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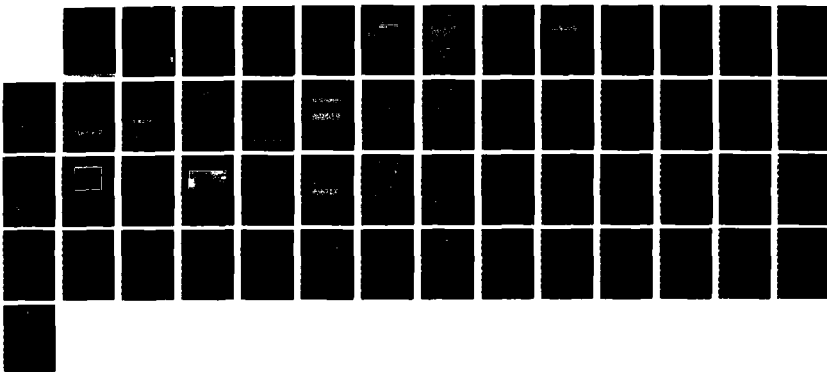
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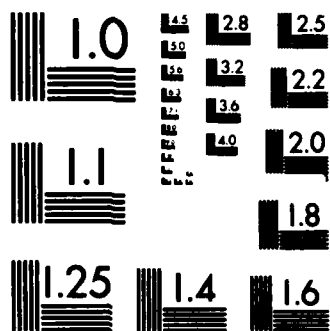
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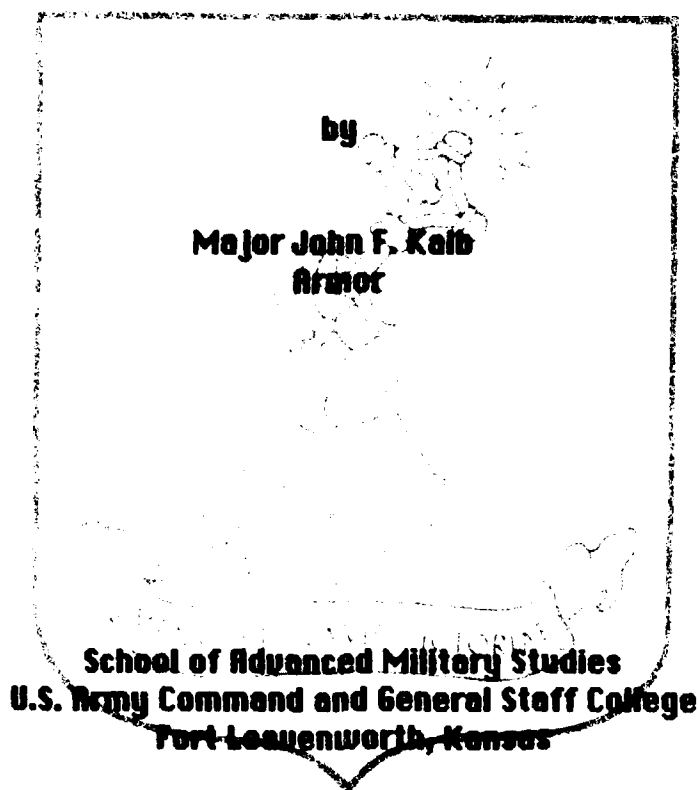
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**A Foundation for Operational Planning:
The Concepts of Center of Gravity, Decisive Point,
and the Culminating Point**



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This study uses the classical writings of Baron Henri Jomini and Carl v. Clausewitz to define center of gravity, decisive point, and culminating point. Operation CRUSADER, conducted by the British in North Africa during November 1941, and Operation GALLOP, conducted by the Soviets in the Ukraine during the winter of 1942-1943 provide historical examples of operational art that illustrate each concept, linkage between concepts, and their use in operational planning.

This monograph suggests that the concepts of center of gravity, decisive point, and culminating point are the foundation of operational planning. A successful commander concentrates his greatest combat power and uses it to neutralize the enemy's center of gravity before available resources are exhausted. He protects his own points of vulnerability while striking enemy weaknesses. He weighs the risks inherent in a direct and indirect approach and selects one or a combination of methods to defeat his enemy. This is the essence of operational art.

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ABSTRACT

A FOUNDATION FOR OPERATIONAL PLANNING: THE CONCEPTS OF CENTER OF GRAVITY, DECISIVE POINT, AND THE CULMINATING POINT by MAJ John F. Kalb, USA, 47 pages.

Commonly understood terms are the foundation for a uniform application of any doctrine. FM 100-5 Operations introduces classical military theory into contemporary U.S. Army doctrine. Appendix B, "Key Concepts of Operational Design," defines the terms *center of gravity* and *culminating point*, notes that both concepts are "central to the design and conduct of major operations," and encourages readers to consult classical and contemporary theory for more elaboration. Unfortunately, classical theory offers several interpretations of these terms and adds a third equally important concept.

The purpose of this study is to illuminate linkage at the operational level between a center of gravity, decisive point, and culminating point in order to provide a clear understanding of these theoretical concepts and their use in the design of campaigns and major operations.

The study uses the classical writings of Baron Henri Jomini and Carl v. Clausewitz to define center of gravity, decisive point, and culminating point. Operation CAUSADER, conducted by the British in North Africa during November 1941, and Operation GALLOP, conducted by the Soviets in the Ukraine during the winter of 1942-1943, are historical examples of operational art that illustrate each concept, linkage between concepts, and their use in operational planning.

This monograph suggests that the concepts of center of gravity, decisive point and culminating point are the foundation of operational planning. A Successful commander concentrates his greatest combat power and uses it to neutralize the enemy's center of gravity before available resources are exhausted. He protects his own points of vulnerability while striking exposed enemy weaknesses. He weighs the risks inherent in a direct and indirect approach and selects one or a combination of methods to defeat his enemy. This is the essence of operational art.

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I. INTRODUCTION

The erudite military historian Professor I. B. Holley, Jr. of Duke University once commented on the usefulness of commonly understood terms.

In his famous study on the art of war, Baron Jomini attempted to identify the essentials of Napoleon's military genius. In so doing, he wrote many pages defining such key terms as *strategy, tactics*, etc. Jomini grasped the fundamental notion that without uniform definitions that were understood clearly by all readers and analysts, any search for sound military practice was certain to be flawed seriously.¹

The essence of Professor Holley's remarks, the notion of uniform definitions understood by all, is the foundation of military doctrine. The writers of FM 100-5 Operations recognized this when they stated in Chapter 1 that "...to be useful, doctrine must be uniformly known and understood."² Indeed, the three appendixes of FM 100-5 are included to reinforce the meaning of certain principles, concepts, and terms.

Appendix B, "Key Concepts of Operational Design," is of particular interest in light of the Army's renewed concern with the study of operational art. The introduction to Appendix B notes that, "While not new to the US Army in application, [concepts central to the design of campaigns and major operations] have not been dealt with in doctrinal literature for some time." The introduction concludes by encouraging readers to "consult the extensive published literature on classical and contemporary operational theory."³ Unfortunately, if the reader does consult the literature, he stands a good chance of becoming confused.

This is especially true for the theoretical concepts - *center of gravity*, *decisive point*, and *culminating point*

The purpose of this study is to illuminate linkage at the operational level between a center of gravity, decisive point, and culminating point in order to provide a clear understanding of these theoretical concepts and their use in the design of campaigns and major operations.

The study uses the classical writings of military theorists and historical examples to define and illustrate the meaning of center of gravity, decisive point, and culminating point. The literary works of Baron Henri Jomini and Carl v. Clausewitz form the foundation for an analysis of each concept from a theoretical perspective. Operation CRUSADER, conducted by the British in North Africa during November 1941, and Operation GALLOP, conducted by the Soviets in the Ukraine during the winter of 1942-1943, provide historical examples of operational art that illustrate the meaning of each concept, linkages between concepts, and their use in operational planning. The monograph concludes with practical implications for operational planning.

II. THE THEORETICAL PERSPECTIVE

Background

Interpreters of classical military theory have from time to time placed Carl v. Clausewitz and Henry Jomini on opposite ends of a

hypothetical scale. Others maintain that the two theorists are very close in thought, differing only on minor points. These contradictory positions highlight the nature of understanding classical military theory: several renditions are possible.

Although Clausewitz and Jomini may disagree on many points, several common threads seem to run through their theories. Both theorists share a similar understanding of what contemporary US Army doctrine calls operational art. This suggests that Clausewitz and Jomini also may share comparable concepts that form a theoretical foundation for operational art.

Clausewitz writes that, "tactics teaches the use of armed forces in the engagement; strategy, the use of engagements for the object of the war."⁴ The singular acts of fighting are the means of the engagement, victorious engagements the means of strategy, and strategy the means to obtain the political aim of the war. Engagements are somehow tied together to produce a successful strategy.

Jomini expresses a similar concept. He begins The Art of War by listing nine principal reasons why a government goes to war. Each is a consideration "from which a statesman concludes whether a war is proper," and each reflects a political aim.⁵ Jomini believes that, "Strategy ... is the art of bringing the greatest part of the forces of an army upon the important point of the theater of war or of the zone of operations."⁶ He defines logistics as "the art of moving armies,"⁷ grand tactics as "the art of posting troops upon the battlefield..., of bringing them into action, and the art of fighting upon the ground,"⁸ and minor tactics as the "details of war."⁹ Jomini connects these

concepts into a larger framework and notes that, "Strategy decides where to act; logistics brings the troops to this point; grand tactics decides the manner of execution and the employment of the troops."¹⁰ Strategy involves deciding where to employ tactics.

Neither Clausewitz nor Jomini use the expression *operational art*. However, both use the term *strategy* to encompass the design and sequencing of tactical activities to achieve political aims. The classical definition of strategy essentially equals the contemporary definition of operational art found in FM 100-5 Operations:

...the employment of military forces to attain strategic goals in a theater of war or theater of operations through the design, organization, and conduct of campaigns and major operations.¹¹

Clausewitz and Jomini arrive at a similar definition of strategy by different routes. Evidence suggests that they also share an understanding of three concepts that form the theoretical foundation of operational art. These are the concepts of center of gravity, decisive point, and culminating point.

Center of Gravity

Clausewitz introduces the concept of the center of gravity in Book VI of On War in a discussion of the defense.

A center of gravity is always found where the mass is concentrated most densely. It presents the most effective target for a blow; furthermore, the heaviest blow is that struck by the center of gravity. The same holds true in war. The fighting forces of each belligerent - whether a single state or an alliance of states - have a certain unity

and therefore some cohesion. Where there is cohesion, the analogy of the center of gravity can be applied. Thus forces will possess certain centers of gravity whose movement and direction govern other points.¹²

Clausewitz uses an analogy from physics to describe a concept. The center of gravity is the principal concentration of forces on either side. Notably, he uses the notion of cohesion as a criterion for designating a center of gravity.

Clausewitz' concept of center of gravity is central to his theory. The surest means to victory is to concentrate one's own power and apply it in such a manner that the enemy's combat power is destroyed. He believed that:

Blow after blow must be struck in the same direction; the victor, in other words, must strike with all his strength, and not just against a fraction of the enemy's. Not by taking things the easy way - using superior strength to filch some province, preferring the security of the minor conquest to a major success - but by constantly seeking out his center of power, by daring all to win all, will one really defeat the enemy.¹³

...no matter what the central feature of the enemy's power may be - the point on which your efforts must converge - the defeat and destruction of his fighting forces remains the best way to begin, and in every case will be a very significant feature of the campaign."¹⁴

Jomini also recognized the concept of concentrated force as the means to destroy the enemy's armed forces and the destruction of the enemy's main force as the means to the political goal.

The core of Jomini's theory is expressed in the following passage from The Art of War:

...there is one great principle underlying all the operations of war...embraced in the following maxims:

- 1. To throw by strategic movements the mass of an army successively, upon the decisive points of a theater of war...**
- 2. To maneuver to engage fractions of the hostile army with the bulk of one's own.**
- 3. On the battle-field, to throw the mass of the forces upon the decisive point, or upon that portion of the hostile line which it is the first importance to overthrow.**
- 4. To so arrange that these masses shall not only be thrown upon the decisive point, but that they shall engage at the proper times and with energy.¹³**

The essence of Jomini's theory is throwing "the mass of the forces upon the decisive point." The expression *mass of the forces* and the context in which it is used implies concentration of power in time and space and suggests that Jomini comprehended a concept similar to Clausewitz' center of gravity.

Destruction of the enemy was also the best means to the ultimate goal. Jomini regarded Napoleon as a master of this fundamental rule.

Rejecting old systems, which were satisfied by the capture of one or two points or with the occupation of an adjoining province, he [Napoleon] was convinced that the best means of accomplishing great results was to dislodge and destroy the hostile army. - since states and provinces fall of themselves when there is no organized force to protect them.¹⁴

Both Clausewitz and Jomini share a common understanding of the concept of center of gravity and its importance in the context of a campaign. The operational center of gravity for either an attacker or defender is the greatest concentration of combat power. Destruction

of an opponent's center of gravity is the surest means to achieve the political aim.

FM 100-5 notes that a fundamental element of operational art "is the identification of the enemy's operational center of gravity."¹⁷ But this is only the first step. The method used to destroy a center of gravity is perhaps an even more important element of operational art. The concept of a decisive point is the locus inherent in the method. Understanding the concept of a decisive point is essential to understanding operational art.

Decisive Point

Jomini discusses the term *decisive point* at great length, while Clausewitz mentions the term only in relation to a center of gravity and the object of maneuver. Both theorists use the concept of decisive point in a context that suggests a common understanding.

Jomini recognizes the concept of a decisive point as a critical aspect of his theory. He notes in his chapter on "...Acquiring A Good Strategic Coup-D'oeil" that:

When a military man who is a student of his art has become fully impressed by the advantages procured by moving a strong mass against successive fractions of the enemy's force, and particularly when he recognizes the importance of constantly directing the main efforts upon decisive points of the theater of operations, he will naturally desire to be able to perceive at a glance what are these decisive points.¹⁸

Jomini defines operational decisive points as "all those [places] which are capable of exercising a marked influence upon the result of

the campaign or upon a single enterprise."¹⁹ He categorizes decisive points as either geographical, "a consequence of the configuration of the country," or as accidental points of maneuver, "which result from the positions of the troops on both sides."²⁰ Geographical decisive points may include an important fortress, a line of communication, a hostile capital, and a base of operations.²¹ Decisive points of maneuver are locations that "relate particularly to the destruction or decomposition of the hostile forces."²² These include the immediate rear of an enemy force, the flank, or perhaps a weak center. Jomini notes that regardless of the category, maneuver is the means of "throwing the mass of the forces upon the decisive point..."²³

Although Clausewitz does not define the term *decisive point*; he recognizes the concept as a location that produces advantageous conditions. He writes that:

Relative superiority, that is the skillful concentration of superior strength at the decisive point, is much more frequently based on the correct appraisal of this decisive point, on suitable planning from the start; which leads to appropriate disposition of the forces...²⁴

Clausewitz also perceives maneuver as part of the method to defeat the enemy. His discussion of maneuver in Book VII of On War provides examples of decisive points for both direct and indirect approaches.

[Maneuver] is, in fact, a play of balanced forces whose aim is to bring about favorable conditions for success and then to use them to gain an advantage over the enemy....

Considerations to be borne in mind, partly as goals and partly as a frame of reference for our actions, are as follows:

- a. The enemy's food supplies, which one aims to cut off or reduce
- b. A combination with other units
- c. A threat to other communications with the interior of the country or with other armies or detachments
- d. A threat to the retreat
- e. An attack on individual points with superior forces.²⁵

Both Clausewitz and Jomini view a decisive point as a location that sets the most favorable conditions for battle. The location of a decisive point does not have to coincide with an enemy's position. This leaves latitude for both a direct and an indirect approach to rendering the enemy powerless. For example, seizing a piece of ground that permits firing into unprotected enemy positions or attacking on a flank that permits overwhelming combat superiority against the enemy's center of gravity are illustrations of a decisive point with a direct approach. Seizing a key port or severing an army's ground lines of communication are examples of a decisive point with an indirect approach.

Center of gravity and decisive point are two concepts that Clausewitz and Jomini incorporated into their theories. A third concept is the culminating point.

Culminating Point

Both Clausewitz and Jomini link the concept of a culminating point to the inherent strength of the defense and a point in time when it is most advantageous for a defender to attack or an attacker to defend.

The concept of a culminating point is rooted in the nature of the defense. Clausewitz believed that "the defensive form of warfare is intrinsically stronger than the offensive,"²⁶ mostly because "it is easier to hold ground than take it."²⁷ The defender also has other advantages as opposed to the attacker. The defender may fall back along his own lines, easing the burden of resupply and reinforcement, while the attacker's forces suffer the effects of longer lines of supply, personnel losses, and the hazards of operating inside enemy territory. The attacker's combat power suffers from what Clausewitz called "the diminishing force of the attack."²⁸

Clausewitz uses the term *culminating point* in several different contexts to designate a point in time. The culminating point of the defense is "reached when the defender must make up his mind and act, when the advantages of waiting have been completely exhausted."²⁹ The culminating point of an attack is the "point where [the attacker's] remaining strength is just enough to maintain a defense and wait for peace."³⁰

Clausewitz believes that the ability to recognize the culminating point is important to both the attacker and the defender. An attacker must determine his culminating point during planning, otherwise he "may take on more than he can manage..."³¹ Likewise, it is also important for the defender to recognize when the attacker exceeds his culmination point. This is the most opportune time to launch an offensive.

Once the defender has gained an important advantage, defense as such has done its work. While he is enjoying this advantage, he must strike back, or he will court destruction... A powerful transition to the offensive - the

flashing sword of vengeance - is the greatest moment for the defense.³²

Jomini describes the concept of culmination in much the same manner as Clausewitz.

He who invades does so by reason of some superiority; he will seek to make the issue as promptly as possible: the defense, on the contrary, desires delay till his adversary is weakened by sending off detachments, by marches, and by the privations and fatigues incident to his progress.³³

Jomini also notes the relationship between the culminating point of an attacker and the timing of a counterstroke by the defender.

It is not so, however, with a general who indeed waits to receive his enemy, but with determination to fall upon him offensively at the proper moment,...with the certainty of throwing the main strength into the action at the most important point,...when the assailant, after suffering severely, finds himself strongly assailed at the moment when the victory seemed to be in his hands, the advantage will, in all probability be his no longer..."³⁴

Theoretical Linkages

Center of gravity, decisive point, and culminating point are theoretical concepts that are linked within a broader theory of operational art and form a foundation for operational planning.

A center of gravity at the operational level is the greatest concentration of combat power. The identification of a center of gravity according to Clausewitz "is a major act of strategic

judgment..."³⁵ and equates to the contemporary practice of identifying the main attack or main effort in a major operation or campaign.

Once a center of gravity is located, the attacker or defender must identify friendly and enemy decisive points. This is equally as important as identifying a center of gravity and is quite possibly the more difficult task. The commander must decide whether to take a direct or indirect approach or a combination of approaches that lead to victory.

Each side directs his center of gravity at a point or points of vulnerability, while he protects his own weaknesses. Each side tries to achieve a decisive result before available resources are exhausted.

The culminating point represents a critical point in time for both the attacker and the defender at the operational level. The attacker must accomplish his mission before passing beyond his culminating point, or he must sequence operations in a manner that provides for a regeneration of combat power. The defender attempts to exhaust the main attack (and any subsequent main attacks) -to cause the attacker to go as far as possible beyond his culminating point. The defender reaches his culminating point when he ceases to grow stronger relative to the attacker. This is the critical point in time to launch the counteroffensive with the greatest concentration of forces possible - the defender's center of gravity.

III. HISTORICAL EXAMPLES

Historical examples provide a useful tool to demonstrate the relevance of theoretical concepts. Operation CRUSADER and Operation GALLOP illustrate the concepts of center of gravity, decisive point, and culminating point. Each example also illustrates linkages between these concepts and their importance with regard to operational planning.

Operation CRUSADER

The small port of Tobruk, situated along the mediterranean coast of North Africa, was the focus of both Allied and Axis forces during the last half of 1941. Operation BATTLEAXE, a corps-size offensive launched during June to relieve a besieged Tobruk ended in failure for the British and success for the Germans. Prime Minister Churchill replaced General Wavell, the Commander in Chief Middle East Forces, with General Sir Claude Auchinleck. Churchill, determined to gain a victory, ordered a build-up of supplies and the expansion of forces for a future offensive. Auchinleck appointed Lieutenant-General Sir Alan Cunningham to command the new British Eighth Army. The British intended to launch an offensive that would destroy the Axis forces, relieve Tobruk, and eventually regain Libya. General der Panzertruppen Erwin Rommel commanded Panzergruppe Afrika, the principle Axis force in North Africa. His plans called for the capture of Tobruk by the end of November to support a drive into Egypt.

The logistical situation during July 1941 in North Africa favored a rapid Allied build up and constrained Axis intentions. The German invasion of Russia soaked up resources. Most Luftwaffe units relocated to Russia. Tight restraints restricted the resupply of critical warfighting material such as tanks. The British Navy dominated most of the Mediterranean Sea. The British Air Force ruled the sky. The British bombing of the port of Benghazi in September extended the Axis "line of communications from 250 to about 1,000 miles."³⁶ The RAF routinely destroyed Axis supply columns. This was further exacerbated by a critical shortage of transport vehicles.³⁷ While tonnages increased dramatically through the British supply base at Suez, Axis supplies slowed to a trickle.³⁸ The Allies rapidly amassed supplies, equipment and men during the months between June and November 1941, while the Axis consumed as little as possible and reorganized in preparation for their attack on Tobruk.

Rommel had to act. He knew that the Allies would eventually mass sufficient combat power to destroy him. His forces were approaching their culminating point.

Ruchinleck began making preparations for Operation CRUSADER upon taking command during the later part of June 1941. The British Western Desert Force quickly grew into the British Eighth Army. The main fighting forces consisted of the XIII Corps [New Zealand Division, 4th Indian Division (Infantry), and 1st Army Tank Brigade], the XXX Corps [7th Armored Division, 1st South African Division (Infantry), 4th Armored Brigade Group, and 22d Guards (Motorized Infantry) Brigade], and the 70th Division at Tobruk.³⁹ By the end of September British tank strength stood at approximately 735 tanks in line units with another

300 in reserve storage.⁴⁰ The XIII Corps contained approximately 135 heavy, slow moving, I-tanks, while the XXX Corps contained the greatest concentration of armor, with some 475 medium tanks in the 7th Armored Division. The 70th Division had 125 tanks.

While the British built their desert army, Rommel continued to invest Tobruk and reorganize his forces within the limits of tight supply constraints. Panzergruppe Afrika was composed of three corps: the Deutsches Afrika Corps [15th Panzer, 21st Panzer, and 90th Light divisions], the XX Italian Corps [Ariete Armored and Trieste Motorized divisions], and the XXI Italian Corps [five infantry divisions]. Rommel's tank strength lay concentrated in the Afrika Corps, with 249 tanks. The XX Italian Corps also contained 150 M13 tanks, but these were obsolete and of little value against British armor.

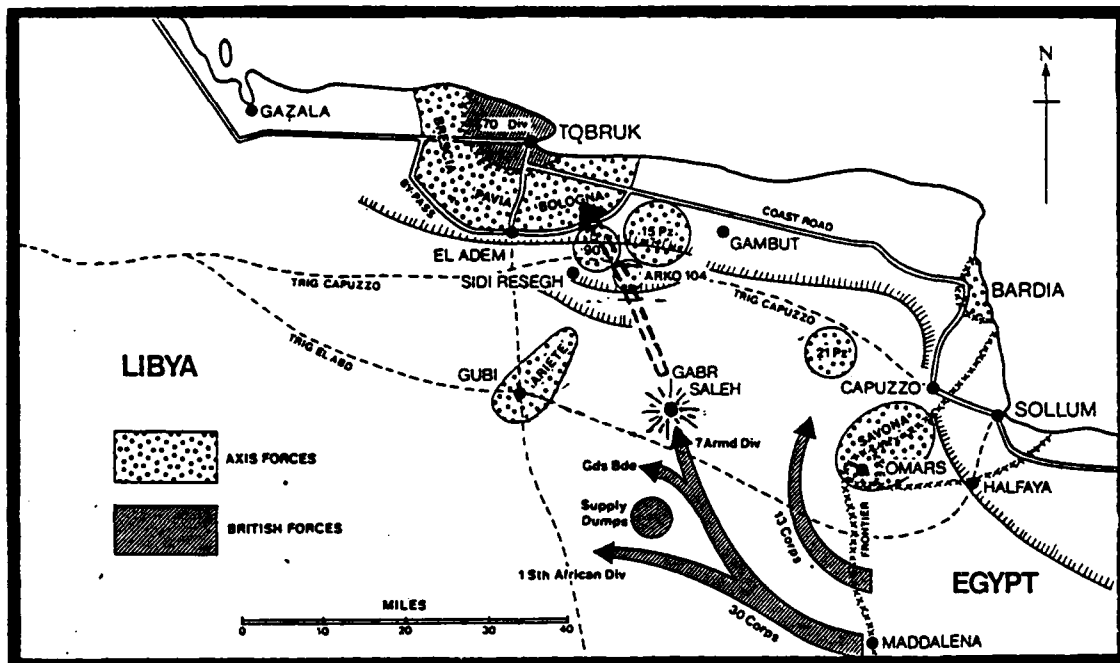
Rommel was used to fighting against a tank force that was superior in numbers. During Operation BATTLEAXE he defeated a British force of more than 200 tanks with 170 tanks. German losses amounted to 25 tanks compared to 91 for the British; German tactical doctrine and methods of command were the reasons for German success.⁴¹ The British operated as "separate entities of infantry and armor" with principal commanders in the rear, while the Germans operated as "homogeneous battle groups" with their commanders well-forward, ready to take advantage of any opportunity.⁴²

Cunningham's plan for Operation CRUSADER (See Map 1) called for the following :

...the infantry divisions of XIII Corps to mask, then surround and capture from the rear the static defenses along the frontier between Sollum and Sidi Omar, while the armor of XXX Corps crossed the frontier south of Sidi Omar,

swung up towards Tobruk where, after defeating the Afrika Korps panzers enroute, they would join hands with the Tobruk garrison and together sweep westwards, to break through the Axis forces in the Gazala line defenses, and repossess themselves of Cyrenaica.⁴³

MAP 1. The plan for Operation CRUSADER: November 1941.



(Original extracted from Great Battles by John Sanders, p. 11)

British raids and reconnaissance deep into Axis rear areas kept the Eighth Army commander informed about Rommel's dispositions.⁴⁴ Cunningham envisioned Rommel launching his main attack against the XXX Corps in the vicinity of Gabr Saleh. The narrative for his plan flatly stated that, "the enemy armor would be compelled to fight on ground of XXX Corps choosing."⁴⁵ Should Rommel decide to attack the infantry, the 4th Armored brigade, initially acting as an immediate flank guard to the XIII Corps, would engage the Afrika Corps, buying enough time for

the 7th Armored Division to launch a counterattack. Once it was clear that Rommel would not threaten the XIII Corps, the 4th Armored Brigade would rejoin the 7th Armored Division.

Cunningham's plan recognized the Africa Korps' armored forces as the Axis center of gravity and the concentrated armor in the 7th Armored Division (the Allied center of gravity) as the means to destroy the enemy. Cunningham believed that Gabr Saleh was the decisive point for the key CRUSADER battle. Tobruk also was a decisive point because it provided "the best means of checking Rommel's progress towards Egypt."

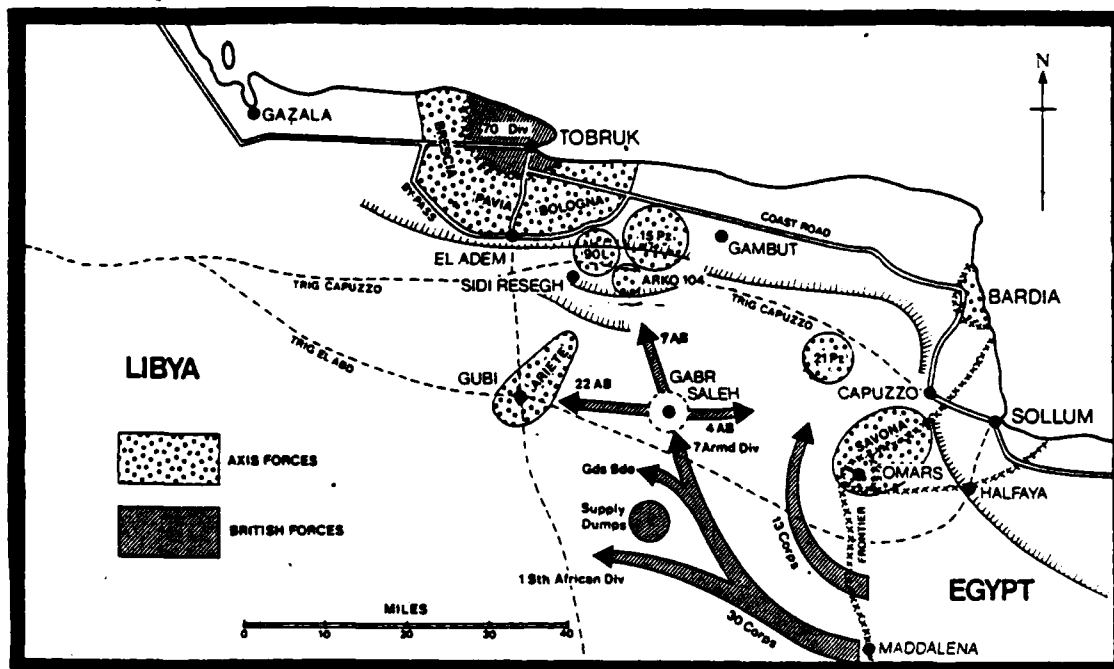
While Auchinleck and Cunningham had a good appreciation of Axis dispositions, Rommel did not know that a major British offensive was brewing. He estimated that the Allies would not attack until early 1942.⁴⁶ German reconnaissance had failed to identify any forward positioning of supply dumps or other major indicators of an attack.⁴⁷ Although intelligence turned up some signs of a pending offensive, Rommel chose to ignore them. He was entirely consumed with the capture of Tobruk and preparing for the drive into Egypt.

Rommel also considered Tobruk as a decisive point. The capture of Tobruk would provide desperately needed port facilities and strike a blow to Allied morale. A serious threat to Tobruk might also force the British to launch an attack before they were prepared. He positioned the 15th and 21st Panzer Divisions of the Afrika Korps and the Italian XX Corps as a flank guard, while two Italian divisions and the 90th Light prepared to attack Tobruk at the end of November. Churchill's impatience for a British offensive changed Rommel's immediate plans.

Operation Crusader began at dawn on 18 November 1941. By the end of the first day, the Allies had achieved their initial objectives. The XIII Corps sat on a line from Halfaya on the coast to Bir Sherzen, with the 4th Armored Brigade on its left flank. The XXX Corps held Gabr Saleh. Although resistance had stiffened, Rommel's armor was not encountered.

Cunningham decided to continue his drive and link up with the Tobruk garrison. He directed the XXX Corps to advance with a strong reconnaissance and the XIII Corps to continue with the plan.⁴⁸ His orders for 19 November unfortunately set the conditions for the defeat of British armored forces. (See Map2).

MAP 2. Operation CRUSADER: 19 November 1941.



(Original extracted from Great Battles by John Sanders, p. 11)

The green 22d Armored brigade lost 52 tanks on a foolishly executed attack on the Ariete Division, dug in with anti-tank guns at Bir Gubi. The 7th Armored Brigade captured the key escarpment overlooking the Trig Capuzzo desert track, overran the airfield at Sidi Rezegh, and threatened to link up with the Tobruk garrison. The 4th Armored Brigade remained in positions at Gabr Saleh. The bulk of British armor was at three locations, each no closer than 30 kilometers from the other, and Rommel still had not shown his hand. Cunningham's orders had dispersed his own center of gravity without a single action by Rommel.

Events during 20 through 23 November demonstrated that Rommel finally had recognized British actions as a major offensive. The 15th Panzer Division struck the 4th Armor Brigade about noon on the 20th. Cunningham ordered the 22d Armor Brigade immediately to reinforce the 4th in an attempt to reconcentrate at least a portion of his armor. By 1800 both brigades were in battle, but the results were inconclusive and the 15th Panzer Division withdrew at dusk. The 21st Panzer Division joined the 15th Panzer during the night, and both subsequently marched for Sidi Rezegh and the 7th Armored Brigade, pursued at a far distance by the two British brigades. Rommel finally understood British dispositions, strengths, and intentions.⁴⁹ He recognized Sidi Rezegh as a decisive point of immediate importance; it offered the opportunity to destroy British armor a fraction at a time.

Furious tank battles took place during 21, 22, and 23 November. The Africa Corps mauled the 7th Armored Brigade at Sidi Rezegh, leaving the British with a mere 10 battle-worthy tanks. Rommel then turned on the 4th and 22d Armored Brigades and an infantry brigade from the

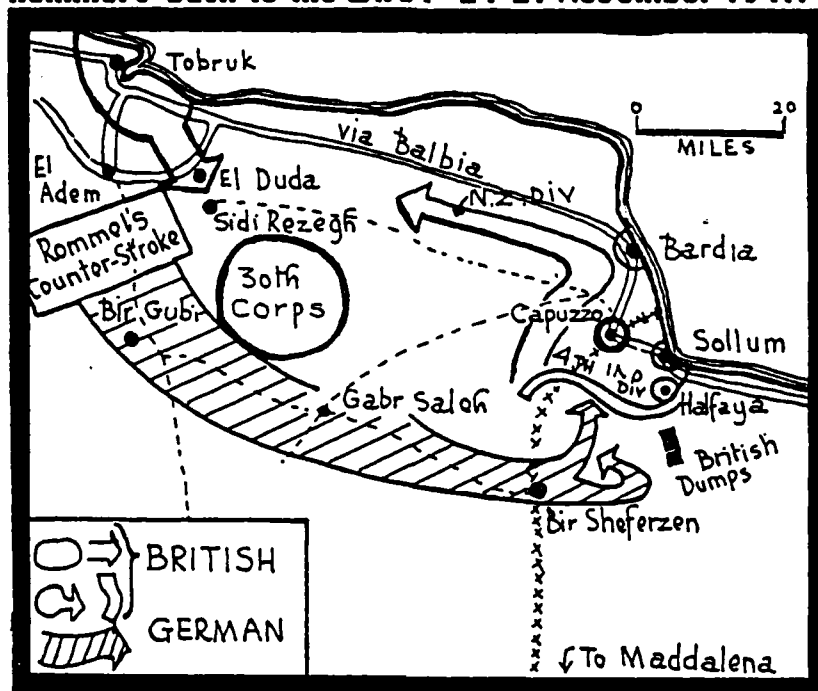
1st South African Division. By the end of the 23d the Africa Corps had 90 tanks of the original 249 remaining, while the XXX Corps had less than 130 tanks running of the original 475. The concentrated force of Rommel's armor and German tactical methods were victorious; the British had lost the first battle.

Ruchinleck, sensing that Rommel had suffered irreplaceable losses, was determined to continue on. He replaced a badly shaken Cunningham with Major General Neal Ritchie and took personal control of the CRUSADER operation. Ruchinleck's orders on 24 November reflected an appreciation for Sidi Rezegh as the location to destroy the Africa Corps and Rommel's supply situation as a vulnerability. He ordered the XIII Corps to recapture the Sidi Rezegh-Duda escarpment and linkup with the Tobruk force. He ordered long range raiding parties to disrupt Rommel's lines of communications.⁵⁰ He reemphasized that the Eighth Army's 'immediate objective will be as always to destroy the enemy tank forces.'⁵¹

Rommel believed that he had destroyed the British center of gravity. He set out quickly on what is known as Rommel's 'dash to the wire.' (See Map 3). His orders were as follows:

The greater part of the [enemy] force aimed at Tobruk has been destroyed; now we will turn east and go for the New Zealanders and Indians before they have been able to join up with the remains of their main force for a combined attack on Tobruk. At the same time we will take Habata and Maddalena and cut off their supplies. Speed is vital; we must make the most of the shock effect of the enemy's defeat and push forward immediately and as fast as we can with our entire force to Sidi Omar.⁵²

MAP 3. Rommel's 'Dash to the Wire': 24-27 November 1941.



(Extracted from The Desert Generals by Correll Barnett, p. 113)

Rommel's "dash to the wire" failed to produce a decisive defeat of the Allied forces. The Africa Korps (minus 90th Light, holding the ridge at Sidi Rezegh) and the Ariete Division raced to the frontier wire, under continual attack by small marauding 'Jock Columns'. Rommel pushed his forces beyond their culminating point. His divisions were stretched over more than fifty miles from Halfaya to Gabr Saleh without resupply for days at a time; his soldiers were exhausted.⁵³ Although several supply stores were captured by Axis forces, Rommel failed to destroy the XIII Corps or effectively cut British lines of communications.

The "dash to the wire" provided the allies with the time they needed to sort out the disaster at Sidi Rezegh and regain the initiative.

Rommel underestimated Allied combat power; he was unaware that: the XIII Corps had captured Sidi Omar, Fort Capuzzo, and Libyan Omar on 22 November; the New Zealand Division with 80 I-tanks had invested Italian-held Bardia on the coast and was marching on Sidi Rezegh;⁵⁴ and the 7th Armored Division had reorganized into a formidable composite force of 130 tanks.⁵⁵ By 27 November the New Zealand Division recaptured the Sidi Rezegh ridge and linked up with Tobruk forces. Rommel underestimated the resilience of the British; he now was forced to retrace his path.

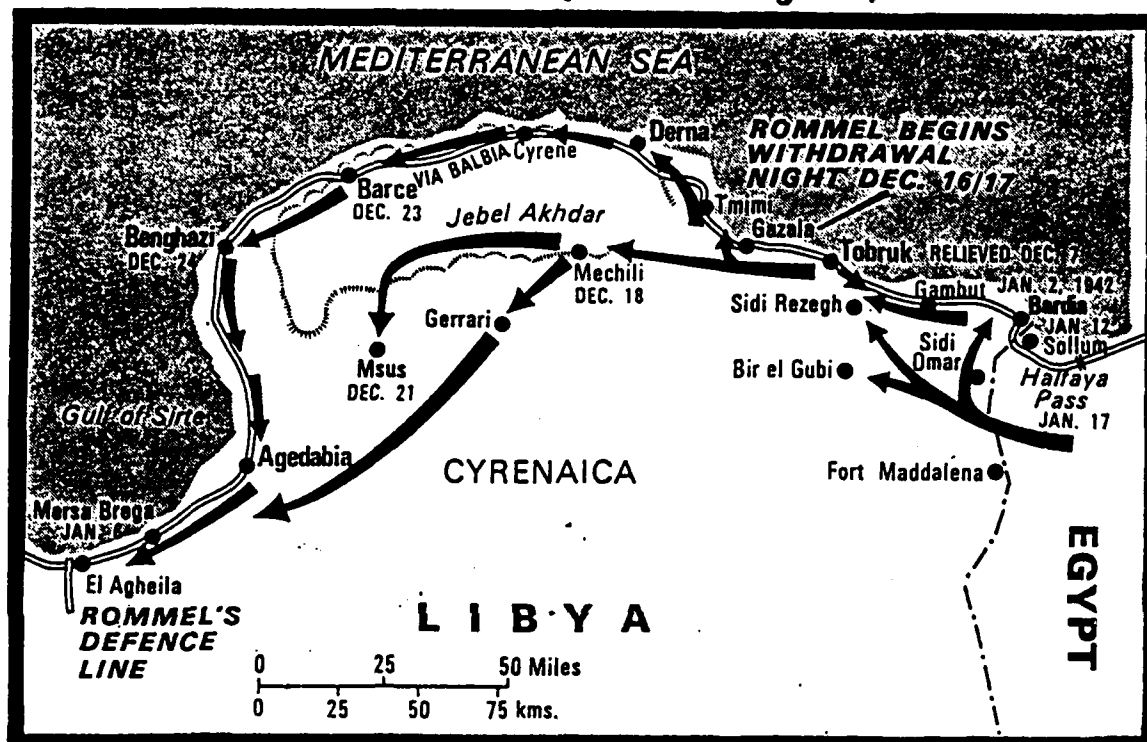
Both sides again demonstrated their tenacity. The Africa Korps, although down to 50 tanks, turned about, fought several tank battles, and cut the corridor to Tobruk by 1 December.⁵⁶ The British moved up infantry brigades as well as additional supplies and persisted in conducting attacks with their tank forces; they were determined to continue the fight.

Rommel realized on 5 December that his forces had passed their culminating point. He received a message informing him that no fresh supplies or reinforcements would arrive for a month.⁵⁷ The continuous harassing actions by small raiding parties and attacks by Allied air, armor, and infantry units had a cumulative effect. Axis resources were exhausted, and Rommel's forces were incapable of continuing the attack or defending under present conditions.

During 5 and 6 December Axis forces withdrew to a line west of Tobruk. (See MAP 4). Rommel continued to fall back under pressure until several sharp ripostes, delivered on 26 and 30 December by 21st Panzer Division, halted any further British advance.⁵⁸ The British salvaged a major defeat and transformed it into a partial victory.

Although Rommel and the Africa Korps escaped, the Allied offensive broke the siege of Tobruk and drove the Axis back to El Aghella.

MAP 4. Axis withdrawal / British pursuit to El Aghella, December 1941.



(Extracted from Afrika Korps, by Kenneth Macksey, p. 48)

Operation GALLOP

Operation GALLOP, conducted between 29 January and 6 March 1943 was a sequel to the Soviet encirclement of the German 6th Army at Stalingrad. Although the subsequent destruction of the 6th Army tied down more than seven Soviet Armies, the Soviet STAVKA believed that conditions favored continuing the offensive. STAVKA was convinced that German forces in southern Russia were exhausted.⁵⁹ A

combination of geography and the disposition of forces offered the Soviets an opportunity to trap the entire German southern wing against the Sea of Azov.⁶⁰

STAVKA initially planned "a series of offensives along the eastern front designed to erode German strength and produce a total collapse of German forces in southern Russia."⁶¹ The quick success of operations conducted by the Voronezh and Bryansk Fronts heightened Soviet optimism and led to the approval of Operations STAR and GALLOP. The Voronezh Front (Operation STAR) would liberate Belgorad, Kursk, and Kharkov and protect the right flank of the Southwestern Front. Operation GALLOP, conducted by the Southwestern Front, would liberate the Donbas region, the area between the Dnieper and Donets Rivers that borders the Sea of Azov. The Southern Front would assist the Southwestern Front by attacking German forces along the Don and Donets Rivers in order to seize Rostov, a key rail center. These major operations would be conducted simultaneously with the reduction of German forces at Stalingrad and other supporting attacks along the entire front.

STAVKA optimism was so pervasive that it led to a serious underestimation of the problems facing Soviet forces during early January 1943. Operation GALLOP would be conducted without an operational pause to rest, refit, resupply, and reposition forces. Soviet formations had been fighting since mid-December, some since November. All were weakened by previous operations and approaching exhaustion.⁶² The supply situation was precarious. Supply lines were severely extended; bases had not moved forward since mid-December.⁶³ The systematic destruction of bridges and rail lines by

German forces compelled the Soviets to rely on scarce wheeled transport and a poor road network. The Soviet Air Force had not advanced their airfields; air support would be considerably reduced.⁶⁴ All problems would be further complicated by severe weather conditions and the spring thaw.

Southwestern Front forces included the 6th Army (40,000 men / 40 tanks), the 1st Guards Army (70,000 men), Mobile Group Popov (55,000 men / 212 tanks), the 3d Guards Army (100,000 men / 110 tanks), the 5th Tank Army (40,000 men), and a reserve of two tank corps and one cavalry corps (20,000 men / 60-100 tanks).⁶⁵

STAVKA issued the following mission to the Southwestern Front Commander, General Vatutin:

The armies of the Southwestern Front, while delivering the main attack from [1st Guards Army] to Kramatorsk and Artemovsk and further in the direction of Stalino, Volnovakha and Mariupol ... will cut off all enemy groups located in the Donbas and Rostov regions, encircle and destroy them and prevent their withdrawal to the west and the evacuation of any of their equipment.⁶⁶

Vatutin's plan envisioned a broad single-echelon offensive that incorporated a rapid exploitation by tank corps. (See Map 5). The Southwestern Front would "attack across the Aydar and Oskol Rivers then wheel southwest and south across the Northern Donets River and through the Donbas region toward the Dnepr River."⁶⁷

Map of the Dnieper River region showing military operations in February 1943. The map includes the Dnieper River, major cities like Kiev, Zhitomir, and Vinnytsia, and various military units and fronts. Key locations marked include: Kiev, Zhitomir, Vinnytsia, Dnepropetrovsk, Kramatorsk, and others. Military units shown include the 37A, 38A, 39A, 40A, 41A, 42A, 43A, 44A, 45A, 46A, 47A, 48A, 49A, 50A, 51A, 52A, 53A, 54A, 55A, 56A, 57A, 58A, 59A, 60A, 61A, 62A, 63A, 64A, 65A, 66A, 67A, 68A, 69A, 70A, 71A, 72A, 73A, 74A, 75A, 76A, 77A, 78A, 79A, 80A, 81A, 82A, 83A, 84A, 85A, 86A, 87A, 88A, 89A, 90A, 91A, 92A, 93A, 94A, 95A, 96A, 97A, 98A, 99A, 100A. Fronts shown include the VORONEZH FRONT, SOUTH-WESTERN FRONT, and others. Dates of operations are marked: DAY 7 & 8 FEB, DAY 8 & 9 FEB, DAY 8 & 7 FEB, DAY 8 FEB, DAY 7 FEB, DAY 6 FEB, DAY 5 FEB, DAY 4 FEB, DAY 3 FEB, DAY 2 FEB, DAY 1 FEB. A scale bar indicates 0 to 40 KMS. The map is titled 'OPERATION 'SKACHOK' (GALLOP) PLAN: 20 JAN 1943 TO VOLNOVYKA 6 FEB'.

Datutin's plans reflected the STAVKA optimism that German forces were on the verge of collapsing. Front initial objectives would be reached in eight days. The Sixth Guards Army would attack in the north, create a penetration for exploitation by a tank corps from mobile Group Popov, destroy two German Divisions, seize Balakleya and Izyum and advance to a depth of 110 kilometers. The First Guards Army would create a penetration for exploitation by the bulk of Mobile Group Popov, envelop and destroy two panzer divisions in the Slavyansk-Artemovsk area, and advance to a depth of 135 kilometers. The Third Guards Army would destroy several infantry divisions, secure Stalinov, and push 200 kilometers deep to secure Krasnoarmeyskoye and link up with First Guards forces. The Fifth Tank Army would occupy defensive positions along the Donets and join operations as the Germans withdrew.

Mobile Group Popov would attack through both Sixth and First Guards Armies and advance over 300 kilometers. The 3d Tank Corps would secure Slavyansk and advance on Kramatorsk; the 4th Tank Corps would seize Kramatorsk; the 18th Tank Corps would assist the First Guards Army in the destruction of German tank-heavy forces in the area around Lisichensk; and the reinforced 10th Tank Corps would secure Artemovsk, cut lines of communications west of Stalino, advance toward Mariupol, and link up with the Southern Front.

German forces reorganized several times during Operation GALLOP. Fresh reserves would prove key to the German defense and counteroffensive. German forces opposing the Southwestern Front during the entire operation included 5 panzer divisions, 10 infantry divisions, an SS panzer corps, and a battle group.⁶⁸ Tank strength varied from 20 to 40 tanks in each panzer division with the exception of SS panzer divisions which had 100 or more tanks.⁶⁹

The plans for Operation GALLOP demonstrate the linkages between culminating point, center of gravity, and decisive point. The Soviets believed that the Germans had exceeded their culminating point and were vulnerable. The nature of the Soviet plan suggests that neither STAVKA nor Vatutin considered the Germans capable of effectively reinforcing threatened sectors or conducting a counteroffensive. The plan reflected a perception that Soviet forces could accomplish ambitious operational missions prior to the culmination of their combat power. The Soviet main attack was directed against the German center of gravity in Army Group Don, the two panzer divisions facing the First Guards Army. The First Guards Army with its five rifle divisions and a tank brigade effectively became

the Soviet center of gravity. Vatutin's plan dispersed the striking power of Mobile Group Popov (almost one-half of the Southwestern Front's available tanks). The Southwestern Front's plan incorporated the rapid capture of decisive points behind the two panzer divisions. The cities of Slavyansk, Krasnoarmeiskoye, and Kramatorsk were vital to the resupply of front line forces. Their capture would cut off German forces from their supply bases, and block a rapid withdrawal. The Soviet plan when viewed from a larger perspective also incorporated decisive points. The major cities of Kharkov, Zaporozhye, Dnepropetrovsk, and Rostov sat astride vital German lines of communication. Their capture would appreciably alter the balance of power.

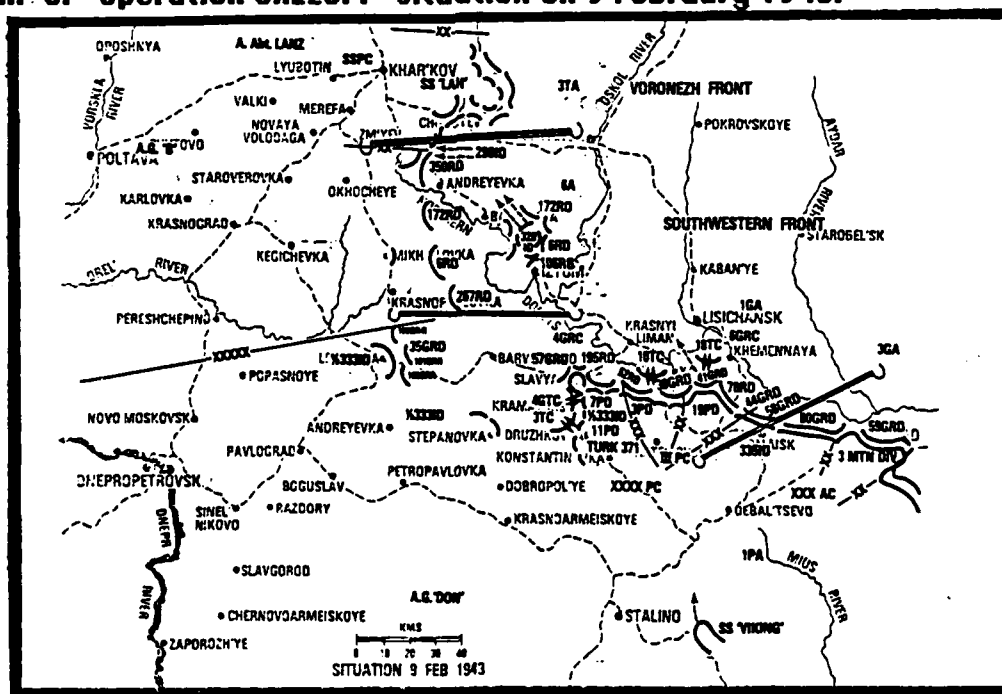
Field Marshall Erich von Manstein, commander of Army Group Don, struggled during early 1943 to "protect Army Group A's rear and at the same time to keep its communications through Rostov open."⁷⁰ His Fourth Panzer Army and Army Detachment Hollidt fought a stubborn defense as First Panzer Army (from Army Group A) withdrew through Rostov to join Army Group Don and Army Group A pulled back into the Kuban peninsula on the Black Sea. By the beginning of February the First Panzer Army was moving to the middle Donets area, and the Fourth Panzer Army was pulling back to the vicinity of Rostov. Manstein had succeeded in protecting the withdrawal of Army Group A. He also had shortened his own front line and gained a powerful panzer army.

The Soviets launched Operation GALLOP on 29 January, while Manstein shifted forces. Soviet units made significant gains by 3 February: the Sixth Army crossed the Oskol River and pushed German

forces to the Donets River; the First Guards Army crossed the Donets River and engaged in a bitter fight for Slavyansk; and the Third Guards Army crossed the Middle Don River and slowed against heavy resistance. The tank corps of Mobile Group Popov either supported infantry divisions or waited in attack positions; the infantry failed to make the requisite penetrations for exploitation.

Soviet forces created a salient by 9 February at the boundary between Army Group B and Army Group Don. (See Map 6). Unfortunately, only three slow-moving rifle divisions were in a position to exploit the advantage. Popov's tank units were either tied up fighting panzer divisions around the towns of Slavyansk and Kramatorsk or waiting for a penetration further to the east.

MAP 6. Operation GALLOP: Situation on 9 February 1943.



(Extracted from From the Don to the Dnepr, David Glantz, p. 590)

STAVKA issued a new directive on 11 February to restore the momentum. Orders "reiterate the front's mission to block an enemy withdrawal to Dnepropetrovsk and Zaporozhye and demanded the front undertake all measures to press the German Donets group into the Crimea."⁷¹ **STAVKA** still believed that German forces were about to withdraw, despite heavy resistance across the front.

By 11 February, Vatutin had pushed the 4th Guards Tank Corps of Group Popov to Krasnoarmeiskoye. **STAVKA** orders prompted him to continue. During the next eight days, Vatutin ordered Popov's 10th Tank Corps and then the remaining two tank corps (18th and 3rd) to Krasnoarmeiskoye. He changed the Sixth and First Guards Armies lines of advance to a southwestern orientation; the Dnieper River crossings were Vatutin's focus. Under mounting pressure from **STAVKA**, Vatutin released his reserve, the 25th Tank Corps and the 1st Cavalry Corps, on 19 February to the Sixth Army for capture of the Dnieper River crossing sites.

Meanwhile, Manstein assumed control of Army Group B and initiated actions to block any Soviet breakthrough. His new command, Army Group South, placed him in control of German forces from north of Kharkov to the Sea of Azov. Prior to this change, the introduction of a fresh SS Panzer corps allowed Army Group B to stabilize the northern shoulder of the breakthrough from Kharkov (Voronezh Front) to Kegichevka. The SS Panzer Corps under Army Detachment Kempf continued to counterattack and stem the advance of Soviet rifle divisions as they attempted to outflank German forces at Kegichevka. Manstein also managed by 16 February to position the Fourth Panzer Army in defensive positions forward of the Dnieper River and establish

a shorter defensive line with Army Detachment Holldt along the Mius River.

While Manstein adapted to the situation, Vatutin and his staff disregarded warnings that Soviet forces had exceeded their culminating point. Vatutin ignored the fighting capability demonstrated by his enemy since the first day of Operation Gallop. German units continued to mount counterattacks at every opportunity, hold on to key cities, and block penetrations. Vatutin ignored warnings from his own commanders. Tank strength continued to drop; one tank corps had only seventeen operational tanks.⁷² A radio transmission to Group Popov by the 10th Tank Corps stated that "no wheel was turning."⁷³ The Southwestern Front intelligence officer, Major General A. S. Rogov interpreted growing concentrations of German armor as withdrawing forces.⁷⁴

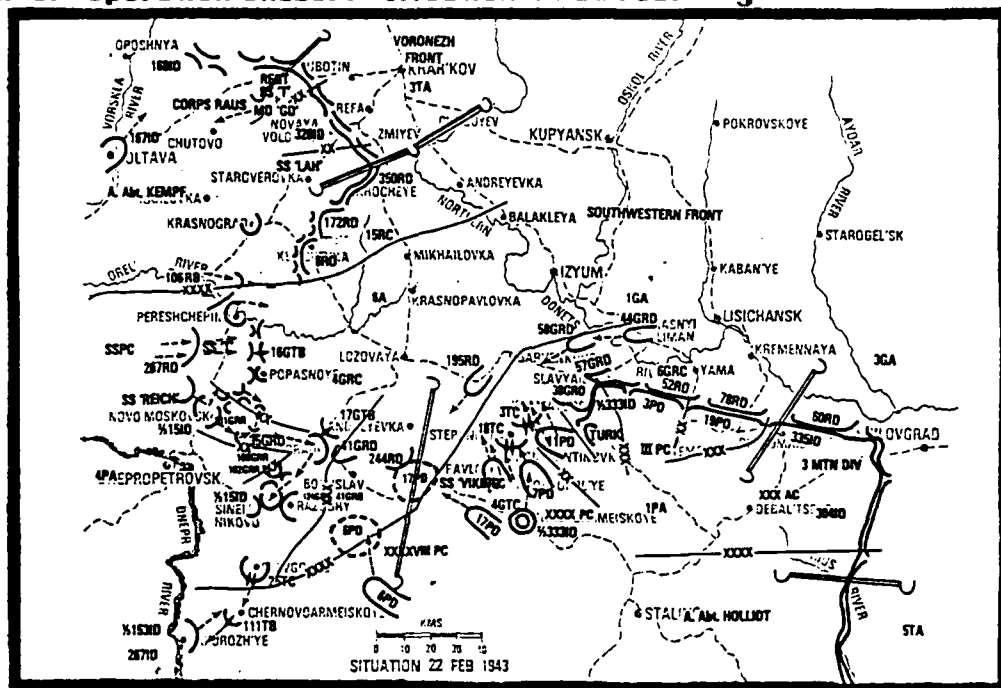
In contrast to the Soviets, Manstein achieved an excellent appreciation of the situation. (See Map 7). He noted in his Lost Victories that by 20 February the enemy's operational intentions were perfectly clear.⁷⁵ The objective of the enemy's main attack was to cut communications over the Dnieper River, while supporting attacks in the north and south sought to envelop and destroy defending forces. Manstein recognized that Soviet forces had passed their culmination point. Radio intercepts "made it clear that ... Group Popov was faring badly."⁷⁶ Soviet units across the front were running out of fuel.⁷⁷ Manstein also recognized that German forces had reached their culminating point. Soviet reinforcements had begun moving southwest from Stalingrad. Manstein placed the SS Panzer corps under the Fourth

MAP 7. Operation GALLOP: Situation on 20 February 1943.



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MAP 8. Operation GALLOP: Situation on 22 February 1943.



(Extracted from From the Don to the Dnepr, David Glantz, p. 594)

IV. CONCLUSIONS

The theoretical concepts of center of gravity, decisive point, and culminating point are useful planning tools. Operation CRUSADER and Operation GALLOP illustrate the value of understanding these concepts in the formulation and execution of operational plans.

Concentrated combat power represented the center of gravity in the preceding historical examples. For different reasons, e.g. the paucity of aircraft, technology, or doctrine, concentrated armored forces produced the greatest combat power. Rommel's massed panzer divisions, Cunningham's 7th Armored division, Manstein's panzer

divisions and SS Panzer Corps, and Vatutin's tank corps offered the most potential combat power.

An element of success was the commander's ability to identify the greatest concentration of combat power for enemy and friendly forces and then maintain his own force's concentration during employment. Cunningham viewed Rommel's panzer divisions as the Axis center of gravity, but he dissipated British armor during execution. Rommel repeatedly sought out and attacked British armor with the concentrated power of both panzer divisions. Manstein blocked the initial main Soviet effort (First Guards Army at Slavyansk), identified the thrust toward the Dneiper River as the subsequent main attack, and massed the combat power of his panzer divisions against the Soviet salient. Vatutin initially identified Army Group Don's greatest panzer concentration but later failed to recognize that the German center of gravity had shifted to a powerful reserve. His plan dispersed Group Popov, the Soviet's greatest potential for combat power.

A second element of success was the identification and use of decisive points to neutralize the enemy center of gravity. The location and nature of the decisive point determined whether the approach to neutralizing the center of gravity was indirect or direct.

One method was the identification and defense of vital logistical nodes. These were decisive points that could indirectly alter friendly or enemy combat power. Auchinleck destroyed Axis ports and key logistical points, while major Allied logistical points were beyond the capability of Axis forces. Allied and Axis commanders recognized Tobruk as a decisive point, necessary to support operations for either side. Sidi Rezegh was also a decisive point for both sides because it

controlled the coastal highway as well as several desert tracks. Manstein shifted forces so that he could initially protect Rostov, a key transportation center, then crossing sites over the Dneiper River.

Another method was the identification and use of locations that provided immediate combat superiority. This represented a direct approach to destroying the enemy center of gravity. Cunningham thought Rommel would attack while British armor was concentrated at Gabr Saleh. Rommel moved from one point to another, overwhelming fractions of British armor. STIMPKE and Detulin sought to encircle the enemy, in effect to place the Southwestern Front in the immediate rear of Army Group Don. Manstein shifted forces and introduced reserves so that he had greater combat power at key points. He held the shoulders of the Soviet penetration and then launched a counteroffensive with massed panzer divisions into the flanks of the salient.

A third element of success was the commander's appreciation for friendly and enemy culminating points. This required a keen understanding of each side's combat power. The combat power of each center of gravity was a function of technology, available numbers, doctrine, and the army's fighting spirit. These were the factors that commanders had to appreciate.

Cunningham failed to appreciate the speed that German forces could take advantage of an opportunity and the advantage German battlegroups had over homogeneous British formations. The 7th Armored Brigade exceeded its culmination point at Sidi Rezegh and was destroyed by the Africa Corps.

Rommel's actions demonstrated an uneven appreciation for the factors that influence the culminating point. He believed that the destruction of the 7th Armored brigade and the results of several minor tank battles had pushed the British beyond their culminating point, a position from which they could not recover quickly. Rommel seriously underestimated British tenacity and their logistical capability for reconstitution. Although he had erred, Rommel later demonstrated a grasp of the situation when he broke off the siege of Tobruk and ordered his forces to execute a delay. He understood the relative correlation of combat power and realized that British strength would eventually culminate in the depths of the desert.

STAVKA orders and Vatutin's plans demonstrated a complete lack of appreciation for the situation. STAVKA ignored the logistical situation and the condition of Soviet troops. Vatutin ignored indicators that the correlation of combat power had swung in favor of German forces. His forces exceeded their culmination point and suffered a major defeat.

Manstein maintained a grasp of the situation throughout Operation GALLOP. He protected his own decisive points and destroyed Soviet tank corps by shifting and then massing his own combat power. He created conditions for success. Manstein recognized before Vatutin that Soviet forces had exceeded the culminating point of their attack. He also recognized that German forces had reached the culminating point of the defense. The German counteroffensive was launched before the Soviets could introduce new forces into the area.

Operations CRUSADER and GALLOP suggest that a successful commander selects a method that uses his center of gravity to

neutralize the enemy's center of gravity before available resources are exhausted. He protects his own points of vulnerability while striking exposed enemy weaknesses. He weighs the risks inherent in a direct and indirect approach and selects one or a combination of methods to defeat his enemy. This is the essence of operational art.

D. IMPLICATIONS

The theoretical concepts of center of gravity, decisive point, and culminating point continue to have practical application with regard to operational planning. They provide a framework to assess the modern battlefield and evaluate doctrine.

The Modern Battlefield and Operational Planning

Examining changes in battlefield conditions with respect to theoretical concepts provides insights for operational planning on the contemporary battlefield. Technological and doctrinal developments form the foundation for changes in the battlefield environment and the basis for investigation. Technological changes include the development of new armored fighting vehicles, a proliferation of sophisticated electronic systems across the battlefield, the introduction and dramatic expansion of automation, and the deployment of nuclear weapons of all sorts and sizes. Among doctrinal changes that concern the operational planner is the Soviet emphasis on deep operations.

The Apache attack helicopter is an "adverse-weather, day-or-night, all purpose weapon system" that exploits the latest technologies.⁷⁰ The attack helicopter is a potential center of gravity for future conflicts. The mobility, firepower, and speed of the attack helicopter make it an ideal operational tool - if employed in sufficient numbers in a manner that maximizes its potential. The operational planner must consider the potential combat power of dispersed attack helicopters that can rapidly mass and deliver a fatal blow before an enemy can react.

Technology is a two-edged sword. For example, communications systems have improved command and control capabilities and added new vulnerabilities. An overreliance on radios and other signal devices has turned communication nodes into key decisive points. They represent an indirect approach to degrading an enemy's combat power and another point of friendly vulnerability that must be protected.

Sophisticated communications systems are also vulnerable if the flow of repair parts is interdicted; you cannot improvise hi-tech parts. A growing reliance on technology means that logistical nodes become increasingly important decisive points. The operational planner must broaden his concern for decisive points particularly in light of precision munitions and the effects of nuclear weapons.

Since most logistical nodes are situated in the rear area, planners must design operations that reduce rear area vulnerabilities to a minimum. The creation of operational maneuver groups (OMG), airborne divisions, and special forces units (*SPETZNAZ*) by the Soviets to accomplish deep attack missions highlight the importance of this issue.

Communication centers and logistical facilities are decisive points that have grown in importance.

Automation offers the planner the opportunity to improve his ability to forecast a force's culminating point. The current method of wargaming is subject to many deficiencies including a lack of common planning norms and subjective interpretations of intelligence data. The automation of wargaming using a common set of values that are integrated with artificial intelligence could increase the probability of accurately predicting the culminating point of friendly and enemy forces. Planners could then reliably phase operations and rapidly adjust branches and sequels as a situation changes.

Theory and Doctrine

A major hypothesis of this monograph is that a center of gravity and a decisive point are two demonstrably different theoretical concepts that have practical utility. Classical theory suggests that the two concepts are related but distinctly separate. History implies the same and offers examples of the functional application of center of gravity and decisive point in the planning of major operations. Indeed, evidence suggests that the distinction between center of gravity and a decisive point is absolutely vital to success at the operational level.

FM 100-5 stresses the point that the "concept of center of gravity is key to all operational design."⁷⁹ Unfortunately, the Field Manual then gives several decisive points as examples of centers of gravity. Admittedly, the two concepts are easy to confuse with one

another. FM 100-5 does exactly that; Army doctrine currently considers the two concepts one and the same.

FM 100-5 reintroduced the Army's officer corps to classical military theory and the study of military history. This has produced an officer corps eager to develop the intellectual foundation of war in order to improve the Army's capability to deter war. As the Army's operational doctrine evolves, the distinction between a center of gravity and a decisive point will become clear. Clarity will prevail and planners will be better able to apply the tools of operational art.

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70 Manstein, op cit., p. 379.

71 Glantz, op cit., p. 129.

72 Ibid., p. 138.

73 Ibid.

74 Ibid., p. 142.

75 Manstein, op cit., p. 429.

76 Ibid., p. 431.

⁷⁷ Ibid., p. 431.

⁷⁸ Douglas W. Nelms, "The Awesome Apache", Army, (Jan. 1987), pp. 38-39.

⁷⁹ FM 100-5, p. 179.

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