. corps artillery's primary mission was counter-fire and the operations section in the headquarters also had

a counter-fire officer. The counter-fire officer's primary duty was to coordinate and synchronize counter-fire operations within the corps.²⁵ The counter-fire officer also had the authority to assign counter-fire missions directly to battalions.²⁶ The corps artillery also had a logistics section devoted to the allocation and distribution of artillery ammunition.²⁷

The primary mission of the corps artillery was to conduct counter-fire. The corps artillery officer along with the corps counter-fire officer was responsible for planning and executing the corps counter-fire scheme. The corps counter-fire scheme included the artillery counter-fire organization for combat, zones of fire by unit, artillery positioning areas, assignment of specific missions based on type of target and firing unit, direct communications between the corps counter-fire officer and the counter-fire organizations to allow immediate neutralization of unplanned enemy batteries, and the synchronization of multiple firing units massing on a target.²⁸

The corps artillery officer and corps artillery headquarters were also responsible for developing the tactical organization or artillery organization for combat for the corps offensive and defensive operations. corps artillery developed the artillery purpose for the tactical missions, then organized the artillery organic or allocated to the corps into groups referred to as groupment. A groupment was a "tactical command formed by the temporary grouping of two or more battalions or larger tactical units assembled from different organizations" to perform a common artillery mission.²⁹ The groupment that would be allocated to division would serve in a direct support or general support role. The groupment retained by the corps artillery would be direct support or general support

to the corps to provide counter-fire, interdiction, long-range fire, or reinforce division artillery.³⁰

The corps artillery was responsible to develop the corps field artillery plan for the corps for both offensive and defensive operations. Several of the current principles for planning fire support are in doctrine from World War II. During offensive operations the corps artillery allocated the main attack the majority of the groupments available to weight the main effort. Corps artillery retained the groupments that were organized to conduct the corps artillery missions of counter-fire, neutralization of command posts and enemy troop concentrations, interdiction to shape the battlefield for the divisions, destroy obstacles and defensive positions, and to reinforce the division artilleries as required.³¹ The control of the artillery within the corps during the attack was dependent on the phase of the operation. During the preparation, the corps artillery retained centralized control of the both corps artillery and the division artillery to mass fires in order to disrupt the enemy's ability to synchronize.³² Once the attack had been initiated, the division artilleries regained control of their organic and allocated groupments to provide direct and general support fires. The corps artillery continued to conduct counter-fire, neutralization, and interdiction fires.³³ The corps artillery officer along with the staff continuously monitored the effects of the artillery and provided recommendations to the corps commander. The artillery plan for against the enemy counter-attack normally required the re-centralization of control to the corps artillery to provide immediate and adequate artillery fire for the committed units.

Defensive operations require a high level of centralized control to mass on enemy attack formations and to deny the attacker's ability to identify and neutralize the

defender's artillery. The defensive artillery plan was broken into the counter-preparation phase, the main attack phase, and potentially, the counter-attack phase.³⁴ The main missions of corps artillery during the counter-preparation phase was interdiction along avenues of approach and assembly areas, high pay-off targets of opportunity, and counter-fire.³⁵ The corps artillery continued to provide counter-fire and interdiction during the main attack. The corps artillery's zones of fire would be beyond the division artillery to shape the battle for the divisions, and on order, would reinforce division artilleries as the tactical situation dictated.³⁶ The corps artillery officer was responsible for ordering the initiation of fire during the defense. Artillery fire focused on enemy artillery and high pay off targets identified by the corps commander. The corps artillery priorities during defensive operations were counter-fire, reinforce division artilleries, and counter-preparation.³⁷

The development of the corps artillery plan was the responsibility of the corps artillery officer and the corps artillery headquarters. The primary means for planning artillery was the development of the artillery estimate. The artillery estimate was based on the types and amount of fire missions the artillery desired to support the maneuver plan. The type and amount of fire missions the artillery required drove the allotment of artillery to the corps.³⁸ This was possible because of the vast amount and types of artillery available in non-division artillery or groups of artillery that could be quickly reallocated between corps and divisions, unlike, the current practice which bases the artillery plan on the number of artillery systems available. Developing an estimate of artillery allowed the corps artillery officer and the corps artillery to ensure adequate artillery was available, the main effort for an operation received the major proportion of

available artillery, there was immediate artillery fire available to the commander to shape the battle, and artillery was never placed in reserve.

Upon completion of the estimate of artillery and the allocation of artillery assets to the corps, the corps artillery headquarters developed the corps artillery plan. The corps artillery plan consisted of recommendations of employment for the artillery, instructions to the subordinate division artilleries, and the methods of employment for all field artillery units within the corps. This provided flexibility to the corps commander because of the artillery's ability to provide a large amount of firepower across the width and depth of the battle without having to reposition.

FM 6-100, *Tactics and Techniques of Division Artillery and Higher Artillery Echelons* published in 1944 is the next doctrinal text to be analyzed in this study. This doctrine was published during the Operation Shingle, but provides insight into the roles and responsibilities of field artillery at the corps level during World War II. The mission of corps artillery was again defined as reinforcing divisions, neutralizing or destroying hostile artillery, interdiction on reserves, disrupt enemy command and control nodes.³⁹ Corps artillery consisted of an organic headquarters and headquarters battery and an observer battalion along with any attached non-division artillery. The corps artillery controlled all the artillery within the corps through either centralized or decentralized control. Centralized control was preferred to develop a synchronized and scheduled plan for artillery fires and to mass the entire corps, but was limited by the communications technology and was not always feasible based on the tactical situation. Centralized control was the primary means of control during defensive operations. Decentralized

control to the divisions was used in a limited fashion and typically during the second phase of an offensive operation.

The artillery organization for combat within the corps was a principle planning duty of corps artillery and the corps artillery officer. The artillery organization for combat consisted of allocated non-division artillery to divisions while retaining portions under corps control.⁴⁰ The artillery retained under corps would be divided into groups based on the group's mission. Groups were comprised of no more than four subordinate units either brigade or battalion sized. The missions for the corps artillery groups would be counter-fire, long-range fires, and interdiction. Artillery that could not fulfill these missions would be allocated to divisions with the majority being allocated to the corps main effort. The corps artillery groups would also provide general support or reinforcing fires when the tactical situation required.

The corps artillery officer was a position with a dual role. He was the commander of the corps artillery and served on the special staff to the corps artillery commander.⁴¹ Instructions to the division artilleries were given to the division artillery commanders in the name of the corps commander. As a member of the special staff he developed the field artillery estimate for the corps and the plan for the employment of artillery along with his headquarters. The corps artillery plan for employment consisted of the attachment of US Army Reserve artillery to divisions, the movement of units into position areas, allocation of ammunition to division and corps artillery, temporary control over division artillery during preparatory phase and reinforcing the counter-battery fire, assignment of artillery missions, coordination of artillery with naval and air force assigned attack or bombardment missions within the corps zone or sector, coordination

between artillery units, survey control for the artillery, and the procurement and distribution of maps, photomaps, and intelligence. These are the same roles that are outlined in current doctrine as the role the FFA HQs.

There are also similarities in the duties of the FSCOORD and the duties of the corps artillery officer as a member of the special staff to the corps commander. The corps artillery officer was responsible for preparing the artillery annex, organizing the corps artillery for combat, arranging with adjacent corps and Army artillery for mutual reinforcement, coordinate with intelligence section (S-2) for exploitation of artillery information i.e. flash-sounding and radar, coordinating the observer plan, and the estimate artillery requirements for an operation.

The corps artillery had two headquarters to control the execution of the artillery plan and each with its own purpose and personnel. The main corps artillery headquarters was to be located with corps main headquarters and was the main location for the corps artillery officer. The main headquarters was to control operations and begin to plan for follow-on operations. The secondary headquarters was the corps fire direction center, which was responsible for the all tactical fire direction for the corps. The corps fire direction center's primary mission was to control counter-fire operations and was synchronized by the assistant corps artillery commander, the corps counter-fire officer.

FM 100-5, *Operations* published in 1941 was analyzed to understand the operational framework the artillery was to operate within. The actions of the corps artillery had to support the operational framework that was outlined in FM 100-5, *Operations*. FM 100-5 was the doctrinal basis for how operations were to be conducted

during World War II. FM 100-5 outlined the operational framework, the role of corps and artillery, how artillery was to be organized, and its primary mission.

The operational framework differs slightly from the current doctrine outline in FM 3-0, *Operations*. Theater of operations was the portion of the land, sea, and air areas of the theater of war necessary for military operations. The military operations were limited to offensive or defensive and the Army was not required conduct stability operations. The commander of the theater of war executed both tactical control and administrative control similar to the current combatant commander. The theater of war was subdivided into two zones. The first zone was the combat zone in which combat operations were conducted. The combat zone was divided into areas for tactical control of armies, corps, and divisions. The combat zone was tactically controlled by the corresponding commander. The rear boundary of the combat zone was designated by the theater commander and would be adjusted to conform to the Army's position. The second zone was the communications zone and it was adjoining to the combat zone. The communications zone was what is currently referred to as the support zone. Within the communications zone, logistical and evacuations operations were conducted. The communications zone was a component of the theater operations which allowed combat commanders to focus on the offensive and defensive operations.

The corps during World War II was primarily a tactical unit focused on combat operations. The size of the corps combat zone was dependent on the tactical situation and the subordinate divisions that the corps controlled. Divisions were assigned their own combat zone within the corps' and the corps headquarters was overall responsible.

FM 100-5 also outlined the roles of the artillery. The artillery would be a direct support organization to the corps and would provide general support to the divisions as needed. Corps artillery was organized with an organic headquarters and headquarters battery with an observer battalion that included forward observers and artillery acquisition assets, such as radars and flash to sound assets. The corps artillery was not assigned any organic artillery. Non-divisional artillery would be allocated and attached to the corps artillery headquarters from the Army. The corps commander with recommendations from the corps artillery officer would then develop the field artillery organization for combat and form groups of artillery. Portions or all of the attached groups of artillery would then be allocated to divisions based on the tactical situation and artillery missions. The artillery retained under the corps artillery would be commanded by the corps artillery officer. The corps artillery's principal mission was the neutralization or destruction of hostile artillery. The other missions of the corps artillery were destruction of defensive positions, long-range interdiction, and reinforcing the subordinate division.

The next time period of doctrine that was reviewed for this study in which corps artillery was employed is the timeframe of the late 1980s and the promulgation of AirLand Battle Doctrine, which was used during Operation DESERT STORM. The primary manuals that are relevant to this study are FM 100-5, *Operations*, FM 6-20, *Fire Support in Airland Battle*, and FM 6-20-30, *Fire Support for Corps and Division Operations*.

FM 100-5 was the doctrine regarding Army operations which defined the roles and responsibilities of corps and artillery. Corps was responsible for operational level

planning and execution within its battle space. The corps' battlespace consisted of a combined battle area of its subordinate divisions, long-range weapons such as multiple rocket launcher systems, airborne and ground acquisition systems. Corps operations within its battlespace was focused on close operations to shape the battlefield using combined arms for its divisions. Corps would employ non-divisional organizations such as cavalry regiments and FAB to do so. Corps headquarters could now be selected to perform duties as a joint task force headquarters and commanders, which expanded the corps headquarters capacity and capability.

Field artillery's mission was to add depth the battlefield through neutralization, suppression, destruction fires as well as the employment of scatterable mines. The corps artillery commander was responsible for all means of fire support. This now included fixed and rotary assets, electronic warfare, and field artillery. The corps artillery commander possessed the ability to centralize fires at the corps level if the tactical situation required it. Elements of the principles of the current fire support were present in FM 100-5. There was a requirement for adequate and continual fire support available to committed units, and the need for an allocation to enable the commander to directly influence the course of a battle. During offensive operations, the main attack would receive most of the artillery or fires assets available. Corps artillery mission during offensive operations remained the same as it had been during previous doctrine. Its mission was to neutralize enemy artillery and command posts, interdict enemy reserves prior to their employment, and to destroy in-depth defensive positions. According to AirLand Battle doctrine, defensive operations required a broader balance due the

increased mobility of the US military, but also due the attacker's mobility. Regardless of the situation, the main effort was always allocated increased fire support.

FM 6-20, *Fire Support in Airland Battle* was the primary fire support doctrine in air-land battle and provided greater detail on the roles of artillery across a broad spectrum. Planning and coordination were the cornerstones of fire support and it was responsibility of FSCOORD to ensure that they were completed correctly. The FSCOORD was the driving force of fire support coordination across the corps, had requisite authority to direct and coordinate all fire support on behalf of the force commander, responsible for all fire support assets allocated to corps and supervised the operation of the force commander's fire support coordination agencies and command their respective field artillery organizations. Fire support systems must operate as one force and must be responsive enough to meet the needs of the force commander. To achieve the force commander's mission the FSCOORD directed the entire fire support system across the corps.

The corps artillery headquarters was organized into a headquarters and headquarters battery as well as the fire support element that was a part of the corps headquarters with organic artillery assigned to the corps artillery headquarters. Corps artillery provided field artillery support the subordinate divisions and to other corps maneuver elements by attaching or allocating non-divisional artillery to divisions. Non-divisional was in the form of FABs from regular army, army reserve, or army national guard organizations. Divisions would have artillery attached or allocated based on the tactical situation. The tactical missions that artillery would be assigned had expanded to

the current four missions of direct support, general support, general support reinforcing, and reinforcing.

The field artillery organization for combat was based on five principles as is in current doctrine. This was the first era in which the principles were codified to that which we see in current doctrine. The principles were adequate field artillery support for committed combat units, weight to the main attack in offense or more vulnerable area in defense, facilitate future operations, immediately available field artillery support for commander to influence the action, maximum feasible centralized control.⁴² There have been slight changes in the verbiage to the current form. These principles had been mentioned in the previous fire support doctrine, but this was the first time it was codified.

FM 6-20-30, *Fire Support for Corps and Division Operations* discussed the fire support coordinator's role at the corps level and corps artillery roles and responsibilities. These roles and responsibilities as an artillery headquarters had expanded beyond just field artillery assets. The corps artillery commander, the fire support element, and the corps artillery headquarters now focused on air assets, electronic warfare, and when applicable, naval fires assets. This would require detailed planning, coordination, and integration into the corps operations to allow the fires system to operate as a single effective organization.

The corps artillery commander also serving as the corps FSCOORD began the corps artillery planning effort by developing the corps level fires estimate. This included the task organization within the corps, availability of field artillery and other fire support resources, the enemy disposition and possible courses of action, what ammunition was available and time both for position and technical preparation. Targeting had begun to be

an element of planning and the FSCOORD was the lead for corps level targeting effort. The FSCOORD along with the corps artillery staff and fire support element developed high payoff targets and a target-oriented method of target analysis. The target process begun to be married to the air tasking order produced by the Air Force to engage targets beyond the range of artillery.

The large amount of fire support assets available and the improved ranges in weapon systems required a large amount of coordination not only within the Army but also other branches of the military that would have assets operating within the corps airspace. The development of fire support coordination measures assisted with the integration of all fire support assets. The corps fire support coordinator, fire support element, the corps artillery staff, and the battle coordination element (currently known as the battlefield coordination detachment) all play a critical role in developing the proper fire support coordination measures and airspace coordination measures. These coordination measures facilitated fire support assets' integration across the battlespace. The two main coordination measures that were developed were the fire support coordination line and the coordinated fire line. The fire support coordination line was a permissive boundary that allowed Air Force and Navy assets to engage targets beyond the control of the Army. The Army could also engage targets beyond the fire support coordination line, but it must be coordinated with the appropriate tactical air commander and other supporting elements.⁴³ Corps artillery was responsible for developing and coordinating the location of the fire support coordination line with the Air Force or the appropriate air space control authority. The coordinated fire line was also a permissive boundary to allow indirect fire systems to engage targets beyond without coordination.⁴⁴

Typically, the coordinated fire lines were developed by division and below, but corps artillery would normally develop a corps level coordinated fire line to focus corps artillery on specific areas of the battlefield.

The development of these boundaries was important because it allowed the integration of the three Air Force missions to effect Army operations. The Air Force would provide air interdiction, battlefield air interdiction, and close air support to the Army. These missions were coordinated between corps artillery and the battlefield coordination element and executed in certain areas of the battlefield framework. The purpose of air interdiction was to destroy, neutralize, or delay targets prior to them being employed on the battlefield.⁴⁵ These targets typically included follow-on forces, lines of communications, logistic nodes, and command and control elements. These targets were beyond the fire support coordination line and the friendly effects would not have direct effect friendly forces, but engaging these targets required joint planning and coordination. Battlefield air interdiction was similar to air interdiction with the exception that it was executed both beyond and short of the fire support coordination line. Battlefield air interdiction could have direct effect on friendly forces and required joint integration and planning, but not detailed integration because it was not in close proximity to friendly forces. Battlefield air interdiction is no longer in current doctrine. Close air support missions would be conducted short of the fire support coordination line and would have direct effects on friendly forces. Close air support required detailed integration, direct and indirect control due to the proximity to friendly forces.

Corps artillery, in conjunction with the battlefield coordination element, developed the corps fire plan across the corps battle space. The critical factors in

developing the corps fire plan was support forces in contact, support all aspects of the battle plan, synchronize fire support, and support and sustain fire support.⁴⁶ Corps retained the primary role of providing counter-fire to deny the enemy's ability to place effective artillery fire on friendly units within and adjacent to the corps area. The corps artillery was focused on the deep area and the close area. Corps artillery was focused in the corps deep area of deny enemy ability to concentrate combat power, influence the control rate at which enemy can introduce forces into close battle, deny enemy freedom of action, and set conditions for close operations.⁴⁷ The close area the corps artillery was focused on the complete defeat of engaged echelons and enabling maneuver to achieve operational objectives.⁴⁸ A significant development in fire support planning brought out in the AirLand Battle doctrine was the concept of "top-down planning" and "bottom-up refinement." This concept was new to doctrine within the field artillery and was enabled by the increase in command and control technologies that allowed flexibility in the development of the fires plan. The corps artillery would develop the overall corps fires plan and publish it to the subordinate organizations. The subordinate organizations would refine the fires plan based on the subordinate organizations mission and provide more details to the fires plan. The plan would then be returned to corps artillery with the fires plan and based on the corps commander and the corps FSCOORD the plan would be adjusted to ensure that the fires assets were unison to support the maneuver force.

The final time period of doctrine that was reviewed during this study was current doctrine. This study reviewed Army Technique Publication (ATP) 3-92, *Corps Operations*, FM 3-09, *Field Artillery Operations and Fire Support*, and ATP 3-09.24, *Techniques for the Fires Brigade*. It is important to note that during this time period that

this is the first time period that corps artillery headquarters no longer exists in the force structure. The gap that was created by the de-activation of corps artillery is supposed to be covered by the corps chief of fires, the corps fires cell, and the FAB.

ATP 3-92, *Corps Operations* is the current doctrine on the roles and responsibilities of corps during operations. The United States Army corps headquarters is the link between the operational and the tactical levels of warfare. During large-scale combat operations the corps headquarters is the highest tactical command headquarters. The corps headquarters can also serve as a joint task force headquarters, a joint, multinational, or land component command headquarters. The corps headquarters is a battalion-sized element which is organized by warfighting functions and responsibilities. The corps chief of fires is the senior artillery officer within the corps staff.⁴⁹ The corps chief of fires advises the corps commander on all matters of fire support and leads the targeting process when the corps FSCOORD is not present. The corps FSCOORD is the FAB commander for the FAB allocated to corps. Corps have subordinate divisions and non-division brigades assigned and there is no standard organization for the number of subordinate divisions or non-divisional brigades assigned to corps. Typically a corps is allocated a military intelligence brigade, a maneuver enhancement brigade, and a FAB.

The FAB affords the corps commander the ability to plan, coordinate, and execute fires and conduct corps level targeting in support of the corps operations.⁵⁰ The FAB provides a FFA HQs if designated by the corps commander, provides long range fires to support subordinate divisions and brigades, and a headquarters to control of all Army fires capabilities.⁵¹ The FAB can also serve as the counter-fire headquarters and responsible for corps-wide target acquisition.⁵² The FAB commander is also the corps

FSCOORD and must work closely with the corps chief of fires and the corps fires cell.

The corps chief of fires is part of the corps coordinating staff and works closely with the corps commander, operations officers, and the corps FSCOORD, if available. The corps chief of fires is a colonel position making him the senior artillery officer on the corps staff and advises the commander on the employment of fires, yet this individual is not a command with any vested authority. He and the rest of the fires staff plan and coordinate the warfighting function of fires. The corps chief of fires also leads the targeting working group in the absence of the corps fire support coordinator.⁵³

The corps chief of fires is supported by the corps fires cell. The fire cell coordinates indirect and joint fires, electronic warfare, and nonlethal effects within the corps. It accomplishes this by developing and recommending the scheme of fires for the corps commander's approval.⁵⁴ The corps fires cell also must integrate with the intelligence section of the staff during the targeting process and the development of the scheme information collection because the fires cell is also the senior artillery senior manager for the corps. The fires cell must work closely with and support the FFA HQs if one has been established. If a FFA HQs has been established the fires cell can be given operational control over artillery that have been allocated and retained by the corps to support the tactical situation.⁵⁵

FM 3-09, *Field Artillery Operations and Fire Support* discusses the principles, tactics, and procedures for field artillery and fire support across the realm of army operations and the spectrum of conflict. The field manual is the second manual in the hierarchy of the field artillery doctrine. FM 3-09 codifies the principles of fire support

execution, the FFA HQs, the duties of the fire support coordinator, duties of the corps fires cell, role of FABs, and artillery support-relationships.

The principles of fire support execution were known in AirLand Battle doctrine as the principles of field artillery. The change from field artillery execution principles to fire support execution principles is was to ensure that all the fire support assets, not just artillery was properly planned and integrated into every operation. The fire support execution principles are adequate fire support for committed units, weight to the main effort, immediately responsive fires, facilitate future operations, maximum feasible centralized control, and never leave artillery in reserve.⁵⁶ These principles had been previously codified in doctrine but had limited them to only field artillery. The new FM 3-09 published April 2020 expands these principles to all fire support assets to include lethal and nonlethal systems.

Adequate fire support for committed units is a minimum of one field artillery battalion in direct support of a committed brigade. There can only be one field artillery unit in direct support of a maneuver unit, but a maneuver unit can be allocated other field artillery units with a different command support relationship. Adequate fire support also consists of fixed and rotary wing aviation assets as well as nonlethal capabilities such as electronic attack systems.

Weighting the main effort or the decisive operation with the majority of fire support systems is to increase the support of the main effort or decisive operation to set conditions for success. Weighting the main effort or decisive operation can be accomplished through several means; an increase in the allocation of lethal and nonlethal fire support systems, the development of command and support relationships assigned to

fire support assets to increase responsive fires, additional or particular ammunition can be allocated, target acquisition assets can be prioritize to support, and the priorities for fires can be allotted.

Immediately available fire support for the commander to influence the operation is typically accomplished by the command retaining centralized control of certain fire support assets. Different command support relationships can be employed to increase flexibility of the fire support system while allowing the commander to immediately influence the operation while supporting subordinate units as required. This also allows flexibility within the fires plan. Facilitating future operations allows seamless transition between phase of an operation. This can be accomplished by developing command and support relationships between artillery units and maneuver units, and proper positioning of artillery, ammunition, and target acquisition assets.

The maximum feasible central control principle depends on the tactical situation and the type of operation that is being conducted. Defensive operations require a higher degree of centralized control because it is difficult to determine the location and time of the enemy attack. Offensive operations typically have a lower level of centralized control because the maneuver force has the initiative, but in certain operations, such as a combined arms breach or wet gap crossing higher degrees of centralized control are required.

The last principle is to never leave artillery in reserve. A maneuver force may be placed in reserve, but the artillery must always provide fire support to the force as whole. This can be accomplished by re-positioning the artillery or developing the command and support relationships within the force.⁵⁷

Implementing these principles properly requires a headquarters capable of the task. The FFA HQs is designed to complete this task. A FFA HQs is “a battalion or above field artillery headquarters designated by the supported commander who specifies its duration, duties, and responsibilities.”⁵⁸ The organic field artillery headquarters typically serves as the FFA HQs. A division’s FFA HQs is the division artillery headquarters while brigade’s FFA HQs is the organic artillery battalion headquarters. Corps do not have an organic artillery headquarters and the FABs headquarters can be designated to serve as the corps FFA HQs. The FFA HQs has many possible functions that the supported commander dictates to the headquarters. The FFA HQs facilitates a single point of contact for organizations to coordinate for support or integration such as the battlefield coordination detachment for the integration of Air Force assets. The headquarters provides command and control for subordinate artillery organizations to ensure the entire fire support system can support the maneuver commander’s operation in its entirety. The FFA HQs develops the field artillery support plan and assists the fire support element in the development of the fires annex for the operation order. This includes developing the field artillery organization for combat which establishes command and support relationships, positioning guidance for artillery and target acquisition assets, and ensure appropriate sustainment is provided for subordinate artillery organizations, particularly ammunition.⁵⁹

The commander of the FFA HQs is typically the fire support coordinator. The FSCOORD is “the senior field artillery commander for the theater, corps, division, brigade combat team and is the maneuver commander’s primary advisor to plan, coordinate, and integrate field artillery and fire support in the execution of assigned

tasks.”⁶⁰ The FSCOORD is a the senior advisor to the maneuver commander in all aspects of fire support and the commander of their respective field artillery organization.⁶¹ The FSCOORD has overall responsibility to ensure that the fire support system is integrated and in harmony with the maneuver commander’s plan. This includes the fire support personal as well as the delivery assets.

The corps FSCOORD is supported by the corps fires cell within the corps staff. The corps fire cells primary focus is corps level targeting.⁶² The corps fires cell will develop high pay-off targets, as well as the possible delivery systems with effects. Upon approval of the recommended targets by the corps commander, (under the supervision of the corps fire support coordinator) the corps fire cell develops and recommends a scheme of fires that includes lethal and non-lethal assets to deliver the approved effects on the targets.⁶³ This requires a synchronization of all fire support assets under the command of the corps as well as Air Force assets. Integrating with the Air Force requires input into the appropriate air tasking order, developing fire support coordination measures and airspace coordination based on the target’s locations and artillery position areas for artillery fires assets under corps control.

Corps are typically allocated at least two FABs to support operations. One FAB headquarters serves as the FFA HQs with the FAB commander acting as the fire support coordinator. The FAB provide a headquarters and strike fires via rocket and missile fires, and target acquisition assets to the corps.⁶⁴ The second FAB serves as the counter-fire headquarters.⁶⁵ The mission of the counter-fire headquarters is to synchronize fires to destroy or neutralize enemy in-direct fires on friendly forces. The counter-fire works closely with the intelligence section for tasking authority for sensors to detect enemy fires

assets..⁶⁶ The artillery target acquisition assets must be integrated and synchronized with all detection assets available to corps. As one can see, there is a need for a single headquarters and a commander vested with the authority to provide command and control for the multiple field artillery organizations and fires assets within the corps' area of operations, which points to the need for corps artillery headquarters to serve in that role.

Field artillery command and support relationships allow the FSCoord and the FFA HQs to plan and execute missions using the principles of fire support. There is a limited amount of field artillery assets currently available, but the range of the assets allow a single asset to support multiple maneuver forces during operations. The four command and support relationships used in artillery are direct support, general support, general support reinforcing and reinforcing each with specific caveats and controlling headquarters. Direct support is the most de-centralized support relationship. The artillery unit in a direct support role only answers calls for fire from the organization it is supporting. A maneuver force can only have one artillery unit as a direct support organization. Reinforcing requires an artillery unit to provide support to another artillery mission. A direct supporting artillery unit may be reinforced by up to two other artillery battalions. The reinforcing unit maintains its command relationship with its original organization while the reinforced unit positions and establishes priorities for the reinforcing unit..⁶⁷ General support-reinforcing artillery unit supports a maneuver force in its entirety and reinforces another artillery unit. The priority for artillery support is to the maneuver force then reinforcing the artillery unit. The maneuver command or the associated FFA HQs controls a general support-reinforcing artillery unit. General support-reinforcing artillery provides a great deal of flexibility into the field artillery plan

because an artillery unit and perform multiple different missions in support of maneuver and other artillery units. The last command and support relationship is general support. General support is the highest degree of centralized control because all the field artillery assets are under the immediate control of the supported command or associated FFA HQs, in the case of a corps this requires a headquarters that can coordinate the fires of multiple field artillery organizations with appropriate command authority. General support artillery cannot be subdivided into other missions.⁶⁸

Table 1. The Seven Field Artillery Inherent Responsibilities

in Army Support Relationships

<i>Army support relationship</i>	<i>Answers calls for fire in priority from:</i>	<i>Has as its zone of fire:</i>	<i>Furnishes fire support team (FIST):</i>	<i>Furnish liaison officer:</i>	<i>Establishes COMM with:</i>	<i>Is Positioned by:</i>	<i>Has its fires planned by:</i>
Direct Support	1. Supported unit 2. Own observer ¹ 3. FA HQ ²	AO of supported unit.	Provides temporary REP for casualty losses as required	No Requirement	Supported HQ and FSO as required	Supported unit or FFA HQ	Supported unit or FFA HQ
Reinforcing	1. Reinforced FA 2. Own observers ¹ 3. FA HQ ²	Zone of fire of Reinforced FA.	No Requirement	To reinforced FA unit HQ or as required.	Reinforced FA unit HQ or as required	Reinforced FA unit HQ.	Reinforced FA unit HQ
General Support Reinforcing	1. Supported unit. 2. FA HQ. ² 3. Reinforced unit. 4. Own observers. ¹	AO of supported unit to include zone of fire of reinforced FA unit.	No Requirement	To reinforced FA unit HQ or as required.	Reinforced FA unit HQ or as required	1. Support unit. 2. FFA HQ. ²	1. Support unit. 2. FFA HQ. ²
General Support	1. Supported unit 2. FFA HQ. ² 3. Own Observers	AO of Supported unit.	No Requirement	No Requirement	No Requirement	1. Support unit. 2. FFA HQ. ²	1. Support unit. 2. FFA HQ. ²
Note: (1). Includes all target acquisition means not deployed with the supported unit. In NATO, the gaining unit may not task-organize. Note: (2). If designated by the support commander.							
AO	area of operation						
COMM	communications						
FA	field artillery						
FFA	force field artillery						
FIST	fire support team						
FSO	fire support officer						
HQ	headquarters						

Source: Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, October 2017), 4-9.

ATP 3-09.24 discusses the techniques for the fires brigade. This doctrine is current, but has lost some relevance since the fires brigades were re-organized to only multiple rocket launch system or high mobility artillery rocket system battalions, removed from divisions and allocated to corps, and the name organization's name was changed to FABs. This study will refer to the fires brigade as the FAB. The doctrine does

still provide some insights on the roles and responsibilities of the organization. FM 3-09 published April 2020 refers to this organization as the FAB, but ATP 3-09.24 refers to the organization as a Fires Brigade. The FABs are unique in that they are the only artillery organizations that are not organized within a brigade combat team or within a division.⁶⁹ The FAB can serve as the FFA HQs for either a corps or a division depending on the tactical situation, but has limited capability due to the organization of its headquarters, the equipment therein, and the fact that it is commanded by a colonel rather than a general officer.

US Army Reports

The United States Army conducted several reports immediately following the end of World War I to understand what changes were required for the force structure and organization of the Army based on the experience. The two boards that are applicable to this study are the *Hero Board* and the *Westervelt Board*. These boards discussed the requirement for corps artillery and its structure.

The *Hero Board* was concluded in December 1918 and had four major findings regarding corps artillery and its structure. The board acknowledged the need for corps artillery and its missions. The experience from the commander's and the artillerymen in French had taught them that an artillery organization above divisions was required to shape the battlefield for the divisions. The missions that corps artillery executed during World War I of counter-fire, interdiction, and long-range fires needed to remain corps level missions. This allowed the division's artillery to focus on supporting the division's maneuver elements. These observations seem applicable to today's challenge with the employment of artillery at the corps level.

The board identified two changes for corps artillery. The first was a change in the staff organization at the corps level. The board recommended that corps artillery commander and his staff should be permanently assigned to corps.⁷⁰ This would allow better command and control of the artillery and the development of standard operating procedures within the corps. The second recommendation for change was an increase in the quantity of non-division artillery or groups of artillery that could be allocated to the corps artillery. There are numerous accounts throughout the report of commanders stating that corps artillery was a requirement during the war but there was typically a lack in the number of artillery assets to complete the corps artillery mission while divisional artilleries needed more support from corps artillery. The board also allowed commanders to offer opinions on the findings and nearly all agreed with the role and need for corps artillery and that there needed to be an increase in the amount of artillery that could be allocated. The increase in artillery available would allow greater flexibility across the corps and the army. The corps should be allocated a larger amount of non-divisional artillery so it could focus on its missions and provided an appropriate allocation of resources to the main effort or deceive operation. Here again, we see relevance to today's challenges from a report written over one hundred years ago addressing similar issues.

The second board that is relevant to this study is the *Westervelt Board* completed in May 1919. The *Westervelt Board* was focused on the armament and task organization of the artillery has an entire branch. The role and mission of corps artillery was again found to be necessary and required to conduct successful operations. There were two primary questions regarding the armament as well as duties of the members of corps artillery. There was discussion with regard to confliction between the duties of the corps

artillery commander and the chief of artillery. The members of the board along with other high-ranking officers discussed if the positions should be separate and if the chief of artillery would have authority over the corps artillery commander. The decision was to have the corps artillery commander and the chief of artillery remain a single position. The armament of corps artillery was also discussed. The corps artillery should be equipped with artillery that was suitable for its typical missions that required greater range for deeper interdiction and counter-fire. The typical problem was that corps artillery had almost the same weapon systems as the divisions making it difficult for corps to affect the enemy at a greater range than divisions.

Literature

There have been numerous books written discussing corps artillery and the conflicts in this study is focused on. This study focused on seven different books to analyze. Four of these books were focused primarily on artillery and its role in war and the other three were books discussing the conflicts themselves.

King of Battle and the *Organizational History of Field Artillery* are two literature sources that discuss the history of United States Army field artillery. These sources were used to gain a better understanding of the structure and organization by time period. Each of the time periods analyzed in this study had different force structures due to technology and the conflict that was being conducted. These sources were both published prior to the in-activation of corps artillery headquarters. *King of Battle* and the *History of United States Army Field Artillery* both provide analysis on issues that artillery was attempting to solve and retrospective analysis on the solutions that were developed.

J. B. A. Bailey's *Field Artillery and Firepower* was also reviewed in this study. *Field Artillery and Firepower* also discusses artillery's structure and employment across the time period used during this study. Bailey is a British officer and primarily focused on British artillery but would analyze both American and German artillery. Bailey was able to synthesize the elements of employment and structure particularly as the FFA HQs, the role of the corps artillery commander or fire support coordinator, and the principles of planning for the employment of artillery.

Steel Wind discusses the development of artillery as an indirect fire weapon system from the German perspective during World War I. The primary focus of *Steel Wind* is Colonel Georg Bruchmuller's actions to develop the command and control structure for artillery, the missions of artillery, and the foundations of fire support planning. Colonel Bruchmuller can be viewed as the first successful artilleryman to synchronize, plan, and employ artillery on a large scale as an indirect fire weapon system.

Operation Shingle was an allied amphibious assault in vicinity of Anzio, Italy, in 1943 in an attempt break through the Gustav Line. Corps artillery was a large contributing factor in the success of the operation to secure a beachhead north of the Gustav Line. *From Salerno to the Alps is the History of Fifth Army during World War II* edited by Lieutenant Colonel Chester G. Starr. The employment of massed US corps artillery had direct effect on operation shingle. corps artillery successfully conducted its primary mission of counter-fire, but also had devastating effects on counter-preparation and during defensive operations. IV Corps Artillery was able to develop field artillery overmatch against the Germans by destroying or neutralizing enemy artillery. The ability

to mass the corps for counter-preparation and defensive operations denied the German's the ability to mass combat troops into an effective attack against the allied defenders.

Operation DESERT STORM is another conflict that this study analyzed and *The World Wind War* is a primary book that was used to understand and analyze the conflict. These literary works provided an overview campaign and key elements that allowed the conflict to be successful for the coalition forces.

The World Wind War by Frank Schubert and Theresa Kraus discuss in detail the build-up of combat power during Operation DESERT SHIELD and the execution of the ground war in Operation DESERT STORM. *World Wind War* gives analysis on the strategic, operational, and tactical objectives and operations of DESERT STORM. Artillery was a major factor in the success of the operation. Corps artillery was able to shape the battle space for the subordinate divisions and had devastating effects on the material and morale of the Iraqi Army.

Corps artillery's main mission of counter-fire was executed so effectively that Iraqi indirect fire was negligible and by the end of the operation nearly all the Iraqi artillery was destroyed. The corps artillery also played a significant role in preparatory fires on objectives. Corps artillery was critical in the development of Air Force assets into the fire support system. The Air Force transitioned to battle air interdiction and close air support once offensive operations commenced. Development of air integration and the ability to influence the air tasking order was the responsibility of the corps artillery with the battlefield coordination element. The ability to integrate Air Force assets into the fire support system enabled immediate fire support to the commanders to influence the battle.

Corps artillery weighted main efforts with the vast quantity of non-divisional artillery available. This was hinged on the ability to conduct dynamic re-tasking and rapid changing of command and support relationships due to the speedy advance of maneuver units. Logistic support for the considerable amount of non-divisional artillery that corps artillery was command and controlling. The Army was consuming large amounts of ammunition and fuel while re-positioning to support operations. The ability to successfully provide logistical support to the artillery facilitated future operations was crucial to the outcome of the operation even though the conflict was only hundred hours. Operation DESERT STORM was the last long-scale combat that corps artillery would fight before its removal from the force structure.

Scholarly Journals

Military Review and the *Field Artillery Journal* were the two scholarly journals reviewed for this study. These journals were written during the conflicts and their primary focus were current and relevant issues and techniques to solve these issues prior to doctrine being developed to codify the principles.

Military Review provided two articles that are relevant to this study. The first article is a discussion on the employment of corps artillery in support of division operations during World War II. The fine main points of this article are the situations when corps artillery organizations should be attached to divisions, the amount of artillery to be attached, what corps artillery staff should be augmented to divisions, the missions of corps artillery, and the employment of corps artillery.

Corps artillery or portions of corps artillery's allocation should be provided to divisions in four tactical situations. The first is when the corps artillery cannot effectively

mass the corps artillery and conduct a successful corps artillery scheme of fires. During World War II this was normal due to the lack of a communications network in which the corps artillery officer or corps counter-fire officer could not control the allocated battalions or brigades retained by corps.

The second was when the frontage of the corps does not facilitate the flexibility for the corps artillery to be mutual supporting of either the units retained under corps artillery or the divisions. This would also prevent the corps artillery to mass the corps on targets that corps was responsible for executing. The inability for the corps artillery to mass on targets makes artillery and the FFA HQs ineffective.

The next point was when divisions possess ability to better control the corps artillery or that tactical situation dictates. Offensive operations are a good example of the type of tactical situation that the corps artillery organizations would be better suited under division control. This is because offensive operations typically require less centralized control because the attack has the initiative and the division commanders would require more immediate fire support to influence the tactical situation, thus requiring fires in a reinforcing role.

The amount of artillery that should be attached to divisions is not static but fluid based on the tactical situation and the terrain. The suspected enemy situation dictates the amount of artillery to be allocated to divisions. An enemy with a large quantity of artillery will require an increase in counter-fire missions, which is a corps mission. The missions of the subordinate divisions will also influence the amount of artillery that will be allocated to divisions. The main effort of an operation or the decisive operation should be allocated an increase in artillery or a command and support relationship to be

developed to support the main effort or decisive operation. The terrain within the area of operations is also a factor. Artillery requires a suitable road network to operate successfully due to the requirements for ammunition resupply during operations. An artillery organization can fire more rounds than it can carry, and ammunition is typically the largest planning factor for artillery operations.

The amount of the artillery allocation of corps artillery to divisions may also require staff augmentation as well as howitzers. An increase in organizational size also requires an increase in the staff's ability to provide command and control of the organization. The augmentation of the staff is flexible and would be tailored to meet the mission requirements. Situations in which the corps cannot effectively mass the corps artillery to provide counter-fire artillery to support a division would need to be augmented with the corps counter-fire officer and the counter-fire section to synchronize the counter-fire scheme and control the operation. Divisions will need the support of the corps artillery intelligence section to effectively develop a counter-fire plan. The corps artillery intelligence section was focused on counter-fire operations. They would assist the corps counter-fire officer and section in the development of the counter-fire scheme. Staff attachments also facilitate an increase in situational understanding and the ability for the corps artillery officer or the division artillery commander to rapidly centralize fire when the tactical situation demands. This would allow the fire support coordinators at each echelon to provide mutual support to one another.

The mission of the artillery in an operation would also dictate the amount of artillery to allocated from corps to divisions. Corps artillery's primary mission was to conduct counter-fire operations and retain artillery organizations to accomplish this

mission and achieve field artillery overmatch. If the tactical situation within a division's combat area requires an increase in counter-fire assets the division should allocate artillery with the ability to conduct that mission. The corps secondary missions of long range-fires to provide interdiction and counter-preparation also were factors in the amount of artillery to allocated to divisions. This was to ensure there was adequate fire support available to committed units, the main effort or the decisive operation. The corps artillery would weight these operations with the majority of fire support, so that there was immediate fire support available to the commander to influence the operation while ensuring that maximum feasible centralized control was achieved, and there were no artillery units left in reserve. To achieve all of these complex and critical tasks requires an artillery headquarters organization that is properly sized and capable to perform these tasks on behalf of the corps. Currently, nothing similar to this exists in the force structure and expecting the corps chief of fires in conjunction with a FAB commander whose headquarters is designated as the FFAHQs is inadequate to the task.

The second article from *Military Review* is from September 1945 titled "Artillery with the American Army in Europe" by Brigadier General Charles Hart. This article discusses the coordination that is required between the field artillery headquarters as well as with the maneuver headquarters that it is supporting particularly with the organization of non-divisional artillery. This article was published after the end of World War II and benefits from the ability to review the topic holistically after the conflict.

Corps were allocated or attached non-division artillery from the Army headquarters. The typical allocation during normal combat conditions consisted of three group headquarters and ten artillery battalions of various calibers and types, but all of

155mm or greater.⁷¹ These headquarters and battalions would be allocated to divisions for an allotted mission and upon completion corps artillery would regain control.

The ability to mass artillery requires an artillery commander with the authority to mass or employ the entire fire support system, which doctrine in World War II clearly provided. Under the current doctrine, the corps FSCOORD or chief of fires does not have the authority to dictate to the subordinate division artilleries their missions and or positioning, likewise division artillery does not have the authority to dictate missions and positions to corps field artillery battalions without the approval of the corps unless specified in the field artillery organization for combat. The corps FSCOORD or division artillery commander also lacks the authority to direct set the artillery organization for combat. He can recommend the organization, but it must be approved by the chief of operations and/or the commander before it can be executed. This practice requires a large amount of situational understanding of the field artillery at each echelon and requires time to execute.

The corps artillery officer of World War II had dual responsibilities. He served as a special staff officer and the commander of the corps artillery. These two responsibilities required an enormous amount of attention and understanding to accomplish. Because of this the concept of designating a deputy FSCOORD began to develop. The deputy FSCOORD would be able to share the responsibilities of the corps artillery officer with regard to the staff responsibilities, but the corps artillery officer would retain command authority. The command and support relationship compared to the command authority is a continuous issue within artillery especially regarding the amount of artillery that is available. An artillery battalion is the minimum force to support a committed brigade and

the only current ability to weight the main effort or to provide immediate fire support is through command and support relationships. An increase or attachment of non-divisional artillery would require command authority from a field artillery commander to allocate and develop the field artillery organization for combat. Again, doctrine from World War II provided such authority, while current doctrine does not which is a jarring gap in capability to employ artillery above the division level.

The *Field Artillery Journal* has been published since 1910 and used as a platform for the field artillery community to discuss current issues that the artillery was facing. The *Field Artillery Journal* attempts to fill gaps in published doctrine by offering unique tactical solutions to tactical problems faced at all echelons and in different operating environments. The *Field Artillery Journal* also emphasizes and expounds upon changes within the artillery, such as the organizational changes to FABs upon the deactivation of the corps artillery headquarters. There are five articles during this period that provided insights into the employment of corps artillery and the activation of the FABs to serve as the corps FFA HQs with emphasis on the special challenge encountered when this latter is attempted.

The first article analyzed in this study “Employment of Corps Artillery” was written by Colonel John Burns and was published in March 1943. The article was written while operations in Italy were on going and the allies had just completed a successful amphibious landing at Anzio in which employment corps artillery was a major factor. The key points of Colonel Burns’ article are centralized control is a key factor in successful military operations, discussion on the role of artillery command authority, and a recommendation for a change in the staff organization of the corps artillery staff.

Centralizing control of artillery at the highest echelon increases the synchronization of the fire support system and the effects of massed fires during the artillery plan. Corps Artillery is the level in which fires can be feasible centralized and the most successful during defensive operations. Commanders should always strive to centralize fires.⁷² Centralized control increases the responsiveness of artillery and therefore provides immediate fire support to the commander to influence the operations. Centralizing fires at the corps level also ensures that artillery organizations are not placed in reserve or are not actively influence the current or future operations.

Corps artillery acting as the FFA HQs for the corps orchestrates the entire fire support system for the corps. The corps artillery headquarters through the corps commander or through command and support relationships could command the corps artillery as well as the division artilleries. Proper employment of the corps artillery allows division maneuver elements and division artillery to maneuver and attack the enemy from a position of advantage.⁷³ The corps artillery would synchronize the fire support system and provide long-range fires for counter-fire, preparation, and counter-preparation to allow the divisions to focus their artillery on targets that directly support the maneuver plan and operation. The command and support relationships that would be develop by the corps artillery as the FFA HQs, also enabled the corps to also reinforce the division artilleries when the tactical situation dictated.

The experience that had been gained through the actions in Mediterranean Theater (Africa, Sicily, and Italy) had identified a gap in the organization of the corps artillery. Corps artillery was staffed with seven officers and eleven enlisted personnel, as well as corps artillery commander. Corps artillery headquarters was typically co-located with the

corps headquarters. which allowed the corps artillery commander to perform his duties as the senior artilleryman on corps staff and the commander of the corps artillery. The issue was that with the entire corps artillery headquarters located at the corps headquarters it was difficult to control the corps artillery fires. The article recommended an increase to the corps artillery staff to enable the corps artillery headquarters to be divided into two command posts.

The first remained located with the corps headquarters and operated as the corps FFA HQs and the headquarters of the corps artillery. This command post was responsible for planning, synchronizing, and executing of the field artillery and possible air force elements allocated for the operation. The corps artillery commander and his primary staff would occupy this headquarters.

The second headquarters would be located forward in a position to communicate and control the artillery responsible for the counter-fire artillery plan, in current doctrine this headquarters known as the counter-fire headquarters. The corps counter-fire officer would be responsible for this command post and would be aided by the assistant intelligence officer.⁷⁴ The corps counter-fire office was responsible for the counter-fire plan which was corps artillery's primary mission. Command and support relationships developed by the corps artillery commander and approved by the corps commander would allow the corps counter-fire officer to conduct tactical fire direction to division artilleries for execution of the counter-fire plan. The assistant intelligence officer was responsible for identifying and locating enemy artillery positions and assist in the development of the counter-fire plan.

Operation DESERT STORM provided a conduit for the Army to analyze and evaluate the doctrine and force structure. The operation was short in duration of actual combat but it was the first time the Army was able to evaluate the how it functioned in joint operations in large-scale combat operations. The technology that was employed is very similar to current capabilities, but the organization of the Army and artillery has changed since. The Army was not organized into the current modular structure and corps artillery is an organization was an integral organization for the Army at that time. The effectiveness of corps artillery in employing fires on a large scale was a major factor in the success of the operation. Iraq prisoners of war were terrified and constantly told their captors “no more boom-boom, no more boom-boom” after surrendering to the coalition.⁷⁵ The *Field Artillery Journal* provided two articles that are relevant to this study during Operation DESERT STORM.

The first article, “Improving the Field Artillery after Operation Desert Storm” by Lieutenant Colonel Scott Lingamfelter analyzes the field artillery organization for combat regarding the FABs and their allotment to divisions. Corps artillery would weight the corps main effort by allocating an entire FAB or a portion of it to the main effort which is typically a division. The corps artillery commander, along with corps artillery staff of the develops the field artillery organization for combat for the corps. The FABs would be attached to divisions with the preponderance being allocated to the corps main effort. However, attaching the FABs to the divisions places strain on the divisions ability to command and control these non-organic brigades.⁷⁶ The attached FABs would be required to reposition, which would lengthen the brigade’s lines of communication from their support elements. The division would also be required to supply the attached units

which would be beyond their logistic capacity. The “plug-in” constraints of the FABs being attached to divisions were not new considerations. Major General John Crane discussed these constraints in 1945 in his article “Field Artillery Groups” discussed previously. The recommendation was to permanently assign rocket fires to the division’s artillery or the rocket organizations should remain at corps artillery with a command and support relationship to division.

The *Field Artillery Journal* article “Steel Rain” also provide a detailed analysis of XVIII Airborne Corps Artillery in Operation DESERT STORM. The XVIII Airborne Corps Artillery served at the FFA HQs for the corps and was allocated with an appropriate amount of fire support assets and staff to support the corps. The Corps Artillery organized the artillery under Corps control for combat, conducted corps level targeting, and develop the fire support coordination measures for the Corps. Operation DESERT STORM was the first time that the US Army employed AirLand battle doctrine as well as new fire support assets such as multiple launch rocket systems, Tactical Fire Direction System, and multiple different command and control systems.

XVIII Airborne Corps Artillery was allocated three artillery brigades and several artillery battalions to support corps operations..⁷⁷ Corps allocated FABs to serve as the FFA HQs for non-divisional artillery that was attached. Throughout the operation the corps artillery acting as the corps FFA HQs would re-organize the command and support relationships between the corps artillery and the divisions. Corps and supporting brigades would mass entire organizations on targets with devastating effects on the enemy..⁷⁸

Command and control of the artillery was facilitated by establishing liaisons with subordinate and adjacent units through new command and control equipment..⁷⁹ The

establishment of this network allowed corps artillery to provide immediate fire support to the corps commander, weight the main effort as the mission or situation dictated, and maintain feasible centralized control throughout.

The Corps Artillery was also conducting deep targeting for XVIII Airborne Corps. The corps artillery commander developed corps level targeting and executed the targets using the new long-range rocket fires that was provided by the attached artillery. Deep targeting shaped the battlefield for the subordinate divisions and allowed division level artillery to focus its fires in support of maneuver elements.⁸⁰ Corps Artillery was also developing the fire support coordination measures and airspace coordination measure to enable long-range fires. The close relationship to the battlefield coordination element allowed rapid development and execution of air integration into the fire support system.

The Corps Artillery also took responsibility for planning and synchronizing the logistical support of the subordinate artillery brigades and battalions. The brigades and battalions were required to travel great distance to support operations and fire a high volume of ammunition.⁸¹ The Corps understood that to facilitate future operations and be able to provide immediate responsive fire for the corps, the artillery must be fueled and armed. The Corps Artillery staff worked closely with Corps' support command to ensure the artillery was properly logistically supported with these assets.

The transition to the modular brigade combat team system and the requirement for assets to support the Global War on Terror brought about the demise of corps artillery within the force structure. The final article that the *Field Artillery Journal* used in this study was the introduction of the fires brigade after the de-activation of corps artillery.

“The Fires Brigade” was published in December of 2005 by Lieutenant Colonel Samuel White and it discusses the organization, roles and responsibilities of the fires brigade as a Division FFA HQs.

Fires brigades were supposed to replace the corps artillery, division artillery and FABs to serve as a FFA HQs at every echelon. The fires brigade was the only divisional artillery not assigned to a maneuver brigade and possessed the ability to provide Army and joint fires.⁸² The brigade was a self-contained organization with organic logistics and intelligence support. The fires brigade’s fires and effect cell would be responsible for all deep targeting and not the division fire support element. The brigade would be tasked to conducted deep strike operations through the division mission orders when supporting a division. The fires brigade could also serve as the counter-fire headquarters with the ability to manage all the target acquisition radars within the organization.⁸³ The fires brigade was originally designed with one rocket battalion to reinforce division artillery or conduct-fire operations, but this design evolved through time and location. Fires brigades varied in number of battalions and type of artillery. The fires brigade was designed to support a division leaving the corps was without any organic artillery support besides the fire support element on the corps staff. The division was the focus due to the nature of the Global War on Terror. Corps headquarters were not tactical fighting organizations. Brigade combat teams were the primary fighting organizations known as units of action while divisions were the units of employment during the conflict.

Masters of Military Art and Science

Previous Master of Military Art and Science theses have provided insight into the research that has been conducted by previous students. Major Russel Weatherby

completed his thesis in 1965 discussing the action of “Artillery Groups in Support of the Corps and Field Army 1942-1953” and this study built upon that study. “Artillery Groups in Support of the Corps and Field Army 1942-1953” is an in-depth analysis of the structure, employment of effects of non-divisional artillery during World War II and the Korean War. The actions of VII Corps Artillery during operation avalanche and at Anzio were extremely relevant to this current study. VII Corps Artillery was a critical factor in the success of the operation. The Corps Artillery was able to effectively execute the principles of fire support planning and serve as a force-field artillery headquarters during the operation.

There are several gaps in literature discussing the current state of artillery above the division level. There is a doctrine gap in outlining fires at the corps level. ATP 3-09.24 still refers to the FABs as Fires Brigades with the primary role as serving as an FFA HQ for divisions not for the corps. The Fires Brigades nor Field Artillery Brigades in their current organization have been employed in large-scale combat operations and their structure is poorly designed for executing the roles and missions of a corps artillery FFAHQs. Fires and FABs have deployed battery sized elements to support operations, but not the entire brigade size organization. FFA HQs at the division level and above have not been employed since DESERT STORM. The Army is in the process of closing the doctrine and organization gaps through the development of theater fires commands and operational fires commands but these organizations are years away from full operational capability within the force.

This study did not investigate the use of corps artillery during the Korean and Vietnam wars as well as during the Global War on Terror in Afghanistan or Iraq. These

conflicts were not analyzed during this study due to the echelon in which artillery was controlled and structured. There was a vast quantity of artillery employed during the Korean War due to the nature of combat operations artillery was rarely commanded and controlled at the corps level. During the Vietnam War, artillery batteries were typically assigned a general support or direct support to infantry battalions and the level of control was not at the corps level. The Global War on Terror brought the de-activation of the corps artillery headquarters and the field artillery was typically organized with platoon size elements supporting maneuver battalions.

The US Army has not conducted significant large-scale combat operations without the Corps Artillery Headquarters in the force structure since its inception during World War I. The requirement for a corps artillery headquarters to return to the US Army force structure was selected to study due to the US Army's focus on preparing for large-scale combat operations in light of the changing international environment. This study is analyzing the history of the corps artillery along with its responsibilities and roles since World War I and the possible gap that has been developed without the headquarters.

The research methodology for this study is to examine the command and control and organization of field artillery units at the corps level during large-scale combat operations. It will examine large-scale combat operations within the continuum of war. This case study will use military theory, history and doctrine research focused on archival material, historiography, current, and past doctrine, and theoretical frameworks to answer the proposed research question.

The theoretical framework for this study is the fire support planning principles outlined in FM 3-09, the role of a FFA HQs at the corps level, and the responsibilities of

the fire support coordinator. The fire support planning principles are the doctrinal standard for how fires and artillery operations are planned and executed at all levels. The entire fire support system, which includes lethal and non-lethal fires must be integrated, synchronized, and control to be effective. Historically, the force that is able to create a fires overmatch over the enemy is successful. The force field artillery head headquarters provides command and control for subordinate fires elements and is a single headquarters to coordinate the fires for the echelon it is supporting. The Army is returning to the corps as a tactical organization and therefore requires an adequate FFA HQs at the corps level. The FSCOORD is the centerpiece of the fire support system and the FFA HQs. He is sole individual responsible for the action of fires. The FSCOORD is not only a member of the corps commander's special staff member but also a commander. Currently the FSCOORD at the corps level is a Colonel and the FAB Commander. The chief of fires at corps is a colonel staff officer with out command authority and the subordinate division artillery commanders are also colonels which requires an in-depth analysis of the roles and responsibility of each position to understand the relationships between them.

The process of reviewing the literature for this study was divided into three categories as well as three time periods that this study focused on. The study analyzed literature focused on the doctrine of the US Army, the organization of the US Army artillery at the corps level and non-divisional artillery that supported the corps, and a historical review of the actions in large-scale combat operations that corps artillery participated in. The doctrine review by time period analyzed what artillery and more specifically which corps artillery operations were conducted. The organization of the corps artillery in the relevant time period provided insight on what force structure was

available to the corps artillery. The historical review of the actions of corps artillery expose if the force structure possessed the capability and capacity to complete its doctrinal responsibilities. The historical review of the operations of corps artillery provided insight into the success of the organization and possible gaps in force structure and doctrine.

Previous studies on the actions of corps artillery have been primarily focused on the historical actions of the organization with minimal insight into the doctrine being executed by the force or the force structure of the corps artillery. There was been analysis on the number of artillery assets available to the US Army, not the headquarters responsible for providing command and control for these assets. Most literary works and studies also focus on the number of rounds fired during operations as a metric for analysis. The number of rounds fired in an operation does not provide insight into if the artillery headquarters and the artillery commander supporting operations were successful in planning and executing the operation.

There is a vast majority of literature written about US Army artillery and its action in combat operations. Works of literature focused on large-scale combat operations and traditional warfare were selected for this study. Large-scale combat operations involve a vast quantity of artillery and require a headquarters capable of providing command and controlling the artillery. Literature relevant to actions during large-scale combat operations warfare was also selected for this study. Conventional warfare against another nation's military infers that the enemy also possess an adequate amount of artillery that possess an operational and tactical threat. The enemy's artillery must be destroyed, neutralized, or suppressed for the operation to be successful. US Army

doctrine and force structure was selected for this study to answer the research questions. The only exception to this is the study of German World War I Artillery tactics. German World War I Artillery tactics was included in this study because it is widely believed that the Germans were the pioneers in the development of artillery as an indirect fire weapon system. US Artillery has been in the force structure since the Continental Army when Colonel Henry Knox retrieved the artillery cannons from Fort Ticonderoga for the siege of Boston in 1775. The selection of literature to be analyzed for this study required the literature to be limited to topics relevant to corps artillery. Artillery has been controlled at various echelons of command since its inception due the firepower and range that artillery provides. The literature selected for this study only focused on artillery used in an indirect fire mode in large-scale combat operations organized at the corps level.

This study focused on the use of artillery as an indirect fire weapon system on a large-scale. Literature that discusses the use of artillery as a direct fire weapon system and in limited quantities is not relevant to this study. The use of artillery as an indirect weapon system on a large scale did not occur until World War I. Studies which focused on the command and control of artillery below the corps level is not analyzed during this study. Time periods in which corps artillery did not exist in the US Army force structure was also not analyzed for this study which includes the Global War on Terror. Artillery employed against an irregular threat was also not reviewed in this study. The enemy in the Vietnam was primarily an irregular enemy and was not analyzed. The employment of artillery in conventional warfare is vastly different than the employment during contingency operations and while opposing an irregular enemy. Contingency operations

typically limit the amount of artillery supporting the operations and the headquarters controlling the artillery is below the echelons of corps.

This study is of significance to understand the history of corps artillery in large-scale combat operations and the necessity to re-establish the corps artillery headquarters within the force structure. The US Army is refocusing the doctrine and force structure to fight and win our nation's wars in large-scale combat operations against a peer or greater enemy. The US Army has not conducting large-scale combat operations without corps artillery headquarters within the force structure. The introduction of new long-range artillery assets will have operational and strategic effects. These new systems will require a headquarters capable of integrating these systems. There is also a vast quantity of non-divisional artillery within the Army National Guard. During large-scale combat operations, these organizations will most likely be mobilized. A higher headquarters will be required to command and controlled the mobilized National Guard FABs and battalions. These artillery organizations will provide the flexibility within the fire support system to meet the six fire support planning principles.

¹ War Department, *Field Artillery Notes One* (Washington, DC: War Department, 1917), 142.

² Ibid., 144.

³ Ibid., 140.

⁴ Ibid., 153.

⁵ Ibid.

⁶ War Department, *Field Artillery Notes Four* (Washington, DC: War Department, 1917), 9.

⁷ Ibid., 23.

⁸ General Headquarters, American Expeditionary Forces, *Report of Hero Board; Proceedings of the Board of Officers Convened by the Following Order, General Headquarters, American Expeditionary Forces, Office, Chief of Artillery* (Fort Sill, OK: Field Artillery School, 1918), 529-530.

⁹ War Department, *Field Artillery Notes Four*, 24.

¹⁰ War Department, *Field Artillery Notes* (Washington, DC: War Department, 1917), 7.

¹¹ *Ibid.*, 9.

¹² *Ibid.*

¹³ War Department, *Field Artillery Notes Nine* (Washington, DC: War Department, 1918), 15.

¹⁴ War Department, *Field Artillery General Notes* (Washington, DC: War Department, 1917), 18.

¹⁵ *Ibid.*, 11.

¹⁶ *Ibid.*, 30.

¹⁷ *Ibid.*, 31.

¹⁸ *Ibid.*, 38.

¹⁹ War Department, FM 6-20, *Field Artillery Field Manual, Tactics and Technique* (Washington, DC: War Department, 1940), 105, 129.

²⁰ *Ibid.*, 71.

²¹ *Ibid.*, 75.

²² *Ibid.*, 75-76.

²³ *Ibid.*, 77-78.

²⁴ *Ibid.*, 117.

²⁵ *Ibid.*, 91.

²⁶ *Ibid.*, 134.

²⁷ *Ibid.*, 119.

²⁸ *Ibid.*, 105.

²⁹ Ibid., 108.

³⁰ Ibid.

³¹ Ibid., 129.

³² Ibid., 164.

³³ Ibid., 131.

³⁴ Ibid., 139.

³⁵ Ibid.

³⁶ Ibid., 140.

³⁷ Ibid., 142

³⁸ Ibid., 155.

³⁹ War Department, FM 6-100, *Tactics and Techniques of Division Artillery and Higher Artillery Echelons* (Washington, DC: War Department, 1944), 34.

⁴⁰ Ibid., 35.

⁴¹ Ibid., 36.

⁴² Department of the Army, Field Manual (FM) 6-20, *Fire Support in Airland Battle* (Washington, DC: Government Printing Office, 1988), 27.

⁴³ Department of the Army, Field Manual (FM) 6-20-30, *Tactics, Techniques, and Procedures for Fire Support for Corps and Division Operations* (Washington, DC: Government Printing Office, 1989), F-3.

⁴⁴ Ibid., F-2.

⁴⁵ Ibid., 3-1.

⁴⁶ Ibid., 4-1.

⁴⁷ Ibid., 4-3.

⁴⁸ Ibid.

⁴⁹ Department of the Army, Army Technique Publication (ATP) 3-92, *Corps Operations* (Washington, DC: Government Printing Office, 2016), 1-23.

⁵⁰ Ibid., 7-23.

⁵¹ Ibid., 1-4.

⁵² Ibid., 6-7.

⁵³ Ibid., 1-23.

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ Department of the Army, Field Manual (FM) 3-09, *Field Artillery Operations and Fire Support* (Washington, DC: Government Printing Office, 2020), 3-27.

⁵⁷ Ibid.

⁵⁸ Ibid., 2-9.

⁵⁹ Ibid.

⁶⁰ Ibid., 1-4.

⁶¹ Ibid., 2-1.

⁶² Ibid., 2-6.

⁶³ Ibid., 3-6.

⁶⁴ Ibid., 2-4.

⁶⁵ Ibid., 2-10.

⁶⁶ Ibid.

⁶⁷ Ibid., 4-7.

⁶⁸ Ibid.

⁶⁹ Department of the Army, Army Technique Publication (ATP) 3-09.24, *Techniques for the Fires Brigade* (Washington, DC: Government Printing Office, 2012), 1-1.

⁷⁰ General Headquarters, American Expeditionary Forces, *Report of Hero Board*, 9.

⁷¹ Charles E. Hart, “Artillery with an American Army in Europe,” *Military Review* (September 1945): 31.

⁷² John Burns, “The Employment of Corps Artillery,” *Field Artillery Journal* (March 1943): 208.

⁷³ Ibid., 209.

⁷⁴ Ibid.

⁷⁵ Scott Lingamfelter, “Improving the FA after Operation Desert Storm,” *Field Artillery Journal* (August 1991): 27.

⁷⁶ Ibid., 28.

⁷⁷ Kenneth P. Graves, “Steel Rain,” *Field Artillery Journal* (October 1991): 50.

⁷⁸ Ibid., 52.

⁷⁹ Ibid., 51, 53.

⁸⁰ Ibid., 53.

⁸¹ Ibid., 54.

⁸² Samuel R. White, “The Fires Brigade,” *Field Artillery Journal* (November 2005): 14.

⁸³ Ibid., 16.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The purpose of this study is to review the history of the Corps Artillery Headquarters from World War I through Operation DESERT STORM to identify if it is advantageous for the US Army to re-establish Corps Artillery Headquarters in large-scale combat operations. This chapter will discuss the resources selected for the study, how the resources selected were organized and analyzed, and possible areas of bias throughout this study. The rationale for this research methodology is to examine the command and control and organization of field artillery units at the corps level during large-scale combat operations. This case study will use military theory, history and doctrine research focused on archival material, historiography, current, and past doctrine, and theoretical frameworks to answer the proposed research question.

Data Collection

The research areas selected for this study were based on various types of warfare, across the range of military operations and conflict continuum, the headquarters involved in the operations, and the command and control of field artillery assets within the operations. Traditional warfare will be reviewed in this study. Traditional warfare is defined in the US Joint doctrine as a form of “warfare is characterized as a violent struggle for domination between nation-states or coalitions and alliances of nation-states.”¹ Traditional warfare historically employs field artillery organizations in mass. This case study will review several major operations and campaigns across the conflict

continuum to assess the utility of Corps Artillery Headquarters (see figure 1). This range of military operations and conflict continuum was selected due to the full application of military power as a coercion force. At the high end of the range of military operations at the conflict continuum of war is large-scale combat operations. Large-scale combat operations are conducted “in the form of major operations and campaigns aimed at defeating an enemy’s armed forces and military capabilities in support of national objectives.”² The Corps Headquarters is the highest tactical US Army Headquarters in large-scale combat operations. It was for this reason that this study selected resources that discussed corps level organizations to be reviewed and analyzed. The command and control of field artillery organizations at the corps level were selected to answer the primary research question and the scale of artillery employed during large-scale combat operations.

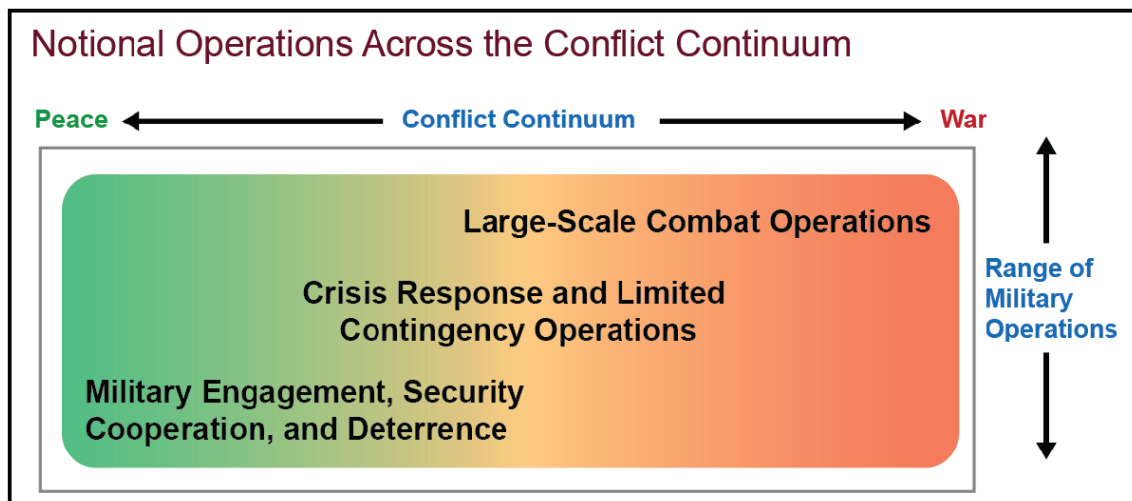


Figure 1. The Conflict Continuum and the Range of Military Operations

Source: Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, October 2017), 1-1.

The instruments used to collect data for this study include primary and secondary sources from United States Army operations and the evolution of German artillery tactics. The primary sources include field service manuals, doctrine, orders, written accounts, journal articles discussing the use of corps artillery. Secondary sources were selected for this study based on the topic and depth of analysis conducted by the author or authors. The majority of secondary sources referenced the primary sources selected as well as other secondary sources used in this study.

Sources selected outside of the use of US Artillery is limited to World War I German artillery tactics. The Germans, in particular Colonel Georg Bruchmuller, pioneered the development of techniques for the command and control of multiple field artillery organizations in large-scale combat operations. Colonel Bruchmuller organized and employed artillery at and above the corps echelon as well as developed tactics and techniques that set the foundations in which artillery is currently employed.

The criteria for selecting sources of research for this study were large-scale combat operations conducting traditional warfare in which artillery was commanded and controlled at the corps level. These criteria provide a feasible and suitable method of research due to the varied history of large-scale combat operations over the past hundred years and the nature of the research question. These criteria also developed strengths and weaknesses in this study. The strengths of this study are that is limited to US Army artillery history, organization, and command and control with the addition of German World War I organization and doctrine because the United States Army developed much of its field artillery doctrine based on the experiences of the German Army in World War I. There are differences in organization, doctrine, and command and control of artillery

across this globe and this focus facilitates in-depth study. The weakness of this study is that it is limited primarily to the United States' experience in large-scale combat operations. Other militaries across the globe have developed different organization and command and control methods based on that country's doctrine. The major difference can be seen in Russian doctrine, which is firepower based, in contrast to US doctrine, which is maneuver based. The possible insights that Russian doctrine could provide to this study is not reviewed and analyzed. The criteria for research also limit this study to traditional warfare in the range of large-scale combat operations. Artillery is also employed during irregular warfare and limited contingency operations; however, this study is focused on large-scale combat operations.

Data Analysis and Synthesis

This study has been organized chronologically starting with World War I and ending with Operation DESERT STORM. World War I provided the first large-scale combat operations in which artillery was employed as an indirect fire asset and built the foundations for the future use of artillery. The period between World War I and World War II will be briefly studied. This period set the conditions for the implementation of the artillery in World War II based on the experience of World War I and the development of new technology. World War II will be the next time period reviewed because it provides the first extensive use of US Army field artillery at the corps level in the forms of artillery groups and the Corps Artillery Headquarters in large-scale combat operations. Operation Desert Storm will be the final period that will be covered in this study. Operation Desert Storm was the last large-scale combat operation in which artillery was employed, organized, and commanded and controlled at the corps level in US history.

This period and historic precedent provide insight into the use, employment and command and control of current weapon systems at the disposal of US Artillery, possible employment of future weapon systems such as the Extended Range Cannon Artillery, and how the Army could effectively employ field artillery assets at higher echelons of command.

Ethics and Trustworthiness

The literary sources and doctrine throughout this study have been referenced and cited throughout to provide a better understanding of the study. The sources represent various authors with differing opinions and viewpoints regarding the research question. The author of this study is a current US Army Field Artillery Officer with a vested interest in the future of US Artillery. The author has served in the US Army during Global War on Terror in which the military has conducted unconventional operations in which the highest tactical echelon has been a brigade and not during large-scale combat operations, which is the focus of this study. During this time in service, the US Army has not had Corps Artillery established in the force structure. The author has served in a Fires Brigade that performed the FFA HQ at the division level and conducted a division level warfighter exercise as a staff planner. The assignment to the Fires Brigade staff was also the highest echelon that the author has served during his time in service.

Summary and Conclusion

This study will use archival material, historiography, as well as current and past doctrine in large-scale combat operations in the continuity of traditional war to answer the research question. Since the first use of artillery in an indirect fire role during World

War I, there have been three major events that this study will use as case studies. Chapter 4 will discuss the foundations of corps artillery during World War I, the evolution of the corps artillery in the Mediterranean Theater during World War II, and the employment of corps artillery during Operation Desert Storm. It will conclude that there is a fires headquarters organizational gap at the corps level. The Theater Fires Command will support the Theater Army while Division Artillery will continue to support Division level fires but there is no artillery headquarters capability of supporting Corps level operations during large-scale combat operations. The ability to command and control artillery and other fires assets at the corps level will critical to the success of the US Army in large-scale combat operations against a peer or near-peer enemy.

¹ Chairman of the Joint Chiefs of Staff, Joint Publication (JP) 1-0, *Doctrine for the Armed Forces of the United States* (Washington, DC: Government Printing Office, March 2013), I-5.

² Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, October 2017), 1-1.

CHAPTER 4

ANALYSIS

World War I

The employment of artillery as an indirect fire weapon system did not begin during World War I, but it was the first time it was employed on a massive scale with operational and strategic effects. The increase in the size and effect of artillery required a growth in the roles and responsibilities of higher headquarters to command and control the artillery. During World War I, the German, British, French, Russians, and the United States experimented with the new role of artillery and the headquarters commanding the artillery. The experiments set the foundation for the United States Army's eight planning principles for the employment of field artillery planning process. The principles are adequate fire support for the committed units, weight to the main effort or the decisive operation, immediate responsive fires, facilitate future operations, maximum feasible centralized control, mission, ammunition, and position. These principles were developed during World War I.¹ A capable headquarters at echelons above the division level was required to provide appropriate control and exercise of these principles during large-scale combat operations with vast quantities of artillery assets available.

Development of effective employment of indirect artillery during World War I was one of experimentation through trial and error. Common World War I doctrine during the initial phases of the conflict was Napoleonic maneuver warfare. The operational and strategic goal was to envelopment the enemy army. This maneuver-based warfare required limited numbers of artillery assets that were light and mobile to maintain the pace with the infantry as it advanced. The ratio of artillery tubes to 1,000

soldiers in 1914 varied between armies. The French employed 4.6 artillery tubes per 1,000 men, the British employed 6.8 artillery tubes per 1,000 men and the German ratio was 6.4 artillery tubes per 1,000 men.² The ratio for the German Army was not the largest at the outset of the war, but the Germans did have the most diversity in the type and caliber of the howitzers they employed. Maneuver did not require large amounts of ammunition because the artillery could not maneuver with large quantities of ammunition due to limited transportation assets. The limited ammunition requirements for maneuver warfare impacted the amount of ammunition that the industrial community was able to produce. As maneuver warfare proved indecisive, the lack of artillery ammunition available became the limiting factor in the employment of artillery.

Late in 1914 trench warfare began to develop on the Western Front. The trench warfare of 1914 required firepower instead of maneuverability. During the next three years, trench warfare on the Western Front allowed both sides of the conflict to experiment with the employment, structure, and command of the artillery since neither side knew how to control large pools of artillery. However, these experiments resulted in little success. Each side of no-man's land employed artillery with the mission of destruction. Armies began to increase the number and caliber of howitzers possessed to achieve the destruction of the enemy while they searched for a way to restore maneuver to the battlefield. By 1918 the ratio of howitzers to soldiers nearly doubled from 1914 numbers.³ The increasing size and complexity of employment required an artillery command structure capable of planning, commanding, and controlling the vast quantity of artillery now employed on the battlefield.

The first major successful operation to restore maneuver to the battlefield while employing, commanding, and controlling the artillery on the offense during World War I took place on the Eastern Front during the Battle of Riga in 1917. Colonel Georg Bruchmuller was the leader responsible for the successful employment of large pools of artillery in its new role as an indirect fire weapon in offensive operations.

The German attack on the Latvian port of Riga was conducted by the German Eighth Army which consisted of ten divisions commanded by General Oskar von Hutier.⁴ The German Army was opposed by the ten Russian divisions of the Russian Twelfth Army under General Vladislav N. Klembovski.⁵ The German plan was to attack across a 9,000 meter front to seize the city of Riga. The attack included crossing the Duna River by emplacing pontoon bridges. The attack by General Hutier was successful for two reasons: new infantry tactics and new artillery planning and coordination principles by a central headquarters. General Hutier would be responsible for new infantry tactics later referred to as “Hutier Tactics” or “Storm-Trooper” Tactics. Colonel Bruchmuller was responsible for improvements in artillery organization, planning, and execution to support “Storm-Trooper” tactics.⁶

Before the Riga Offensive, a large artillery reinforcement from units across the German Army was received by the Eighth Army. The arrival of additional artillery units allowed Colonel Bruchmuller to task organize the artillery based on their missions and an artillery headquarters to provide command and control. Colonel Bruchmuller task-organized the artillery into groups based on the mission and not based on the type or caliber to create the greatest effect. Employing the artillery based on a mission was a controversial concept at the time because it was believed that it eroded the unity of

command. Contrary to this belief the reorganization enhanced control of the artillery at the regiment, division, corps, and army, enabling smoother transition between phases of the operation, and facilitated better synchronization with infantry.

He developed three groups of artillery: counter-infantry, counter-artillery, and long-range artillery. These groups were delineated this way to maximize their effect and retain centralized control. The counter-infantry group accounted for seventy-five percent of the artillery in the attacking sector.⁷ The primary mission of the counter-infantry group was to neutralize or suppress the enemy positions in depth. During the Riga offensive, the counter-infantry group was divided into subgroups with their headquarters co-located with the supported infantry regiment. The co-location of headquarters not only created a more effective command and control over artillery fire, but it also allowed for the almost seamless transition of artillery control from regiments through divisions to the corps.

The counter-artillery group accounted for twenty percent of the artillery in the attacking sector. The group consisted primarily of field guns and controlled by the corps Artillery.⁸ The normal planning factor for artillery in the counter-artillery group was two German batteries for every one enemy battery, particularly during the initial preparation phase for an operation. During the preparation phase of an offensive operation, the counter-artillery group would be reinforced by the counter-infantry group. Once the infantry attack began the control of the counter-infantry artillery would transition to the division or regimental headquarters while the counter-artillery was retained at the corps level. The command and control created by the new artillery task organization allowed division and regimental commanders to focus assigned artillery on the infantry targets while the corps focused on the counter-artillery fight to set conditions for subordinate

divisions and attack decisive points in accordance with the corps commander's guidance. The counter-infantry group was retained at the division or regimental level until objectives were seized. Once objectives were seized then the corps headquarters would control the movement of all artillery into forward positions for future operations in the corps sector. This created the operational level control required for campaign planning across a wide front by corps and armies.

The last major group of artillery is the long-range artillery group. The mission of the long-range artillery was to interdict and disrupt command centers, lines of communications, logistics nodes, and reserve forces important for the success of the entire force. Their zone of fire was not limited to the corps boundary which allowed it to re-enforce counter-infantry and counter-artillery groups as required. The corps retained centralized control of the long-range artillery, which facilitated timely coordination for cross-boundary fires. Typically, there was one long-range artillery group per corps and its headquarters was co-located with the counter-artillery group headquarters.

Centralized command of the artillery at the army or corps level facilitated the transitions between centralized and decentralized control of the groups of artillery. Colonel Bruchmuller exercised command over all artillery assets and was very deliberate when the artillery task organization would change based on the situation. Centralized control of artillery was the centerpiece of Colonel Bruchmuller's system. Centralized control of the artillery allowed organizational flexibility eased transition and coordination between different organizations. The Riga offensive was the first time Colonel Bruchmuller transitioned from centralized control during the preparation and counter-artillery phases then exercised decentralized control during the start of the infantry attack,

and once the objectives were seized, he would regain centralized control in preparation for defensive and future operations. In the later years of World War I, more centralized control was also required due to the experience of the new artillery commanders. The centralized planning at the corps level also allowed for effective artillery planning to ensure the maximum effect of the artillery at the decisive point designated by the corps commander, and only a headquarters dedicated to controlling artillery at the corps level was capable of providing such detailed planning on behalf of the corps commander.

Ammunition is one of the largest factors of effective artillery planning. The number of rounds that an artillery organization can fire at a sustained rate is larger than an artillery organization can haul. This factor requires detailed planning and control at higher echelons to ensure that the artillery is allocated effectively, that it is appropriately re-supplied with the proper ammunition by type and postured for future operations. Before the Riga offensive, the Germans not only re-allocated additional artillery assets but also the ammunition required to execute the artillery plan. During the two days offensive operation the artillery fired 560,000 rounds or approximately 480 rounds per tube.⁹ The different artillery groups were allocated different types of ammunition based on the missions assigned to the group. For example, the counter-infantry group would fire eighty percent high explosive and twenty percent gas at their assigned targets.¹⁰ The counter-artillery group fired seventy-five percent gas and twenty-five percent high explosive at Russian artillery.¹¹ Colonel Bruchmuller found that gas was the most effective method to neutralize enemy artillery and would mix nonpersistent and persistent gas to maximize the effect. The number of rounds fired during the Riga offensive was minuscule compared to other operations of comparable size during the war such as

12,000,000 rounds fired by both the Germans and French at Verdun or the 1,732,873 rounds fired during the Somme by the British and French, but it required detailed planning and preparation at echelons above division to execute the artillery plan.¹²

The German success at Riga essentially knocked Russia out of World War I, which allowed troops and equipment to be transferred to the Western Front. Colonel Bruchmuller was also transferred to the Western Front and became the artillery advisor for General Eric Ludendorff. Before Colonel Bruchmuller's arrival, the mission of artillery on the western front was destruction. Massive artillery barrages lasted for days which removed any element of surprise both tactically and operationally with limited effect while wasting large quantities of precious ammunition. The infantry would be able to seize initial objectives, but the destruction to the terrain and road networks prevented exploitation and required the employment of reserves to the point of penetration. Colonel Bruchmuller improved and implemented the techniques that he had developed on the Eastern Front to the offensives of 1918.

Colonel Bruchmuller evolved his techniques and tactics to the operational environment to suit the operational and strategic objectives for the Western Front. German artillery shifted from destruction fires to neutralization fires. They focused on neutralizing the allies' command posts to degrade the allies' ability to coordinate an effective counter-attack and deploy reserve forces. The organization of artillery into groups with specific missions on the Eastern Front were now being employed on the Western Front but on a wider scale due to the vast quantities of artillery available. Preparatory artillery barrages were shortened to only several hours to maintain the surprise. The long-range group could disrupt the enemy reverses assembly areas with

observation from aerial observers. Here again, it is important to note that without a higher-level artillery headquarters at the corps and higher levels, such coordination of the vast field artillery units for the decisive effect to meet the commander's intent was not possible. Corps artillery headquarters made such coordination possible.

The creeping barrage, rolling barrage or *feuerwalze* (fire waltz) was a common tactic used by both sides in World War I.¹³ The purpose of the creeping barrage was to support the infantry during the attack by suppressing enemy positions as the infantry advanced. It is difficult to control the rate of movement, so the barrage normally advanced too quickly for the infantry to keep pace. The infantry attempted to follow behind the creeping barrage at a distance of 300 meters. Control was also limited by the available technology. Wireless communication equipment was too heavy and fragile to be taken with the advancing infantry and telephone wire was prone to being cut by incoming artillery fire. The common practice to control the barrage was the use of a time-based schedule. Both sides experimented with the rate of advance with little success. Colonel Bruchmuller attempted to improve the success of the *feuerwalze* by conducting close coordination with the infantry through liaison officers (future fire support officers) and briefings to the infantry and the artillery.¹⁴ The goal of the liaison officers and briefings was to synchronize the artillery plan with the infantry plan from the army level to the division level to provide the most combat power available at the decisive point. The artillery plan would then be briefed to the infantry to develop a common understanding of the artillery plan. This is very similar to the modern US Army combined arms rehearsal. The artillery groups would also receive a briefing on the technical aspects of the artillery operation. This is currently known as a field artillery technical rehearsal. The

coordination provided by the corps artillery headquarters ensured this common understanding across the force and provided inestimable value to the force while validating the need for such a higher level of artillery headquarters.

The battlefield on the Eastern Front was much more fluid than on the Western Front providing the opportunity to maneuver. This is different from the static trench warfare of the western front, but when Ludendorf launched the 1918 offensives Colonel Bruchmuller's principles of planning, organizing, and employing artillery enhanced their success. Despite their tactical success, the German Army was unable to exploit it at the operational and strategic levels due to a lack of transportation and logistic support, which limited the advance of the German force when they outran their supplies.

Colonel Bruchmuller's principles did not go unnoticed by the French, British, and in turn the American artillerymen. The United States did not have established doctrine or headquarters designed for the new role of artillery once it arrived in France in 1918. Instead, the American Expeditionary Force relied on the lessons learned from the German, French, and British over the past four years of warfare. The United States began translating and publishing the French and British tactics and techniques in the form of artillery notes which set the foundations of US Army artillery organization and doctrine.

The American Expeditionary Force recognized immediately the need for more artillery and received French artillery units. The increase in the number of artillery assets required a change in command structures to command and control the growing number of artillery organizations. The corps artillery remained under the control of a general officer but the corps staff increased to provide greater command and control for the increased number of artillery organized under corps or into the groups re-enforcing the corps. The

corps artillery commander had direct control over all the artillery within the corps and, when appropriate, would re-organize the artillery to the control of the divisions.¹⁵ The primary mission of corps artillery was to provide counter-fire with interdicting fires at a greater depth than division artillery and re-enforcing destructive fires on enemy strong points.¹⁶ Corps artillery would organize its own groups to achieve specific missions. The size and organization of corps artillery varied based on the situation. The corps artillery was responsible for neutralizing or destroying the enemy artillery within a given sector but the boundaries of the sectors for counter-artillery were permissive.¹⁷ This permissive boundary allowed adjacent corps artillery to reinforce each other quickly to mass at decisive points in the counter-artillery fight. The corps artillery organization mimics the counter-artillery and long-range artillery groups that Colonel Bruchmuller developed. The US Army began to emphasize the use of liaison officers between the infantry and artillery to synchronize artillery fire with the infantry. Once again, leveraging the knowledge of the infantry operation the artillery plan would be planned and controlled at the corps level. The US Army began to develop reserve artillery groups to provide general support artillery fire to the corps and general support reinforcing artillery fire to the subordinate divisions. The reserve artillery groups would be self-contained organizations that could be organized quickly to different corps or divisions. The structure of corps artillery and the use of reserve artillery groups allowed flexibility to task organize artillery units provided flexibility. This flexibility enabled corps artillery commanders to weight the main effort or deceive operation, provide immediate responsive fires, facilitate future operations, maximum feasible centralized control, mission, ammunition, and position. This enhanced the subordinate divisions to employ its

own organic artillery in support of brigade and regimental levels. Without a corps artillery headquarters it is questionable if the corps could have brought its varied artillery units to bear at the corps commander's designated decisive points.

After four years of war and over 200 million shells fired, the foundations for eight principles of field artillery planning were laid. These principles require an artillery headquarters capable of commanding and controlling vast quantities of artillery in dynamic and complex large-scale combat operations. The US Army adopted the principles, continued to study them throughout the interwar period, codifying them in US Army doctrine and began to develop a force structure to execute the doctrine.

World War II Lessons Learned Applied

World War II is the next period that will be analyzed for this study. World War II was selected for this study to assist in answering the research question based on the methodology developed. World War II provides insight into the growth of US Army corps artillery post-World War I. The doctrine that has been transferred from the French, British, and Germans has now been instilled into US Army doctrine. The force structure had been adjusted based on new doctrine and advances in technology. The United States involvement of World War II spanned four years. This study focuses on the actions of VI Corps Artillery at Anzio, Italy, during Operation Shingle in 1944.

The United States field artillery was continuing to study the lessons that it had learned from German artillery in World War I, and the *Field Artillery Journal* continued to publish articles analyzing tactics into the mid-1920s. The United States Army had built upon the doctrine that it had developed in World War I. The artillery doctrine continued to be refined based on the lessons learned in France and new technology developments.

The two primary doctrinal sources that were used by the corps artillery were FM 6-20, *Field Artillery Manual Tactics and Techniques* and FM 6-100, *Tactics, and Techniques for Division Artillery and Higher Artillery Echelons*. These are two main pieces of doctrine that the US Corps Artillery would use during World War II.

The base doctrine for artillery during World War II was FM 6-20, *Field Artillery Manual Tactics and Techniques*. FM 6-20 describes the force structure, the role of artillery at echelon, and the commander's responsibility. The doctrine of the period focuses on artillery systems with minimal integration of Air Force assets. Artillery was the primary means to destroy the enemy's material.¹⁸

The corps artillery officer had dual responsibility as a staff officer and commander with similar responsibilities as the fire support coordinator in current doctrine. He was a special staff member and the commander of the artillery organizations that were not assigned to subordinate divisions or other commands.¹⁹ The corps artillery officer's headquarters functioned as the force field artillery headquarters for the corps. Corps artillery did not possess command authority over the subordinate division artilleries. All orders and direction the divisional artilleries from corps artillery were given in the name of the corps commander.²⁰ Corps artillery would develop the artillery organization for combat using the non-division artillery to meet the principles of fire support planning. Corps artillery attached non-divisional artillery, weighted divisions, and retained for corps artillery missions, general support, or direct support to divisions.²¹

Corps artillery would retain some or portions of the allocated non-divisional artillery to conduct corps artillery's required missions. Corps artillery's primary mission was counter-fire. The other missions that corps artillery provided were reinforcing

division artillery, destruction of defensive positions, neutralization of command posts and enemy assembly areas, and long-range interdiction fires.²² The corps artillery counter-fire officer did retain the ability to mass all the artillery within the corps to conduct counter-fire operations. Concentrating artillery fire in mass required common fire direction and centralized control. Centralized control also enabled corps artillery to provide immediate fire support to the maneuver commander to influence the battle.²³

FM 6-100, *Tactics and Techniques for Division Artillery and Higher Artillery Echelons* were specific doctrine focused on artillery at the corps level and division level. The mission of corps artillery was “to contribute effective support to the action of the corps by reinforcing the fire of division artillery, by neutralizing or destroying hostile artillery, by fire on hostile reserves, by restricting movement in hostile rear areas, and by disrupting hostile command agencies.”²⁴

The corps artillery organically consisted of a headquarters and headquarters battery and an observer battalion with no organic artillery.²⁵ The corps artillery was commanded by a general officer and staffed appropriately with intelligence, operations to include a counter-fire officer and logistical sections. The observer battalion consisted of the corps artillery observers but target acquisition assets such as flash-sounding radar. Non-divisional artillery consisted of FABs and battalions of various types and calibers.²⁶ The non-divisional artillery was organized into groupments. The groupments were organized to achieve a specific artillery mission for a specific period and enabled flexibility for corps artillery. Groupments consisted of two or more artillery brigades or battalions based on the amount of artillery allocated to the corps artillery. The groupments artillery was allocated to the corps artillery, and based on the tactical

situation and missions the corps artillery allocated the non-divisional artillery to subordinate divisions.

Corps artillery was employed extensively throughout World War II. This study selected to review the actions of VI Corps Artillery during Operation Shingle in January 1944. Operation Shingle provides an excellent illustration of the effect of corps artillery effectively employed during large-scale combat operations. Operation Shingle was the amphibious assault in the vicinity of Anzio, Italy, in 1944. The intent of the operation to increase the tempo of operations in the Mediterranean theater of operations and to seize Rome and force the Germans to relocate troops from the Gustav Line. Allied operations had been disturbed attacking north along the Italian peninsula due to the mountainous terrain and the German Gustav Line. The Gustave Line was a defensive line running east to west along the Garigliano and Rapido Rivers, which included Monte Casino.

The initial landings were conducted on January 22, 1944, catching the German Army entirely by surprise. VI Corps began to establish a beachhead line approximately 15 miles across and 7 miles in-depth and seize their objectives with no resistance.²⁷ The terrain of Anzio was limited to mounted mobility but was accessible for dismounted troops. On January 24, 1944, the Germans had been able to reinforce the area with several regiments in the area and began to conduct aggressive patrols with armored support. The VI Corps attacked on January 30, 1944, from the beachhead and encountered stiff German resistance. The terrain favored the defenders, and the German's had established well camouflaged strong point defensive positions. The German's had established a strong defensive position along the limited avenues of approach to their objectives. The German's also began to employ massed artillery fire on VI Corps. The

low-level clouds during the attack deny the use of air support assets. The VI Corps Artillery began to arrive in sector the same day of the attack, which did not allow the VI Corps Artillery to conduct counter-preparation and counter-fire operations. These factors halted VI Corps' advance short of their objectives, and VI Corps was required to establish a defensive perimeter.

IV Corps had sustained heavy casualties during its initial assault with most of the units seriously understrength. The German's had begun to transition troops from the Gustav Line and from across the Mediterranean Theater to conduct a counter-attack against VI Corps at Anzio. Operation Shingle quickly became a defensive operation. The transition to defensive operations provided the time required for the VI Corps artillery to organize and employ the corps artillery to face the German counter-attack. The Corps artillery quickly centralized fires at the corps level. The German began to conduct their counter-attack on February 3, and the VI Corps artillery's two missions were to conduct counter-fire and counter-preparation. During the next two weeks of defensive operations, the VI Corps artillery was able to correctly provide adequate and immediate fire support to the corps. Counter-preparation was significantly effective against the German counter-attacks, and the German's were forced to conduct infiltration attacks at night to prevent massed troop formations that could be quickly massed upon through the centralized control of the corps artillery.

The German's attempted the second phase of their counter-attack February 16, 1944. The German's occupy favorable terrain, but VI Corps had received additional non-divisional artillery. The VI Corps artillery developed the field artillery organization for combat with a focus on counter-fire and counter-preparation missions. Counter-fire

operations were effective, and VI Corps established artillery overmatch against the Germans. The Corps artillery was firing over 25,000 rounds per day despite the limited quantity of ammunition available to the corps.²⁸ In contrast to the German artillery that was only capable of firing 1,500 rounds per day. The effect of the massed corps artillery denied the German's ability to conduct preparatory fires. The corps artillery began to employ the use of aerial observers to detect German artillery locations due to the terrain. The corps counter-fire officer would mass entire brigades or battalions on German artillery positions identified by the airborne observers. The German's continued to attack piecemeal and during the night to prevent VI Corps artillery from massing on troop formations. VI Corps artillery began to then focus its efforts on interdiction fires against enemy assembly areas, denying the ability to the Germans to attack in mass against the limited number of troops in defensive positions. The German counter-attack was halted on February 18, 1944, when the Germans made a heroic attack across open terrain during daylight, which was destroyed by corps artillery.²⁹

VI Corps conducted a counter-attack on February 19, 1944, with a massive artillery preparatory barrage. VI Corps advanced over two-thousand yards, and the Germans attempted to conduct a counter-attack. The German counter-attack force was disrupted by VI Corps artillery, and the Germans began to employ additional combat power in restrictive terrain, which was subsequently destroyed by centralized artillery fire. The German artillery was ineffective due to VI Corps artillery. VI Corps artillery responded to every German artillery round fired with twenty to third rounds in response. German prisoners of war confirmed the effect of corps artillery. They described the effective and constant artillery fire created terrific conditions, shattering moral, and

disrupted lines of communication and supply, which lead to days without resupply of food and water.

Corps artillery played a critical role in the success in defense of Anzio beach. Operation Shingle became the first defensive operation of the Italian campaign. The terrain restricted the use of tanks for direct support to infantry and artillery was the primary means of fire support to the infantry. Anzio was the first-time during World War II that corps artillery would centralize all artillery assets within the corps at the corps level, which is the highest-level artillery can be centralized. Corps artillery had previously centralized fires at the corps level but only with Corps artillery allocated units.³⁰ The corps artillery would centralize and employ not only the artillery units allocated to corps artillery but also the division artilleries. The corps artillery would also relocate attached groupments of artillery to divisions using command and support relationship to vulnerable areas within the defensive perimeter. The reallocated artillery was particularly successful in the salient that the Germans had created in the Allied lines at Anzio. IV Corps artillery repositions groupments of artillery protect the wedge that been driven into the allied lines. These groupments created a zone of destruction to which the Germans continued to attempt to attack through and were destroyed. The groupments create the flexibility within the field artillery organization for combat, but it required a corps level FFA HQs to command and control the groupments to effectively employ them.

Corps artillery also began to synchronize the Air Force with artillery fires for the first time. VI Corps would closely coordinate with the Air Force to conduct interdiction and some close air support missions. Corps artillery would also coordinate what is

currently known as “joint air attack teams” to mass artillery and Air Force assets on particular targets such as harden defensive positions or enemy assembly areas. Airborne observes would also mark and adjust fires for the artillery.³¹ The additional fire support provided by the Air Force provided immediate fire support assets for the corps commander to influence the battle. The corps artillery headquarters acting as a corps-level FFA HQs synchronization of both Air Force assets and artillery. Air-power with artillery at corps level Germans could not mass combat power or artillery.

Lessons of World War I were validated during World War II. There was a requirement for a corps-level artillery headquarters capable of executing the principles of fire support planning. During the beginning of World War II, divisions typically centralized fires but have the war progress the need to centralize at the corps level grew. After the actions at Anzio, it became common practice to centralize fires at the corps level during preparation for the offense and during defensive operations. The addition of Air Force assets expanded the range and breadth of the effect of artillery and therefore required a higher headquarters to synchronize the operation. The Air Force required more detailed integration, which the corps artillery headquarters could provide as well as proper allocate to supplement artillery fires within the corps operations.

Operation Desert Storm

The final time-period to analyzed for this study is Operation Desert Storm in conjunction with AirLand Battle doctrine. Operation Desert Storm was selected because it was the last time that the US Army conducted large-scale combat operations during traditional war with corps artillery within the force structure. The technology that existed during Operation Desert Storm is very similar to the current technology available to the

US Army. The principles of fire support planning that originated in the trenches of World War I, refined during World War II, were still applicable in the desert of Operation Desert Storm with devastating effects. The corps artillery was still required to command and control the artillery and the additional fire support provided by the Air Force. Historical principles of artillery were still applicable to the development of new technology.

AirLand Battle Doctrine was the US Army's doctrine leading into the doctrine the United States Army executed during Operation Desert Storm. AirLand Battle was developed to combat Soviets forces during the Cold War with possible nuclear weapons employment. The force structure had also changed to support AirLand Battle and developments in technology. The increased range and mobility of artillery in conjunction with Close-Air Support increased the depth and the complexity of artillery. The primary US Army doctrine that this study analyzed for this study was FM 6-20, *Fire Support in Airland Battle* and FM 6-20-30, *Fire Support for Corps and Division Operations*.

FM 6-20, *Fire Support in the Airland Battle* was the overall doctrine for fire support in US Army doctrine. AirLand Battle doctrine was the initial period in which lethal and non-lethal fires were included in fire support. Fire support's role was to destroy, neutralize, and suppress enemy weapons systems, troops, and facilities. The fire support system was divided into fire support command and control, target acquisition, and fire support resources.³² Artillery had become a piece of the entire fire support system due to increased material and weapons systems available to the force commander. Indirect fire as the primary means of fire support with air assets being a secondary role supplementing artillery. Artillery remained the primary means of fire support because the

Army commander had direct influence over the artillery. Planning for fire support was to be conducted at the same levels that maneuver planning was being conducted, and the FSCOORD was the lead for the integration of fire support to support the maneuver.

The concept of the FSCOORD was not a novel or new concept. The FSCOORD performed the same duties as the Corps Artillery Officer had performed in World War II and the Corps Artillery Commander in World War I. The addition of non-lethal fire support and Army rotary aviation as well as increased Air Force integration only expanded the realm of his responsibilities. The primary tasks of the FSCOORD were to support troops in contact, support the force commander's battle plan, synchronize fire support, and sustain fire support.³³ These four tasks are a simplified version of the current fire support planning principles. The corps FSCOORD still did not have command authority over subordinate division artilleries, and all orders were made in the name of the corps commander.

FM 6-20 provides five of the seven current principles of fire support planning. FM 6-20 defines the five principles as fundamentals of field artillery organization for combat: adequate field artillery support for committed combat units, weight to the main attack in offense or most vulnerable areas in defense, facilitate future operations, immediately available field artillery support for the commander to influence the action and maximum feasible centralized control.³⁴ These fundamentals were limited, specifically field artillery and not all means of fire support.

Corps artillery was required to develop the field artillery organization for combat in support of corps operations. This included not only subordinate divisions but also independent cavalry regiments. Corps artillery was supported by FABs and other non-

divisional artillery. The FABs were structured up to six field artillery battalions.³⁵ The FABs would be general support or general support reinforcing to the corps commander to provide immediate fire support to the corps. The FABs could also be directly supporting or reinforcing to a maneuver element.

FM 6-20-30, *Fire Support for Corps and Division Operations* provided the base for fire support for the corps artillery. Unlike previous doctrine, the set roles and responsibilities were not clearly codified. The role of corps artillery was now into the corps deep and close areas. Corps artillery would still carry out the missions of counter-fire and deep strike fires targeted at enemy command posts, logistical nodes, and assembly areas. The artillery would be focused on the corps close area or short of the fire support coordination line and Air Force assets would be focused on the corps deep area beyond the fire support coordination line. The coordination of fire support system within both areas was the responsibility of corps artillery. The corps artillery was structured with a Brigadier General as the command and at least one FAB and attached to field artillery battalions.³⁶ Corps artillery would coordinate and synchronize Air-Force assets to conduct air interdiction, battlefield interdiction, and close air support using the battlefield coordination element. The battlefield coordination element was an army liaison element at the corps echelon and is currently referred to as the battlefield coordination detachment. Air Force assets were to be used to supplement the fires of artillery within the corps battlespace. Corps artillery and the battlefield coordination element would develop the fire support coordination measures to integrate the entire fire support system.

VII Corps during Operation Desert Storm was comprised of the 1st Armored Division, 3rd Armored Division, 1st Infantry Division, 1st Cavalry Division, the British

1st Armored Division, and 2nd Armored Cavalry Regiment. VII Corps was the main effort of Operation Desert Storm, and its mission was to destroy the Iraqi Republican Guard.³⁷ The Iraqi Republican Guard was believed to be the center of gravity for the Iraqi military, and once destroyed, the Iraqi military would withdraw from Kuwait, which would achieve the military endstate and the political objectives of Operation Desert Storm.

VII Corps artillery was allocated four FABs to support VII Corp operations. The corps artillery developed the field artillery organization for combat by developing command and support relationships between each brigade and at least one of the subordinate divisions. The development of the field artillery organization for combat provides flexibility into the overall fires plan with FABs to support divisions but also provide reinforcing fires to one another.

On February 7, 1991, the corps artillery, along with subordinate division artilleries, began to conduct artillery raids prior to the start of the ground war. The artillery raids were directed by the corps commander to deceive on the location of the main attack, serve as a rehearsal for the upcoming invasion, and to destroy the Iraqi artillery in the VII Corps area of operations. VII Corps need to neutralize the Iraqi artillery, which had proven itself as a lethal force during the Yom Kippur War in 1973. The artillery raids would be orchestrated by corps artillery. The artillery raiding force would move into firing positions and fire while be covered by another artillery unit linking to target acquisition radars to conduct immediate counter-fire on the Iraqi artillery. Artillery raid was also conducted in conjunction with Army attack helicopters. Corps artillery would conduct suppression of Iraqi air-defense systems to enable the

attack helicopters to enter the target area. Once in the target area, the helicopters would destroy Iraqi command posts and observe targets for artillery. The artillery would then shift back to suppressing Iraqi air-defense systems as the helicopters retrograded back to the border..³⁸

VII Corps attacked into Iraq on February 24 with a planned three-hour artillery preparation program. The rapid tempo of adjacent units and its own reconnaissance elements required the three-hour artillery preparation to be condensed into thirty minutes..³⁹ Corps artillery quickly revised the fire plan and, at 1430, began to fire on Iraqi positions. The corps artillery command and controlled the field artillery fire plan, which included three FABs, two-division artilleries, and ten multiple launch rocket systems (MLRS). Within the thirty-minute artillery preparation, the corps artillery fired 11,000 rounds and 414 MLRS rockets..⁴⁰ Corps artillery using unmanned aerial vehicles for observation also began to destroy the Iraqi artillery position. The effect of the corps artillery on the Iraqi Army was both lethal and non-lethal. The Iraqi artillery in the VII Corps sector was destroyed entirely, and Iraqi command posts had been neutralized. The initial artillery bombardment has also broken the Iraqi soldiers' will to fight and began to surrender in large numbers.

VII Corps continued to attack into Iraq to destroy the Republican Guard supported by corps artillery. VII Corps attack was phased with a different maneuver element, becoming the main effort each phase. Corps artillery would dynamically adjust the field artillery organization for combat through command and support relationships. The increased range of artillery and command and control assets allowed corps artillery to adjust artillery support without repositioning artillery organizations.

Corps artillery, another focus was providing logistical support of the corps artillery organizations. Ammunition has always been the primary logistical planning consideration for artillery, but the rapid advancement of maneuver also meant that fuel was a critical factor. Corps artillery was required to plan for logistical support for the allocated artillery, especially for ammunition for the MLRS. The divisions did not have organic MLRS units, and it was up to corps to plan for their ammunition resupply.

The increased range and lethality of artillery required a headquarters at the corps level to control. Corps artillery headquarters was able to command and control vast quantities of artillery and integrate Air Force assets to shape the battlefield for the subordinate divisions. Corps artillery continued to prove effectively integrated and employed artillery is essential for success on the battlefield. Corps artillery developed the field artillery organization for combat to meet the principles of fire support founded in World I, validated in World War II, and remained proven timeless during Operation Desert Storm.

¹ Department of the Army, Field Manual (FM) 3-09, *Field Artillery Operations and Fire Support* (Washington, DC: Government Printing Office, March 2020), 3-14.

² J. B. A. Bailey, *Field Artillery and Firepower* (Annapolis, MD: Naval Institute Press, 2004), 241.

³ Ibid.

⁴ David Zabecki, *Steel Wind: Colonel Georg Bruchmuller and the Birth of Modern Artillery* (Westport, CT: Praeger, 1994), 21-22.

⁵ Ibid.

⁶ Bailey, *Field Artillery and Firepower*, 260-261.

⁷ Zabecki, *Steel Wind*.

- ⁸ Ibid.
- ⁹ Ibid., 25.
- ¹⁰ Ibid., 24.
- ¹¹ Ibid.
- ¹² Bailey, *Field Artillery and Firepower*, A4-A5.
- ¹³ Ibid., 54.
- ¹⁴ Ibid., 260.
- ¹⁵ War Department, *Field Artillery General Notes* (Washington, DC: War Department, 1917), 8.
- ¹⁶ General Headquarters, American Expeditionary Forces, *Report of Hero Board; Proceedings of the Board of Officers Convened by the Following Order, General Headquarters, American Expeditionary Forces, Office, Chief of Artillery* (Fort Sill, OK: Field Artillery School, 1918), 13.
- ¹⁷ War Department, *Field Artillery General Notes*, 10.
- ¹⁸ Department of the Army, Field Manual (FM) 6-20, *Fire Support in Airland Battle* (Washington, DC: Government Printing Office, 1988), 69.
- ¹⁹ Ibid., 76.
- ²⁰ Ibid., 75.
- ²¹ Ibid., 71.
- ²² Ibid., 118.
- ²³ Ibid., 69.
- ²⁴ Ibid., 34.
- ²⁵ War Department, FM 6-100, *Tactics and Techniques of Division Artillery and Higher Artillery Echelons* (Washington, DC: War Department, 1944), 34.
- ²⁶ Ibid., 35.
- ²⁷ Chester Starr, *From Salerno to the Alps, A History of Fifth Army 1943-1945* (Washington, DC: Infantry Journal Press, 1948), 130.
- ²⁸ Ibid., 145.

²⁹ Ibid., 157.

³⁰ Boyd Dastrup, *King of Battle: A Branch History of the U.S. Army's Field Artillery* (Fort Monroe, VA: Office of the Command Historian, 1992), 217.

³¹ Ibid.

³² Department of the Army, FM 6-20, *Field Artillery Field Manual, Tactics and Technique*, 1-2.

³³ Ibid., 3-1.

³⁴ Ibid., 2-11

³⁵ Ibid., 2-12.

³⁶ Department of the Army, Field Manual (FM) 6-20-30, *Tactics, Techniques, and Procedures for Fire Support for Corps and Division Operations* (Washington, DC: Government Printing Office, 1989), A-2.

³⁷ Center of Military History, *War in the Persian Gulf* (Washington, DC: Center of Military History, 2010), 41.

³⁸ Robert Scales, *Certain Victory: The US Army in the Gulf War* (Washington, DC: Office of the Chief of Staff, 1993), 204.

³⁹ Ibid., 226.

⁴⁰ Ibid.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study is to review the history of the corps artillery headquarters from World War I through Operation DESERT STORM to identify if it is advantageous for the US Army to re-establish corps artillery headquarters in large-scale combat operations. This chapter will interpret the findings of the previous chapter to understand what the results conclude, the implications, unexpected insights, and a recommended answer to the research question. The previous chapter discussed a historical and doctrine reviewed of corps artillery in large-scale combat operations during World War I, World War II, and Operation DESERT STORM.

Historically corps level artillery headquarters has been a significant factor in large-scale combat operations. The side that can effectively employ fires at a higher level is typically successful. Colonel Bruchmuller pioneered the employment of vast quantities of artillery during World War I with such an effect that it set the foundations for all field artillery planning in most armies and is still studied over a hundred years later. World War II illustrated that artillery centralized and properly employed at the corps level has devastating effects on the enemy. Operation DESERT STORM provided insight into the flexibility that the corps artillery headquarters provides to the corps. The increased range of artillery and command and control systems allows a corps artillery headquarters to support the corps and subordinate divisions across the breadth and depth of the area of operations as the tactical mission requires.

Corps artillery's primary mission is counter-fire. Counter-fire requires highly centralized planning and execution to be effective. The ability to grain artillery over-

match against an enemy force is critical to the success of an operation. Neutralizing the enemy's fire support provides not only freedom of action by the friend forces but also has a devastating effect on the enemy's morale and will to continue to the conflict. The corps artillery has also provided counter-preparation, interdiction fires, and reinforcing fires to the subordinate divisions. Counter-preparation fires denied the enemy to employ forces in mass during defensive operations and degraded the synchronization of the attack. Corps interdiction fires on logistics and command and control networks facilitated future operations for the corps and subordinate divisions. The enemy was unable to supply their committed forces, and their command and control network could not coordinate the operation, which would lead to mass confusion. Corps artillery's ability to develop the field artillery organization for combat to support the subordinate divisions was critical to the success of the divisions.

Division artillery is minimally equipped to support itself with a single field artillery battalion to each brigade. The ability for division artillery to organically conduct operations outside of direct support to the division is unachievable. Corps artillery's ability to allocate non-divisional artillery to subordinate divisions through command and support relationships provided flexibility and increased firepower. The corps artillery headquarters provided a higher artillery headquarters to command and control non-divisional artillery that could be quickly reallocated to different divisions while remaining mutually supporting.

The field artillery direct chain of command between corps artillery and division artillery has rarely existed. The commands and direction of the artillery between corps and divisions have been given in the name of the corps commander through his fire

support coordinator, the corps artillery commander. This commander was vested with the authority to command, synchronize, organize, and employ all artillery above the division level to support corps operations. Artillery uses command and support relationships to support maneuver forces while providing flexibility. The lack of a direct chain of command between corps artillery and division artillery has required the proper rank structure to be effective. The corps artillery commander may not have command authority over the division artillery commander, but he did possess a higher rank. With the authority to command all non-divisional artillery on behalf of the corps commander for the purpose of influencing operations with fires to augment the fires of the divisions.

Artillery increases the width and deep of the area of the battlefield. The increased depth of the battlefield allows the corps to shape the battlefield for the divisions. There corps artillery has been the primary asset to shape the battlefield. Corps artillery required artillery assets that would out-range division artillery to conduct counter-fire, counter-preparation, and interdiction fires. Corps artillery also provided mutual support for adjacent corps to facilitate cross-boundary fires and deny the enemy areas free of artillery fire.

Principles of employing vast quantities of artillery in large-scale combat operations have not changed drastically since World War I. An artillery headquarters at the corps level has been present to plan and employ artillery from that time until transformation in the mid-2000s. The corps artillery headquarters has used the seven principles of fire support since the use of artillery as a primary in-direct fire weapon system. Corps artillery headquarters has been critical to the massing of artillery and other fires assets to create multiple dilemmas for the enemy to allow maneuver forces to seize

their objectives. Corps artillery provides flexibility for FABs and non-divisional artillery. Corps artillery would develop the field artillery organization for combat to meet the principles of fire support planning and execution. This would allow the corps to shape the battle while providing general support reinforcing or reinforcing fires to the divisions. The flexibility also allowed more than one FAB to be allocated to corps. Corps artillery could provide command and control to multiple brigades and battalions of artillery when the tactical situation dictated. The presence of the headquarters was also critical for facilitating future operations. When the corps was not the main effort and not allocated vast quantities of artillery, it planned and prepared for the next operation. The artillery estimate developed by corps artillery ensured that no field artillery assets were in reserve and that there was immediate fire support available to the corps commander.

The lack of a corps level artillery headquarters could have a drastic negative effect on future large-scale combat operations. Since artillery became primarily an indirect fire weapon system corps employed on a large scale, artillery headquarters has played a significant role in large-scale combat operations. The corps artillery neutralized enemy artillery, which provided freedom of action for the maneuver and artillery. Counter-preparation fires denied the enemy the ability to mass combat power and disrupted the synchronization of operations. Long-range interdiction fires prepared the battlefield for friendly action by denying the enemy valuable combat power before it could affect subordinate divisions. These actions allowed the subordinate divisions to focus on the close fight and employ organic field artillery to support maneuver actions.

There is a significant doctrinal gap between FM 3-09 and ATP 3-09.24. The FAB can provide strike and deep fires in support of corps and division operations, but it is not

permanent headquarters to the corps. If there are multiple FABs allocated to a corps, there is not a unity of command for fires. The same relationship can be said between Corps, the FAB, and Division Artillery. The corps chief of fires, the FAB commander, and the division artillery commanders are all the equal rank with unclear responsibilities of how each will implement fires to support the entire corps. When a FAB is allocated to a corps for an operation it becomes the corps artillery headquarters in accordance with current doctrine. If there is not a FAB allocated, there is not an artillery headquarters at the corps level, which makes future planning for the employment of fires at the corps level problematic. ATP 3-09.24 still refers to the FAB as the Fires Brigade. This is significant because it means it has not been updated since the force structure change and the implementation of division artillery. The relationship between corps, the FAB, and division artillery remains unclear.

There is also a fire force structural gap between the theater army and the corps. The Army is re-instituting a theater army fires command to “serve as the senior HQ assigned to an ASCC/Theater Army to integrate theater fires assets, and execute critical fires functions.”¹ The theater army fires command will have the responsibility to allocate FABs and non-divisional artillery to corps and divisions. Thus, the artillery organizations allocated to a corps will not have a field artillery headquarters to provide command and control to those organizations, which demonstrates another reason for corps to have an artillery headquarters to organize and coordinate the fires of these assets. The only permanent field artillery headquarters are current at the theater army and division levels. Corps possess the capability to conduct deep sensing with national assets, but has no organic headquarters to plan, prepare, and execute fires to provide lethal effects on

targets. The development of new extended-long range fires with operational and possible strategic effects also requires a headquarters to provide command and control of these assets.

During this study, there were several unexpected findings. The most significant unexpected finding was the fundamentals of planning and employing artillery in large-scale combat operations has undergone few changes in over a hundred years. There has been increasing lethality, range, and command and control abilities, but the principles of employing artillery on a large scale in high intensity combat operations across a broad area of operations is irrelevantly unchanged. As the US Army is re-focusing on large-scale combat operations, the lessons learned in the trenches of World War I and the beachhead of Anzio are very applicable. There are *Field Artillery Journal* articles from World War I and World War II that discuss the same problems that the current US Army Field Artillery community is discussing.

This study recommended that the US Army needs to re-establish the corps artillery headquarters to be successful during large-scale combat operations. The corps artillery headquarters requires a brigadier general to command allocated FABs as well as other non-divisional artillery and serve as the single source of fires command. This will provide unity of command of all these assets and facilitate the employment of fires on behalf of the corps commander. Corps may be allocated more than one FAB, and the corps artillery commander is the single individual vested with command authority to employ the artillery assets across the breadth of the corps area of operation. The rank of brigadier general will also avoid any confrontations that might exist between the division artillery commanders, the FAB commanders, and the corps chief of fires. The corps

artillery commander can provide guidance and direction to all fires assets within the corps to facilitate unity of effort within the fire support system.

The Army requires corps artillery headquarters in order to properly coordinate the missions of counter-fire, counter-preparation, long-range interdiction, and reinforcing fires needs for the corps. This will also require updated the force structure and doctrine to codify the employment of the headquarters in operations. Standardizing the roles and responsibilities of fires elements at echelon assists in the development of field artillery organization for combat and focuses each echelon on successfully executing the fire support principles of planning. The reinstatement of corps artillery headquarters facilitates the execution of the artillery missions at echelon through the establishment of an organizations that serves specifically as the FFA HQs for the corps.

The structure of the corps artillery should consist of a headquarters and headquarters battery as well as an organic target acquisition battalion. Headquarters should be staffed to meet the missions of corps artillery and conduct coordination with the battlefield coordination detachment. The addition of an observer battalion will provide the detect assets for the Corps. The structure of the observer battalion is beyond the scope of this study, but unmanned aerial systems would be practical. The observe battalion would provide deep sensing for the corps and target acquisition for the artillery. This would also provide the corps would also be provided with organic assets to conduct corps level targeting to service targets on behalf of the corps commander and to support the divisions focused on the close fight.

Corps artillery headquarters would also provide flexibility for planning and execution of operations during large-scale combat operations. A permanent artillery

headquarters at the corps would allow non-divisional artillery organizations to be efficiently allocated and employed across the breadth and depth of the corps area of operation without having to stand up and ad hoc headquarters to provide this service to the corps. This will allow for quick employment of allocated artillery systems for rapid repurposing in the combat operations to influence the course of the battle and ensure that no artillery is left idle in reserve. Corps is the linkage between operational and tactical operations. The range of modern artillery has tactical and operational effects and requires a headquarters at the operational level to coordinate the plethora of assets available to the corps and serve as a link between the divisions, theater army, and the joint force through the battlefield coordination detachment.

This study has also identified other potential areas of research that were beyond the scope of this study. The development of extended long-range cannon artillery and other extended-range fires is currently on-going with great potential for success. When these systems operational capability, wherein the force structure will they be located? How will the US Army integrate extended-range fires assets into the fires plan and deconflict the airspace with other airspace users? The Army National Guard currently has eight FABs with a hybrid of both cannon and MLRS systems. If the US conducts large-scale operations in the future, the Army National Guard will be mobilized and be expected to be a part of the total force Army. How will these FABs be integrated, and what echelon will command and control them? The last area identified for further study is the development of the corps artillery observer battalion. Corps level sensing has been identified as a modernization effort by the Joint Chief of Staff, and the solutions are on-going. Once the systems are developed, where will they be located in the force structure?

Nevertheless, this study concludes that the Army needs corps artillery headquarters in the force structure to ensure the proper and efficient employment of artillery assets in support of large-scale combat operations. Without such headquarters it is incredibly difficult to coordinate large pools of artillery because there is a lack of unity of command and not single commander vested with the authority to employ such assets on behalf of the corps commander. Corps artillery headquarters fills this gap and provides a solution that ensures efficient employment of critical artillery assets.

¹ Department of the Army, Field Manual (FM) 3-09, *Field Artillery Operations and Fire Support* (Washington, DC: Government Printing Office, March 2020), 4-2.

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