

Hunting Steel Beasts: A Comparative Analysis of Anti-Tank Units in World War II

A Monograph

by

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2019

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REPORT DOCUMENTATION PAGE			<i>Form Approved</i> <i>OMB No. 0704-0188</i>		
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1. REPORT DATE (DD-MM-YYYY) 23-05-2019		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) June 2018-May 2019	
4. TITLE AND SUBTITLE Hunting Steel Beasts: A Comparative Analysis of Anti-Tank Units in World War II			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) MAJ Albert Timmreck			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301			8. PERFORMING ORG REPORT NUMBER		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Advanced Military Studies Program			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution is Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT In order to fight and win in large-scale combat operations, the Army must think of and employ corps and divisions as fighting formations instead of simply headquarters organizations. Over the course of the Global War on Terror, the Army focused on employing the modular Brigade Combat Team as the tactical echelon of choice in warfighting. Over the past few decades, the Anti-Tank units in particular disappeared almost completely from the US Army's organization. The study is significant because there is potentially a lack of dedicated organic anti-tank capability in US Army divisions and corps. Given the threats that the US Army could do battle with in the future in large scale combat operations, there exists certain biases that suggest that American technological advantages can close operational and tactical gaps with our adversaries. Anti-Tank units are legacy formations that employed low-tech options to destroy armor. This capability seems to get overlooked in the modern high-tech Multi-Domain concept battle of the future. Historical case studies from World War II were selected for examination because of the use of Anti-Tank units at the operational level of war. This study conducts a structured, focused comparison of two World War II historical case studies that examine Anti-Tank units in the defense by asking six research questions related to operational art. These questions focus on testing three hypotheses concerning Anti-Tank units providing operational flexibility, preventing culmination, and enabling a quick transition to the offense. The empirical evidence examined partially supports this monograph's thesis that Anti-Tank units provide lethality to divisions and corps in the defense. The evidence from both case studies supports the hypotheses that Anti-Tank units provided operational flexibility and prevented culmination of the defense, but did not support the hypothesis that Anti-Tank units enabled a quick transition to the offense.					
15. SUBJECT TERMS Anti-Tank; defense; Corps; Division; Kursk; Caen; Eastern Front; Northwest Europe; culmination; operational flexibility; transition.					
16. SECURITY CLASSIFICATION OF: Unclassified			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT (U)	b. ABSTRACT (U)	c. THIS PAGE (U)	(U)	61	MAJ Albert Timmreck
			19b. PHONE NUMBER (include area code) 832-490-0716		

Monograph Approval Page

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Monograph Title: Hunting Steel Beasts: A Comparative Analysis of Anti-Tank Units in World War II

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Abstract

Hunting Steel Beasts: A Comparative Analysis of Anti-Tank Units in World War II, by MAJ Albert J. Timmreck, US Army, 61 Pages.

In order to fight and win in large-scale combat operations, the Army must think of and employ corps and divisions as fighting formations instead of simply headquarters organizations. Over the course of the Global War on Terror, the Army focused on employing the modular Brigade Combat Team as the tactical echelon of choice in warfighting. Over the past few decades, the Anti-Tank units in particular disappeared almost completely from the US Army's organization. The study is significant because there is potentially a lack of dedicated organic anti-tank capability in US Army divisions and corps. Given the threats that the US Army could do battle with in the future in large scale combat operations, there exists certain biases that suggest that American technological advantages can close operational and tactical gaps with our adversaries. Anti-Tank units are legacy formations that employed low-tech options to destroy armor. This capability seems to get overlooked in the modern high-tech Multi-Domain concept battle of the future.

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Acknowledgment

I would like to thank Dr. Bruce Stanley for providing me with the guidance, direction, and motivation in tackling this research question. I would also like to thank Colonel Michael Manner for providing leadership and the needed occasional push to my classmates and me throughout the monograph process. Additionally, I would not have been able to complete this monograph without the steadfast friendship of the fine officers in Seminar 5, who provided feedback, criticism, and support. I would like to thank Mr. Bruce Perry, who taught me the importance of good writing in my profession. I would like to thank my grandfather Albert Jr., my grandmother Frances Ann, and my parents for fostering my interest in history at a young age. My dogs, Dylan and Uzi, provided much needed companionship on long weekends spent cooped up writing and researching. Lastly, and most importantly, I would like to sincerely thank my wife Captain Nichole Timmreck and my daughter Nola. You provide all the love and support that a guy could want. Nichole, I appreciate your support and understanding when I had to work long hours reading and researching. Nola, you provided your dad an opportunity to set a good example for you by continuing my education. I love you guys.

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Introduction

The US Army evolved from 2001 to the present day to meet the demands of fighting the War on Terror in Iraq and Afghanistan. Tactics, technology, organization, and purpose changed as the Army re-focused from large scale combat operations to counter-insurgency and stability operations. Combined with the lack of peer or near peer threats in the post Cold War world, the Army made the necessary changes with little risk. Throughout the constant deployments to the US Central Command area of responsibility, Army unit's skill in fighting in ground combat against a peer adversary atrophied. Current Army leadership is determined to reverse this trend and has placed a premium on readiness. The US *National Security Strategy* of 2017 outlines threats to the nation, and the document identifies Russia, China, Iran, and North Korea as potential future adversaries.¹ With this in mind, the Army is adapting and preparing to fulfill its role in combatting these threats.²

In order to fight and win in large-scale combat operations, the Army must think of and employ corps and divisions as fighting formations instead of simply headquarters organizations.³ Over the course of the Global War on Terror, the Army focused on employing the modular Brigade Combat Team as the tactical echelon of choice in warfighting. This was not the case prior to the Global War on Terror. Prior to the shift to modular Brigade Combat Teams, division and corps were the primary fighting organizations. As such, these echelons contained enabler formations such as Reconnaissance, Fires, Aviation, Air Defense, and Anti-Tank units. In the pre-

¹ The White House, *National Security Strategy* (Washington, DC: Government Printing Office, 2017), 2.

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

³ *Ibid.*, xi.

2001 Army, these enabler formations assisted the corps or division to shape the battlefield for its subordinate units.

Over the past few decades, the Anti-Tank units in particular disappeared almost completely from the US Army's tables of organization. In fact, currently, the only US Army unit that is purely dedicated to destroying enemy armor is the Stryker Brigade Combat Team's organic Anti-Tank Platoon in the Stryker Brigade Combat Team Weapons Troop.⁴ The other means that the Army uses to destroy tanks include the M1 Abrams family of Main Battle Tanks, TOW missile equipped M2 Bradley Infantry Fighting Vehicles, Infantry carried anti-tank missile launchers (either shoulder fired or mounted on wheeled vehicles), and AH-64 Apache attack helicopters. The US Air Force can also use fixed wing aircraft to destroy tanks in support of the Army by conducting close air support or interdiction.

Considering that the countries outlined as threats to the nation detailed in the most recent *National Security Strategy* possess large armored or tank formations, the US Army requires additional means to address the problem. Given the US Army's current means to destroy large armored formations outlined previously can be effective in certain situations, each of those means has drawbacks. US Army M1 Abrams and M2 Bradley equipped Combined Arms Battalion that have to be arrayed to destroy tanks are not necessarily free to perform their primary function. The primary mission of that particular formation is to close with the enemy by means of maneuver.⁵ Additionally, infantry carried anti-tank missile or rocket launchers, while very effective in favorable terrain, are possibly too dispersed in those units to destroy large tank formations. Also, dedicated airborne anti-tank assets such as AH-64 Apaches and Air Force fixed-wing attack aircraft are vulnerable to air defense, expensive, and lack the persistent ability to loiter over the

⁴ US Department of the Army, *Army Techniques Publication (ATP) 3-21.91, Stryker Brigade Combat Team Weapons Troop* (Washington, DC: Government Printing Office, 2017), 1-13.

⁵ US Department of the Army, *Army Techniques Publication (ATP) 3-90.5, Combined Arms Battalion* (Washington, DC: Government Printing Office, 2016), 1-15.

battlefield. In the past, Anti-Tank units significantly enhanced the Army's ability to conduct a defense against large tank formations. Possessing a dedicated anti-tank organization in a current or future US Army division or corps will increase lethality in the defense and allows operational flexibility, prevents culmination, and facilitates quick transitions to the offense.

The purpose of this study is to use the lens of operational art and the characteristics of the defense along with two historical case studies in order to determine whether having a dedicated anti-tank organization in the division or corps increases their effectiveness in the defense. The study also analyzes the defensive tasks outlined in new US Army operational doctrine and whether the force lacks a capability in destroying large tank formations.⁶ US Army divisions and corps have lacked a dedicated organic anti-tank organization in the post Cold War era. In light of the potential adversaries that the US could face in the future, should this capability be re-introduced into the force?

The study is significant because there is potentially a lack of dedicated organic anti-tank capability in US Army divisions and corps. Given the threats that the US Army could do battle with in the future in large-scale combat operations, there exists certain biases that suggest that American technological advantages can close operational and tactical gaps with our adversaries. Anti-Tank units are legacy formations that employed low-tech options to destroy armor. This capability seems to get overlooked in the modern high-tech Multi-Domain concept battle of the future. In addition, the doctrine for Anti-Tank units in the US Army has not been updated for some time. However, going back to the formation of the first US Army Anti-Tank units created before World War II, the doctrine existed before the capability did in anticipation of future needs.⁷

⁶ US Army, *FM 3-0* (2017), 6-1.

⁷ Harry Yeide, *The Tank Killers: A History of America's World War II Tank Destroyer Force* (Oxford: Casemate Publishers, 2007), 1.

The potential added lethality that Anti-Tank units provide divisions and corps will be analyzed through the characteristics of the defense and operational art. In order to establish shared understanding, certain key terms need to be defined. Operational flexibility is a characteristic of the defense in which the defender who is agile enough to counter or evade the attacker's blow can then strike back effectively.⁸ Culmination is the point in time and space at which a force no longer possesses the capability to continue its current form of operations.⁹

In order to test the thesis, the study tested three hypotheses to determine whether the addition of a dedicated Anti-Tank unit to the US Army division or corps will increase the lethality of those echelons in large -scale ground combat operations. The first hypothesis suggests that Anti-Tank units provide division and corps commanders with increased operational flexibility. The second hypothesis presents the idea that Anti-Tank units will prevent the culmination of divisions or corps in defensive operations. Finally, the last hypothesis in this study suggests that Anti-Tank units allow commanders to quickly transition from the defense to the offense.

In order to find evidence to test the previously stated hypotheses, the study requires multiple research questions. The first three research questions will query the qualities inherent in the Anti-Tank units for a specific campaign; what is their organization, doctrine, and capability. The additional research questions will analyze the performance of Anti-Tank units in the defense and gauge the value added to their higher headquarters. First, how do Anti-Tank units provide operational flexibility? Secondly, how do Anti-Tank units prevent culmination of their parent units in the defense. Thirdly, how do Anti-Tank units facilitate the quick transition to the offense. In the conclusion these research questions will strive to inform recommendations for the US Army in the future. If an organic Anti-Tank unit is added to US Army division and corps

⁸ US Department of the Army, *Army Doctrine Publication (ADP) 3-90, Offense and Defense* (Washington, DC: Government Printing Office, 2013), 11.07.

⁹ US Department of the Army, *Army Doctrine Reference Publication (ADRP) 1-02, Terms and Military Symbols* (Washington, DC: Government Printing Office, 2016), 1-25.

organizational structure, what should that Anti-Tank unit's composition be and what doctrine should it use? The discovery of the answers to these research questions will be explored through two historical case studies.

This study will seek to answer the research questions with certain limitations that prevent a holistic view of history of Anti-Tank units. The study is based on Anti-Tank units that are battalion, regiment sized instead of companies or platoons. Also, much of the history that exists on the case studies focuses on the anti-tank weapons themselves and not the doctrine and theory on the use of Anti-Tank units in combat. Additionally, this study will focus on how Anti-Tank units affect the operational level of war instead of the tactical effects that are usually associated with their use. Lastly, due to the inherent nature of Anti-Tank units, the study will focus solely on their value added to the defense.

In order to adequately answer the research questions in an efficient and permissive manner, certain delimitations are imposed. The two historical case studies will be limited to the time period of the World War II. During this conflict, modern anti-tank weapons such as anti-tank missiles and rockets did not exist yet. Additionally, of all the belligerents in World War II, only the Soviets and Germans will be examined in the case studies. This is due to the fact that the Soviets and Germans employed their Anti-Tank units at the regiment or battalion level to perform their designated function, whereas the Western Allies provide more limited examples.

This study relies on four main assumptions regarding the future of the US Army. First, due to their naming in the most recent National Security Strategy, it is assumed that the US Army will be expected to fight the ground armies of Russia, China, Iran, or North Korea. These four countries all possess large tank formations. Secondly, there is the assumption that a real or perceived gap in capability exists, especially when US Army capability concerns the previously mentioned adversaries. It is also assumed that the US Army would add organic Anti-Tank units to division or corps at the expense of manpower and equipment in another capability or formation.

Lastly, it is assumed that the Army will conduct mostly large scale ground combat operations in the future vice stability or counter-insurgency operations.

This study is composed of six sections. The first section is the introduction, which includes the problem statement, thesis, purpose, significance, key definitions, limitations, delimitations, and assumptions. The second section outlines the literature review that the study is built upon. Section three is the methodology of the research. The fourth section will cover the case studies: the Russian Anti-Tank units during the Battle of Kursk in 1943; and the analysis of the German Divisional Anti-Tank Battalion performance and effectiveness in the Battle of Caen during the Normandy breakout attempt by the British in 1944. Section five will present the findings and comparisons of the case studies. Finally, section six will conclude the study and assess whether Anti-Tank units in fact increase the lethality of divisions and corps in the defense in large-scale combat operations.

Literature Review

This section presents a review of the existing literature on Anti-Tank units and their conduct in large scale combat operations. The current literature on the performance of Anti-Tank units throughout military history mainly focuses on the weapon system itself and their inherent technological performance factors against tanks. When the tank appeared on the battlefield in the Great War, anti-tank weapons development followed in response. The Inter-war period informed and tested cost-efficient means by which infantry formations could destroy tanks. By World War II, anti-tank platoons, companies, battalions, and even regiments and brigades found their way onto the battlefield in response to the great success of tanks in this new mechanized warfare. However, other than the few writings on US Tank Destroyer unit doctrine and history, most World War II literature on Anti-Tank units focuses on systems and in particular effects of the weapon (round penetration) on armor and mechanization of anti-tank platforms. Post World War II, the combination of the lack of large-scale tank battles and advances in anti-tank technology

(either Anti-Tank Guided Missiles Attack Helicopters, or Fixed-Wing Attack Aircraft) make literature on Anti-Tank units scarce during this period. The findings and further comparative analysis in this study will be extrapolated from various campaign studies that focus on Anti-Tank units and their effect on the outcome of battles. In particular, their role in the defense will be analyzed. Moreover, an attempt will be made on how they provide increased operational flexibility, prevent culmination, and allow quick transition to offensive operations. Since Anti-Tank units are part of a larger system in combat, determining their role in the outcome of a battle is complex. This study will use campaign history, more technical analysis on anti-tank weapons, and doctrine to provide a possible solution to a perceived existing gap in current literature on Anti-Tank units and their employment.

As Anti-Tank units are inherently defensive in nature, the defense will be the analytical lens that will be used in this study. Many great military theorists have expounded on the intrinsic value and advantages of the defense. In US Army doctrine, the defense is what provides time for a commander to build combat power in order to transition to the offense.¹⁰ This view is appropriate because one of the hypotheses of this study is do Anti-Tank units enable a quick transition to the offense coming out of a defense. Inherently then, the US Army sees the defense as a means to an end to counterattack and seize the initiative. Prussian military theorist Carl von Clausewitz saw the defense in other terms. He wrote that the defense is a stronger form of fighting than offense, though an army conducts a defense because of unfavorable conditions for the attack, thus being negative in its object.¹¹ His theory of the defense lends itself to analyzing the intrinsic defensive nature of Anti-Tank units, perhaps in a prepared defense where an army may be taking advantage of terrain to gain an advantage. In fact his views on defensive battles are

¹⁰ US Army, *FM 3-0* (2017), 6-1.

¹¹ Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton Press, 1989), 85, 358.

apt, “The defender waits for the attack in position, having chosen a suitable area and prepared it; which means he has carefully reconnoitered it, erected solid defenses at some of the most important points, while the forces at the points of actual contact are destroying each other, to inflict heavy losses on the enemy at low cost to himself.”¹² Carl von Clausewitz’s usual historic opposite, Baron Antoine de Jomini had a view of the defense more akin to US Army doctrine. He states that the best thing for an army on the defense is to know how and when to transition to the offense and take it.¹³ As technology improved throughout the industrial and early modern age, military theorists addressed the changes in weapons when discussing the defense. Prussian Field Marshall Helmuth von Moltke stated that new improvements in firearms gave the defense a tactical advantage, though operational and strategic offense was the stronger form of war.¹⁴ Moltke saw the advantages of the defense being the enemy being out of position for the impending Prussian counterattack or envelopment. Considered the father of modern *Bewegungskrieg* or “*Blitzkrieg*”¹⁵ tactics and operations, German Field Marshall Heinz Guderian saw the defense as useless if an army possessed tanks and mechanized forces.¹⁶ However respected Guderian’s view is, *Achtung Panzer!*, published in 1937, was an appeal for tanks to take a central role in the upcoming war. Regardless on his professed views of the defense, Guderian envisioned several roles for Anti-Tank units. He saw their use as securing assembly areas, covering initial points of departure for armored forces, such as river crossings, and

¹² Ibid., 390.

¹³ Antoine-Henri Jomini, *The Art of War* (London: Greenhill Books, 1992), 183.

¹⁴ Helmuth von Moltke, *Moltke on the Art of War: Selected Writings*, ed. Daniel J. Hughes (Toronto: The Random House Ballantine Publishing Group, 1993), 51.

¹⁵ A term not present in the German doctrine or military lexicon of the period, and most likely the term coined by and attributed to the English press.

¹⁶ Heinz Guderian, *Achtung Panzer!*, trans. Christopher Duffy (London: Orion Books, 1992), 202.

covering flanks.¹⁷ What can be agreed upon is that an army conducts a defense for a variety of factors, but mainly because it is advantageous to them at a particular time and place. Anti-Tank units intrinsically find their role in the defense, primarily due to the fact that their mandate is to kill enemy tanks *en masse*, usually from a position of a terrain advantage.

In order to understand the hypotheses in relation to Anti-Tank units and the defense, several key terms must be defined. Much has been written on the defense and its underlying principles, however this study focused on three precepts that stand out from the rest because they best highlight the usefulness of Anti-Tank units in the defense. These terms are operational flexibility, culmination, and transitions. This part of the literature review attempted to define these terms through US Army doctrine and select writings of military theorists and historians. Operational flexibility, according to John Q. Dickmann of The Massachusetts Institute of Technology, defined the term as the ability to have alternatives, or options, which can be chosen or exercised with relative ease in response to certain types of changes in operational demands.¹⁸ He claims that operational flexibility is directly related to command and control and the flattening or networking of organizations, with specific attention into how a unit is task organized.¹⁹ When describing operational flexibility in Operation Desert Storm, he further explains how flexibility at the operational level of military operations comes from combining forces of different services, with each service itself composed of different capabilities, and from being able to change the mission and orientation of the overall force in response to external conditions.²⁰ So, for the purpose of this study, operational flexibility will be providing the operational commander options

¹⁷ Ibid., 197.

¹⁸ John Q. Dickmann Jr., *Operational Flexibility in Complex Enterprises: Case Studies from Recent Military Operations* (Cambridge, MA: MIT Press, 2009), 78.

¹⁹ Ibid., 4.

²⁰ Ibid., 158-159.

and alternatives during planning and arranging forces. According to US Joint doctrine, culmination is the point at which a force no longer has the capability to continue its form of operations, either offense or defense.²¹ Prussian theorist Carl von Clausewitz defines culminating point as “that point the scale turns and the reaction follows with a force that is usually much stronger than that of the original attack.”²² For the purpose of this study, culmination is the point at which a force or unit can no longer carry out its assigned mission or intent. Clausewitz also characterized transitions to the offense as “a sudden powerful transition to the offensive—the flashing of the sword of vengeance—the greatest moment for the defense.”²³ In *On War*, Clausewitz goes on to say that this essential transition must be planned for and is an integral part of the idea of the defense. In Baron Antoine Henri Jomini’s writings concerning transitions, he emphasizes that “the best thing for an army standing on the defense is to know *how* to take the offensive at a proper time, and to *take* it.”²⁴ He elaborates by alluding to the element of *coup d’oeil*²⁵ when determining this specific moment of transition. The definition of transition used for the research questions will be the point at which a defending force changes the nature of its operations to the offense.

This study proposed three hypotheses that attempt to describe how Anti-Tank units increase the combat effectiveness of divisions and corps in large-scale combat operations. As previously stated, little literature exists on Anti-Tank units and their performance and doctrine on the battlefield. Most literature covers the weapon systems of Anti-Tank units and their

²¹ US Department of Defense, Joint Staff, *Joint Publication (JP) 5-0, Joint Planning* (Washington, DC: Government Printing Press, 2017), GL-7.

²² Clausewitz, 528.

²³ Clausewitz, 370.

²⁴ Jomini, 183.

²⁵ Clausewitz, 102. He describes the French term as the “inward eye” or sixth sense type intuition in reference to tactical decision-making.

effectiveness *vis-a-vis* opposing tanks. This makes sense, as Anti-Tank units generally operate as part of a larger system in the defense with other combat arms to include infantry and armor. The lone exception being the limited literature on the history, performance, doctrine, and organization of US Tank Destroyer battalions in World War II. However, in order to test or evaluate the proposed hypotheses, the effectiveness of Anti-Tank units in the defense was extrapolated from detailed analysis of the historical case studies.

The first hypothesis states that Anti-Tank units provide division and corps commander's increased operational flexibility. Indeed, much has been written on the role of US Tank Destroyer Battalions in World War II and their flexibility. Harry Yeide conducted one of the most in-depth looks at the role and performance of US Tank Destroyer units in the war. They performed several jobs to include anti-tank defense, infantry support, mobile artillery, and reconnaissance.²⁶ That is flexible in the ability to technically perform many roles, but a more appropriate description of their operational flexibility is that they freed up the armor to perform their envisioned traditional role of exploitation and pursuit.²⁷ Dr. Mark T. Calhoun's biography of General Lesley McNair has some insights into the creation and evolution of Tank Destroyer units before and during World War II, and flexibility came with an eventual understanding of how to best use the Anti-Tank units.²⁸

The second hypothesis is that Anti-Tank units help prevent culmination of their parent units in the defense. There is not much in the literature on the specific point of preventing culmination in the defense and its relation specifically to Anti-Tank units, however, during World War II they did just that. Anti-Tank units preventing an army's defense from culminating

²⁶ Yeide, 1.

²⁷ Robert M. Citino, *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare* (Lawrence, KS: University of Kansas Press, 2004), 102.

²⁸ Mark T. Calhoun, *General Lesley J. McNair: Unsung Architect of the US Army* (Lawrence, KS: University of Kansas Press, 2015), 282.

possibly decided several battles. More often than not, it is easier to pinpoint this early in the war when the initiative was neutral and the terrain was suited for tank warfare. Campaigns in the North African desert and the steppes of Russia highlighted this fact. In reference to the attempt to seize the fortress city of Tobruk in 1941 Field Marshall Erwin Rommel said:

In this assault we lost more than 1,200 men killed, wounded and missing. This shows how sharply the curve of casualties rises when one reverts from mobile to position warfare. In a mobile action, what counts is material, as the essential complement to the soldier. The finest fighting man has no value in mobile warfare without tanks, guns, and vehicles. Thus a mobile force can be rendered unfit for action by destruction of its tanks, without having suffered any serious casualties in manpower. This is not the case with position warfare, where the infantryman with rifle and hand grenade has lost little of his value, provided of course, he is protected by anti-tank guns or obstacles against enemy's armor. For him enemy number one is attacking infantrymen. Hence, position warfare is always a struggle for the destruction of men- in contrast to mobile warfare, where everything turns on the destruction of enemy material.²⁹

Thus, in preventing culmination in the defense, Anti-Tank units inversely cause culmination of an attacking force, and they culminate by losing tanks and armored vehicles while preserving his own for the counterattack.

The final hypothesis is that Anti-Tank units enable their parent units to quickly transition to the offense from the defense. Once again, literature does not pinpoint Anti-Tank units alone in being the primary reason for quick transitions to the offense, since Anti-Tank units are part of a larger system. However, one need not look farther than the Battle of Kasserine Pass or the Battle of Kursk to see the effect of Anti-Tank units being the primary enabler of the transition to the offense. In his autobiography *Panzer Leader*, Heinz Guderian highlighted the effectiveness of Anti-Tank units in forcing river crossings, most crucially at Sedan in 1940.³⁰ Wolfgang Fleischer and Richard Eiermann wrote a detailed book on German anti-tank troops in World War II. While the book mostly focuses on weapons systems and task organization, it elevates the rise of the tank

²⁹ Citino, *Blitzkrieg to Desert Storm*, 52-53.

³⁰ Heinz Guderian, *Panzer Leader*, trans. Constantine Fitzgibbon (New York: Da Capo Press, 1996), 104.

destroyer or assault gun in the German Army. This mechanization not only enabled a quick transition to the offense for friendly armor and infantry, but allowed the Anti-Tank units to transition to the offense and maneuver with infantry and tanks as part of a combined arms team or *kampfgruppe*. As the war dragged on, Germany increasingly used their tank destroyers and assault guns and tank substitutes.

The review of the literature examined the theory of the defense in war. Literature from several military theorists expounded on their views on the defense and why an army would conduct a defense. It also defined key terms needed for understanding the hypotheses. Additionally, this section presented three research hypotheses and related them to current literature. The empirical literature review highlighted the gaps in knowledge related to Anti-Tank units and their contribution to effectiveness in the defense. The next section details the methodology, selection of cases, and research questions.

Methodology

The main goal of this study was to evaluate the research questions as they relate to Anti-Tank units in large scale ground combat operations through examining them in historical case studies. The researcher examined two historical case studies to evaluate Anti-Tank units and their perceived ability to increase their parent unit's combat effectiveness by preventing culmination in the defense, providing operational flexibility, and enabling a quick transition to the offense. The study compared the two historical case studies using the structured, focused comparison methodology. The structure will be limited by the focused questions outlined in the three hypotheses, in that those aspects of the historical case studies will be zeroed in on. Also, the different make-up of the Anti-Tank units in the two case studies allow these variables to assist in the structured, focused comparison. In addition to the descriptions of the historical case studies, this section will examine the data collection sources and details the research questions outlined in

the introduction. The methodology section is divided into six parts, the introduction, the selection of cases, data collection, data analysis, and a summary.

This part of the section describes the case studies and why they were appropriately selected for analysis. World War II case studies were selected because this period was the last time where large Anti-Tank units played a significant role in the outcome of engagements, battles, and campaigns. Each case study examines the performances of Anti-Tank units and their contribution to operational flexibility, preventing culmination in the defense, and enabling a quick transition to the offense. Additionally, note that each case study takes place in between 1943 and 1944. The next part of this section provides additional detail on each of the historic case studies.

The first case study examines the performance of Soviet Anti-Tank units during the Battle of Kursk in the summer of 1943. The Battle of Kursk is widely considered the largest tank battle in the history of warfare. In particular, this case study will examine Anti-Tank units in a prepared and deliberate defense facing large formations of tanks. The Soviet commander, Nikolai Vatutin expected to blunt German Field Marshal Erich von Manstein's armored thrusts with a matrix of mutually supporting anti-tank defense zones.³¹ Additionally, the Soviets employed two separate Anti-Tank Brigades close to the front line in order to seal off any armored breakthrough in their defense.³² This case is appropriate for both detailing large Anti-Tank units using towed anti-tank guns in a prepared defense and as a mobile reserve.

The second case study covers German Anti-Tank units (*panzerjager*) in the defense at Caen during several sequential British offensives to seize the city in 1944. The British Army conducted an offensive on the important French city of Caen during the Normandy breakout of 1944. British commanders wished to use Caen for basing and increasing their operational reach in their drive to eject the German Army from France. German Anti-Tank units defended in French

³¹ Robert Forczyk, *Kursk 1943: The Southern Front* (Oxford: Osprey Publishing, 2017), 20.

³² *Ibid.*, 21.

hedgerows and urban areas as part of a larger defense containing a force of heavy German tanks. The German Divisional Anti-Tank units in the battle used a combination of towed anti-tank guns and mobile tank destroyers. This historical case study is appropriate for their greater research because of the variables of terrain and Anti-Tank unit composition. These variables will assist in the structured, focused comparison methodology.

The collection of the data for this study relied on doctrinal, primary, and secondary sources. Data collection focused on the analysis of Anti-Tank units as part of the defense in historical case studies from World War II. Doctrinal data provided a baseline for the manner in which Anti-Tank units in the historical case studies were expected act. Modern US Army doctrine also provides a basis for comparison with the doctrine guiding the Anti-Tank units in the historical case studies. Secondary sources provided the history of the campaigns and a record of the performance of Anti-Tank units. Any primary sources from commanders in the campaigns and members of Anti-Tank units are used to flesh out details about decision-making and specifics on weapon systems employment. The structured focused comparison includes three steps. The first step is gathering the empirical data to the research questions presented in the historical case studies. The second and third steps are outlined in the findings and analysis section of the study, which compares the empirical data found using the focused research questions and then analyzes their impact on the study's hypotheses.

This study used six research questions to guide the process of discovery. Each of the questions was applied to the historical case studies, providing comparative approach to the findings with some variables. The cases were evaluated and measured on how effective Anti-Tank units performed in the defense in preventing culmination, enabling a quick transition to the offense, and providing operational flexibility. By using two historical case studies in the same war over a one-year period, with specific variable characteristics, the answers to the research questions allowed the analysis to determine their applicability to the three hypotheses. The first three questions compare the intrinsic capabilities of each of the Anti-Tank units across the three

historical case studies: organization, doctrine, and capabilities. This will enhance the structured focused comparison by analyzing the differences of the Anti-Tank units in the case studies. The final three research questions focus on the performance across a campaign. The fourth question will focus on the planning phase, the fifth question will query actions during the campaign, and the sixth question analyzes an Anti-Tank units' ability to set up for after the campaign.

The first research question was what composition of Anti-Tank units provided the best mix for the results required for effectiveness in the defense. Anti-Tank units in the periods covered in the historical case studies varied in the different armies of the era. While their primary purpose was similar, their variable compositions between the belligerent's aids in structured, focused comparison. Anti-Tank units could be composed of platoon-sized elements all the way up to brigade-sized organizations. Also, Anti-Tank units could be tasked organized to possess enabler assets such as engineers or reconnaissance. The different compositions of Anti-Tank units allow for critical look at how this aspect affected performance.

The second research question queries the doctrine of Anti-Tank units. Each army's Anti-Tank units in the historical case studies is guided by unique doctrine. This doctrine dictates how the Anti-Tank units would fight in the defense, how to employ weapon systems, target selection criteria, disengagement criteria, and conditions for offensive action. The Soviet and German anti-tank doctrine was variable based on cultural, organizational, and technological aspects that highlight their differences, thus lending to structured, focused comparison. It is also possible that Anti-Tank units neglected their anti-tank doctrine in certain situations in the historical case studies. The researcher expected to find Anti-Tank units fighting within their doctrinal role during the campaigns analyzed in the case studies.

The third question asked what capability Anti-Tank units provided in the case study. This question was the one most easily answered. One, this is the aspect of Anti-Tank units that most literature expounds on, and two, capability is the most visible quality of Anti-Tank units. The two historical case studies evaluated the different capabilities of Anti-Tank units in the defense and

how this affected the three hypotheses. Anti-Tank units could be made up of towed anti-tank guns, tank destroyers and assault guns, or a mix including infantry carried anti-tank weapons. Different anti-tank weapons provided different capabilities based on weapon range, penetration power, mobility, survivability, and sustainability.

The fourth, fifth, and sixth research questions apply directly to the three proposed hypotheses. The last three questions are: Do Anti-Tank units provide operational flexibility? Do Anti-Tank units prevent culmination in the defense? Do Anti-Tank units enable a quick transition to the offense? These questions were used to directly evaluate the hypotheses applied in the historical case studies.

This section detailed the purpose of the research and presented the primary research questions. The research relied on two historical case studies that attempted to discover the performance of Anti-Tank units in two different and unique situations. The study used a structured, focused comparison methodology to compare the answers of the research questions proposed in each case study. Doctrine, primary sources, as well as secondary sources related to the performance of Anti-Tank units in the time frame of the case studies. The study focused on research questions relating to operational flexibility, preventing culmination in the defense, and allowing transition to the offense. This section also presented possible answers to the research questions with the expected discovery that the hypotheses are valid and true. The following section describes the historical case studies of Anti-Tank units in large scale ground combat operations, with the section following that discussing the analysis and findings of the case studies.

Case Studies

The previous section reviewed the necessary theories and terms relevant to Anti-Tank units in the literature review. This section will outline two historical case studies that involved Anti-Tank units in large-scale ground combat operations. The historical case studies will answer the six focused questions posed in the methodology section. By answering the six focused

questions, this section will lay out the needed data in order to compare and contrast the performance of Anti-Tank units in the analysis and findings section. The first case study will look at Soviet Anti-Tank units during the Battle of Kursk in the summer of 1943. The second case study will evaluate the performance of German Anti-Tank units during the Battle of Caen in 1944. Each case study will evaluate the performance of Anti-Tank units in the defense, and each case study will have different variables in order to assist the structured, focused comparison. This case study section is broken up into two sub-sections, one for each of the historical case studies. Each sub-section will start off with a campaign overview of the case study followed by the answers to the focused questions using documented evidence.

Battle of Kursk: Campaign Summary

The German offensive against the Kursk salient between 5 July and 16 July, 1943 proved to be the last major German offensive on the Eastern Front in World War II. Over the two weeks of the campaign, the complex series of Soviet defenses ground down a German attack by elements of two Army Groups. The battle was one of the largest in the history of warfare and is generally considered the largest tank battle in modern warfare.³³

³³ Ivan Parotkin, ed., *The Battle of Kursk* (Moscow: Progress Publishers, 1974), 6-7.

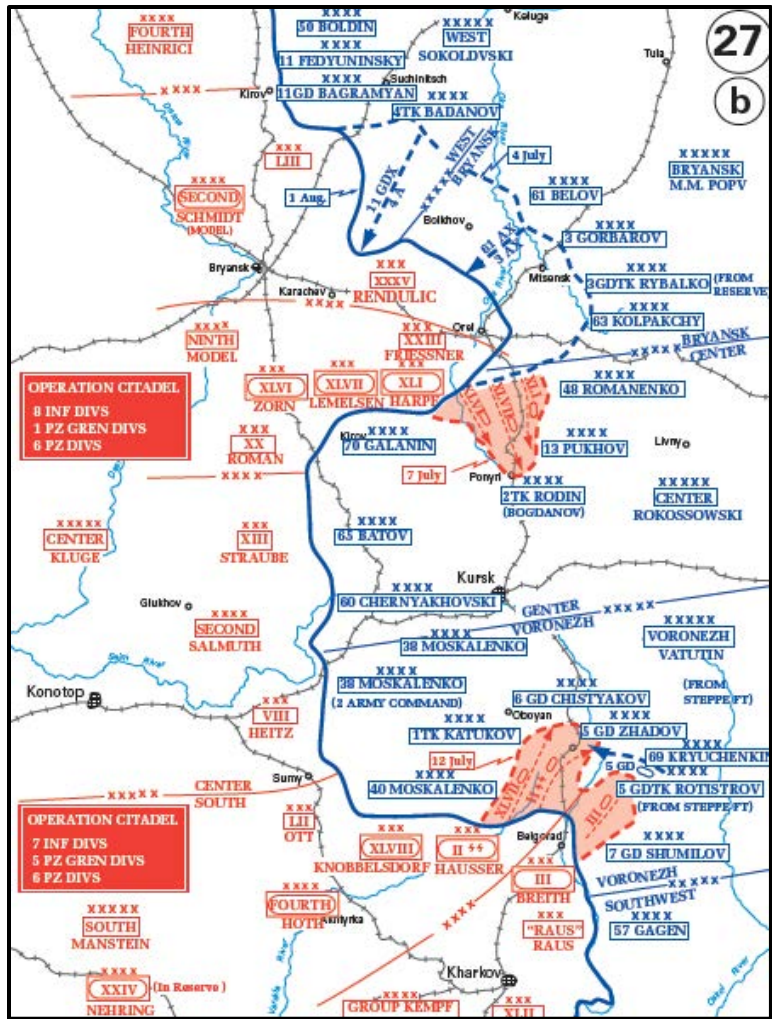


Figure 1. Battle of Kursk, 1943. *Source:* Map courtesy of the Department of Military History, United States Military Academy, accessed 25 October 2018, https://www.usma.edu/sites/default/files/inline-images/academics/academic_departments/history/WWII%20Europe/WWIIEurope27Combined.pdf.

By the spring of 1943, the Eastern Front had stabilized. A Soviet counter-offensive was halted, and newly appointed Army Group South commander; Field Marshal Eric von Manstein regained lost territory from the overstretched Soviets.³⁴ The fighting left a westward pointing bulge in the front that was 190 kilometers wide and 120 kilometers deep around the important rail

³⁴ Walter S. Dunn Jr., *Kursk: Hitler's Gamble, 1943* (Mechanicsburg, PA: Stackpole Books, 2008), 14-17.

junction of Kursk.³⁵ Inside the Kursk salient were five Soviet Armies. Adolf Hitler sought to regain the initiative on the Eastern Front by reducing this salient. The offensive, code named *Zitadelle* (Citadel), would involve Army Group South attacking north into the bulge, while Field Marshal Gunther von Kluge's Army Group Center would hold the Soviets in the center and attack the salient from the north.³⁶ Hitler intended the offensive to begin in early May, however the Germans delayed the operation in order to shift divisions from France to Russia, and for more newly developed heavy tanks (*Panzerkampfwagen* Mark VI "Tiger" and *Panzerkampfwagen* Mark V "Panther") to arrive at the front.³⁷ This delay would allow the Soviets a generous amount of time to improve their defenses in the Kursk salient, specifically their anti-tank defenses.

Josef Stalin and his Commander in Chief of the Soviet armed forces, Marshal Georgi Zhukov intended to use the Kursk salient as a start off point for their first summer offensive in 1943.³⁸ The Soviets had previously only conducted their offensives in the winters of 1941 and 1942. Zhukov and his staff persuaded Stalin to allow the Germans to attack and to assume a defensive posture.³⁹ A decision was made to reinforce the two Fronts (Soviet Army Group level commands) within the Kursk salient, Konstantin Rokossovsky's Central Front and Nikolai Vatutin's Voronezh Front. A 105-day intercession between the time the front stabilized until the beginning of *Zitadelle* gave the Soviets time to develop six defensive belts of 3 to 5 trenches, and lay immense mine fields. The Voronezh Front laid some 321,000 mines, with nearly half of that

³⁵ Janusz Piekalkiewicz, *Operation "Citadel" Kursk and Orel: The Greatest Tank Battle of the Second World War*, trans. Michaela Nierhaus (Novato, CA: Presidio Press, 1987), 35.

³⁶ Erich von Manstein, *Lost Victories: The War Memoirs of Hitler's Most Brilliant General*, ed. and trans. Anthony G. Powell (Minneapolis, MN: Zenith Press, 1982), 446-448.

³⁷ Will Fowler, *Kursk: The Vital 24 Hours* (London: Amber Books, 2005), 26-29.

³⁸ Forczyk, 32.

³⁹ Georgi Zhukov, "In the Kursk Bulge," in *The Battle of Kursk*, ed. Ivan Parotkin (Moscow: Progress Publishers, 1974), 34.

amount being anti-tank mines.⁴⁰ The critical delay by Hitler and British supplied intelligence on the specifics of the German attack significantly assisted the Soviets in their preparations.⁴¹

The German *Ostheer* initiated Operation *Zitadelle* on the 5th of July 1943. Walther Model's *Panzer* Corps of Army Group Center attacked south towards Kursk. His objective were to disrupt command and control around Kursk, cut Soviet lines of communication, and draw forces away from the main effort (Army Group South, II SS *Panzer* Corps).⁴² Although Model penetrated 21 kilometers into the Rokossovsky's Central Front defenses, his tank force was severely depleted due to the anti-tank defense zones, and his force culminated by 9 July.⁴³ General Rokossovsky launched an immediate counterattack in order to force the German 9th Army and 2nd *Panzerarmee* to withdraw. By this point, Army Group Center had lost over 400 tanks and fighting vehicles.

The fighting in the south proved to possibly the fiercest fighting in the war. General Nikolai Vatutin prepared the Voronezh Front's defensive belt in significant depth. They constructed three defensive belts in the first echelon that were 30 to 50 kilometers deep and extended 244 kilometers, the second and third defensive belts spanned 235 kilometers and 250 kilometers respectively.⁴⁴ Colonel General Herman Hoth, commander of 4th *Panzerarmee* directed the attack northward against the southern sector of the salient for Army Group South. Hoth's primary objective was Oboyan, on the road to Kursk and just astride Vatutin's final trench

⁴⁰ Forczyk, 22.

⁴¹ Alexander Vasilevsky, "Strategic Planning of the Battle of Kursk," in *The Battle of Kursk*, ed. Ivan Parotkin (Moscow: Progress Publishers, 1974), 71-72.

⁴² Fowler, 47-48.

⁴³ *Ibid.*, 52-55.

⁴⁴ Valeriy Zamulin, *Demolishing the Myth: The Tank Battle at Prokhorovka, Kursk, July 1943, An Operational Narrative*, ed. and trans. Stuart Britton (Solihull, UK: Helion, 2011), 37.

line.⁴⁵ In two days, Hoth's attack penetrated 20 kilometers on a frontage of 40 kilometers.⁴⁶ Although Vatutin committed his First Tank Army and a tank corps from the strategic reserve, Hoth's *Panzers* gained an additional 15 kilometers by 11 July due to the poor coordination of the Soviet commitment of reserves. The Germans did not have a sufficient number of infantry units to consolidate their gains in the areas that they attacked through.⁴⁷ The next day, Paul Hausser's II SS *Panzer*, the best equipped unit in the entire German armed forces, crossed the last trench line and at Prokhorovka, 35 kilometers south east of Oboyan, and encountered the 5th Tank Guards Army from the Stavka reserve. The ensuing tank battle involved some 1,200 tanks, and although the fight was not decisive, Army Group South had culminated. Hitler called off the offensive on 13 July, after the *Ostheer* suffered 33,708 casualties and 60 percent of their tank force.⁴⁸

The first structured question posed is what was the organization of the Soviet Anti-Tank units during the Battle of Kursk? By the time of the Kursk campaign, Soviet Anti-Tank units evolved in composition in order to best defeat their intended target, German tanks. Their form met their intended function after the initial shock of German tactics and operations during *Barbarossa*. According to strategist Edward Luttwak, this logic of action in the countermeasures to innovation in war is common.⁴⁹ In April of 1943, the Soviet Army overhauled their anti-tank forces. Previously in 1942, the Soviet anti-tank guns were organized into "destroyer brigades" with two or three regiments each.⁵⁰ Each regiment had a mix of towed 76mm (ZiS-3), 45mm (M-

⁴⁵ Dunn, 112-113.

⁴⁶ *Ibid.*, 124.

⁴⁷ Forczyk, 47, 48.

⁴⁸ *Ibid.*, 91.

⁴⁹ Edward Luttwak, *Strategy: The Logic of War and Peace* (Cambridge, MA: Harvard University Press, 2001), 30.

⁵⁰ Dunn, 26.

42), and 37mm (1-K) anti-tank guns with a battalion of anti-tank rifle equipped infantry in support.⁵¹ Three of the anti-tank destroyer brigades were sometimes accumulated into an anti-tank destroyer division, which proved too difficult to control, maneuver, and sustain (mixed caliber anti-tank gun regiments taxed the Soviet supply system).⁵² By the Battle of Kursk, the Anti-Tank units were reorganized into brigades containing two 76mm ZiS-3 regiments and one regiment of the smaller caliber guns (either 45mm or 37mm).⁵³ During the battle, especially in the Central Front on the north side of the salient, Anti-Tank units were kept together to form an anti-tank reserve to quickly move to and blunt *Panzer* breakthroughs. The anti-tank brigade commander controlled the anti-tank defense of a particular sector, and held a reserve that could move guns quickly by truck. The Front commander controlled full Anti-Tank Brigade reserves with 60 guns each that could be in place with enough firepower to stop a *Panzer* Division.⁵⁴ Significant attention was paid to the amount of anti-tank guns per kilometer in each defensive belt. The Central Front's artillery adjutant and military historian, Colonel Georgi Khoroshilov had this to say concerning the density of anti-tank guns:

Anti-tank defences were organized most thoroughly in accordance with a single plan and to the entire depth of the armies' defences. On the average, the anti-tank defences were 30-35 kilometers deep, with 16-30 anti-tank guns per kilometer. With our Air Force dominating the air, this number of anti-tank guns sufficed to repulse enemy attacks launched by 30 to 60 panzers on a front one kilometre wide. To a large extent this predetermined the success achieved in thwarting the offensive of the nazi assault groupings.⁵⁵

⁵¹ Ibid.

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Ibid., 27.

⁵⁵ Georgi Khoroshilov, "Employment of Artillery," in *The Battle of Kursk*, ed. Ivan Parotkin (Moscow: Progress Publishers, 1974), 210.

To highlight the importance that Anti-Tank units held during the battle, Josef Stalin signed NKO Order No. 0528, which renamed the destroyer artillery units as destroyer anti-tank artillery units, and placed a priority on their strength and replenishment.⁵⁶

The second focused research question asks what doctrine the Soviet Anti-Tank units used during the campaign. Going back to pre-war conflict at Khalkin Gol against the Japanese in 1939 up through the battles with the Germans leading up to the Battle of Kursk, the Soviet Army did not subscribe to the theory that the best anti-tank weapon is another tank.⁵⁷ The Soviets recognized the primacy and abilities of anti-tank guns and weapons when fighting tanks at a comparatively earlier time than the other belligerents, either Allies or Axis, during World War II. That being said, there were several shortcomings in Anti-Tank units, and their anti-tank doctrine evolved throughout the war. While the Soviet victory at Stalingrad the winter prior to Kursk was a tactical and operational success, the Red Army suffered a setback during Manstein's spring counter-offensive in the Ukraine, and the performance of Anti-Tank units left much to be desired.⁵⁸ Up to this point, Soviet tactical and operational defenses had failed to significantly affect German *Panzer* formations from penetrating in depth during their envelopments and *Kesselschlact* operational approach.⁵⁹ However, of all the combatants during the war, the Red Army evolved and improved in the operational art of war and learned the correct lessons from previous defeats.⁶⁰ The Soviets used their experiences from numerous failures to build a thorough and robust anti-tank defense at Kursk. It has been suggested in certain literature on the campaign that the Soviet defenses at Kursk were informed by the elastic defense in depth concepts born out

⁵⁶ Zamulin, 41.

⁵⁷ Dunn, 29.

⁵⁸ George M. Nipe, *Blood, Steel, and Myth: The II SS Panzer Korps and the Road to Prochorowka, July 1943*, ed. Robert Crawford (Stamford, CT: RZM Publishing, 2011), 13.

⁵⁹ Ibid.

⁶⁰ Ibid., 11.

of World War I but further research is required to adequately prove this theory.⁶¹ The defense was based on the use of deeply echeloned anti-tank forces integrated into every level of command and were grouped into anti-tank strong points.⁶² Previously, Anti-Tank units had been subordinated and integrated into infantry units, primarily grouped on the very front line positions. Not much thought was given to the echelonment and depth of Anti-Tank units, and they were vulnerable to flank attacks and envelopments, which was the hallmark of German combined arms maneuver tactics. How much of this new defensive doctrine was influenced by the concept of Soviet offensive deep operations requires further research, although the similarities are apparent. For example, when asked about the Battle of Kursk for the Soviet after action review, Lieutenant General Pytor Vashurin stated that offensive battles from Moscow through Stalingrad made it necessary to switch from single-echelon to deeply echeloned battle formations.⁶³ The other evolution of Soviet anti-tank doctrine involves the concept of mobile Anti-Tank reserves, which at Kursk reached the Brigade level.⁶⁴ Smaller tactical aspects of the doctrine also appear. The greatest advantage of towed anti-tank guns is their low silhouette and concealability. During Kursk, the new doctrine emphasized the Anti-Tank units to refrain from firing at German tanks until they had closed within 450 to 500 meters for maximum ambush effect.⁶⁵ This also negated the range of new German *Tiger* and *Panther* tanks with their 88mm and 75mm guns respectively. Another aspect of the changing doctrine was the emphasis on not committing anti-tank reserves too quickly. Previously because of political considerations not to give up an inch of Soviet

⁶¹ Dunn, 103-107.

⁶² Fowler, 38.

⁶³ Pytor Vashurin, "Tactics Employed by Ground Forces in the Battle of Kursk," in *The Battle of Kursk*, ed. Ivan Parotkin (Moscow: Progress Publishers, 1974), 166.

⁶⁴ Fowler, 38.

⁶⁵ *Ibid.*, 39.

territory, reserves were committed much too quickly and piecemeal to have a significant effect on the German attacks.

The third research question regards the specific capabilities of the Anti-Tank units in each of the case studies; each Anti-Tank unit in the historical case studies provides a different and unique set of capabilities. The Red Army Anti-Tank units at Kursk were primarily made up of towed anti-tank guns of mixed calibers and anti-tank rifles. The new formation created specifically for the campaign was the Anti-Tank Brigade.⁶⁶ The Anti-Tank Brigade (there were 7 such brigades on the Voronezh Front alone, and 27 brigades available for the action), as previously stated in the organization research question section, consisted of two regiments of ZiS-3 76mm guns, one regiment of Model 1937 45mm guns, and several smaller units consisting of infantry with anti-tank rifles.⁶⁷ The most capable of the Soviet anti-tank guns was the ZiS-3. In addition to performing anti-tank duties, the ZiS-3 could act as a light artillery piece, as the barrel could elevate high enough for indirect fire. Although the ZiS-3 proved to be inferior to similar German anti-tank guns, it could penetrate 69mm of armor at a range of 500 meters, which was efficient enough to penetrate the armor of most German Armored Fighting Vehicles at Kursk.⁶⁸ Due to the density of anti-tank guns (specifically the ZiS-3) on both the Central and Voronezh Fronts defenses, anti-tank guns could overwhelm more heavily armored German vehicles such as the “Tiger”, “Panther”, and “Elefant” with flank or rear shots where their armor was thinner.⁶⁹ The ZiS-3 was light enough to be repositioned by the gun crew over short distances without the

⁶⁶ Zamulin, 40. The NKO (People’s Commissariat of Defense) Order No. 0063 dated 10 April 1943, which authorized the creation of a larger anti-tank formation, the destroyer anti-tank brigade.

⁶⁷ Zamulin, 40.

⁶⁸ Ian Hogg, *Tank Killing: Anti-Tank Warfare by Men and Machines* (New York: Da Capo Press, 1997), 90. This is true of most German AFVs, but the ZiS-3 could not effectively penetrate the armor of ‘Tigers’ or ‘Panthers’ at this range 100 percent of the time.

⁶⁹ *Panzerjager* ‘Tiger’ also known as the ‘Ferdinand’ or ‘Elefant’ was a German heavy Tank Destroyer on a *Panzerkampfwagen* Mark VI or ‘Tiger’ chassis, armed with an 88mm gun, and frontal armor 200mm thick.

need for a prime mover. However, at Kursk, Red Army Anti-Tank Regiments had organic American Lend-Lease trucks and half-tracks in order to move the guns and ammunition over farther distances and broken terrain in a matter of hours.⁷⁰ The next step in the evolution of mobility in Red Army Anti-Tank units was the development of self-propelled tank destroyers. These vehicles were present at Kursk, but in smaller numbers than later in the war. The Soviet self-propelled tank destroyers or SUs came about as a response to larger German AFVs appearing on the battlefield in 1943 and as a means to provide a mobile anti-tank capability that could keep pace with Red Army tank formations. The first of these new tank destroyers were the SU-85 with a high velocity 85mm anti-aircraft gun mounted on a T-34 chassis.⁷¹ These tank destroyers were mostly grouped into independent regiments in the Front reserves.⁷² Additionally, Soviet Anti-Tank units contained a significant number of 14.5mm PRTD anti-tank rifles. Although they were capable of penetrating early war German tanks, they proved useless against heavier AFVs, and at Kursk, they were mainly used against light skinned vehicles.⁷³ In summation, Red Army Anti-Tank units primarily provided point anti-tank defense in depth out to 500 meters with an array of towed anti-tank guns. They best provided this defense in conjunction with infantry support and obstacles in front to slow German tanks.

The fourth research question directly links to the offered hypothesis of Anti-Tank units providing commanders and armies operational flexibility. Did Soviet Anti-Tank units provide the Red Army operational flexibility at Kursk? According to the offered definitions in the literature review, Soviet Anti-Tank units did in fact provide operational flexibility. The large amount of Anti-Tank units on the defensive belts at Kursk allowed for the Red Army to plan their counter-

⁷⁰ Dunn, 68.

⁷¹ Hogg, 116.

⁷² Dunn, 68-69.

⁷³ Hogg, 54. The PRTD-41 could penetrate 20mm of armor at 500 meters at a 30-degree angle.

offensive before defensive planning even began. Soviet historical analysis on the subject stresses that the defensive battle at Kursk should not be regarded as a classic case study on the defense, rather that the defense was specifically constructed to defeat aircraft and tanks in order to preserve traditional offensive maneuver combat power.⁷⁴ This allowed the flexibility for the Red Army commanders on both fronts during the planning phase to arrange their forces in a flexible manner to specifically defeat German tanks and aircraft, all the while preserving their tank formations behind the many defensive belts. Anti-tank units also allowed commanders to integrate tanks along the line into infantry units in order to be best set up for local counterattacks and ambushes where German penetrations broke through.⁷⁵ These reallocations of forces along the front happened behind several defensive belts of Anti-Tank units in strongpoints. The primary advantage through operational flexibility that Anti-Tank units provided the Red Army at Kursk was the luxury of not having to place their tanks (offensive means for counter-offensive) in the first and second defensive lines. On the Voronezh Front specifically Anti-Tank units in the first and second defensive lines allowed the Front commander to regroup “35 percent of its infantry divisions, almost all the tank, mechanized and motorized infantry brigades, and more than 40 percent of its self-propelled artillery” into operational reserves.⁷⁶

The next research question asks did the Anti-Tank units prevent the culmination of the defending force during the campaign? This question is not as easily measurable as the other questions. However, it seems that a comprehensive defense plan that not only included Anti-Tank units, but mines, dug in infantry, tank ditches, massed artillery, obstacles, close air support, and

⁷⁴ Vasily Morozov, “The Need of a More Detailed History of the Battle of Kursk,” in *The Battle of Kursk*, ed. Ivan Parotkin (Moscow: Progress Publishers, 1974), 328-330.

⁷⁵ Pyotr Vashurin, “Tactics Employed by Ground Forces in the Battle of Kursk,” in *The Battle of Kursk*, ed. Ivan Parotkin (Moscow: Progress Publishers, 1974), 159-160.

⁷⁶ Semyon Ivanov, “The Battle of Kursk and its Effect on the Development of Strategy and Operational Skill,” in *The Battle of Kursk*, ed. Ivan Parotkin (Moscow: Progress Publishers, 1974), 156.

limited counterattacks prevented the Red Army from culmination at Kursk. Soviet Anti-Tank units alone did not prevent the culmination of the Red Army in the defense, but they were a significant part of it. According to detailed analysis of the campaign, Soviet anti-tank guns destroyed more than half the total German tanks lost at Kursk.⁷⁷ In fact, the density of Soviet Anti-Tank units along the approaches to Oboyan and Prokorovka forced the German pincer attack from II SS *Panzer* Corps to culminate at the limit of the German advance on 8 July.⁷⁸ Furthermore, although the German II SS *Panzer* Corps penetrated deep into the Soviet first and second defensive belts on the Vornoezh Front, rapid movement of Anti-Tank Brigades from the Front reserves prevented the Panzer Corps from penetrating the final defensive lines near Prokhorovka.⁷⁹ At this moment, the inverse is true of the German forces. According to Erich von Manstein's memoirs concerning Prokhorovka, "Speaking for my own Army Group, I pointed out that the battle was now at its culminating point, and that to break it off at this moment would be tantamount to throwing away victory. On no account should we let go of the enemy until the mobile reserves he had committed were completely beaten."⁸⁰ Five days after Prokhorovka, a major Soviet counter-offensive initiated the two-year unabated advance to Berlin.

The final research question for the Kursk case study queries whether Anti-Tank units enabled the Red Army a quick transaction to the offense. Just as with the previous research questions, the answer is complicated. A large Soviet counterattack in the vicinity of Prokhorovka occurred simultaneously with the II SS *Panzer* Corps attempted penetration of the third Voronezh Front defensive line. The Soviets transitioned to the offense too soon, and the engagement at

⁷⁷ Dunn, 81.

⁷⁸ Ibid., 143.

⁷⁹ Ibid., 159-163.

⁸⁰ Manstein, 449.

Prokhorovka (considered the largest tank engagement in the history of warfare)⁸¹ proved to be a mass meeting engagement rather than traditional offense or defense. However, the Soviets launched their counterattack in the south because of the perceived culmination of II SS *Panzer* Corps attack. Considering the fact laid out in the previous research question on the destruction of roughly half of all German tank losses in the campaign, even though the initial counterattack failed, the performance of Anti-Tank units enabled that decision. On the other hand, something has to be said of the German army's ability to recover, repair, and return to service many of their disabled vehicles. For example, II SS *Panzer* Corps tank numbers dropped to 40 percent of their initial strength during the first week of July, but by the time of the Prokhorovka meeting engagement, the number repaired and returned to service increased them to 46 percent of their initial strength.⁸² So this indicates that the number of destroyed tanks during the week of fighting was less than the number of tanks returning to service. On the other hand, the meeting engagement at Prokhorovka proved to be the last gasp of the German attack that culminated on 15 July. The front stabilized for the next two weeks, and then the Soviets launched a major offensive in August of 1943.⁸³ The Anti-Tank units at Kursk along the defensive lines allowed two of the five Soviet Tank Armies to remain fresh in reserve, even though another two Tank Armies were launched from reserve for the Prokhorovka counterattack.⁸⁴ Regardless of the outcome of the Prokhorovka battle, Anti-Tank units still allowed the Voronezh Front commander, Vatutin the ability to make that decision to resume the offense.⁸⁵

⁸¹ Although there is a disagreement among many sources as to the exact number of AFVs involved in the Prokhorovka battle, the number is usually between 1,000-1,800 tanks and assault guns.

⁸² Zamulin, 534.

⁸³ Dunn, 192.

⁸⁴ *Ibid.*, 190.

⁸⁵ Zamulin, 550-55. In the Soviet counter-attack at Prokhorovka, Vatutin misjudged the remaining German strength and launched the attack which caused loss of 5,000 men and 400 tanks.

The German pincer attack at Kursk culminated on 15 July 1943. They had only gained 20 kilometers of ground in the Kursk salient. A large part of their failure belongs to the ability of Soviet Anti-Tank units, sometimes in brigade strength, to engage German tanks from concealed positions out to 500 meters. Numerous anti-tank strongpoints in the defensive lines assisted in the culmination of the German offensive. The planning for, emplacement, and use of Anti-Tank units in the defense allowed Soviet tank units to be held in reserve for a quick transition to the offense at the culminating point of the German attack.

Battle of Caen: Campaign Summary

The Battle of Caen consisted of a series of British attacks and German counterattacks in northern France as part of the Allied Operation Overlord from 6 June until the first week of August in 1944. Caen is a strategically important road and rail junction, 12 kilometers inland from the English Channel, astride the River Orne. The roads going east lead to the Pas de Calais, its roads and rail heading southeast leads to Paris, and the roads west lead to Bayeaux and the Cotentin Peninsula.⁸⁶ Caen was a British and Canadian objective, and the Allies needed to capture the key city in order to build combat power on the continent to continue the offensive north and east.⁸⁷ The terrain of the area around Caen and in most of Normandy, called *bocage*,⁸⁸ prevented large armored maneuvers. Tanks were highly vulnerable in this tight terrain to anti-tank guns and anti-armor ambushes.⁸⁹

By the summer of 1944, the Allies had been planning the invasion of the European continent, particularly France, for some time. The Armies of the United States, Great Britain, and

⁸⁶ Ken Ford, *Caen 1944: Montgomery's Break-out Attempt* (Oxford: Osprey Publishing, 2004), 7.

⁸⁷ Ken Ford, *D-Day 1944: Gold and Juno Beaches* (Oxford: Osprey Publishing, 2002), 84.

⁸⁸ French for hedgerow or box country.

⁸⁹ Ford, *D-Day 1944*, 82.

other Allies (primarily Canada) built up significant combat power for this operation even as the campaigns in North Africa and Italy were being conducted. The plan would be a combined naval (Neptune), air (Pointblank), ground (Overlord), and deception (Bodyguard) operation in order to establish a lodgment in Normandy to quickly breakout into the French countryside.⁹⁰ The deception operation intended to deceive the Germans into believing that the primary landings would be conducted in the vicinity of Calais.

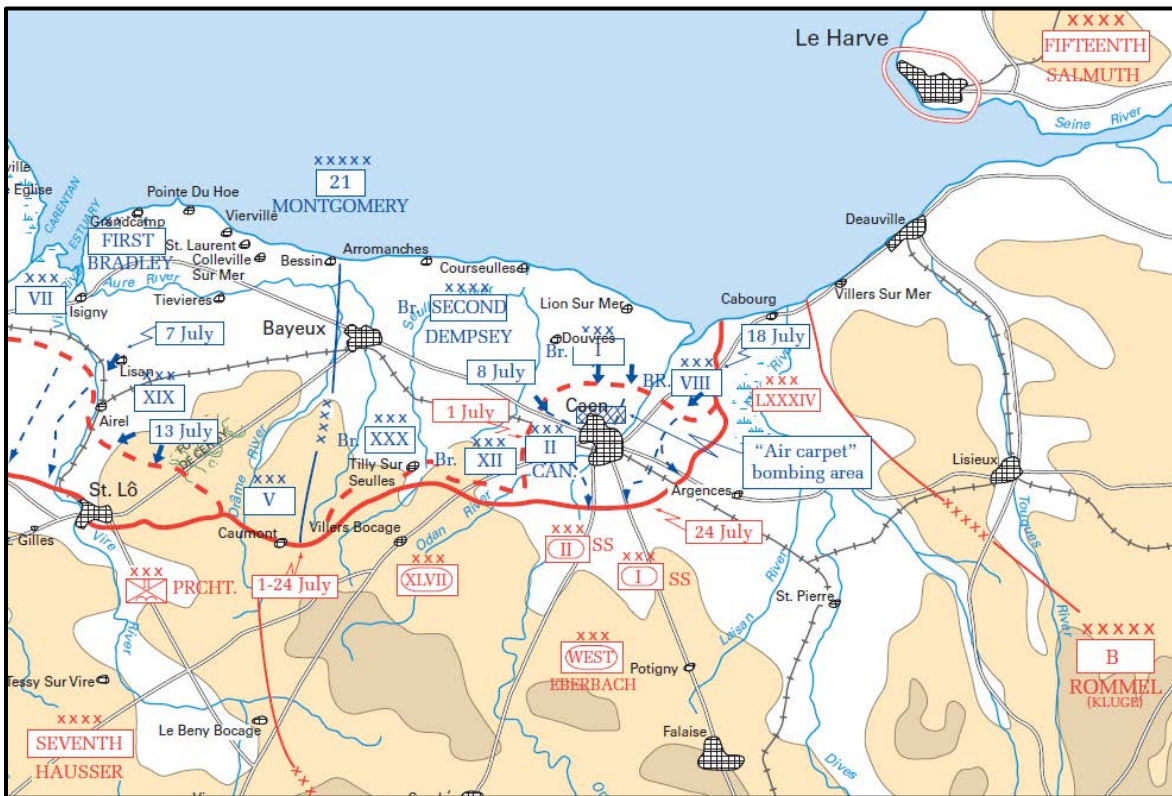


Figure 2. Normandy, 1944. *Source:* Map courtesy of the Department of Military History, United States Military Academy, accessed 15 December 2018, https://www.usma.edu/sites/default/files/inline-images/academics/academic_departments/history/WWII%20Europe/WWIIEurope59.pdf.

The British and Canadians would land on the eastern most beaches while the Americans would land in the west. The British breakout attempt would ultimately be a feint as the Allies

⁹⁰ Stephen Badsey, *Normandy 1944: Allied Landings and Breakout* (Oxford: Osprey Publishing, 1990), 26-29.

assumed that the Germans would attempt to reinforce to areas closest to Paris and their supply lines. The feint would allow American forces landing in the west to rapidly break out to envelop the Cherbourg Peninsula and out maneuver Germans to the south and west.⁹¹ Caen would be the British and Canadian primary objective on D-Day plus 1, particularly the 2nd British Army under Lieutenant General Sir Miles Dempsey. The Germans Army Group B, under the command of Field Marshal Erwin Rommel, would attempt contain or defeat the Allies on the beaches.⁹² However, between Rommel and Field Marshal von Rundstedt, there was a disagreement over the method in which their *Panzer* formations would be employed. Rommel argued for them to be used on the beaches to quickly defeat the Allied landings, but limiting flexibility and mass and made units vulnerable to air attack and naval gunfire. Rundstedt advocated for the *Panzer* units to be held in reserve as a mobile striking force once an Allied landing was identified. Adolf Hitler's solution was to give Rommel's Army Group B three *Panzer* Divisions (11th *Panzer* Division, 9th *Panzer* Division, and 2nd SS *Panzer* Division "*Das Reich*") for use against the beaches, and created *Panzer* Group West (I SS *Panzer* Corps which included 12 SS *Panzer* Division "*Hitlerjugend*", 21st *Panzer* Division, and *Panzer Lehr* Division) under General Leo Geyr von Schweppenburg which would act as a mobile reserve.⁹³

On 6 June, the British 3rd Division and Canadian 3rd Division advanced rapidly from Sword and Juno beaches respectively in order to seize Caen and its important airfield at nearby Carpiquet.⁹⁴ This attack was stopped by the 21st *Panzer* Division (part of OB West's mobile reserve), and further attempts to capture Caen and its airfield on 7 June were blunted by 12 SS

⁹¹ Ibid., 28.

⁹² Army Group B was under Field Marshal Gerd von Rundstedt's command in *Oberbefehlshaber West* (OB West), which was the supreme German command in western Europe.

⁹³ Chris Bishop, *Order of Battle: German Panzers in WWII* (St. Paul, MN: Zenith Press, 2008), 152.

⁹⁴ Ford, *Gold and Juno Beaches*, 81.

Panzer Division ‘*Hitlerjugend*’ as they arrived on the battlefield from their assembly areas. Over the next week, the Canadians and British would attempt to enlarge their beachhead and push around to the west of Caen (where Carpiquet is located), but the combination of the constrictive terrain and limited counterattacks by the ‘*Hitlerjugend*’ Division frustrate their efforts.⁹⁵ On 13 June, two divisions (51st Highland Division and 7th Armoured Division from XXX Corps) attempted to envelop Caen from the west by crossing US boundaries through Villers Bocage.⁹⁶ Over a course of a few hours, SS *Hauptsturmführer* Michael Wittman’s 1st Company of *Schwere Panzer Abteilung* 101 (equipped with the *Panzerkampfwagen* Mark VI “Tiger I”) destroyed over thirty British tanks and vehicles, and the attack failed. There was now a race on between the Allies and the Germans to build combat power in Normandy, and Caen was the key for both sides.

Beginning in late June, Field Marshal Montgomery (now the commander of 21st Army Group) would attempt a series of named operations in order to seize Caen directly or attempt an envelopment of the city from its flanks. These operations would be conducted in Montgomery’s new operational approach dubbed “Colossal Cracks”. The operational approach called for a mass of infantry, armor, logistics, and most importantly fires applied in depth along a frontage that normally a brigade would use (such as a road network or highway).⁹⁷ This allowed Montgomery to fight set piece battles that would be preceded by air and artillery bombardment in order to significantly reduce British casualties for politically cautious reasons. The first of these operations would be Epsom. Operation Epsom made a salient in the German lines and established a bridgehead over the River Odon, but failed in its intended objective of capturing bridges across

⁹⁵ Ford, *Gold and Juno Beaches*, 81-83.

⁹⁶ *Ibid.*, 85-88.

⁹⁷ Stephen Ashley Hart, *Colossal Cracks: Montgomery’s 21st Army Group in Northwest Europe, 1944-45* (Mechanicsburg, PA: Stackpole Books, 2007), 6-7.

the River Orne, which bisected the city of Caen. The British also failed to secure the high ground overlooking the Caen-Falaise road when elements of several divisions of II SS *Panzer* Corps counterattacked to regain the key terrain of Hill 112.⁹⁸ Montgomery's "Colossal Crack's" hallmark preparatory bombardment and carpet bombings created craters, fallen buildings, and rubble providing excellent cover and concealment for the German defenders in and around Caen.⁹⁹ British and Canadian armored vehicles attempting to move along these torn up roads provided easy targets for German Anti-Tank units, especially as the Allied elements attempted time consuming passages of lines during their attacks.¹⁰⁰ Montgomery next attempted a seizure of the bridges across the Orne in a frontal assault operation named Charnwood. The operation was preceded by heavy bomber raids on the northern side of Caen, a method learned from British operations in the vicinity of Monte Cassino in Italy.¹⁰¹ During Operation Charnwood three infantry divisions of British I Corps attack the city in force following the aerial bombing. The northern part of the city was taken by the British, but the bridges over the River Orne remained in German hands. Over the next two week of July, XII Corps and XXX Corps attacked again against the west side of the city in order to re-take Hill 112 and draw German armor away from the city in preparation for Montgomery's next offensive.¹⁰² Operation Goodwood, planned for 18 July with 3 corps (Canadian II, British I and VII), would attempt to envelop Caen south of the River Orne from the east. The plan called for the sending of three armored divisions southwards to establish them on the high ground astride the Caen-Falaise road. Again, a large bombing raid

⁹⁸ Alexander McKee, *Caen: Anvil of Victory* (New York: St. Martin's Press, 1964), 150-65.

⁹⁹ Hart, *Colossal Cracks*, 86.

¹⁰⁰ *Ibid.*, 84-85.

¹⁰¹ McKee, 209-211.

¹⁰² Ford, *Caen 1944*, 64-66.

preceded the attack before the infantry divisions initiated their movement.¹⁰³ Initially, the Allied progress was positive, but German anti-tank guns on the Bourgeubus Ridge and in the adjacent fortified villages along the German defensive line forced the attack to culminate short of their objective with extensive losses in armored vehicles.¹⁰⁴ Operation Goodwood was halted by Field Marshal Montgomery on 20 July with 21st Army Group's armored divisions still well short of the Caen-Falaise road, but the bridges on the River Orne were eventually seized, completing the seizure of the city. American success in their breakout further west during Operation Cobra forced the Germans defending south of Caen to abandon their position in order to prevent their envelopment by US 3rd Army in the Falaise Pocket, ending serious German resistance in Normandy.

The first focused research question in this historic case study concerns the organization of German Anti-Tank units during the battle for Caen. German Anti-Tank unit organization came about during the Inter-War period *Reichswehr* as a forecasted need for the next war based on the appearance of tanks during the closing stages of World War I. The primary fighting unit of the German Army was the division, and the appropriate sized Anti-Tank unit to support the division in combat would be the anti-tank battalion or *Panzerjager Abteilung*.¹⁰⁵ The battalion was normally organized into three batteries with an organic light anti-aircraft battery and a support platoon with the units prime movers.¹⁰⁶ In German *Panzer* Divisions, the Anti-Tank Battalion possessed the necessary mobility to keep pace with the tank and *panzergrenadier* battalions in

¹⁰³ The bombing raid preceding Operation Goodwood was the largest bombing attack in support of ground maneuver until Operation Cobra in the American sector the following week on 25 July.

¹⁰⁴ Ian Daglish, *Goodwood: The British Offensive in Normandy, July 1944* (Mechanicsburg, PA: Stackpole Books, 2005), 139-145.

¹⁰⁵ Wolfgang Fleischer and Richard Eiermann, *German Anti-Tank (Panzerjager) Troops in World War II* (Surrey, United Kingdom: Schiffer Publishing, 2004), 11-14.

¹⁰⁶ *Ibid.*, 16.

order to provide timely support. They did this by utilizing their organic prime mover assets.¹⁰⁷ Also, based on the German Army experience on the Eastern Front, anti-tank guns were increasingly being mounted on tracked chassis for added mobility. The urgent need for heavier and more mobile anti-tank firepower to counter Soviet armored forces led to a major expansion of *panzerjager* units in 1942.¹⁰⁸ By the time of the Battle of Caen, the organization of the *panzerjager abteilungen* in each of the divisions in the field varied widely. Due to the inability of the German war machine to adequately outfit each division equally at this point in the war and the priority of filling units of “elite” stature with the best equipment, each *panzerjager abteilung* table of organization looked different. *Panzer* Divisions such as the *Waffen-SS* Divisions and the elite *Panzer Lehr*¹⁰⁹ Division fielded the best and most capable equipment. For example, 21st *Panzer* Division, which defended the avenues of approach into Caen on D-Day, consisted of three batteries of towed PaK 43¹¹⁰ anti-tank guns with a headquarters platoon and its own organic light air defense guns. Each battery consisted of four PaK 43s and four heavy prime movers (*Sonderkraftfahrzeug* 8, 12 ton half-track).¹¹¹ The 21st *Panzer* Division’s anti-tank battalion played a significant part in preventing the British from quickly seizing Caen on D-Day and D+1.¹¹² The division also had a battalion of self-propelled assault guns, which mounted a 75mm

¹⁰⁷ As the caliber of anti-tank guns grew in size due to the evolution of tank armor thickness, the size and capability of the required prime movers for the guns grew also.

¹⁰⁸ David Porter, *Das Reich at Kursk* (London: Amber Books, 2011), 106.

¹⁰⁹ *Panzer Lehr* was an elite armored division that was formed in Munster with cadre from the tank instruction and demonstration school.

¹¹⁰ The *Panzerabwehrkanone* (PaK) 43 anti-tank gun was a high velocity 88mm cannon on a split trail mount provided by leFH 105mm Howitzer.

¹¹¹ Fleischer and Eiermann, 115.

¹¹² McKee, 64-66.

anti-tank gun, but were used primarily for infantry support in the offense.¹¹³ Another example of differing organization was the anti-tank battalion of the 10 SS *Panzer* Division ‘*Frundsberg*’. The Division assisted in defending Caen during Operation Epsom in mid-June 1944. The division consisted of one company of *Sturmgeschutz* IV assault guns (regularly used as ersatz tanks) and two batteries of towed PaK 40 75mm anti-tank guns.¹¹⁴ A further example is the organization of anti-tank battalion in 12th SS *Panzer* Division ‘*Hitlerjugend*’. The Division defended Caen throughout the German defense of the city and was heavily involved in German counterattacks in the area. The anti-tank battalion consisted of one company of self-propelled tank destroyers and one battery of towed anti-tank guns of mixed caliber.¹¹⁵ The third battery of towed anti-tank guns organic to the battalion was task organized to the *panzergrenadier* Regiments of the Division. The widely varied organization of the Anti-Tank units in the German divisions defending Caen did not intentionally fit the designed or intended mission sets of the units. The organization was reflective of the state in which the German war machine found itself at the onset of the Allied invasion.

The second focused research question queries the doctrine of German Anti-Tank units that operated during the defense of Caen. The Germans identified the primacy of anti-tank guns during the Interwar period as a result of their experience in World War I. Hans von Seeckt tasked *Oberst* Ernst Volckheim to establish an initial tactical anti-tank doctrine to fit the intended operational employment of the German Army in the field.¹¹⁶ Volckheim suggested adapting the

¹¹³ The difference in the German naming convention for a self-propelled *panzerjager* (tank destroyer) and a self-propelled *sturmggeschutz* (assault gun) is the assault gun has an enclosed casemate versus the open top of a tank destroyer.

¹¹⁴ Dieter Stenger, *Panzers East and West: The German 10th SS Panzer Division from the Eastern Front to Normandy* (Guilford, CT: Stackpole Books, 2017), 328.

¹¹⁵ Gordon Williamson, *The SS: Hitler’s Instrument of Terror* (London: Amber Books, 1994), 244.

¹¹⁶ James S. Corum, *The Roots of Blitzkrieg: Hans von Seeckt and the German Military Reform* (Lawrence, KS: University of Kansas Press, 1992), 129.

German concepts of elastic defense from the Great War by replacing artillery and mortars with anti-tank guns in the defense plan.¹¹⁷ He also emphasized the importance of having reconnaissance and Anti-Tank units well forward in order to destroy enemy tanks to force the culmination of their attack, and then counterattack with a fresh armored reserve. The development of anti-tank weapons during the Interwar Period highlighted the offensive nature of Anti-Tank units in support *Bewegungskrieg*, the guns developed were light and could be repositioned quickly.¹¹⁸ The German experience in the Spanish Civil War confirmed their ideas on this doctrine for Anti-Tank units supporting the offense.¹¹⁹ As the Germans found themselves increasingly on the defensive after years of offensive success, especially on the Eastern Front, the German General Staff issued new instructions on the employment of Anti-Tank units and weapons in the summer of 1943.¹²⁰ The new instructions were borne out of the inefficiency of German Anti-Tank units against Soviet tanks when in the defense and the offense. There were several main tenets to the instructions. Anti-Tank units should not be split up (the report laid out that the two gun section is the smallest advisable unit, unless covering roads), and that companies or at least platoons should cover likely tank avenues of approach.¹²¹ Anti-Tank units should avoid engagement with infantry targets. In the offense, Anti-Tank units should follow advancing infantry units and be quickly set up by the Anti-Tank unit commander along routes that the enemy is likely to counterattack. In the defense, the Anti-Tank unit battalion commander is responsible for the anti-tank defense of a given sector, to include setting the guns in place,

¹¹⁷ Ibid.

¹¹⁸ Corum, 111. The primary German anti-tank gun at the beginning of World War II was the 37mm PaK36, weighing just over 700 pounds and could be moved by a crew of three by hand.

¹¹⁹ Timothy A. Wray, *Standing Fast: German Defensive Doctrine on the Russian Front During World War II* (Fort Leavenworth, KS: Combat Studies Institute, US Army Command and General Staff College, 2004), 17-20.

¹²⁰ Porter, 110.

¹²¹ Ibid.

emplacing mines, and clearing fields of fire. Also, when possible, Anti-Tank unit positions must be established somewhat in the rear of the forward edge of the battlefield in camouflaged locations to avoid being destroyed in an enemy's preparatory bombardments.¹²² The instructions do not cover the employment of self-propelled anti-tank guns or assault guns, which were being increasingly used as replacements for tanks in the offense. These 1943 instructions would be the doctrine that the German Anti-Tank units operating at Caen would fight with, and the terrain in the French *bocage* country complemented the adherence to the updated doctrine.

The third research question inquires about the capability of German Anti-Tank units at the Battle of Caen. German divisional *panzerjager abteilungen* provided Army Group B considerable anti-tank capability in either an area or mobile defense. A single battery could defend approaches to important village in the *bocage* country, and a battalion could effectively close off all entrances to larger towns. Even at this point in the war, the German Army demonstrated that simple numerical superiority was not enough to ensure Allied victory on every occasion, and the divisions and corps of the *Westheer* remained capable of inflicting tactical and operational defeats.¹²³ The mobile self-propelled companies of the *abteilung* could provide advancing infantry considerable anti-tank firepower in a counterattack (though less successful when being used as a substitute for tanks).¹²⁴ The most numerous German anti-tank unit/gun combination in Normandy was the towed 75mm PaK 40 equipped battery.¹²⁵ The PaK 40 had an effective range of 1,800 meters and could penetrate over 75mm of armor at 1,500 meters.¹²⁶ Although the *bocage* country limited the range of the PaK 40, it was employed from camouflaged

¹²² Ibid.

¹²³ Hart, 37.

¹²⁴ W. J. K. Davies, *German Army Handbook, 1939-1945* (New York: Arco Publishing, 1974), 66.

¹²⁵ Daghish, 220.

¹²⁶ Fleischer and Eiermann, 84.

positions and 95 percent of the hits they scored on Allied Sherman tanks out to 1,000 meters would penetrate the armor regardless of the angle.¹²⁷ The PaK 40's heavy weight required it to be moved by a prime mover over any distance further than a couple of meters, which limited its mobility in the defense. A battery of PaK 40s with experienced crews could limber and displace their guns in under 10 minutes.¹²⁸ The anti-tank battalion made up for the mobility of towed guns with their self-propelled company, however, any movement of the Anti-Tank unit in the open could be vulnerable to attack from Allied fighter-bombers.¹²⁹ The most infamous of German anti-tank guns was the vaunted 88mm.¹³⁰ The *Flak 18* heavy anti-aircraft gun fired a high velocity 88mm shell from a cruciform mount and was occasionally used as an improvised anti-tank gun. The *Flak 18* was used as an anti-tank gun to destroy Soviet T-34 and KV-1 tanks during Operation *Barbarossa* when existing German anti-tank guns proved inadequate to penetrate their armor, and Erwin Rommel made famous use of them in the North Africa. In Normandy, their use was primarily for high altitude AA defense in *Luftwaffe Flak* units, but were pressed into the expedient anti-tank role most notably at Cagny during Operation Goodwood.¹³¹ A purpose built 88mm anti-tank gun, the PaK 43 was the best towed anti-tank gun in any World War II era army, and its performance against modern tanks would shock some observers. The PaK 43 was mounted on a split trail mount, had a 6m barrel, and weighed 5 tons.¹³² It required significant effort to reposition the gun, but once in place it proved extremely lethal to Allied tanks. The

¹²⁷ Daghish, 221.

¹²⁸ Fleischer and Eiermann, 87.

¹²⁹ The most numerous German SP tank destroyers in the *panzerjager abteilung* was the *Marder III* and *Jagdpanzer IV/48* which mounted the PaK 40's vehicle mounted 75mm equivalent.

¹³⁰ The '88' had become a standard expression covering any German anti-tank fire. Operations research noted that estimates by fighting soldiers were found to be unreliable since many reported that they had been knocked out by 88mm, when in fact it had been 75mm shot. Daghish, 221.

¹³¹ Daghish, 255-263.

¹³² Davies, 107.

performance of the gun was impressive, it could penetrate 130mm of armor at 2,000 meters and with its flat trajectory could engage targets with some accuracy out to 4,000 meters.¹³³ The 21st *Panzer* Division's 200th *Panzerjäger Abteilung* employed two batteries of PaK 43s during the Battle of Caen, and they were key in forcing the British attack during Operation Goodwood.¹³⁴ German Anti-Tank units provided significant anti-tank capability in a point defense in close quarters like villages and towns, and when provided a clear field of fire, they could engage Allied armored formations over a large area at a greater range than the Allied units could react to. However, the anti-tank battalion's prime movers were vulnerable to attack from the air, and once destroyed significantly hampered the ability of the unit to re-position and continue fighting.

Did German Anti-Tank units provide operational flexibility in the defense during the Battle of Caen? Taken as several engagements over two and a half months, the answer is somewhat complicated. Given the definition of operational flexibility offered in the literature review section of the study being providing the commander options or alternatives, the slowed German reaction to the Allied landings at Normandy prevented this level of operational flexibility. The Germans sent *Panzer* and infantry units from Caen piecemeal on 6 and 7 June to stop the British and Canadians from quickly seizing key terrain.¹³⁵ The 21st *Panzer* Division and 12 SS *Panzer* Division's Anti-Tank units did not provide operational flexibility during this early defense of Caen, and their role was minimal until the British and Canadians reached the outskirts of the city. Combined with other arms of these divisions, they provided Rommel space and time to reposition other *Panzer* Divisions from his operational reserve over the following week. During the first two weeks of June, German "Tiger" and "Panther" tanks provided the more

¹³³ Ibid.

¹³⁴ Daghish, 244.

¹³⁵ Anthony Beevor, *D-Day: The Battle for Normandy* (New York: Penguin Group, 2009), 143-145.

effective tank killing method due to their mobility and Rommel's operational approach intended to force the Allies back to the English Channel.¹³⁶ The German Anti-Tank units ability to provide operational flexibility was more apparent in late June during the British Operation Epsom, where they allowed II SS *Panzer* Corps to hold their tanks in reserve for their counterattack.¹³⁷ The *panzerjager abteilungen* of *Panzer Lehr* and 12 SS *Panzer* Divisions kept the armored divisions of British XXX and VII Corps from seizing key terrain on the first day of Epsom, while the second day featured a counterattack from 2nd, 9th, and 10th SS *Panzer* Divisions. On the other hand, due to the British maxim of lengthy preparatory barrages and bombardments before their attacks (especially during Operations Charnwood and Goodwood), Anti-Tank units were kept from the first line of German defenses, thus dampening operational flexibility. During 21st Army Group's Operation Charnwood, German Anti-Tank units once again provided operational flexibility by preserving *Panzers* for counterattacks and even for some German units to be moved behind the lines and shifted to the American sector.¹³⁸ However, during Charnwood, they did not prevent the British capture of Hill 112 or the capture of Caen north of the River Orne. During Operation Goodwood, significant performance from German Anti-Tank units at Cagny and Bourgebus Ridge allowed *Panzer* regiments to conduct limited counterattacks and ultimately retrograde south towards Falaise.¹³⁹ In this instance, provided Army Group B the operational flexibility to preserve combat power for future operations. Throughout the battle, the air superiority of the Allies limited German tank and armored vehicle movement during the day, and Anti-Tank units provided a more survivable option for tank defense, especially in dense terrain.

¹³⁶ McKee, 82-85.

¹³⁷ Ford, *Caen 1944*, 39-41.

¹³⁸ McKee, 243-244.

¹³⁹ Ford, *Caen 1944*, 76-83.

The next research question asks whether German Anti-Tank units prevent culmination of the defending force. During British Operations Epsom and Charnwood, Anti-Tank units assisted corps and division formations from culminating in their defense as part of a combined arms force. The Anti-Tank units routinely forced the British and Canadians to culminate in their attacks and allowed the Germans to hold Caen, a D-Day objective for 21st Army Group, for nearly two months. In tactical engagements and across operations, even single anti-tank batteries could delay even a corps attack.¹⁴⁰ The singular operation where German Anti-Tank units were indispensable to preventing the culmination of the defense at Caen was during Operation Goodwood. On 18 and 19 July, a hastily assembled “stop line” of PaK 43s from *Panzerjager Abteilung* 1039 in the fields north of Cagny prevented the collapse of the German eastern defense sector.¹⁴¹ Their awesome killing power stopped the British Guards Armoured Division in its tracks, and prevented the success of Montgomery’s operation. Further to the north, 21st *Panzer* Division’s Anti-Tank Battalion firing at tanks out to 2,000m produced similar results.¹⁴² The 1st SS *Panzer* Division ‘*Leibstandarte*’ provided anti-tank defense from Bourgebus Ridge in the west and highlighted the fact that the terrain over which Goodwood was fought was more conducive to firing flat trajectory anti-tank rounds at greater range than in the bocage.¹⁴³ At the conclusion of Goodwood and at the start of the next British operation, Totalize (the British attempt to drive south from Caen and close the Falaise Pocket), *Panzerjager Abteilung* 1039’s PaK 43s were still defending

¹⁴⁰ Beevor, 254-256.

¹⁴¹ Daghish, 232. “Even long after the battle it was not realized in many quarters how vital had been the contribution of German antitank units operating around the fixed defences of the Goodwood villages. In the early stages of the battle, lightly armoured yet powerfully armed mobile batteries proved highly effective.”

¹⁴² McKee, 264-268.

¹⁴³ Daghish, 222.

Bourgebus Ridge, allowing German armored forces to attempt to exit the Falaise Pocket.¹⁴⁴ The sheer weight of the Allied continued attack, and the American breakout during Operation Cobra forced the culmination of the defense for the Germans in Normandy.

The final research question for this historical case study asks did German Anti-Tank units enable the defending force to quickly transition to the offense. German Anti-Tank units did not enable a quick transition to the offense at the operational level. Field Marshal Erwin Rommel's operational approach to defeat an Allied landing in Normandy was to quickly and decisively defeat any Allied lodgments on the beaches, so the counterattack was already pre-planned, though inadequately resourced.¹⁴⁵ Once Allied combat power was built up in Normandy, the opportunity for the Germans to conduct a large scale counter-offensive was lost, especially in the face of Allied air superiority. At Caen, German Anti-Tank units did assist in enabling small local counter attacks to regain key terrain, such as Carpiquet and Hill 112. However, the German typical maxim at the divisional and regimental level was to conduct counter attacks quickly after an enemy attack culminated.¹⁴⁶ So, in effect, the counterattacks were conducted out of habit and necessity without meeting preconceived conditions provided Anti-Tank units. The two examples where Anti-Tank units enabling a local counterattack were at Hill 112 during British Operation Epsom and at Cagny during Operation Goodwood by 21st *Panzer* Division. In addition, any counterattack during the day was vulnerable to air interdiction by Allied fighter-bombers.

Although German Anti-Tank units did not prevent the German defeat at the Battle of Caen, they did provide the German commanders key chess pieces to stymie British efforts to rapidly capture the city. What they lacked in numbers of materiel and hardware, they made up for

¹⁴⁴ Stephen A. Hart, *Operation Totalize 1944: The Allied Drive South from Caen* (Oxford: Osprey Publishing, 2016), 21.

¹⁴⁵ Beevor, 34-41.

¹⁴⁶ Ludwig Beck, *Truppenfuhrung: On the German Art of War*, ed. David T. Zabecki and Bruce Condell (Mechanicsburg, PA: Stackpole Books, 2009), 131.

it in ingenuity, tactics, and utilization of terrain. In the end the Battle for Caen tied up significant German armored divisions and enable American forces to break out of Normandy to the south and attack north, threatening German lines of operations, thus ending their defense of Caen.

Findings and Analysis

This section will use the empirical data gathered from the historical case studies in order to conduct a structured, focused comparison of Anti-Tank unit performance in the chosen campaigns. The section will be presented in two distinct portions. The findings portion of the section will compare the data gathered in response to each of the six research questions. The analysis portion of this section will use the results of the findings in order to test the study's three hypotheses. Overall, this section seeks to illustrate the additional value and lethality provided by dedicated Anti-Tank units in the defense.

The study's first research question is what is the organization of the Anti-Tank unit in the historical case study? The question was posed in order to compare the intrinsic qualities of the Anti-Tank units and determine what the differences are between the two case studies. The historical data suggests that the organization of Anti-Tank units in the two case studies were completely different. Although both armies in the historical case study conducted an operational defense, the Soviet Anti-Tank units at Kursk in 1943 were organized at the regimental and brigade level and were employed as such. The German Anti-Tank units during the battle of Caen in 1944 were organized at the battalion level and were primarily employed as batteries and platoons. The empirical data suggests that it is possible that the echelon at which the Anti-Tank units were organized contributed to their performance on the battlefield. Further research is required to determine if this was the case in World War II, but an initial glance at the issue reveals that Anti-Tank units organized at a higher echelon in the defense produce greater results *vis a vis* tank formations.

The second question is: what doctrine did the Anti-Tank units fight with during the historical case studies? This research question is posed to illustrate the theoretical way which the Soviets or Germans would employ their Anti-Tank units in the defense. The empirical data suggests that Soviet and German anti-tank doctrine evolved throughout the war. Soviet anti-tank doctrine was heavily influenced by their setbacks of Operation *Barbarossa* and the German *Fall Blau* offensive in the summer of 1942. Soviet Anti-Tank units were not employed in sufficient depth to be of any use to blunt German deep encirclements, and new Soviet doctrine instituted before Kursk emphasized depth and flexibility. German anti-tank doctrine evolved out of necessity as they found themselves increasingly on the defense by 1943. The most significant difference in the empirical evidence was the anti-tank gun engagement ranges at which each sides doctrine suggested. Soviet doctrine highlights a shorter range at 500m in order to increase accuracy, while German doctrine emphasized engaging at the farthest possible range to prevent envelopments or breakthroughs.¹⁴⁷

The third research question asks: what was the capability of the Anti-Tank units in the defense? Both Soviet and German Anti-Tank units organized primarily around towed anti-tank guns and provided similar capability; point defense of strongpoints or avenues of approach. However, while the Germans provided that capability at longer ranges (and significantly more accurate),¹⁴⁸ the Soviets provided much more of that capability over a larger frontage and depth due to the size of their Anti-Tank units. Additionally, German Anti-Tank units equipped with self-propelled tank destroyers provided mobile anti-tank support in local counterattacks, but they

¹⁴⁷ Fleischer and Eiermann, 102.

¹⁴⁸ Daghish, 186-187. The PaK 43 had a flat trajectory out to 914m and was equipped with Carl Zeiss telescoping sights.

were in turn vulnerable to Allied air attacks. The empirical evidence also suggests that German Anti-Tank units were able to displace and move their anti-tank guns quicker than Soviet units.¹⁴⁹

The fourth, fifth, and sixth research questions deal directly with the posed hypotheses, and query the effectiveness of Anti-Tank units in the defense before, during, and after a battle respectively. The fourth research question asks did the Anti-Tank units in the historical case studies provide operational flexibility? In the Soviet case at Kursk, the empirical data suggests that Anti-Tank units (in addition to anti-tank mines and physical obstacles)¹⁵⁰ significantly provided Soviet commanders operational flexibility in that they allowed infantry and specifically armored units to be placed in reserve for counterattacks. To a lesser extent, German Anti-Tank units during the Battle of Caen provided operational flexibility. At the beginning of the campaign in the first week of June 1944, German Anti-Tank units did not provide alternatives or options. However, during further British operations, German Anti-Tank units provided a reliable anti-tank option that due to their relative concealability, were less vulnerable to Allied air attacks than tanks and other AFVs. They also provided the tactical space for German armored forces to conduct local counterattacks or withdraw.

The fifth research question asks did the Anti-Tank units prevent culmination of the defense in the historical case study? In the Soviet case at Kursk, their Anti-Tank units significantly contributed to preventing culmination in the defense as they destroyed the majority of German tanks during the offensive and kept German Divisions from penetrating deep into tertiary Soviet defensive belts. In the Caen historical case study, ultimately, German Anti-Tank units could not prevent the strategic culmination of the defense. However, during a window of time, German Anti-Tank units prevented tactical and operational culmination of the German

¹⁴⁹ Fleischer and Eiermann, 45-48.

¹⁵⁰ Mines and obstacles provided the capability to slow or immobilize tanks, while anti-tank guns provided a surefire way to destroy tanks.

defenses around Caen for two months. Due to the sheer weight of the Allied assault in conjunction with the inadequate resources that the Germans could bring to bear, it could be argued that the Germans lost the fight before the first Allied troops landed on the Normandy beaches.

The final research question asked: did Anti-Tank units enable a quick transition to the offense? The Soviets at Kursk were able to transition quickly (though prematurely) to the offense in the Voronezh Front in the south that led to the meeting engagement at Prokhorovka. They were able to make that shift to the offense in large part to the performance of Soviet Anti-Tank units killing tanks. Although the Soviet counterattack failed, the German offensive at Kursk culminated on 15 July 1943. The German Anti-Tank units at Caen could only provide windows for German armored units to conduct local limited counterattacks. Additionally, empirical evidence suggests that the Germans were more influenced by ingrained military culture and tactical necessity to conduct local counterattacks rather than conducting them after preconceived pre-requisites had been met. They could not provide a quick shift to and operational offense.

This study's first hypothesis asserts that Anti-Tank units provide commanders operational flexibility. The findings in both historical case studies suggest that this hypothesis is supported. According to the definition of operational flexibility offered in the literature review of this study, the Anti-Tank units of both defending armies provided their respective commanders with options and alternatives. In both case studies, commanders were able to maintain an armored reserve of tanks and did not have to employ tanks in their first lines of defense out of necessity. Both armies did not adhere to the principal that the best method to kill tanks is with other tanks. Evidence suggests that when arranging forces in the defense, Anti-Tank units allow commanders to defend strong points, avenues of approach, and gap crossings without the need to apply tanks to the defense, thus preserving them for maneuver. Further research with an expanded sample size will most likely support this hypothesis.

The second proposed hypothesis states that Anti-Tank units prevent culmination in the defense. The evidence suggests that this assertion is supported, with a caveat in the case of the Germans at Caen. In both cases, Anti-Tank units significantly contributed to holding defensive lines, preventing envelopments, and preserving combat power for the defending force. Anti-Tank units played perhaps the greatest role in preventing the Clausewitzian “point the scales turn” for the defenders.¹⁵¹ Given the definition offered in the literature review section, the Soviet and German defending forces were able to continue or carry out its mission and intent. The Soviet mission and intent at Kursk were to conduct an operational and tactical defense in order to regain the offensive, and Anti-Tank units preventing culmination of the defense allowed that. The German mission and intent at Caen was to conduct a mobile defense in order to eject the Allied landing force from northern France. The mission changed once Operation Cobra forced the Germans to abandon their mobile defense and begin to conduct a withdrawal to the east. This aspect of the hypothesis is an element of a mixed outcome. German Anti-Tank units prevented the collapse of the mobile defense against several combined British and Canadian operations, and once the mission changed, they assisted in providing anti-tank support during Army Group B’s escape from the Falaise Gap. So, in regard to the hypothesis being supported, German Anti-Tank units prevented culmination in the tactical and operational defense, but could not be decisive in preventing a culmination of the strategic defense of northern France.

The final hypothesis states that Anti-Tank units enable commanders and armies to quickly transition to the offense. The findings from the two historical case studies suggest that this hypothesis is unsupported. Further research could examine more examples where the hypothesis could be proven, but one of the historical campaigns presented in this study does not meet the criteria. The Soviet Anti-Tank units enabled the Red Army (specifically the Voronezh

¹⁵¹ Clausewitz, 528.

Front, although too quickly)¹⁵² to quickly transition from the operational defense to the operational offense. Soviet Anti-Tank units allowed commanders to hold nearly 2,500 tanks in reserve for this counterstroke. Additionally, once the German attack culminated on 15 July 1943, the Soviets were able to resume the offensive across a broad front until the end of the war. On the other hand, the empirical evidence suggests that German Anti-Tank units during the Battle of Caen did not enable commanders (specifically Army Group B) to quickly transition to the offense. The Germans only conducted limited counterattacks to regain key terrain locally over the two and one half month battle for Caen.

The two historical case studies, using structured, focused comparison, suggest that only two of the three hypotheses are supported. Given the outcome of the analysis, the stated thesis of the study is only partially supported. Corps or divisional Anti-Tank units will increase lethality in the defense by providing commanders operational flexibility when arranging forces before a battle, and they prevent culmination of the defense during a battle. The counter argument to directly targeting tanks with Anti-Tank units in the defense is to employ the indirect approach.¹⁵³ Tanks require large amounts of fuel, spare parts, bridges, and ammunition. Critics of dedicated Anti-Tank units argue that effort could be better spent targeting the tank's critical vulnerabilities. Critics also argue against having such a specialized unit that can only reasonably perform one mission, killing tanks. On the other hand, there is little doubt that the historical case studies demonstrated the lethality and importance of Anti-Tank units in the defense.

Conclusion

This study compared German and Soviet Anti-Tank units during World War II through the lens of operational art and the characteristics of the defense in order to determine the added

¹⁵² Forczyk, 92.

¹⁵³ Hogg, 30-32.

lethality of those units to their parent organization. In both case studies, Anti-Tank units provided commanders operational flexibility and prevented culmination of the operational defense. However, unlike the in the Kursk case study, German Anti-Tank units did not enable a quick transition to the offense for Army Group B or any of the lower echelon units that they were supporting. The study attempted to fill a perceived gap in the historical literature by analyzing Anti-Tank unit performance, organization, and doctrine instead of only focusing on weapon systems. The empirical data collected for the study only partially supports the offered thesis, which asserts that Anti-Tank units increase a division or corps' lethality in the defense by allowing operational flexibility, preventing culmination, and enabling a quick transition to the offense.

The performance and qualities of the Anti-Tank units in the historical case studies was evaluated using a structured, focused comparison of the two campaigns. This study collected empirical data from a variety of primary and secondary sources using six focused research questions, which enabled a comparison of the findings and analysis of the study's two hypotheses. The research questions ranged from the organization, doctrine, and capabilities of the Anti-Tank units to the value added by them to their parent organizations before, during, and after a battle. Ultimately, the findings from the two historical campaign studies only partially supported the study's hypotheses and thesis.

The analyzed comparison of the two case studies is significant for military planners and operational artists seeking to understand the value of dedicated Anti-Tank units in the defense. The similarities of the two case studies highlight the importance of maximizing the use of anti-tank assets by massing them along avenues or areas that enemy armored formation must utilize in the attack. Both the Soviet and German Anti-Tank units were employed in support of armies, corps, or divisions and were organized to fight at the battalion up to brigade level. The case studies also shed a light on how Anti-Tank units could preserve friendly armored formations and

tank units to be kept in reserve for counterattacks, either local actions or full-scale counter offensives.

The two historical case studies were chosen because they best illustrated the successful use of Anti-Tank units in the defense. However, more additional case studies should be examined to develop a more holistic assessment across a greater time range. Suggested further research pertaining the performance of Anti-Tank units in the defense could include the Battle of France in 1940, the US's first deployment to Korea (Task Force Smith) in 1950, and the Yom Kippur War of 1973. Modern weapon systems have changed Anti-Tank units or weapons qualities that on the surface, improve their performance. However, more advanced 21st century anti-tank technology is expensive, limits endurance,¹⁵⁴ not entirely all-weather, and they can be affected by electronic attack.¹⁵⁵ Also, additional questions should be asked about the value of Anti-Tank units in the offense.

The most common narrative on Anti-Tank units on the battlefield, especially in discourse on their use in modern warfare, is that they can only perform one task, to kill tanks. The US military regularly endeavors to develop and employ units and weapon systems that can perform multiple tasks. However, as this study has illustrated, Anti-Tank units not only kill tanks, but they can also enable maneuver elements (tanks, infantry, aviation, artillery) to focus on other tasks outside of destroying enemy armored formations. Ideally, their re-introduction to US Army corps and divisions table of organization will allow these formations to regain the initiative and resume the offense.

¹⁵⁴ Single shot anti-tank rockets and missiles are large and sometimes limited in availability, making sustainment an issue, thus not necessarily suited for long duration defenses.

¹⁵⁵ Russian tanks have used active countermeasure Doppler radar in recent deployments in the Ukraine and Syria to defeat wire guided and active homing anti-tank rockets or missiles.

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