



The Airborne Force Role in Operational Maneuver

**A Monograph
by
Major Anthony J. Tata
Infantry**



**DTIC
ELECTE
JAN 04 1994
S E D**

93-31522



**School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas**

Second Term AY 92-93

**THIS MONOGRAPH CONTAINS COPYRIGHT MATERIAL
Approved for Public Release; Distribution is Unlimited**

93 12 28078

**Best
Available
Copy**

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 14 MAY 1993		3. REPORT TYPE AND DATES COVERED MONOGRAPH	
4. TITLE AND SUBTITLE THE AIRBORNE ROLE IN OPERATIONAL MANEUVER				5. FUNDING NUMBERS	
6. AUTHOR(S) MAJOR ANTHONY J. TATH					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SCHOOL OF ADVANCED MILITARY STUDIES CGSC FT. LEAVENWORTH, KS				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED.				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) SEE ATTACHED					
14. SUBJECT TERMS AIRBORNE, BASE OF OPERATIONS, LINES OF OPERATION, DECISIVE POINTS, CULMINATING POINTS, CENTER OF GRAVITY, THEATER DESIGN, OPERATIONAL MANEUVER				15. NUMBER OF PAGES 65 (INCLUDING ABSTRACT)	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASS		18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASS		19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASS	
20. LIMITATION OF ABSTRACT					

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

Major Anthony J. Tata

Title of Monograph: The Airborne Force Role in
Operational Maneuver

Approved By:

James J. Schneider
James J. Schneider, Ph. D.

Monograph Director

James R. McDonough
COL James R. McDonough, MS

Director, School of
Advanced Military
Studies

Philip J. Brookes
Philip J. Brookes, Ph. D.

Director, Graduate
Degree Program

Accepted this 14th day of MAY 1993

ABSTRACT

The purpose of this monograph is to identify the airborne force role in operational maneuver. Specifically, the monograph attempts to define how airborne forces can contribute to the establishment of a theater of operations or other elements of operational design. Theory reveals that modern operational maneuver often needs protection either from fires or other forces. History shows that armies have used airborne forces to seize bases of operations, protect lines of operations, extend culminating points, secure decisive points, and contain enemy centers of gravity. In the final analysis, airborne forces seem best suited for seizing bases of operations and extending culminating points. They are less suited for containing an enemy center of gravity. The critical point about employment of airborne forces is to follow the Eisenhower doctrine of dropping a force where a converging conventional force may rapidly link up with it or ensuring it can protect itself if isolated.

Accession For	
NTIS CRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

DTIC QUALITY INSPECTED 8

Table of Contents

I.	Introduction	p. 1
II.	Theory: Operational Maneuver	p. 7
III.	Historical Review	p. 13
a.	Operation Just Cause: Forcible Entry to Establish Bases of Operation	p. 14
b.	Operation Market-Garden: Seizing Decisive Points to Sustain Tempo	p. 20
c.	The Normandy Invasion: Protecting Lines of Operation and Extending Culminating Points	p. 26
d.	The Eastern Front: Attempting Operational Containment of the Enemy Center of Gravity	p. 31
IV.	Analysis	p. 34
V.	Conclusions	p. 38
VI.	Annex A: Theater of Operations	p. 41
VII.	Annex B: Figures	p. 48
	Figure 1: Theater of Operations	
	Figure 2: Simpkin Deep Maneuver Model	
	Figure 3: Just Cause Abn Targets	
	Figure 4: Market-Garden Plan	
	Figure 5: Overlord Abn Plan	
	Figure 6: Soviet Abn Plan--Vy'azma	
VIII.	Endnotes	p. 54
IX.	Bibliography	p. 58

I. Introduction.

On the morning of June 5, 1944, General Dwight D. Eisenhower said his now famous, "O.K., let's go."¹ His simple utterance, though, did not reflect the enormity of his decision. While he was worried about the weather, his visit to the 101st and 82d Airborne Divisions that evening demonstrated his concern over dropping his airborne units behind enemy lines.

Essentially, Eisenhower faced a dilemma. Air Chief Marshall Sir Trafford Leigh-Mallory argued that the "parachute regiments could not be fully reinforced" in time to avoid destruction.² General Omar Bradley, conversely, believed the airborne forces were ideally suited for the mission and refused to attack Utah beach without the airborne landings.³ How two senior Allied leaders could so strongly disagree over the use of airborne forces in the context of conventional force operational maneuver illustrates an issue that has confounded the airborne community for decades.

Soviet Marshal Mikhail Tukhachevskii was among the first military theorists to develop the concept of using airborne forces in conventional force operational maneuver. Military theorist Richard Simpkin interprets Tukhachevskii's argument when he writes that highly mobile armored forces "would cooperate with airborne forces, especially mechanized airborne forces, in

extremely wide and deep sweeps against the enemy."⁴ Indeed, in the 1970s, the Soviet Union achieved the force structure to support Tukhachevskii's notion of deep maneuver with conventional and mechanized airborne forces.

During the course of World War II, however, the Soviet Union and Germany both had marginal experiences with airborne forces and seriously debated their relevance for future warfare. After a costly German operation in Crete, Hitler chose not to pursue further largescale airborne operations.⁵ Likewise, after World War II, Stalin was skeptical of the use of airborne forces and "relegated large airborne forces to the realm of theory rather than practice."⁶ It seems that after World War II, the two countries most respected for their intellectual approach to warfare had dismissed Tukhachevskii's concepts.

Yet, the notion of using airborne forces in conjunction with conventional force operational maneuver has maintained a tenuous theoretical viability. Today it is appropriate to revisit the issue in the context of modern war where there exists a myriad of forces and weapons that can rapidly travel great distances. The history of airborne force employment and the capabilities of modern forces frames

the research question: What is the role of airborne forces in conventional force operational maneuver?

As such, the purpose of this monograph is to identify the role of airborne forces in conventional force operational maneuver. The apparent mismatch in capability between airborne and conventional forces is the source of much controversy. Some argue that the airborne force lacks the firepower capability to sufficiently complement heavy forces, while others contend that it is the airborne forces' extended maneuver capability that makes it a valuable operational tool. Max Hastings and Simon Jenkins capture the airborne dichotomy best when writing about the battle for the Falklands:

The concept of massed parachute drops into battle was obsolete within a generation of its inception in the Second World War. Yet in every army in the world today, paratroops remain elite formations ... Its critics argue that maintaining parachute formations is uneconomic.⁷

Essentially, Hastings and Jenkins argue for maintaining airborne forces, yet against dropping them in battle.

The relevance of this study is derived from the notion that the planner must understand how different type forces can contribute to operational design. For example, airmobile, airborne, light, and mechanized infantry, and armor forces all have different capabilities that the planner can exploit to reinforce

or establish a component of operational design. Also, future force reductions make this issue relevant to the United States. As the Congress pares the army to nine divisions, or less, and the debate over roles and missions escalates, each type force will have to justify legitimately its existence. Yet, the greater relevance lies in the concept of a planner viewing each type force as a tool in his planning tool box with which he can influence actions in the theater of operations.

Likewise, the methodology for conducting this research will consist of a theoretical discussion of the theater of operations which will lead to a discussion of the components of operational design and maneuver. These constructs will serve as the basis for the historical analysis. The historical portion will review four airborne operations to assess the airborne role in achieving or establishing specific components of operational design. Likewise, the historical examples will then provide lessons learned that apply to contemporary conventional force operations.

The theoretical portion of the monograph and Annex A will first define the theater of operations using concepts from Jomini and Clausewitz. Specifically, the notions of bases of operation, lines of operations, decisive points, culminating points, and centers of

gravity are components of operational design that, when pieced together, help to define the theater of operations. The operational artist must designate forces to establish or achieve these constructs to translate theory and doctrine into achievable end states. As the planner pieces together the plan, he can focus on these components of operational design and determine which forces are best suited to perform each task.

The historical research will discuss the employment of airborne forces within the context of conventional force operational maneuver. This particular phase of the monograph will strive to test the viability of using airborne forces to influence conventional force operational maneuver by focusing on the primary components of theater design. Specifically, the monograph will test the airborne force ability to establish lodgements, seize decisive points and pivots of maneuver, protect lines of communication by extending culminating points, and contain the enemy center of gravity. The following examples will serve as historical points of discussion for analyzing airborne capabilities:

--The U.S. airborne invasion into Panama in 1989 as a method of forcible entry to establish bases of operations for conventional conflict.

--The Allied airborne operations preceding the Normandy invasion as a means of disrupting enemy forces, releasing pressure from the lines of operation, and extending the culminating point of friendly forces.

--The Allied airborne Operation Market and its effort to sustain the tempo by seizing decisive points for conventional forces participating in Operation Garden.

--The Soviet attack on Vyaz'ma in January 1942 aimed at operationally containing the German center of gravity.

The historical discussion will contrast the operations against the theoretical constructs and determine the viability of airborne forces pursuing similar missions today. By contrasting history and theory, the monograph can then establish a set of criteria applicable to evaluating the feasibility of using airborne forces to influence operational maneuver in the future. As the analysis will reveal, these criteria will include: speed, surprise, link up time-distance from conventional force, and cost-benefit of using an airborne force versus another type force.

The analysis portion of the monograph will then analyze, from an airborne force viewpoint, the viability and wisdom of employing airborne forces within the context of a conventional theater of

operations, using the five theoretical constructs of operational maneuver as points of departure.

II. Theory: Operational Maneuver

Concrete notions such as establishing lodgements, extending lines of operations, achieving decisive points, and containing centers of gravity, as discussed in Appendix A and displayed in figure 1, are components of operational maneuver. When pieced together, they create the skeletal underpinnings of maneuver within a theater. Critical to operational art is the ability of large formations to achieve distributed maneuver within the theater of operations. This portion of the monograph will develop a theory of operational maneuver that will provide a basis for analyzing the airborne role in conventional force operational maneuver.

From a doctrinal perspective, TRADOC Pamphlet 11-9, Blueprint of the Battlefield, refines theoretical concepts of theater design and maneuver into practical terms. For example, it defines theater of operations as "that portion of an area of war necessary for military operations and for the administration of such operations."⁸ The blueprint further reduces the theater to operational operating systems listed as: movement and maneuver, fires, protection, command and

control, intelligence, and support.⁹ These operating systems are "major functions performed by joint and combined operational forces for successfully executing campaigns and major operations in a theater or area of operations."¹⁰

Not only is maneuver a major function to be performed within the theater of operations, it is the foremost task to be performed. TRADOC Pamphlet 11-9 paints Jomini's notion of maneuver:

Operational movement is the function of deployment or regroupment of forces ... it provides for shifting of forces in theater ...it includes the extension of those forces to operational depths through offensive or defensive operations for achieving positional advantage over enemy operational forces to achieve operational or strategic objectives ... the movement of forces is from their bases of operations to their point of concentration.¹¹

Clearly TRADOC Pamphlet 11-9 incorporates concepts of theater design such as bases of operation, lines of operation, decisive points, and centers of gravity. As such, connecting these theoretical constructs provides a broad visual graphic of operational maneuver (see figure 1).

Dr. James J. Schneider, the director of theory at the School of Advanced Military Studies asserts the primary component of operational art is "the distributed operation: an ensemble of deep maneuvers and distributed battles extended in space and time but

unified by a common aim."¹² Schneider identifies three keys to operational art: deep maneuvers and distributed battles; extension of space and time; and unification of aim, which is the "retention or denial of freedom of action."¹³ These characteristics frame the discussion on operational deep maneuver.

Deep battle helps create the distributed operation necessary to conduct operational art. The deep attack by design gives the offensive a distributed nature and increases the pressure the attacker can bring to bear on the enemy. For example, military theorist Richard Simpkin uses the analogy of the fulcrum and lever to illustrate the leverage deep maneuvering can bring to bear on an enemy force.¹⁴ In essence, the deep maneuver distributes the campaign, adding to it an extra dimension that makes operational design critical.

The extension in space and time has historically taken on the form of deep envelopment. Simpkin describes the Soviet method as using a holding force and a turning force (Figure 2).¹⁵ Tukhachevskii's focus was the interaction between those two forces and how to achieve simultaneity throughout the enemy's depth.¹⁶ Likewise, Schneider asserts that it is no longer possible to concentrate all forces at a single point, and therefore the operation can never focus in space or time.¹⁷ Thus, operational maneuver extends

the depth of the battlefield and seeks to simultaneously attack the enemy throughout that depth.

The simultaneity of attack is a contemporary phenomenon focused on a common aim, denying the enemy freedom of action or gaining it for friendly units. Schneider argues that "under operational conditions, battles <are> fought to achieve or deny freedom of action."¹⁸ If we look at the theoretical theater of operations, it is evident that all operations are tethered to a base of operations by a line of operations. Having the freedom to choose and establish that line of operations is a primary component of executing operational art. Likewise, denying the enemy the ability to act freely upon his anticipated lines of operation shackles his flexibility.

Therefore, contemporary operational art and deep maneuver expand the meaning of Jomini's base of operations, line of operations, and decisive points, as well as Clausewitz' center of gravity and culminating point. For example, the size of armies today require more than one base of operations and often lines of operation for the deep battle tenuously stretch over the enemy's main defensive lines. Fuel and ammunition consumption rates determine culminating points, and centers of gravity are often vague and distributed. Likewise, Schneider's distributed operations, expanded

spatial and time concepts, and unified aim compensate for the theoretical gap in Jomini's and Clausewitz' theories as applied to contemporary warfare.

Jomini and Clausewitz envisioned operations moving from a secure base of operations along a secure line of operations, through decisive points, and against a readily identifiable center of gravity, the opposing army, all without culminating. In that era, maneuver was largely unthreatened, and therefore unprotected. Today, however, forces must often seize bases of operation, carve out lines of operation, and secure decisive points. For example, without a base of operations, operational maneuver is not possible. Thus, an army must have the force capability to establish a base of operations, as well as the other components of operational design. Today maneuver is almost always threatened, and planners must develop methods of protecting maneuver so that large formations may perform operational maneuver.

Likewise, by identifying the key components of operational maneuver, the military planner can apply a template to the theater of operations and more readily distinguish which tools are best suited for which operational maneuver components. No one single unit "does" operational maneuver. Rather, operational maneuver is the combined effects of several disparate

units acting in concert across the battlefield.

Simpkin writes that maneuver theory "represents a three-component system of holding force (main force), mobile force, and enemy."¹⁹

Traditionally, the holding force has been a fixing force that frontally attacks the enemy so that the mobile force can maneuver to the flanks and gain positional advantage. Tukhachevskii and others pursued the concept of deep maneuver using airborne forces as a fixing force from the rear. Such forces would serve to operationally contain the enemy so that the ground maneuver forces could complete their destruction. Figure 2 demonstrates Simpkin's articulation of Soviet deep maneuver with the top graph, and in the bottom graph a conceptualization of what deep maneuver using airborne forces to contain the enemy might theoretically look like.²⁰

Jomini's and Clausewitz' theoretical constructs, then, have practical application on today's battlefield and are useful in assessing the role of airborne forces in conventional force maneuver. That is, if both theory and army doctrine agree that bases of operation, lines of operation, decisive points, culminating points, and centers of gravity are key components of operational maneuver, then it is possible to use those concepts as criteria from which to derive missions for

type forces. By developing a theoretical structure of operational maneuver, the monograph can now further explore historical examples that test the theoretical notions. After which, the monograph can then develop criteria for future use of airborne forces in conventional force maneuver.

In summary, operational maneuver takes place within a theater of operations. It originates from bases of operation, proceeds along lines of operation and through decisive points, considers and attempts to avoid culminating points, and attacks centers of gravity. These constructs describe how units perform operational maneuver. As such, they become imperatives of operational maneuver.

The focus of this monograph now shifts from the theoretical to the historical in the context of the research question.

III. Historical Review

The historical review will examine how airborne forces have contributed to achieving components of operational design in the past. The first example will assess why planners used airborne forces to seize bases of operations during Operation Just Cause and how well those forces accomplished the task. The second example

will determine why operational artists employed airborne forces to seize decisive points, key bridges along the axis of advance, during operation Market-Garden. The third example will evaluate why planners used airborne forces during the Normandy invasion to attack tactical reserves and how such action contributed to protecting lines of operation and extending the culminating point. Finally, the last example will focus on the Soviet attack across the Dnepr River in 1942 and why Soviet planners attempted airborne drops to contain the German main forces, or center of gravity.

III a. Operation Just Cause: Forcible Entry to Establish Bases of Operations

While the monograph has previously reduced the theater of operations to theoretical components of operational design and has embarked on an individual analysis of each, it is instructive that the historical review will reveal that each component is inextricably linked to the others when planning for an airborne operation.

As U.S. military planners watched the tensions rise between Panama's Manuel Noriega and the American government, they began developing plans aimed at

removing the dictator and his loyal forces from power while protecting the friendly populations. In their initial estimates they recognized that while the 508th Infantry Regiment, stationed in Panama, and combat forces participating in Exercise Nimrod Dancer gave them over 13,000 military personnel in Panama, they possessed only one significant base of operation, Howard Air Force Base, from which they could sustain combat operations.²¹ According to Major Blair Ross, the 3d Brigade, 82d Airborne Division S-3 who participated in planning the ready brigade's assault on Tocumen/Torrijos, Howard AFB, was

the only airfield we had, and subject to potential interdiction from the jungled areas to the west. The requirement to open an alternate operational airfield was a major reason for the early seizure of Torrijos/Tocumen.²²

In order to conduct a distributed operation, planners of Operation Just Cause sought to open a second base of operations from which to project combat power.

The planning process for Operation Just Cause began with the identification of potential targets. Planners singled out Noriega and his Panamanian Defense Forces (PDF) as the enemy centers of gravity. Of the many targets identified, "the primary target was Noriega himself ... to cut Noriega off from controlling his troops and directing resistance."²³ Likewise, "by eliminating the PDF, Just Cause <would remove> the

institution that controlled Panamanian political life."²⁴ Going after Noriega and his scattered defense forces required additional American forces and control of sustainment bases for extended, continuous combat operations.

Also, identification of targets was a process of singling out decisive points for operational maneuver. Fort Espinar, multiple sites along the Panama Canal Zone, the Commandancia, the PDF Barracks, Madden Dam, and airfields comprised some of the many targets identified for simultaneous attack.²⁵ Of these decisive points, the airfields proved essential to introducing enough force and sustaining the operation (see figure 3). "The planners wanted to deliver a large number of forces as fast as they could."²⁶ By identifying decisive points, the planners determined force levels required and recognized the need for seizing and establishing bases of operations.

In essence, the airfields were the link between the military sustaining base, the United States, and forces in combat in Panama. The Just Cause plan called for one battalion of the 75th Ranger Regiment to secure Tocumen Airport and Torrijos airfield which would serve as the air ports of debarkation for follow on forces from the 82d Airborne Division and the 7th Infantry Division.

The ready brigade of the 82d Airborne would lead Task Force Pacific into Torrijos and Tocumen airfields after these had been secured by elements of the 75th Ranger Regiment. They would then be airlifted to strike Panama Viejo, Fort Cimarron, and Tinajitas.²⁷

Follow on forces flowed into theater after the seizure of Tocumen/Torrijos and Rio Hato airfields. Likewise, the airfields became hubs for medical evacuation and resupply of forces. The authors of Operation Just Cause: The Storming of Panama reveal in their research of the Just Cause plan how planners envisioned the need to secure a second base of operations with airborne forces, flow forces and supplies into those bases, and then use those bases to project combat power.

The decision to use airborne forces to seize the airfields in Panama was not a certainty. Indeed, there existed other forces in the country, as well as in the United States, that could possibly have performed the task. In fact, the initial plan called for the 7th Infantry to perform the tasks later assigned to the ready brigade of the 82d Airborne. LTG Thomas Kelly assesses the difference between airborne forces and airlanded forces:

The fact is, we could get an airborne division on the ground in ten minutes or we could get an airlanded brigade in a day and a half. If you're going to do that you have to work fast. We realized that we had to take down the PDF.²⁸

The planners of Operation Just Cause decided upon using airborne forces for the forced entry and airfield seizure because of the speed with which they could be delivered into the theater of operations.

While the U.S. forces used Howard Air Force Base as a base of operations from which to project supplies, the fact that planners focused on Tocumen and Rio Hato as potential lodgement sites reinforces the links between the components of operational design or maneuver. The many decisive points, derived from choosing Noriega and the PDF as centers of gravity, led to the choice of Tocumen and Rio Hato as bases of operation. From these bases, lines of operation could more easily extend to the decisive points, thereby extending culminating points of various units. Likewise, choosing Tocumen and Rio Hato for airborne insertion and subsequent force introduction facilitated containment of the centers of gravity.

Having established that bases of operation are a necessary part of operational design and that airborne forces are capable of conducting forced entry to establish those bases, it is helpful to study the characteristics of airborne forces that give them that capability. As LTG Kelly mentioned, the speed with which they can be introduced into the theater makes airborne forces especially qualified to secure bases of

operation. Second, the surprise with which they may be employed inhibits the defender's ability to deny entry into the potential base which the enemy has most assuredly identified as a potential target.

Thus, judging by Operation Just Cause, bases of operation are a critical component of operational maneuver and are essential to introducing conventional forces into a theater of operations. Also, airborne forces are uniquely qualified to secure bases of operation. Through the ability to rapidly deploy and land with surprise, airborne forces prevent enemy reinforcement of the designated targets, facilitating the successful establishment of a lodgement.

To support the notion that Just Cause is not an isolated case where airborne forces were uniquely applicable to seizing bases of operation, a short divergence into Operation Urgent Fury is helpful. General Trobaugh, the commander of the 82d airborne during Urgent Fury, "envisaged seizing Pearls and Salines airfields, together with other objectives."²⁹ Likewise, Admiral Metcalf, the Joint task Force Commander, saw the need to secure bases of operations, "advising that it was the army that would conduct an airborne assault on Grenada."³⁰ This assault would be geared toward seizing the two airfields, which "were seen as the major objectives of all the ground forces

being deployed."³¹ As in Just Cause, the Urgent Fury planners recognized the importance of seizing and establishing bases of operations to sustain combat operations.

III b. Operation Market-Garden: Seizing the Decisive Points to Sustain Tempo

That the planners of Just Cause and Urgent Fury both signalled airborne forces to lead their assaults reinforces the notion that airborne units are uniquely qualified to conduct forced entry and establish bases of operations critical to follow on conventional force operational maneuver. Yet, history reveals that airborne forces may have another role in assisting the operational design of the conventional battlefield. Indeed, Operation Market-Garden is a classic example of the use of airborne forces to seize decisive points in an attempt to facilitate conventional force operational maneuver.

In a conceptual sense, General H. H. Arnold, Army Air Force Commander, was pursuing the notion of vertical envelopment to "exploit the fluidity of the pursuit" the allies were enjoying after breaking out from the Normandy peninsula.³² The pursuit, however, was going just fine without the use of airborne forces,

as the Allies had planned and scrapped eighteen airborne missions that had been made obsolete by the rapidly advancing mechanized forces.³³

The operational picture changed, however, as the Allies approached the canals and lowlands of the Netherlands. Mechanized advances would necessarily remain on the roadways and would require fixed bridges to sustain the lines of operations. Indeed, an 82d Airborne Division unit operations order for Market-Garden lists as "critical terrain features" in paragraph 4 of the intelligence annex, the Maas River crossings, Waal River crossings, and Waal--Maas Canal crossings.³⁴ Likewise, the possibility of repeated bitter fighting over each successive bridge loomed in the offing, giving the Germans much needed time to reinforce their deeper defenses. Thus, the bridges became decisive points that would determine the tempo of the Allied advance along their lines of operations.

As in Just Cause, Market-Garden demonstrates a clear link between components of operational design and the planners' desire to influence those components with airborne forces. The Allies viewed the German Army and their reinforcing capacity as centers of gravity and devised a line of operations, the Nijmegen-Arnhem corridor, that would lead to the rapid destruction of the enemy military. The Allies were in a race to

destroy the German Army, regain lost territory, and defeat the German capacity to wage war. Thus, the tempo of advance became critical, making the bridges over the rivers and canals in the Netherlands decisive points.

The plan called for the 101st, 82d, and 1st Airborne divisions to secure successive bridgeheads as the 30th (UK) Corps penetrated to Arnhem and reinforced the tenuous hold the airborne units would have achieved (See Figure 3). The concept was to lay an "airborne carpet" from Eindhoven to Arnhem so that the 30 Corps could move rapidly along the highway and over the many bridges that connected the two towns. The 101st was to secure the highway from Eindhoven to Veghel, the 82d from Grave to Nijmegen, and the 1st vicinity Arnhem.

Weigley describes how the enemy and terrain could foil the Allied operational design:

In MARKET-GARDEN, the Allied airborne troops would have to seize and hold open, and 30 Corps would have to traverse a narrow corridor through additional swampy heath all the way to Arnhem--in fact a single two-lane highway ... <over which> Horrocks planned to move 20,000 vehicles ... a considerable logistics feat--even if the Germans close in on the flanks proved unable to interrupt the traffic flow.³⁵

While the terrain and enemy were the two predominant factors that drove the Allied planners to choose airborne forces to seize the bridges, they were also

the two factors that posed the greatest risk to defeating the plan.

Military historian Gerard M. Devlin summarizes the first day's action:

At the end of the first day, Operation Market-Garden was already riddled with deeply serious problems. At the southern end of the airborne carpet, General Taylor's 101st Airborne had been unable to take the key city of Eindhoven. Midway up the carpet Gavin's 82d Airborne had been halted within a stones throw of the key Nijmegen bridge. And at the end of the carpet in Arnhem, Urquhart's 1st Airborne had only been able to seize the north end of the bridge of the Lower Rhine.³⁶

The situation was tenuous at best, but still not hopeless. However, the inability of the 30 Corps to move ten miles in one day and link up with the 101st Airborne created a grave situation for all three divisions.

The situation improved on the second day, as the 30 Corps slowly moved into Eindhoven and linked up with the 101st Airborne. On the third day, the 30 Corps had made contact with the 82d Airborne and supported the paratroopers' river crossing to seize the Nijmegen bridge. The British tankers never made it to Arnhem; instead, the surviving British paratroopers were ferried back across the river to safety after seven days of isolated combat. Airborne casualties had been heavy: "1,432 for the 82d Airborne; 2,110 for the 101st Airborne."³⁷ Further, the operation is

classified as a failure or disaster in history books. Such categorizations would argue against the use of airborne forces in conventional force maneuver to secure decisive points for deep maneuver.

An analysis of why the mission was not as successful as hoped is necessary to make a proper evaluation of using airborne forces in this manner. First, it is important to highlight that by the first week of October, the highway from Eindhoven to south of Arnhem had been secured. Essentially, 85 miles of roadway had been opened that might not have been possible before. German strength was spent fighting the airborne forces instead of concentrating on the armor. To classify the mission as a failure ignores the reality of what the paratroopers accomplished. The issue, then, is why the mission was so costly and not completely successful given the accuracy of the airborne drops and the fighting competency of the soldiers.

The failure of the 30 Corps to move quickly enough to link up with the airborne forces appears as the greatest cause of failure. Also, bad weather which delayed reinforcements and poor intelligence which underestimated enemy strength in the region have been identified as contributors to the high casualties and inability to seize the Arnhem bridge.³⁸ These

reinforce Eisenhower's concerns prior to the operation.

He said:

There must exist either the definite capacity of both forces to combine tactically, or the probability that each force can operate independently without danger of defeat.³⁹

The action during Market-Garden and Eisenhower's comment provide two significant lessons learned for the employment of airborne forces in support of conventional force maneuver.

First, Eisenhower speaks of the capacity to combine, or link up as being critical to the success of an airborne and conventional force operation. The underlying issue is one of space and time. The conventional force must be able to cover the requisite space in a given time period in order to exploit the surprise of the airborne forces. In Market-Garden, the Allies chose a sequential application of airborne and conventional force. First the airborne drop secured the bridges, then the conventional force moved. To compress the time and space factors, the forces should be employed simultaneously so that the decisive point is being secured at about the same time the conventional force needs to pass through it.

A second lesson is one of cost and benefit. The cost of Market-Garden operation was over 3,000 American casualties. The benefit was an 85 mile stretch of road into Holland. It is difficult to weigh the costs and

benefits, that is largely a matter for high commanders and political leaders. For example, to the oppressed citizens of Holland, gains of Market-Garden may have been worth the cost in lives and injuries. Others believe a more appropriate force may have been chosen that would not have produced such high casualty rates and still been able to achieve the same objectives. Regardless, the lesson for military planners today is that before using airborne forces, they should consider every other type of force.

Further, the relative success of the 101st and 82d Airborne missions indicates that it is viable to use airborne forces as a component of conventional force operational maneuver to achieve decisive points.

III c. The Normandy Invasion: Protecting the Lines of Operation and Extending the Culminating Point

Prior to the Market-Garden operation, Allied planners had to devise a method of getting onto the European continent, as they possessed no base of operations from which to project their lines of operations. The planners chose a large amphibious assault onto the Normandy peninsula which was augmented with airborne drops.

The planners of Operation Overlord needed a way to protect the lodgements and their lines of operation from the sea, lest the Germans could reposition once they detected the landing sites and deny the Allied landings. As such, they identified German artillery and tactical reserves as the enemy centers of gravity. Devlin writes that two of the biggest concerns of planners were:

knocking out big coastal guns that could deliver enfilade fire ... and blocking the movement of German reinforcements attempting to counterattack their amphibiously landed troops.⁴⁰

By identifying the artillery and reserves as enemy centers of gravity, the planners were clearly most concerned about extending their sea lines of operation onto the land and prolonging their culmination point.

To avoid culminating in the sea or on the beaches, as in Gallipoli, the Allies needed a way to interrupt the enemy defenses and extend their culmination point. The task would be difficult, however, as 82d Airborne Division Field Order No. 6 intelligence annex points out:

The entire coastal line from Norway to Spain is heavily fortified with concrete emplacements, strong points, underwater obstacles, etc. These defenses are manned by static divisions ... <which> are closely backed up by a second line of static and field divisions. Behind these, from 50 to 200 miles from the coast, are the mobile reserves.⁴¹

Allied planners opted for airborne forces whose mission it was, in conjunction with air interdiction and bombardment, to block tactical reserves from counterattacking onto the beaches. If the airborne forces could do that, the air force and navy, it was hoped, could reduce the enemy artillery, and the assault forces would be able to project their lines of operation from the sea onto the land, with an extended culminating point.

During the planning phase of Overlord, General Marshall suggested to Eisenhower that the airborne units be dropped in Paris on the morning of the Normandy landings.⁴² Marshall's intent for this deep strike was unclear, and Eisenhower quickly snubbed the idea.

Ike pointed out that it would be better to employ his airborne forces close to the Normandy shoreline where, by knocking out German shore batteries and destroying enemy reserve units, they could be of direct assistance to the amphibiously landed troops. And, wrote Ike, if the Germans managed to contain the amphibious landings in Normandy, the airborne troops far inland near Paris were liable to be cut off and destroyed.⁴³

Eisenhower's response articulated a steadfast vision of the proper employment of airborne forces. In essence, for the Normandy invasion, he was using them to attack the enemy center of gravity in order to establish lodgements, protect his lines of operation, and extend his forces' culmination point.

In execution, the airborne forces were dropped in scattered fashion due to pathfinder, weather, and pilot problems. The paratroopers eventually banded together in mixed groupings where unit designation did not matter. Indeed, General Ridgway wandered aimlessly for three days without ever finding his radio operator.⁴⁴ Yet, the effectiveness of the airborne drop, despite its serious problems, is indisputable.

The landings at Utah beach, protected by the airborne drops of the 82d and 101st Airborne Divisions, proceeded flawlessly (see figure 4).

At H hour there was no opposition to the landing on Utah Beach except for an occasional incoming long range artillery round. At the end of the day, 20,000 troops and 1,700 vehicles had hit the beach ... A total of 12 men were killed.⁴⁵

The landings at Omaha beach, not covered by airborne forces, were not so fortunate. Opposition on the beach was stiff, and at the end of the day the V Corps had reached only one and a half miles inland and had lost close to 2,400 men.⁴⁶ While Utah beach was less fortified than Omaha beach, the evidence still supports the use of airborne forces to protect lines of operation and extend culminating points.

The success of the mission can be attributed to the well reasoned use of the airborne force within a space and time where they could effectively accomplish their mission and still link up with conventional

forces in a reasonable period. Further, the airborne forces were the only type force capable of performing the mission. There were no other maneuver options available to the Allied planners if they wanted to protect the landings and ensure the conventional forces could project their lines of operation sufficiently onto the land. Hence, if airborne forces are to be used in the future to protect lines of operation and extend the culminating point of the conventional force, the planning process should incorporate a test of proximity to the conventional force in space and time and viability of using other type forces.

The failures of the airborne drops in support of Operation Overlord were primarily tactical in nature. Poor visibility and inexperienced pilots led to scattered drops, most of which missed their landing zones. However, the disorganization of the Allied units provides one operational lesson learned. That is, despite the confusion, the mere presence of the paratroopers in between the main enemy defensive belt and their tactical reserves caused both elements to focus on the airborne landings, creating an operational diversion necessary for the amphibious landings to proceed smoothly.

III d. The Eastern Front: Attempting Operational Containment of the Enemy Center of Gravity

In 1942, the Soviets began an offensive in an effort to reclaim ground lost to the Germans, and, more importantly, destroy the hated German Army that had wreaked havoc across the Soviet Union for two years. The Soviet's hoped to employ a version of Tukhachevskii's deep maneuver and deliver a finishing blow to the German Army on the Eastern front. Soviet historian Colonel David M. Glantz writes:

To restore momentum <to the offensive> and to deliver the coup de grace against the reeling German forces, Stalin and the Stavka marshaled the remaining strength of the Soviet forces in a final, desperate attempt to encircle German Army Group Center with a close and wide envelopment.⁴⁷

The operational technique the Soviet planners wished to employ, as Glantz identifies, was a double envelopment with close and deep forces--classic Tukhachevskii.

Driving the planning for the offensive was the identification by Soviet planners of the German Army as the enemy center of gravity. Glantz writes that "the overall objective was to encircle and then to destroy German Army Group Center."⁴⁸ By identifying the German Army as the center of gravity, the Soviet planners needed an operational tool that could help contain the retreating forces that wished to live to

fight another day against the Soviet Union. In essence, complete destruction of the German Army was the operational end-state the Soviet Union wished to achieve, but without a method to block the German withdrawal, it was not achievable.

The Soviet planners chose airborne forces as the containing force which would link up with ground maneuver elements of the 50 Army which was the deep envelopment force. Figure 6 demonstrates the Soviet concept of deep maneuver and how they were attempting to use airborne and conventional force maneuver to cut the enemy lines of operation and routes of retreat by blocking the rail line west of Vyaz'ma.⁴⁹

The Soviet planners "believed a large airborne operation in the Vyaz'ma area would reinforce advancing Soviet mobile armies, and enable Soviet armies to take that city."⁵⁰ Marshal G.K. Zhukov describes the aim of the plan:

The main blow was to be delivered against the centre group of armies. It was planned ... to rout the group by double envelopment with subsequent encirclement and destruction of the enemy's main forces in the area of Rzhev, Vyazma and Smolensk.⁵¹

Zhukov also writes that the key mission of the airborne was to "cut off enemy communications with the rear."⁵² Clearly, the plan was to contain the enemy center of gravity using airborne forces to establish

the conditions for operational maneuver that would lead to the destruction of the German Army Group Center.

In execution, the airborne forces found their mark in frigid weather, but the conventional armored forces, much like Operation Market-Garden, failed to move quickly enough to join the airborne forces. The 11th Cavalry Corps did link up with the airborne force, but not before the Germans had reinforced the area and had effectively encircled the 4 Airborne Corps and the cavalry troops. The two corps operated for nearly two months in the enemy rear, using an air line of communication for resupply and medical evacuation. Zhukov writes, "for two months P.A. Belov's Corps, M.G. Yefremov's force and the air-landing units together with the guerrillas harassed the enemy destroying his manpower and materiel."⁵³ Unable to sustain itself any longer, and under threat of annihilation from the Germans, the two corps exfiltrated back to friendly lines.

The similarities between the 1st Airborne Division at Arnhem and the 4th Airborne Corps at Vyaz'ma are striking and reinforce the idea of establishing a space and time proximity criteria for employment of airborne forces to support conventional force maneuver. Both units accurately landed in their planned drop zones and had the potential for success. However, their relative

distance from the conventional force negated their ability to influence the mission. Likewise, in both cases, the airborne force had to be extracted back into friendly lines as opposed to the friendly lines enveloping them. Based upon the Soviet example, airborne forces would not seem exceptionally well-suited to perform unsupported deep maneuver to contain an enemy conventional force center of gravity.

Eisenhower's two principles seem to apply again. First, while the potential did exist for the 50th Army and the 4th Airborne Corps to "combine tactically", as Eisenhower put it, the conventional force commander did not seem to understand the urgency of making that connection. Perhaps because of the newness of the airborne concept, heavy force commanders could not comprehend the short lived nature of the opportunities an airborne force creates. Second, neither airborne force was capable of protecting itself for a sustained period of time.

IV. Analysis

A recurring theme throughout each example is an effort to contain the enemy in some fashion. In Just Cause, the focus of the airborne drops was to establish a base of operations, but those bases were chosen

because they contributed to the containment of the PDF. If the American planners had simply wanted to introduce forces into the area, they could have used Howard Air Force Base with impunity. However, one of the purposes of the airborne landings was to operationally freeze, or contain, the enemy from reinforcing each other.

Likewise, in Operation Market-Garden, Allied planners foremost hoped to secure the decisive points, but also hoped for a second order effect of containing the German army between Arnhem and Eindhoven. From there, the 30th Corps could destroy the isolated forces. Also, the Overlord airborne landings had a second order intent of preventing the escape of German units that may try to fall back and consolidate in order to counterattack at a later time.

Thus, airborne forces have the capability to operationally contain an enemy force if they are employed in consonance with the Eisenhower doctrine of ensuring there is high probability of conventional and airborne force link up and, should that fail, the units possess the capability to protect themselves for extended periods of time. An offshoot of the Eisenhower doctrine is that prior to commitment of an airborne force, planners should consider all other type forces before choosing airborne forces to contain an enemy center of gravity.

Likewise, the historical examples reveal that when considering the employment of airborne forces, planners seem to consider all of the elements of operational design. Just Cause, Urgent Fury, and even Overlord all demonstrate the airborne capability to secure bases of operation or contribute to the process. Yet, other elements of operational design were present in the planning. For example, planners selected bases of operation based upon the feasibility of projecting lines of operation from those bases or their proximity to the enemy center of gravity.

Similarly, extending the friendly culminating point through the use of airborne landings is a factor present in all four historical examples. Even if such an effect was not preplanned, the airborne landings in Holland, France, and Russia all proved to severely disrupt the enemy rear areas and force enemy forces to concentrate not on the friendly main effort, but on the airborne forces in their rear. To that extent, airborne forces probably are well suited to protecting lines of operations through extension of the culminating point.

While airborne forces essentially serve to protect maneuver of conventional forces, the critical lessons learned from these historical examples are: speed, surprise, time-distance from conventional force, and

cost-benefit of using an airborne force versus another type force.

Speed and surprise are recurring themes in each historical example. Airborne forces must be dropped quickly enough and with complete surprise if they hope to succeed. We derive the concept of simultaneity from these two concepts. A simultaneous drop rapidly enters the force into theater and achieves maximum surprise. An ancillary concept of using airborne forces in connection with conventional force operational maneuver is that the conventional force must move rapidly to link up with the airborne force.

The Arnhem, Normandy, and Vyaz'ma landings reinforce the need to drop airborne forces within a proximate time and space to the conventional force. This may be a judgement call by the planner. For example, the Allied 30 Corps had only to move ten or fifteen miles to link up with the 101st Airborne in Eindhoven, while the 50th Army had to move over ninety miles. Of course, the Soviet Army was more adept at extended maneuver than the British Army. Nonetheless, both planning staffs overextended the airborne reach.

The effects of seizing lodgements, securing decisive points, extending culminating points, and containing centers of gravity all have the unified aim of protecting friendly conventional force maneuver.

The airborne force seems to have a unique capability to most rapidly deny the enemy freedom of maneuver, which can be exploited by conventional forces.

However, the high rates of casualties in all of the airborne landings except Operation Just Cause indicate a need to do a cost-benefit analysis. For example, the landings at Utah beach had 12 men killed in action, yet the airborne casualties were over two thousand. Planners made a decision that the cost in airborne lives was the price to pay for a successful lodgement on the French coast. Further, the cost of airborne operations can be reduced in the future if planners adhere to the concepts of simultaneity (speed and surprise) and proximity to the conventional force in time and space. Regardless, it is necessary to evaluate every other type of force available before employing airborne forces.

V. Conclusions

A review of historical examples against the backdrop of theoretical components of operational design reveals that the airborne force has utility in conventional force operational maneuver. Its utility, however, is mitigated by planning constraints that must be considered before employing the force.

Specifically, the airborne force can be an exceptional force multiplier when attempting to secure bases of operation or extend friendly culminating points. The airborne force can secure decisive points and pivots of maneuver that facilitate conventional force maneuver if it is employed within the appropriate time and space relative to the converging conventional force. Less convincing is the airborne force's role in containing an enemy center of gravity. Ill-equipped to fight a prolonged battle against heavy forces, planners must ensure the conventional force can reach the airborne force before employing airborne troops to contain an enemy.

Not considered in this monograph, but certainly germane to the subject, is the development of more and heavier airborne divisions. As discussed previously, the two key limiting factors of the standard airborne division are its lack of mobility and firepower. Hence, the Eisenhower doctrine which mandates a unit be capable of defending itself or linking rapidly with heavy forces.

Tukhachevskii, however, envisioned the mechanized airborne force over fifty years ago. Simpkin writes:

Certainly it must have been Tukhachevskii's foresight which put the divisions of the Soviet Airborne Forces, now a separate service in name as well as in fact, a good generation ahead of anyone else.⁵⁴

The Russian airborne armored vehicle, or BMD, gives the Russian airborne force enhanced mobility and firepower which increases both its speed and protection capabilities. As such, by increasing protection of the airborne force and decreasing the rapidity with which other forces must conduct link up, the airborne force achieves greater versatility and usefulness in protecting conventional force operational maneuver.

Further, as the American Army enters its force projection era, the airborne force will continue to be the quintessential rapid deployment force most capable of seizing and protecting the all important bases of operation. Because the airborne force initially maneuvers over unconstrained lines of communications, the air, its potential is unlimited. With versatility as a new tenet of Field Manual 100-5, the airborne force seems most suited to take on the challenges that lie ahead. Indeed, an airborne force with enhanced tactical mobility may prove to provide enormous operational benefit.

Appendix A

Theory: The Theater of Operations and Components of Operational Design.

Theories help simplify and forecast, they attempt to impose order on, or at least explain, randomness. As such, developing a theoretical theater of operations is the process of creating the territorial and conceptual confines within which campaigns and battles take place. From these confines, it is possible to analyze the viability of using airborne forces to reinforce components of operational design and possibly guide planners in selecting the most suitable forces for particular missions.

Likewise, doctrine translates theory into practical concepts suitable for application. As such, the final draft of Field Manual 100-5, Operations, highlights centers of gravity, lines of operations, decisive points, and culminating points as the primary components of theater and campaign design.⁵⁵ This appendix will use the FM 100-5 concepts of theater and campaign design and the idea of a base of operations to explore the airborne role in conventional force operational maneuver. This portion of the monograph will discuss the theory behind the doctrinal concepts, which will lead to identification of key aspects of

operational design where the planner may wish to apply airborne forces.

By developing the theater of operations as described by Jomini and Clausewitz, we can identify the most critical components of the theater which the planner must build or focus upon. First, there is the physical aspect of terrain which delineates in precise measurements the playing field. "The theater of war comprises all the territory (ground and sea) upon which the parties may assail each other ..."⁵⁶ The geographical boundaries of a theater of operations, and all its terrain variants, give the planner a starting point from which to begin developing a plan.

Second, the presence of two opposing forces within the territorial boundary impart less tangible concepts to the theater.⁵⁷ Jomini delineates nine "artificial features": bases of operations; principal objective points; fronts of operations; lines of operations; lines of communications; obstacles; strategic or decisive points; intermediate bases; and points of refuge. Jomini articulated these constructs based upon his interpretation of Napoleonic warfare. Yet, many of his ideas apply to modern warfare. Those that have endured and bear special relevance to this topic are the bases of operation, lines of operation, and decisive points.

Bases of operations, both primary and intermediate, are relevant to analyzing the role of airborne forces in conventional force operational maneuver because they provide a point from which forces begin their maneuver. Jomini describes the base of operations as the "portion of country from which the army obtains its reinforcements and resources, <and> from which it starts when it takes the offensive."⁵⁸ Force projection being the strategic environment of the U.S. Army, bases of operation often must be gained through battle or built from little infrastructure. The theoretical construct of "base of operations" suggests that, to maneuver, an army must inherently maintain the capability to seize and establish a base of operations.

After leaving a base of operations, Jomini argues that operational maneuver should focus on achieving certain decisive points which will provide a positional advantage over the enemy.⁵⁹ As units move, it is best if they have a destination in mind. Jomini's assorted decisive points are simply a method of indicating in a theoretical sense which destinations are generally the best. Jomini nicely integrates the enemy and terrain by meshing their relationship into the notion of a decisive point, which, then, becomes a theoretical construct of operational maneuver. As a

force maneuvers, it can focus on decisive points that will provide it leverage over the enemy.

Lines of operation are "those important lines which connect decisive points of the theater of operations ..."⁶⁰ Jomini argues that the lines of operations can be diverging, converging, secondary, simple, double, interior, exterior, or accidental.⁶¹ The abstractions of interior, exterior, converging, and diverging lines of operation are crucial to the concept of operational maneuver. Within a theater of operations, the planner will have to compare the projected bases of operations against the identified decisive points and then deduce which types of operating lines he wishes to employ. Forces must be able to identify lines of operations and then maneuver upon them to achieve decisive points.

Jomini's bases of operations, decisive points, and lines of operation give insight into the requirements for conducting operational maneuver in a theater of operations. Yet, he omits two important abstractions from his theory. Clausewitz' ideas of center of gravity and culminating point complement Jomini's concepts to provide a thorough description of the theater of operations. Likewise, center of gravity and culminating points also possess implications for

identifying the airborne force role in operational maneuver.

A culminating point is that place in space and time where an attacking unit's forces have diminished beyond defensibility.⁶² The culminating point deepens the meaning of Jomini's terms. It relates the sustainability of the advance through the theater of operations to the terrain and enemy. As a force attacks, the severity of the terrain and the resistance of the enemy exponentially deplete the attacker of critical sustainment resources. Likewise, Clausewitz uses historical evidence, such as Napoleon's march to Moscow, to predict that attacks generally reach a point where they are no longer sustainable or defensible.

This predictive element augments Jomini's description of the theater of operations. Likewise, the culminating point speaks to operational maneuver in that it involves the diminishing relationship between bases of operation, lines of operation, and decisive points as maneuver becomes extended. From an operational maneuver view, the planner must design methods for overcoming the effects of a culminating point or extending it inevitability.

Clausewitz' center of gravity accounts for the fact that within the theater of operations there is an enemy and there is a single identifiable item from

which that enemy draws its strength. In a strict Clausewitzian sense, "the center of gravity is always found where the mass is concentrated most densely."⁶³ In a modern sense, mass translates into the massing of the effects of combat power.⁶⁴ The essence of operational art is determining a skillful method of neutralizing the enemy's center of gravity, whatever it may be. As such, it is incumbent upon the planner to devise ways of containing or fixing the center of gravity so that further maneuver may destroy it.

Superimposing bases of operation, lines of operation, and decisive points onto the terrain creates a theater of operations. Centers of gravity and culminating points help describe the relationship between opposing forces and their resources (see figure 1). Moving from this theoretical framework to a more concrete, doctrinal design for the battlefield, we can translate the theoretical concepts described above into components of operational maneuver.

For example, the theoretical notion of base of operations leads to the requirement to create or establish that base. This requirement becomes a maneuver task where the planner must decide how to enter a theater and establish a base of operations. Likewise, the planner must identify decisive points and assign forces to secure, seize, or move through those

points. Similarly, the operational artist must identify lines of operations and devise methods of protecting those lines and extending the culminating point. Finally, if the center of gravity is the target of the attack, the planner should consider methods of containing or shaping that center of gravity so that friendly forces may more easily defeat it.

**Annex B
(Figures)**

Theater of Operations

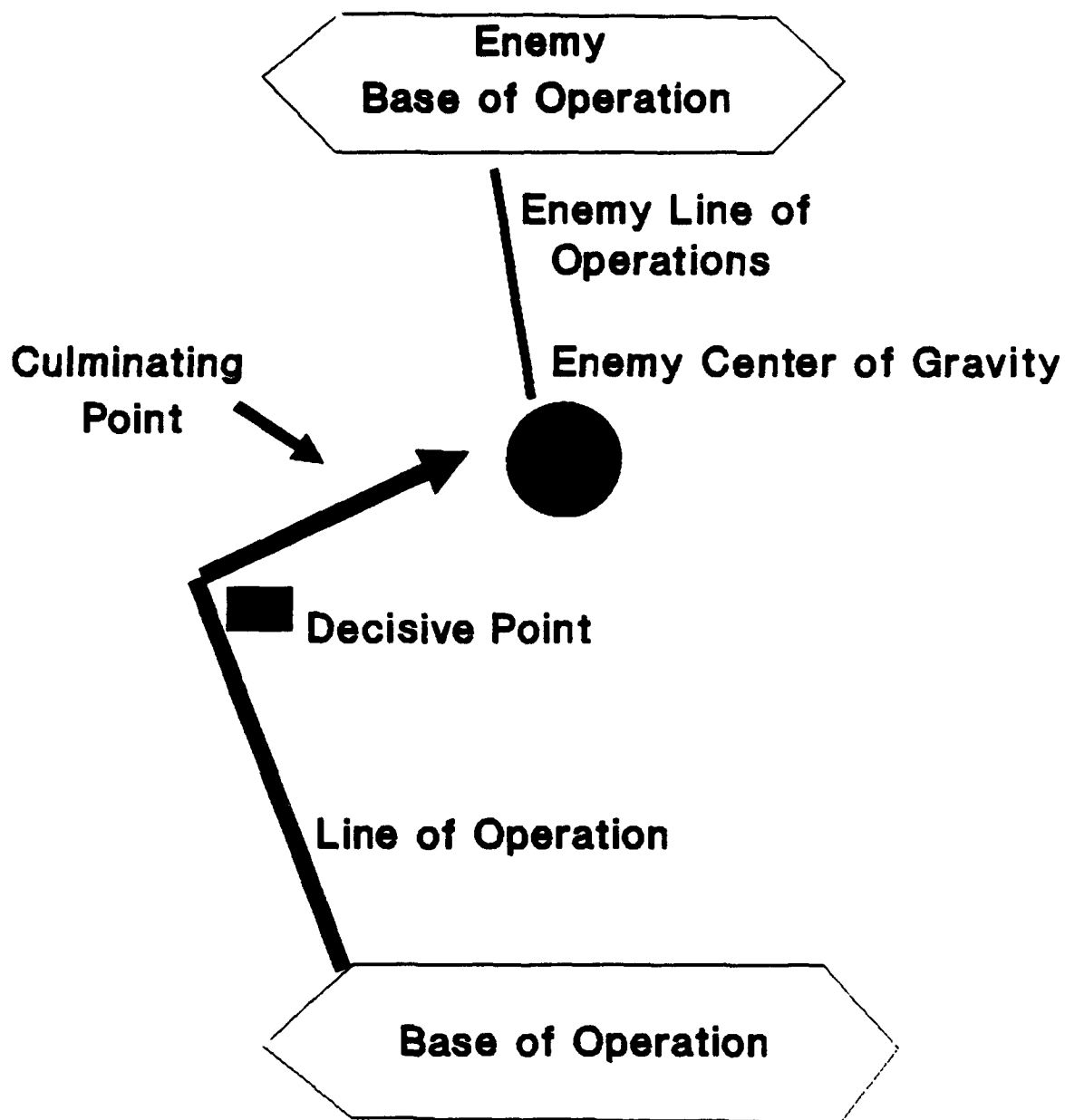


Figure 1

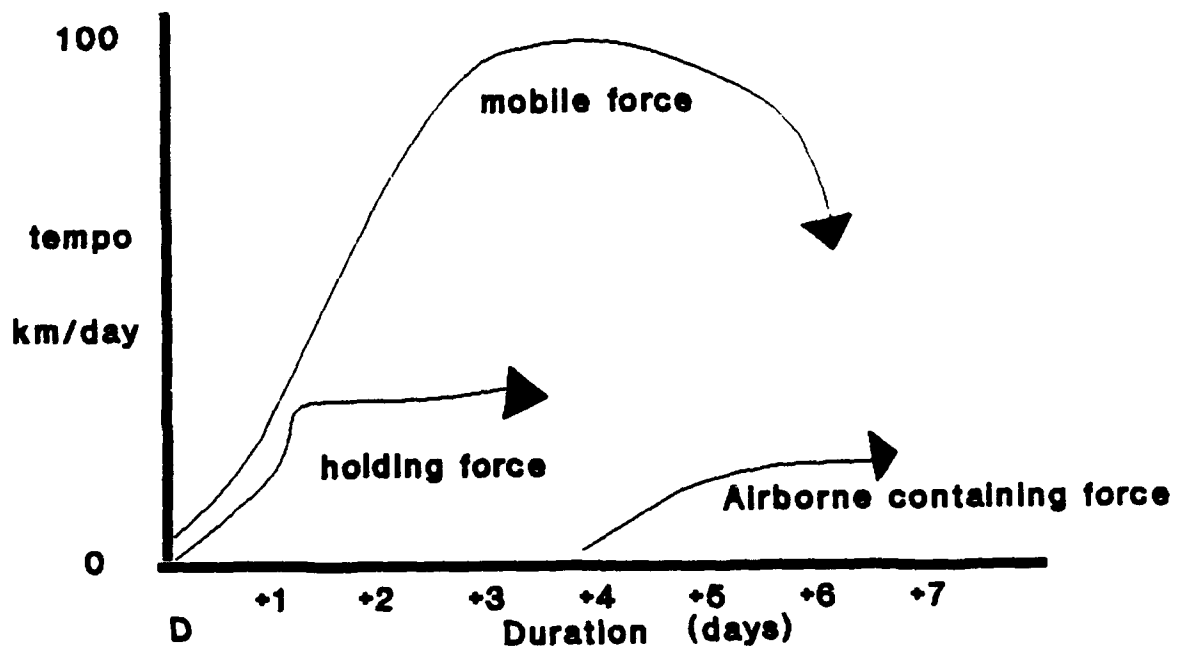
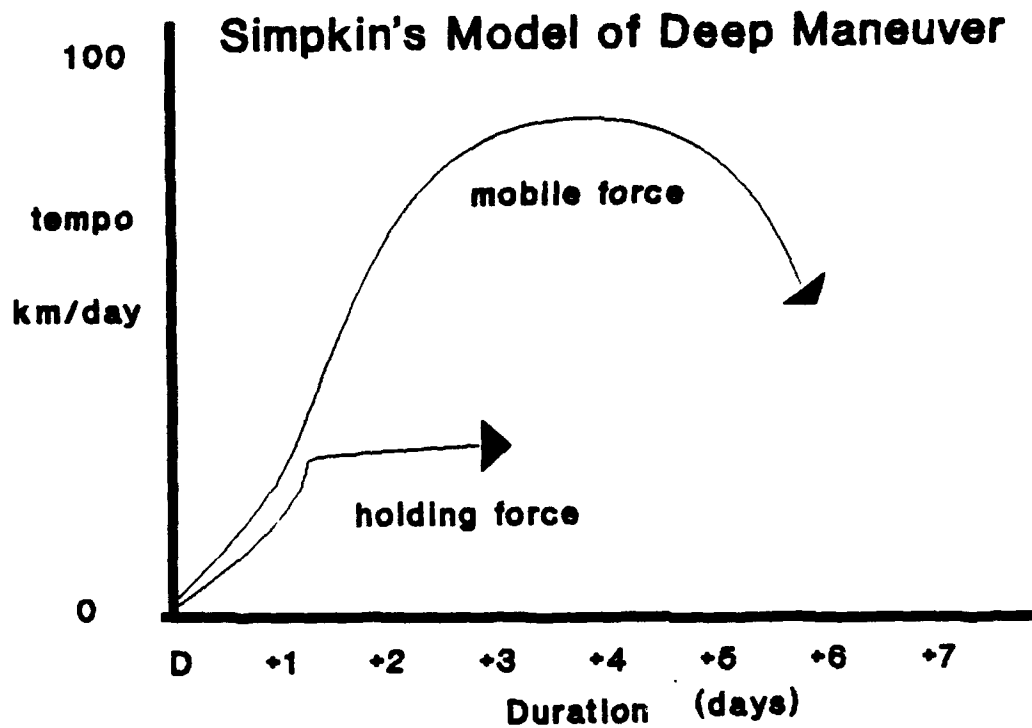
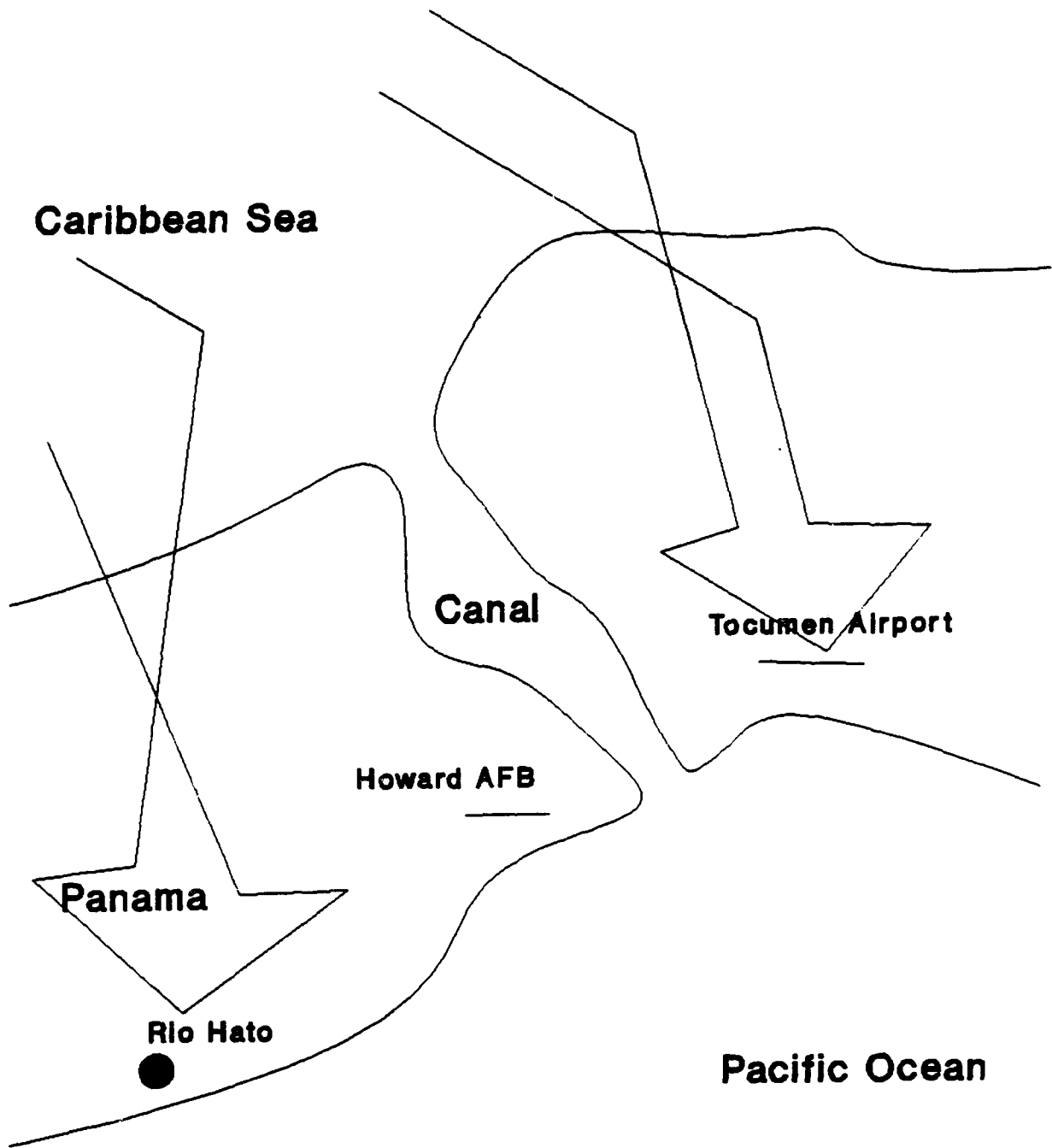
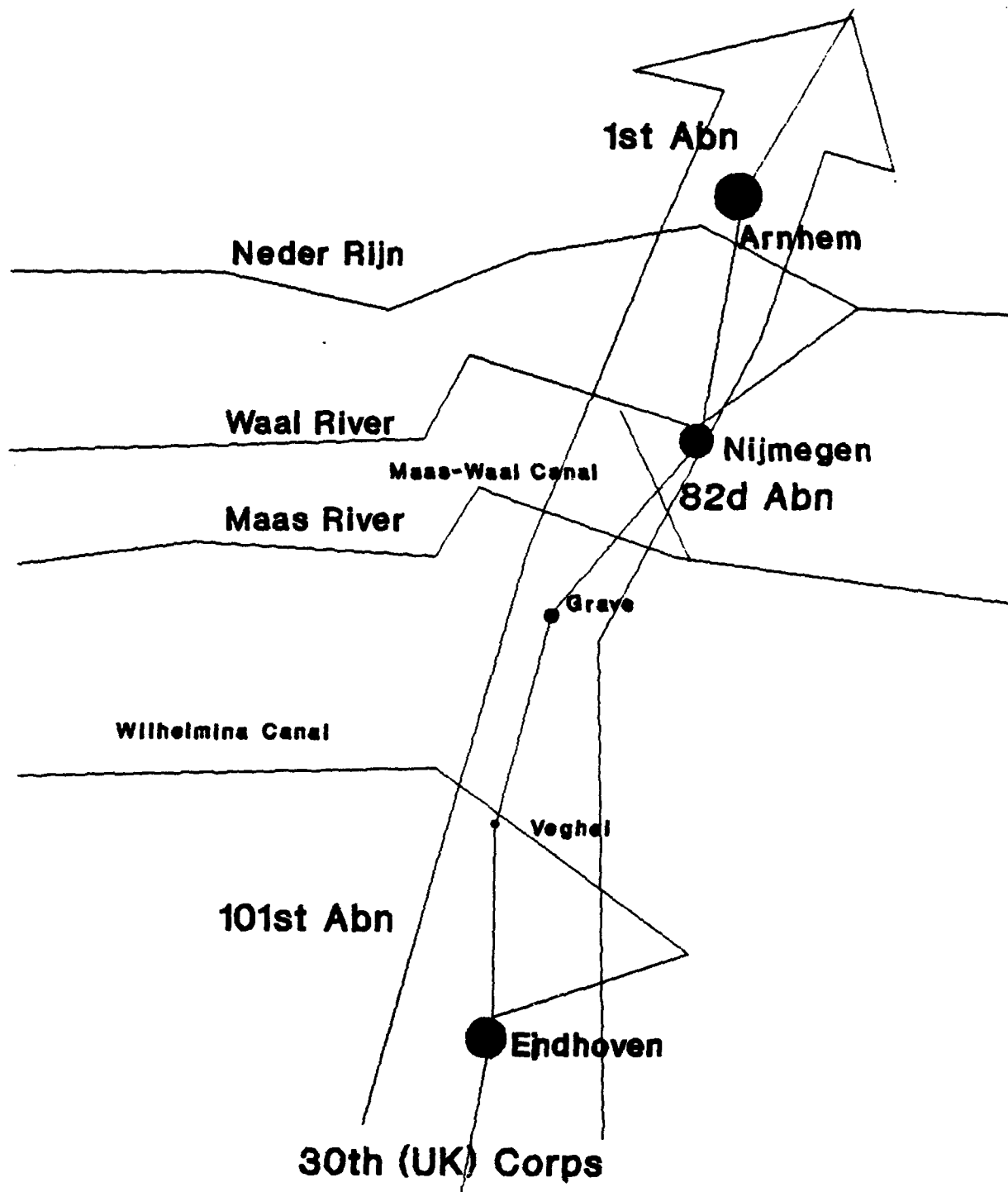


Figure 2



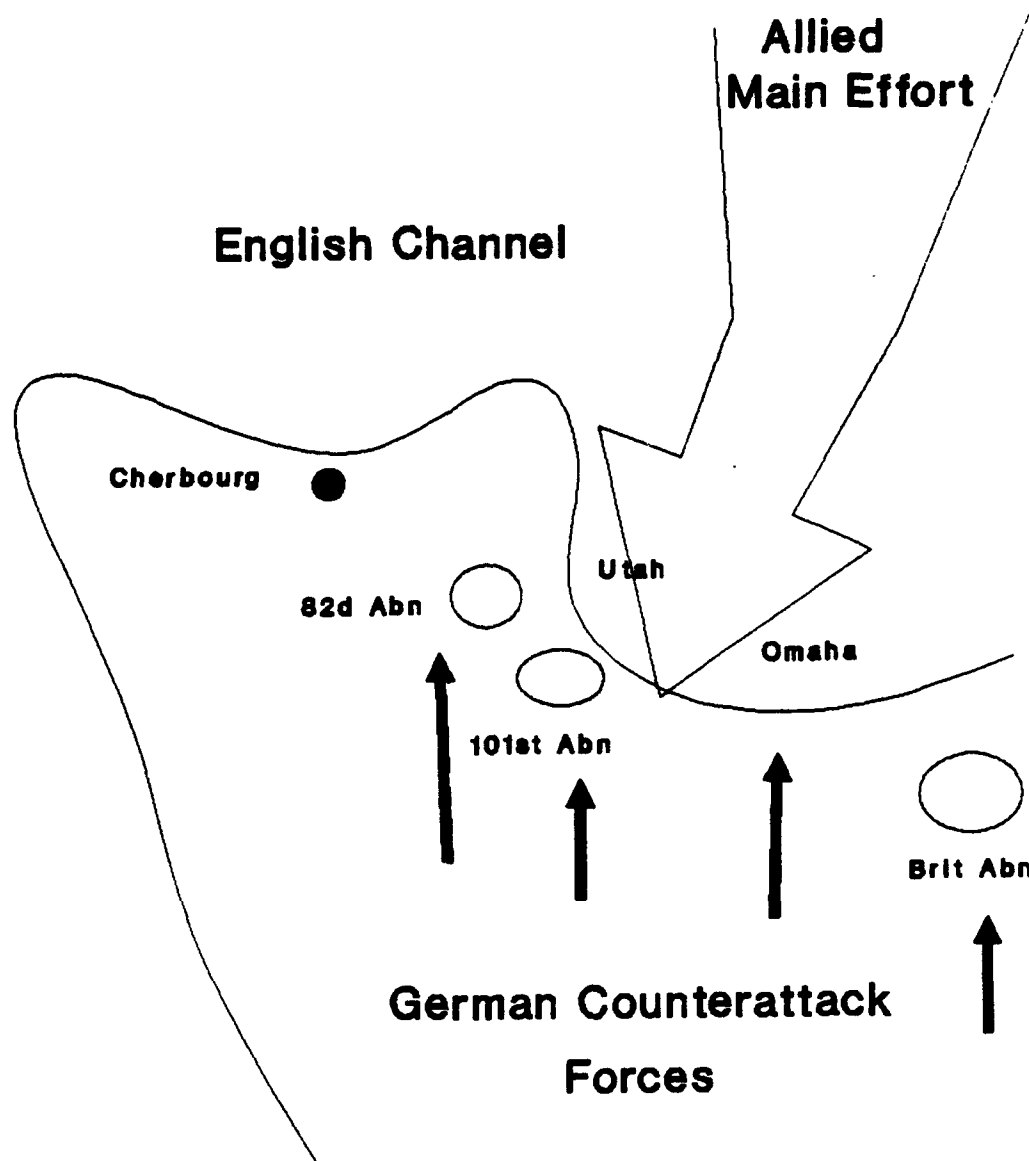
**Operation Just Cause
Airborne Targets**

Figure 3



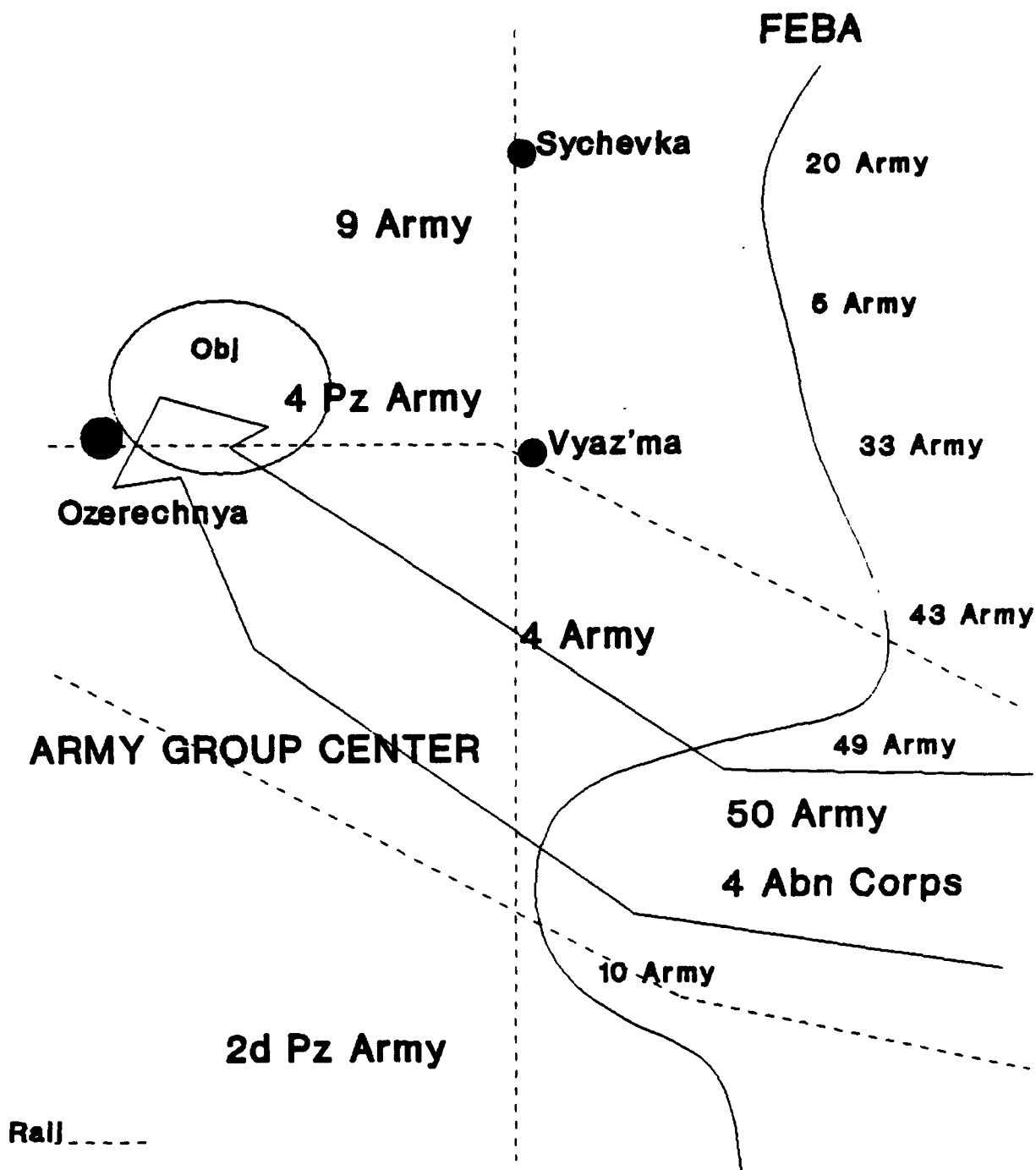
Operation Market-Garden

Figure 4



Operation Overlord

Figure 5



Soviet Concept of Airborne Operation, Jan '42

Figure 6

ENDNOTES

1. Russell F. Weigley, Eisenhower's Lieutenant's (Bloomington, IN: Indiana University Press, 1981), p. 75.
2. Ibid.
3. Ibid.
4. Richard Simpkin, Deep Battle: The Brainchild of Marshal Tukhachevskii (London: Brassey's Defence Publishers, 1987), p. 35.
5. Center for Military History Publication 104-13, Airborne Operations: A German Appraisal (Washington, DC: U.S. Government Printing Office, 1989), p. 21.
6. Colonel David M. Glantz, The Soviet Airborne Experience, "Research Survey No. 4" (Fort Leavenworth, KS: Command and General Staff College, 1984), p. 136.
7. Max Hastings and Simon Jenkins, The Battle for the Falklands (London: W.W. Norton and Company, 1983), p. 233.
8. TRADOC Pamphlet 11-9, "Blueprint of the Battlefield," Department of the Army, HQs, United States Army Training and Doctrine Command, Fort Monroe, VA 23651-5000, 27 April 1990, p. 75.
9. Ibid., p. 1.
10. Ibid., p. 1.
11. Ibid.
12. Dr. James J. Schneider, "Theoretical Paper No. 3." Fort Leavenworth, KS: U.S. Army School of Advanced Military Studies.
13. Ibid.
14. Simpkin, Deep Battle, p. 48.
15. Simpkin, Deep Battle, p. 34.
16. Ibid.
17. Schneider, p. 39.

18. Schneider, p. 41.
19. Simpkin, Deep Battle, p. 54.
20. Simpkin, Deep Maneuver, p. 63.
21. Thomas Donnelly, Margaret Roth, Caleb Baker, Operation Just Cause: The Storming of Panama (New York: Lexington Books, 1991), p. 75.
22. March 19, 1993 interview with Major Blair Ross, who served as S-3, 3d Brigade, 82d Airborne Division in December 1989. Major Ross' brigade participated in planning the attack.
23. Ibid., p. 104.
24. Ibid., p. 395.
25. Ibid., pp. 84-85.
26. Ibid., p. 75.
27. Ibid., p. 77.
28. Ibid., p. 89.
29. Major Mark Adkin, Urgent Fury (Lexington, MA: Lexington Books, 1989), p. 135.
30. Ibid., p. 139.
31. Ibid.
32. Weigley, Eisenhower's Lieutenant's, p. 288.
33. Ibid., p.289.
34. Headquarters, 505th Parachute Infantry Regiment, 82d Airborne Division, Field Order No. 1, dated 14 September, 1944, Annex 1b, p. 2.
35. Weigley, Eisenhower's Lieutenants, p. 295.
36. Gerard M. Devlin, Paratrooper! The saga of U.S. Army and Marine Parachute and Glider Combat Troops During World War II (New York: St. Martin's Press, 1979), p. 495.
37. Ibid., p. 511.
38. Ibid., 512.

39. Weigley, Eisenhower's Lieutenants, p. 292.
40. Devlin, Paratrooper!, p. 356.
41. 82d Airborne Division Field Order No. 6 dated 28 May 1944, Annex 1b, "Enemy Order of Battle", p. 3.
42. Devlin, Paratrooper, p. 355.
43. Ibid.
44. Ibid., 410.
45. Ibid., 414.
46. Ibid.
47. Lieutenant Colonel David M. Glantz, The Soviet Airborne Experience, Research Survey No. 4 (Ft. Leavenworth, KS: Command and General Staff College Combat Studies Institute, 1984), p. 39.
48. Ibid., p. 40.
49. Glantz, The Soviet Airborne Experience, p. 43.
50. Ibid., p. 44.
51. Marshal Zhukov, The Memoirs of Marshal Zhukov (New York: Delacorte Press, 1971), p. 352.
52. Ibid., p. 355.
53. Ibid., p. 357.
54. Simpkin, Deep Battle, p. 76.
55. Field Manual 100-5, Operations, Final Draft (Ft. Leavenworth, KS: Command and General Staff College, 1993), p. 7-6.
56. Antoine Henri Jomini, Summary of the Art of War ed. BG J.D. Hittle (Harrisburg, PA: Stackpole Books, 1987), p.464.
57. Ibid.
58. Ibid., 465.
59. Ibid., 466.
60. Ibid., p. 472.

61. Ibid., 472.
62. Carl von Clausewitz, On War ed. Michael Howard and Peter Paret (Princeton, NJ: University Press, 1976) pp. 527-8.
63. Clausewitz, On War, p. 485.
64. FM 100-5, Operations, p. A-2.

BIBLIOGRAPHY

MONOGRAPHS/PAPERS/SURVEYS/ARTICLES

- Caldwell, Major John F.W. "Forced Entry: Does the Current Airborne Division Still Retain This Capability Under the Light Infantry Tables of Organization and Equipment." Fort Leavenworth, KS: School of Advanced Military Studies, 1987.
- Crow, Major C.L. "Tactical and Operational Depth." Fort Leavenworth, KS: School of Advanced Military Studies, 1986.
- Glantz, LTC David M. "The Soviet Airborne Experience: Research Survey No. 4" Fort Leavenworth, KS: Combat Studies Institute, 1984.
- Gunlicks, Major James B. "Depth at the Operational Level of War: Hitler's Stand Fast Policy and NATO's Forward Defense." Fort Leavenworth, KS, 1986.
- Holcomb, Major J.F. "Soviet Airborne Forces and the Central Region: Problems and Perceptions." Fort Leavenworth, KS: Army Combined Arms Center, Soviet Army Studies Office, June 1987.
- Izzo, LTC Lawrence L. "A Perspective of the Operational Level of War and its Implications." Fort Leavenworth, KS: School of Advanced Military Studies, 1986.
- Schneider, James J. "The Theory of Operational Art: Theoretical Paper No. 3." Fort Leavenworth, KS: School of Advanced Military Studies, 1988.
- Swan, Robin P. "The Pieces of a Military Chessboard--What is the Contemporary Significance of Jomini's Design of a Theater of Operations?" Fort Leavenworth, KS: School of Advanced Military Studies, 1991.
- Turbiville, Dr. Graham H. "Soviet Airborne Assault" Marine Corps Gazette, October, 1987, pp. 52-53.
- Turbiville, Dr. Graham H. "Soviet Airborne Troops: 1987-1988" Fort Leavenworth, KS: Soviet Army Studies Office, 1989.
- Waller, Major Thomas G. "Bolt From the Sky: The Operational Employment of Airborne Forces." Fort Leavenworth, KS: School of Advanced Military Studies, 1986.

BOOKS

- Adkin, Major Mark. Urgent Fury. Lexington, MA: Lexington Books, 1989.
- Clausewitz, Carl von On War ed. and trans. by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.
- Devlin, Gerard M. Paratrooper! The Saga of U.S. Army and Marine Parachute and Glider Combat Troops During World War II. New York: St. Martin's Press, 1979.
- Donnelly, Thomas, Roth, Margaret, and Baker, Caleb. Operation Just Cause: The Storming of Panama. New York: Lexington Books, 1991.
- Farrar-Hockley, Brigadier Anthony. Airborne Carpet: Operation Market Garden. New York: Ballantine Books, 1969.
- Gabel, Kurt. The Making of a Paratrooper: Airborne Training and Combat in World War II. Lawrence, KS: The University Press of Kansas, 1990.
- Galvin, John R. Air Assault: The Development of Airmobile Warfare. New York: Hawthorn Books, Inc., 1965.
- Gavin, James M. On to Berlin: Battles of an Airborne Commander 1943-1946. New York: Viking Press, 1978.
- Griess, Thomas E. Atlas of the Second World War: Europe. Wayne, NJ: Avery Publishing Group, Inc., 1985.
- Halberstadt, Hans Airborne: Assault From the Sky. Novato, CA: Presidio Press, 1988.
- Hogan, David W. Jr. The Evolution of the Concept of the U.S. Army's Rangers: 1942-1983. Ann Arbor, MI: University Microfilms International--Copy of PhD thesis from microfilm, 1986.
- Jomini, Antoine Henri. ed. BG J.D. Hittle Summary of the Art of War. Harrisburg, PA: Stackpole Books, 1987.
- MacDonald, Charles B. Airborne. New York: Ballantine Books, 1970.
- Miksche, F.O. Paratroops. London: Faber and Faber Limited, 1942.
- Savkin, V Ye. The Basic Principles of Operational Art and Tactics. Moscow 1972.

. Simpkin, Richard Deep Battle: The Brainchild of Marshal Tukhachevskii London: Brassey's Defence Publishers, 1989.

Sidorenko, A.A. The Offensive: A Soviet View. Moscow, 1970.

Tukhachevskii, Mikhail New Problems in Warfare. Reprinted by the US Army War College Art of War Colloquim, 1 November 1983.

Weigley, Russell F. Eisenhower's Lieutenants. Bloomington, IN: Indiana University Press, 1981.

Zhukov, Marshal. The Memoirs of Marshal Zhukov. New York: Delacourte Press, 1971.

MILITARY PUBLICATIONS

C500 Joint and Combined Operations. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1991.

C6000 Application of Joint Operations. Fort Leavenworth, KS: U.S. Army Command and General Staff College, 1992.

Center of Military History Publication 104-13 Airborne Operations: A German Appraisal. Washington, DC: U.S. Government Printing Office, 1989.

FM 100-5 Operations. Washington, DC: HQs Department of the Army, 1986.

FM 100-5 (Final Draft) Operations. Washington DC: HQs Department of the Army, 1992.

FMFM 1 Warfighting. Department of the Navy, Washington, DC: HQs, U.S. Marine Corps, 1989.

FMFM 1-1 Campaigning. Department of the Navy, Washington, DC: HQs, U.S. Marine Corps, 1990.

TRADOC Pamphlet 11-9. "Blueprint of the Battlefield" Department of the Army, HQs United States Army Training and Doctrine Command, Fort Monroe, VA. 27 April, 1990.

ORDERS and AFTER ACTION REPORTS

Administrative Order No. 1, "Operation Neptune", 82d Airborne Division, HQs, 507th Parachute Infantry Regiment, 22 May 1944.

Colonel Charles H. Coates, Operations of the 82d Airborne Division on the Cherbourg Peninsula, 6 June-8 July 1944, 2 August 1944.

Field Order No. 1, 82d Airborne Division, HQs, 505th Parachute Infantry Regiment, 14 September 1944.

Field Order No. 1, 82d Airborne Division, HQs, 508th Parachute Infantry Regiment, 13 September 1944.

Field Order No. 6 (Revised Copy), "Operation Neptune", HQs, 82d Airborne Division, 28 May 1944.

Field Order No. 12, 82d Airborne Division, HQs, 504th Parachute Infantry Regiment, 13 December 1944.

Headquarters, Army Ground Forces Board, Operations of the 101st Airborne Division in the Invasion of France, Report No. 16, 15 July 1944.

Headquarters, 101st Airborne Division, After Action Report for April 1945, 22 May 1945.

Headquarters, 82d Airborne Division, Narrative History--1944-45, library call number R-11710 (since declassified).

Headquarters, 82d Airborne Division, A Graphic History of the 82d Airborne Division--Normandy 1944, library call number N-12689.

Orders No. AG 373.2, First Allied Airborne Army, Narrative of Market Operation (w/ field orders of 82d and 101st Airborne Divisions, and 38 Group RAF), 18 December 1944.

U.S. Army Combined Arms Combat Developments Activity, Heavy Light Corps Study (Draft), "Summary of the 1st Cavalry Division and 101st Airmobile Division in Offensive Operations", 3 May 1974.