

# Once Out the Door: A Study of Division and Corps Level Airborne Assaults

A Monograph

by

MAJ Kyle W. Anderson  
United States Army



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

2016

Approved for public release; distribution unlimited.

**REPORT DOCUMENTATION PAGE**

*Form Approved  
OMB No. 0704-0188*

The 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 the burden, to the Department of Defense, Executive Service Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.**

<b>1. REPORT DATE (DD-MM-YYYY)</b> 07-04-2016		<b>2. REPORT TYPE</b> SAMS Monograph		<b>3. DATES COVERED (From - To)</b> JUN 2015 - MAY 2016	
<b>4. TITLE AND SUBTITLE</b> A Study of Division and Corps Level Airborne Assaults				<b>5a. CONTRACT NUMBER</b>	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b> MAJ Kyle W. Anderson				<b>5d. PROJECT NUMBER</b>	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> School of Advanced Military Studies (SAMS) 201 Reynolds Avenue Fort Leavenworth, KS 66027-2301				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Command and General Staff College 731 McClellan Avenue Fort Leavenworth, KS 66027-1350				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>  CGSC	
				<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION/AVAILABILITY STATEMENT</b>  Approved for Public Release; Distribution Unlimited					
<b>13. SUPPLEMENTARY NOTES</b>					
<b>14. ABSTRACT</b> The United States has not conducted a division or corps level airborne assault since the end of World War II. Consequently, there is a void in modern doctrine and experience regarding how best to employ a large-scale airborne assault, should a future conflict ever dictate the need for the employment of the capability. To overcome this challenge, modern planners must examine airborne operations from World War II and frame the lessons learned from those operations in the context of operational art and design. As such, contemporary planners can examine Operations Mercury, Dragoon, and Market Garden to extract lessons that will enable effective airborne assault planning at the division and corps levels. Each of these historical case studies presents unique lessons regarding airborne assault planning in the context of operational art and design. Holistically, World War II airborne assault studies exhibit key lessons regarding their inherent joint nature, the best methods for organizing the operational area to support the assault, and the psychological impact that airborne forces achieve against the opposition.					
<b>15. SUBJECT TERMS</b>  Airborne Assault, Operation Mercury, Operation Dragoon, Operation Market Garden, Operational Art, Operational Design					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>
<b>a. REPORT</b>	<b>b. ABSTRACT</b>	<b>c. THIS PAGE</b>			<b>19b. TELEPHONE NUMBER (Include area code)</b>
U	U	U	SAR	71	913-758-3302

Reset

## Monograph Approval Page

Name of Candidate: MAJ Kyle W. Anderson

Monograph Title: Once Out the Door: A Study of Division and Corps Level Airborne Assaults

Approved by:

\_\_\_\_\_, Monograph Director  
Dan C. Fullerton, PhD

\_\_\_\_\_, Seminar Leader  
Dyrald J. Cross, COL

\_\_\_\_\_, Director, School of Advanced Military Studies  
Henry A. Arnold III, COL

Accepted this 10<sup>th</sup> day of May 2016 by:

\_\_\_\_\_, Director, Graduate Degree Programs  
Robert F. Baumann, PhD

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the US Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

Fair use determination or copyright permission has been obtained for the inclusion of pictures, maps, graphics, and any other works incorporated into this manuscript. A work of the United States Government is not subject to copyright, however further publication or sale of copyrighted images is not permissible.

## **Abstract**

Once Out the Door: A Study of Division and Corps Level Airborne Assaults, by MAJ Kyle W. Anderson, 71 pages.

The United States has not conducted a division or corps level airborne assault since the end of World War II. Consequently, there is a void in modern doctrine and experience regarding how best to employ a large-scale airborne assault, should a future conflict ever dictate the need for the employment of the capability. To overcome this challenge, modern planners must examine airborne operations from World War II and frame the lessons learned from those operations in the context of operational art and design. As such, contemporary planners can examine Operations Mercury, Dragoon, and Market Garden to extract lessons that will enable effective airborne assault planning at the division and corps levels. Each of these historical case studies presents unique lessons regarding airborne assault planning in the context of operational art and design. Holistically, World War II airborne assault studies exhibit key lessons regarding their inherent joint nature, the best methods for organizing the operational area to support the assault, and the psychological impact that airborne forces achieve against the opposition.

## Contents

Acknowledgements.....	v
Acronyms.....	vi
Figures . .....	vii
Introduction.....	1
Literature Review.....	3
Methodology.....	4
Availability of Sources .....	5
Case Study 1: Operation Mercury.....	7
The Importance of Operation Mercury for Operational Artists.....	7
Strategic Context of Operation Mercury.....	8
German Execution of Operation Mercury .....	11
Operation Mercury and Operational Art.....	15
Case Study 2: Operation Dragoon .....	25
The Importance Operation Dragoon for Operational Artists .....	25
Strategic Context of Operation Dragoon .....	28
Allied Execution of Operation Dragoon .....	31
Operation Dragoon and Operational Art.....	38
Case Study 3: Operation Market-Garden.....	43
The Importance of Operation Market Garden for Operational Artists .....	43
Strategic Context of Operation Market Garden .....	45
Allied Execution of Operation Market Garden.....	51
Operation Market Garden and Operational Art .....	59
Conclusion .....	64
Bibliography .....	69

## **Acknowledgements**

I would like to thank the faculty and staff of the School of Advanced Military Studies for the incredible opportunity to receive a world-class education with some of the finest officers I have ever had the privilege to serve with. In particular, I would like to thank Colonel Dyrald Cross for his outstanding leadership and professionalism as a seminar leader. I would also like to thank Professor Dan Fullerton for his guidance, encouragement, and superb mentorship. His ever-watchful eyes helped me to research, write, and finalize this monograph. Above all though, I would like to thank my beautiful wife, Erin, and my wonderful son, Thomas. Their unwavering support allowed me to spend countless hours in the library and their encouragement and love enabled me to fulfill a professional goal that required an untold number of hours apart from them.

## Acronyms

ADP	Army Doctrine Publication
ADRP	Army Doctrine Reference Publication
AOC	Army Operating Concept
CJOA	Combined Joint Operational Area
DCS	Deep-Close-Security
FAAA	First Allied Airborne Army
FABTF	First Airborne Task Force
FM	Field Manual
OPMG	Operation Market Garden
PIB	Parachute Infantry Battalion
PIR	Parachute Infantry Regiment

## Figures

1	German Operational Framework for Operation Mercury.....	19
2	Win in a Complex World Graphic.....	27
3	Operation Dragoon, the Allied Invasion of Southern France.....	32
4	Initial Landing Plan for the First Airborne Task Force.....	36
5	Allied Situation at the Outset of Operation Market Garden.....	46
6	The Execution of Operation Market Garden.....	54



## Introduction

The concept of vertical envelopment is now almost a century old. The idea that troops could attack using parachutes, or air landed, dates back to World War I. Both Winston Churchill, England's World War II prime minister, and Billy Mitchell, US Army Air Corps pilot and early air power theorist, proposed the idea of landing troops behind enemy lines to assist in breaking the stalemate around the city of Metz.<sup>1</sup> Mitchell's plan called for the better part of a division to land behind German defenses and smash through more lightly defended rear areas of the city. Though the Allies cancelled planning after signing the armistice, the concept of vertical envelopment took hold in the minds of the leaders of the Great Powers. While the United Kingdom and the United States were slower to adopt the idea, the Germans and Russians had demonstrated, through exercises during the interwar years, the feasibility of airborne operations by the beginning of the World War II.<sup>2</sup> In fact, these two countries put the concept of an airborne assault at the forefront of American planner's minds after the Germans successfully employed the concept in Holland and Greece and the Russians employed it in Romania. According to historian Marc Devore, the results obtained in these operations were "so disproportionate when compared to the means employed that paratroopers appeared to constitute a revolution in warfare."<sup>3</sup> Vertical envelopment had so impressed leaders of the US military that the US Army published its first conceptual manual, Field Manual (FM) 31-30, *Tactics and Techniques of Airborne Troops*, just a year after the German assault in Greece.

Operations during World War II employed the largest airborne assaults in history, not only in terms of numbers of assaults but also in their sizes. Operation Varsity, the British airborne assault to help

---

<sup>1</sup> C.N. Trueman, "Paratroopers and World War Two," The History Learning Site of the United Kingdom, May 22, 2015, accessed November 1, 2015, <http://www.historylearningsite.co.uk/world-war-two/famous-battles-of-world-war-two/the-battle-of-arnhem/paratroopers-and-world-war-two>.

<sup>2</sup> James Huston, *Out of the Blue* (West Lafayette, IN: Purdue University Studies, 1972), 47.

<sup>3</sup> Marc Devore, *When Failure Thrives: Institutions and the Evolution of Postwar Airborne Forces* (Leavenworth, KS: The Army Press, 2015), 19.

the Canadian Army cross the Rhine River in 1945, initially called for the employment of three Allied corps headquarters and six airborne divisions.<sup>4</sup> In the post-World War II era, the number of airborne forces and number of airborne assaults has significantly declined. The United States has only utilized airborne assault capabilities a handful of times since the beginning of the Cold War, the most notable of which were Operations Just Cause and Urgent Fury.<sup>5</sup> However, in both of these instances, the United States only employed brigade-sized units. Furthermore, these units operated against a relatively poorly trained and equipped enemy.<sup>6</sup>

In light of the fact that the nature of vertical envelopment has evolved since World War II, it is important to examine that evolution against an operational framework to determine the strengths and weaknesses of the concept. Since the United States has no recent experience with large-scale, division-sized or larger, airborne assaults against near-peer enemies, operational artists must examine World War II to generate lessons learned and best practices for airborne assault planning. World War II operations provide operational artists of airborne assaults a litany of lessons and principles that are not only still valid today but also span a variety of operations that airborne forces may execute. Contemporary planners can examine Operations Mercury, Dragoon, and Market Garden to extract key lessons regarding operational art and design that will enable effective airborne assault planning now and in the future.

---

<sup>4</sup> Huston, 217.

<sup>5</sup> The United States employed an airborne assault in both these operations. In the case of Operation Urgent Fury, the US invasion of Grenada, two battalions from the US Army 75th Ranger Regiment conducted an airborne assault to secure Point Salinas airfield. Subsequently, the 82nd Airborne Division air landed a brigade minus to execute ground operations. In Operation Just Cause, the US invasion of Panama, the US military employed a brigade minus from the 82nd Airborne Division and approximately a battalion of special operating forces as part of the airborne assault force.

<sup>6</sup> Devore, 61.

## Literature Review

This literature review will cover the purpose of this paper, review the methodology employed, and will examine the availability of primary and secondary sources as they relate to each case study. The US Army has not conducted an airborne assault above brigade strength since World War II. As a result, most of the contemporary writing on airborne employment falls into two categories. The first category argues whether airborne assaults are even feasible given the current force structure and anti-access and area denial weapons that countries like China or Iran possess.<sup>7</sup> Companies such as the RAND Corporation are publishing studies for the US government and recommending structural changes to the airborne force to counter, or at least minimize, the threat to airborne forces from these threats.<sup>8</sup> These writings do not focus on planning considerations at the operational level of war, but rather on the strategic deployment of forces and force structure changes necessary to accomplish the tactical mission once the airborne forces consolidate on the ground.

The second category of contemporary writings on airborne assaults debate whether the size of the current US Army airborne force makes sense given the inherent drawbacks of airborne forces when they face even moderately trained or equipped enemy opposition. Marc Devore, a professor of political science at the Massachusetts Institute of Technology and author of numerous articles published by the US Army Press, recently published a superb article that highlights the second category of writings and details why airborne assault capabilities are no longer as viable as they once were. He argued that airborne forces are merely a legacy of World War II and the Cold War. Devore further contends that a force structure of five

---

<sup>7</sup> The capabilities of surface-to-air missiles and anti-ship missiles have improved significantly since the end of World War II. In the case of airborne forces, the Chinese HQ-9 and Iranian S-300 surface-to-air missile systems are extremely sophisticated and provide these countries the ability to detect and engage paratroop transports well before the airborne forces can get within range of their airborne assault target locations.

<sup>8</sup> John Gordon IV, et al., *Enhanced Army Airborne Forces: A New Joint Operational Capability* (Santa Monica, CA: RAND Corporation, 2014), 16.

brigade combat teams, one Ranger Regiment, and seven Special Forces Groups are neither capable of conducting an assault above brigade level without significant assistance and are capable of only defeating the poorest equipped, controlled, and organized forces the United States may face.<sup>9</sup> His conclusion, in light of these arguments, is that the US Army should reduce the size of the current airborne force because their capabilities no longer fill a major requirement. This is the common argument in the second category of current airborne thought.

The shortfall in these two categories of contemporary writing on airborne assaults is that they focus on elements of airborne operations that are outside the control of the operational artist. Furthermore, they provide no guidance on how to employ the airborne capabilities, regardless of the organization or if the capability fills a need in the US Army, with which operational artists will have to work. As such, this paper fills an academic gap in that it will analyze the instances where the US Army did employ its airborne assault capability in large-scale operations, division-sized or larger, and draw out lessons that are still viable for today's operational level planners. Based on the 2015 US Army Operating Concept (AOC), this paper will focus on three specific airborne assault employment methods that conform to the AOC's envisioned uses for the capability. The first type of operation is a unilateral airborne assault conducted entirely by airborne and air landed forces. The second type of operation is a joint airborne and amphibious assault conducting a combined joint forcible entry operation. The third is an airborne assault that serves as a shaping operation in support of a larger operation conducted by conventional ground forces.

## Methodology

This paper contains five sections. The first section includes the introduction and examines why operational art is critical for airborne assault planning. This section also includes a literature review and overview of the methodology employed. The subsequent three sections utilize a case study methodology

---

<sup>9</sup> Devore, 71.

to analyze various World War II operations that exemplify the intended uses of modern airborne assaults, as noted above. Each case study analysis will focus on two to three elements of operational art and design as defined in Army Doctrinal Reference Publication (ADRP) 3-0, *Unified Land Operations*.<sup>10</sup> The first case study will focus on Operation Mercury, as it was the first attempt in history to secure strategic objectives solely by airborne assault.<sup>11</sup> The second case study will analyze Operation Dragoon which was the first large scale airborne assault that successfully achieved a shaping effect for an amphibious assault.<sup>12</sup> The third case study will examine Operation Market Garden. It demonstrated the potential strategic advantages gained by employing an airborne assault to secure objectives in support of a conventional ground force attack. The last section of the paper briefly reviews the findings and ties the lessons from the case studies together into one holistic assessment for current operational artists.

#### Availability of Sources

There is a significant collection of secondary writings on Operation Mercury. Two of the foremost secondary sources referred to by most researchers are Callum MacDonald's *The Lost Battle Crete 1941* and G.C. Kiriakopoulos's *Ten Days to Destiny*. These writings analyzed the battle at the strategic and tactical levels of war. They provide solid information regarding the strategic context that necessitated execution of the operation and reliable information concerning the tactical action on the ground. There is a shortfall in primary research material for Operation Mercury, since it was a German

---

<sup>10</sup> Elements of operational art and design are intellectual tools that help commanders and planners understand, visualize, and describe how the organization is going to integrate and synchronize combat power to achieve desired missions or end states.

<sup>11</sup> Peter Antill, *Crete 1941: Germany's Lightning Airborne Assault* (New York, NY: Osprey Publishing Ltd, 2005), 7

<sup>12</sup> While Operation Dragoon took place after the invasion of Normandy, the airborne assault in support of Operation Neptune is widely considered a pyrrhic victory. Therefore, Operation Dragoon provided a better case study than Operation Neptune for examining how airborne operations can support amphibious assaults.

operation. Furthermore, the primary documents translated online carry a risk of losing the meaning and context associated with the narrative. Primary sources of note are the personal interviews and memoirs of several German generals directly involved in the planning and execution of the battle, or were in the chain of command that approved and tracked the progress of the operation. This material, generally compiled ten years or less after the operation, provides insight into the German operational approach to the battle, the strategic vision, and the impact the outcome had on future events. The US Center for Military History published *Airborne Operations: A German Appraisal*, which captures the personal experiences, assessments of German airborne operations, and recommendations for the future of airborne as described by some German general officers either directly involved in executing, or responsible for the planning of Operation Mercury.

There is a wide variety of both primary and secondary literature regarding Operation Dragoon. The primary source material includes overall operational plans, tasks to VI Corps, and after action reports for the operation. The one shortfall is that most of the available primary source material relates either to the amphibious assault force, or to the post airborne assault movement of VI Corps through southern France. There is very little primary source material from the First Airborne Task Force (FABTF), with respect to its planning process. There are a lot of after action reports regarding the success of the operation, which prove valuable in understanding that the overall airborne portion was successful. However, little in these reports reflects the nuances of the actual operational planning piece prior to the airborne assault. Numerous secondary sources detail Operation Dragoon. Most secondary materials refer to *Operation Dragoon* by William Breuer. This work is extremely useful for this paper, as it focuses solely on the airborne and amphibious assault portions of the operation. As such, it will serve as the foremost to analyze both the strategic context and the actual execution of Operation Dragoon.

With the exception of perhaps Operation Neptune, no airborne assault has more primary and secondary sources available than Operation Market Garden. There is a significant amount of primary source material available on the subject that ranges from the tactical to strategic planning levels, which

includes both planning and after-action material. The one shortfall in the primary source research material available is that it focuses largely on the two US airborne divisions. The lack of primary documents available regarding the British airborne division forces the use of secondary sources and thereby potentially inhibits a complete understanding from a British perspective. This is significant because, arguably, the British faced the largest challenge in this operation and therefore perhaps have the greatest lessons to provide to contemporary operational artists. In terms of secondary material, the foremost work is Cornelius Ryan's *A Bridge Too Far*, which has a largely British flavor and will serve as the backbone for providing the strategic context and overview for this case study.

### **Case Study 1: Operation Mercury**

#### The Importance of Operation Mercury for Operational Artists

Operation Mercury, the German airborne assault to seize Crete, was a landmark operation in the history of vertical envelopment and airborne assaults. Until Crete, airborne assaults were small tactical actions used as shaping operations in advance of ground forces.<sup>13</sup> The 1940 German use of airborne forces in Denmark, Norway, and the Netherlands exemplified how airborne forces could seize small tactical objectives to aid a conventional ground operation. Operation Mercury, on the other hand, tested the viability of using an airborne assault as a unilateral operation to achieve strategic objectives. Peter Antill, an Operation Mercury historian, commented that Crete is historically important because it “remains the only operation in history in which a major strategic objective was assaulted and secured exclusively by airborne troops.”<sup>14</sup> While there was actually one more unilateral airborne assault conducted in the Far East during World War II, almost all other airborne assaults in the war shaped the

---

<sup>13</sup> Antill, 7.

<sup>14</sup> Ibid., 7.

area of operations for a larger ground campaign.<sup>15</sup>

A second reason to study Operation Mercury is that in all other airborne operations, a failed airborne assault did not necessarily constitute failure for the entire operation. A failed airborne assault on Crete not only meant an operational failure but a strategic one as well, since the Germans would not have been able to secure their southern flank before initiating Operation Barbarossa, their plan to invade the Soviet Union.<sup>16</sup> While the potential for a future unilateral airborne assault is unlikely, Operation Mercury provides operational artists with valuable lessons for planning an airborne assault and highlights the risk associated at both the operational and strategic levels should it fail.

While Operation Mercury can teach airborne assault planners numerous lessons about operational art and design, the three most important elements are mass, operational framework, and decisive points. Using these elements of operational art and design as the framework, the Operation Mercury case study will reveal some key points regarding how to arrange tactical actions to achieve strategic purposes in unilateral airborne assaults.

### Strategic Context of Operation Mercury

In order to understand how Operation Mercury developed, it is important to understand the strategic context that necessitated its design and execution. By the beginning of 1941, Hitler had focused his attention on the invasion of the Soviet Union, code-named Operation Barbarossa. As a result, he had not planned on further operations into either the Balkans or Greece for a number of reasons. First, Hitler wanted to keep the Balkans relatively stable since Germany had an economic relationship with them. To this end, Hitler had vetoed Italian plans to invade Yugoslavia for fear it would plunge the historically

---

<sup>15</sup> The other operation was an airborne assault conducted in the China-Burma-India Theater of operations during World War II and outside of the scope of analysis of this paper.

<sup>16</sup> Antill, 17.



unstable area into chaos.<sup>17</sup> Additionally, this would potentially bring war with the Soviet Union sooner than Hitler intended. Hitler had already angered the Soviet Union by interfering in the Balkans, an area typically viewed by the Soviet Union as within their sphere of influence, by settling a dispute between Hungary and Romania over the area of Transylvania. To Hitler, the Soviets would only view any further action there with increasing suspicion. Furthermore, Germany stationed a large garrison in Romania, despite avid protests from the Soviets, under the guise of guaranteeing Romanian sovereignty. In reality, the Germans wanted to secure their access to vital oilfields in the region. The Germans had already raised some speculation about their intentions with these actions, and with a timetable set for Operation Barbarossa; Hitler wanted to ensure that war with the Soviet Union would be “initiated under circumstances of his own choosing, not as a result of some crisis in the Balkans.”<sup>18</sup>

Meanwhile, Benito Mussolini, the Italian dictator, was afraid that without some significant military conquest, the war would end and his country would gain little influence in the Mediterranean area. Since Hitler had vetoed an Italian plan to attack into the Yugoslav region, Mussolini instead chose to attack Greece. Though Greece was technically neutral, it had strong economic ties to Britain in terms of natural resource trade and Mediterranean port usage, and strategically, Greece provided Allied forces access to mainland Europe.<sup>19</sup> The Italian proposal to sever those ties by occupying Greece and strengthening the Axis position on the mainland intrigued Hitler, as it would preempt a British invasion into southern Greece and thereby secure the German southern flank for the commencement of Operation Barbarossa.<sup>20</sup>

The Italians invaded Greece in late October 1940, but a poor operational plan, British air and

---

<sup>17</sup> Albert Palazoo, *Battle of Crete* (Bayswater, Australia: Shannon Books Pty Ltd, 2007), 6.

<sup>18</sup> Anthill, 8.

<sup>19</sup> *Ibid.*, 8.

<sup>20</sup> Callum MacDonald, *The Lost Battle: Crete 1941* (New York, NY: The Free Press, 1993), 56.

ground support, as well as native reinforcements from Crete, not only halted the Italian advance but also drove it backward into Albania.<sup>21</sup> Fearing that the British would be in his rear area at the outset of Operation Barbarossa, Hitler ordered the German Army to execute Operation Marita on April 6, 1941.<sup>22</sup> It had a twofold purpose. First, it would serve to deceive the Soviet Union by explaining the rapid buildup of German forces in southeastern Europe. While some of these troops would execute Operation Marita, the majority of German forces were staging for Operation Barbarossa. Second, Operation Marita provided some buffer space, as Axis forces would occupy the German southern flank on the mainland and force the British to withdraw to Northern Africa.<sup>23</sup>

Operation Marita proved to be extremely successful as the Germans advanced rapidly through Greece and drove the Greek and Allied forces back to the southern tip of the peninsula. Despite German efforts to cut off the retreating Allied forces, from April 17 until April 30, the Allies were able to evacuate almost 25,000 Allied troops from Greece.<sup>24</sup> By the end of April, Germany had cleared and secured Greece, thus ending the operation. However, Operation Marita would have profound impact on Operation Mercury for two important reasons. First, the vast majority of the 25,000 Allied forces that evacuated Greece withdrew to Crete, significantly increasing the number of forces available for its future defense. Though these troops arrived largely without heavy weapons, the nature of the German unilateral airborne attack prevented any armor or mechanized forces from landing anyway, thereby negating one of the Allied critical vulnerabilities. Second, in the effort to cut off the Allied retreat in southern Greece, the Axis had employed an airborne assault of two battalions to secure a bridge over the Corinth Canal on

---

<sup>21</sup> Antill, 8.

<sup>22</sup> Ibid., 12.

<sup>23</sup> MacDonald, 56.

<sup>24</sup> Antill, 15.

April 26.<sup>25</sup> General Kurt Student, the lead planner for German airborne operations and commander of XI Fliiegerkorps, had been on convalescent leave and was furious that his forces had conducted the assault without his approval.<sup>26</sup> The Allies were now aware that German paratroopers were in southern Europe. This meant that the Germans lost the element of surprise, a critical tenet for airborne operations. Allies viewed an airborne assault as one of the most likely courses of action if the Germans were to attempt a seizure of Crete.

Despite the loss of surprise regarding the location of German airborne forces, and with the Greek campaign nearing its conclusion, General Student, always seeking to prove the value of his airborne forces, convinced Hitler of the necessity of seizing Crete. He argued that its possession would prevent the British from utilizing their long-range bombers to interfere with operations in the Ploesti oil fields, extend the Luftwaffe range into North Africa, and enable the Germans to disrupt British shipping in the Mediterranean. Hitler saw the value of seizing Crete as a shaping effort to support Operation Barbarossa and issued Directive 28 on April 25, 1941, which called “for the seizure of Crete as a base for air warfare against Great Britain in the eastern Mediterranean.”<sup>27</sup>

#### German Execution of Operation Mercury

A brief narrative on Operation Mercury is required to provide the background information necessary to analyze the operational art employed by the Germans. However, this narrative will only cover the period immediately preceding the airborne assault and will end with the air landing of follow on reinforcement troops. This portion of Operation Mercury relates directly to the case study of arranging

---

<sup>25</sup> Antill, 13.

<sup>26</sup> The XI Fliiegerkorps was the Luftwaffe’s parachute and air landing corps. General Student had been on convalescent leave, from injuries sustained during a previous operation, when the Germans approved and executed the airborne operation.

<sup>27</sup> G.C. Kiriakopoulos, *Ten Days to Destiny* (New York, NY: Franklin Watts, 1985), 39.

tactical actions for a unilateral airborne assault.<sup>28</sup>

After conducting a withdrawal from Greece, almost 25,000 Allied troops retrograded to Crete.<sup>29</sup> Despite their large number, these troops lacked heavy weapons, armor, and large caliber artillery. ULTRA-intercepts of German communications in the middle of April had alerted the British high command to an impending German attack on Crete by airborne and amphibious assault.<sup>30</sup> Winston Churchill understood the value of holding Crete for use in future Allied operations, which prompted him to give guidance that the “island must be stubbornly defended.”<sup>31</sup> General Archibald Wavell, commander-in-chief of the Mediterranean, believed General Maitland Wilson, the acting British commander on Crete, and was incapable of meeting Churchill’s intent and subsequently appointed General Bernard Freyburg to command the defense of Crete on April 30, 1941.<sup>32</sup> Freyburg, believing the amphibious assault to be the greatest threat, dispersed his defending forces into three sectors and utilized decentralized control by allowing the sector commanders to control their fight and employ local reserves, generally consisting of two light tanks, as necessary.<sup>33</sup>

On May 20, 1941, the Germans initiated Operation Mercury. The first German paratroopers and gliders dropped on the western portion of the island. General Eugen Meindl, commander of Assault Group West, hit the ground shortly after 0800 and was responsible for seizing Maleme airfield. Further east, Assault Group Central, commanded by General Sussman, landed just after 0830 and was responsible

---

<sup>28</sup> While the battle did not end at this point in time, the remaining tactical actions were simply conventional infantry maneuver and therefore outside the scope of this paper.

<sup>29</sup> John Sadler, *Operation Mercury: The Battle for Crete 1941* (Barnsley, South Yorkshire: Pen and Sword Books, Ltd., 2007), 51.

<sup>30</sup> ULTRA was the codename for the Allied signals intelligence capability to decode German radio and teleprinter communication messages.

<sup>31</sup> Sadler, 58.

<sup>32</sup> Ibid.

<sup>33</sup> Ibid., 62.

for seizing the administrative center of Canea, the port facilities of Souda, and the airfield at Retimo.<sup>34</sup>

Both attacks faced inauspicious starts, due largely to the significant numbers of troops near the drop zones. German intelligence initially estimated that the island contained only 5,000 Allied troops when in actuality there were over 25,000 who had retrograded to Crete after being defeated in Greece.<sup>35</sup> By the end of the first day, General Meindl's force had suffered heavy casualties, including Meindl himself, and had seized neither the airfield nor the dominating terrain of Hill 107 immediately south of the airfield. Central Group fared even worse. By days end, they had not seized Souda or Canea and had strength enough only to establish a circular defense and await an inevitable Allied counter attack. The Germans in Central Group believed that the Allied counter attack would annihilate the remaining German forces on the central coastline.<sup>36</sup>

Late in the afternoon on May 20, the Germans conducted a second airborne assault on the eastern portion of the island that fared no better than had the morning assaults. Delayed due to transport maintenance and refueling, the afternoon airborne assaults took off piecemeal and dropped the paratroopers in packets all around the Heraklion and Rethymnon areas. At Heraklion, the Allied commander had dismissed the threat of seaborne invasion and as such had formed a tight perimeter around the airfield, the primary objective of German Assault Group East.<sup>37</sup> As General Bruno Brauer's forces descended in and around Heraklion, they faced the largest garrison of Allied troops. Incurring devastating losses, Brauer's forces managed to gain only a small foothold in a local town by the time the sun had set. Additionally, the second wave of Sussman's forces in Center Group dropped in small packet-sized elements around Reimo and Rethymnon and failed to seize either of those objectives by the end of

---

<sup>34</sup> Palazzo, 38-63.

<sup>35</sup> Sadler, 49.

<sup>36</sup> Palazzo, 45-72

<sup>37</sup> Ibid., 76.

the first day.<sup>38</sup>

As the final reports for action on May 20 came into General Student's headquarters, the operation appeared "a total shambles – a much more numerous and better prepared enemy, catastrophic losses and nothing, particularly not a single airstrip, to show for it all."<sup>39</sup> The only bright spot for the Germans was that they held a small toehold at the western end of the Maleme airstrip. Fortunately, for the Germans, the Allied "fog of war" caused them to execute a withdrawal from key terrain that eventually turned the tide of battle to favor the Germans. The Allied battalion that had been holding Hill 107, the key terrain just south of Maleme airfield, had withdrawn its companies to ridges a little farther east to reduce their exposure. Unfortunately, for the Allies, it also reduced their ability to observe and deliver effects onto the airfield.

On the morning of May 21, reconnaissance elements of Student's headquarters successfully landed on Maleme airfield in the dead space created by the Allied withdrawal from Hill 107. While a minor tactical victory in which the crew delivered ammunition and exfiltrated the wounded, operationally, it proved that Maleme airfield was still a viable objective that could enable air landings of follow-on reinforcements.<sup>40</sup> Student capitalized on the Allied withdrawal from the hill and ordered the Assault Regiment of Operations Group West to seize Hill 107. By midafternoon, the Germans seized the hill and the area immediately surrounding Maleme airfield. Student immediately ordered the One Hundred Mountain Rifle Regiment to air land and reinforce Operations Group West. Despite Allied shelling, the Germans were able to begin landing aircraft on Maleme airfield and the "toehold had become, however precarious, a bridgehead."<sup>41</sup> The successful capture of Maleme meant that the Germans could bring in

---

<sup>38</sup> Antill, 49.

<sup>39</sup> Sadler, 123.

<sup>40</sup> Ibid., 125.

<sup>41</sup> Ibid., 128.

reinforcements and begin the expansion of the lodgment.

Beginning to realize the seriousness of the situation at Maleme, General Freyburg ordered an Allied counterattack that began in the early hours of May 22. The Allies, however, had underestimated the necessary combat power needed to seize the airfield and sent only two battalions “to oust an enemy that was being reinforced by transports landing every few minutes.”<sup>42</sup> Despite ferocious fighting by the New Zealand units, their counterattack stalled and eventually failed and German air-landing operations continued at a feverish pace. By the afternoon of the May 22, the Germans “were rapidly reinforcing their troops on Crete...Transports were landing at a rate of 20 per hour.”<sup>43</sup> As the Germans began to reinforce Crete, their technical and tactical superiority eventually overcame the difficulties imposed by their numerical inferiority. While certainly not an easy conventional infantry operation from this point forward for the Germans, the first three days of Crete are the valuable ones for operational artists involved in airborne assault planning.

#### Operation Mercury and Operational Art

The context of late 1940 and early 1941 is important for understanding how the Germans planned and executed Operation Mercury. Of paramount importance is understanding that Hitler saw Operation Mercury as a minor operation that could in no way interfere with the build-up or execution of Operation Barbarossa. As such, the planning timeline and resources available were severely limited, as units were either already moving into place for Barbarossa or would have to redeploy in the middle of Operation Mercury. After issuing the order on April 25, the tentative D-Day was May 20, giving Student less than a month to plan and prepare the largest airborne assault at that point in history. Furthermore, Student faced numerous constraints such as reduced lift support, non-organic air landing units, and logistical and basing

---

<sup>42</sup> Antill, 63.

<sup>43</sup> Ibid., 65.

requirements that could not interfere with the build-up of German capacity for Operation Barbarossa.<sup>44</sup>

The most important element of operational art debated in the planning phase of Operation Mercury, and the one that would ultimately lead to the near failure of the operation, was that of mass. US Army doctrine states that mass should “concentrate the effects of combat power at the most advantageous place and time to produce decisive results.”<sup>45</sup> The high command of the Luftwaffe, who controlled both the airborne forces and transports, had disagreements on how to achieve mass against the decisive point. On one hand, General Student envisioned a dispersed attack of paratroopers across the entire northern coast of Crete that would land near seven key objectives and secure them near simultaneously.<sup>46</sup> The advantage to this plan was that it would force General Freyburg to keep his defenses dispersed and prevent him from leveraging one large counterattack force. The disadvantage to this course of action was that it would spread the paratroopers thin at each location, making it easier for local forces to retain the key terrain and, furthermore, required significant synchronization of the air schedule, since there were not enough aircraft to transport all paratroopers in one lift. Modern US Army doctrine notes that multiple drop zones “creates a number of small airheads in the objective area. This method supports the principle of mass by placing the maximum number of paratroopers in the objective area in the minimum amount of time.”<sup>47</sup> Therefore, the operational artist choosing this method can achieve mass, as Student favored, by spreading out the number of drop zones and the defensive forces allocated to each.

General Alexander Lohr, General Student’s immediate superior and overall commander of the operation, held an opposing position. Lohr suggested that the entire airborne force should be concentrated

---

<sup>44</sup> Antill, 32.

<sup>45</sup> Army Doctrine Publication (ADP) 3-0, *Unified Land Operations* (Washington, DC: Government Printing Office, 2012), 4-2.

<sup>46</sup> Kiriakopoulos, 89.

<sup>47</sup> Field Manual (FM) 3-99, *Airborne and Air Assault Operations* (Washington, DC: Government Printing Office, 2015), 4-10.



on one objective near Maleme airfield to maximize the effort at one location. Of course, this would negate some of the drawbacks imposed by the lack of aircraft and it would have maximized the chances of success in securing an airfield, which was vital to enable the follow on reinforcements provided by the air landed troops of the mountain division.<sup>48</sup> The drawback to massing the available combat power this way was that it would give time to the defenders to pull forces from elsewhere around the battlefield to make a concerted counterattack against a single point with vastly superior numbers. Modern US Army doctrine notes that a single drop zone “allows the assaulting unit to assemble quickly and mass combat power against the enemy.”<sup>49</sup> Lohr’s concept, like Student’s plan, achieves mass from a US Army doctrine perspective and is therefore viable as an option for an airborne assault.

Ultimately, both sides had to accept a compromised landing plan imposed by Reichsmarschall Hermann Goering, who decided that there would be two major assaults. The first, scheduled for the morning of D-Day, would drop Operations Group West and half of Operations Group Center on the western half of the island. The afternoon assault would drop the second half of Operations Group Center and Operations Group East on the eastern half of the island. Neither Student nor Lohr favored this method since it would neither achieve surprise nor provide enough combat power in any one location to ensure decisive success.<sup>50</sup> While both Lohr’s and Student’s landing plans adhered to the US Army principle of mass in an airborne assault, the compromised landing plan negated the surprise achieved by Student’s plan and the overwhelming force concentrated against a single point in Lohr’s plan.

One key concept from Operation Mercury, and the German argument over the landing plan, is that the landing plan determines how to achieve the principle of mass for an airborne assault. The operational artist must envision a landing plan that enables the swift massing of combat power for

---

<sup>48</sup> Kiriakopoulos, 90.

<sup>49</sup> FM 3-99, 4-10.

<sup>50</sup> Kiriakopoulos, 90.

execution of the follow on ground tactical plan.<sup>51</sup> That mass aims at achieving the operation's decisive point, which for a unilateral airborne operation is usually an airfield that enables air landing for armor, artillery, and reinforcement infantry. Simply dropping troops in packets across the operational area violates the principle of mass in this type of operation, because there is not enough combat power in any location sufficient to achieve a decisive action. Both Student's and Lohr's landing plans, though different, would have achieved the principle of mass. The compromised landing plan did not, and nearly resulted in the complete annihilation of the German airborne force on Crete.

Using operational framework as a lens, Operation Mercury provides some valuable lessons in terms of air and sea superiority during unilateral airborne operations. The organization of the battlefield framework can enable the isolation of an objective area for the airborne assault force through the utilization of joint partners. Therefore, it is important to study how the Germans organized the battlefield framework for Operation Mercury and subsequently utilized the Luftwaffe to isolate Crete to set conditions for the success of the airborne assault forces. The framework chosen for this analysis will be the Deep-Close-Security (DCS) framework as it is typically associated with terrain orientation and the deceive point on Crete was terrain-based.<sup>52</sup>

ADRP 3-0, *Unified Land Operations*, denotes three types of DCS frameworks. Operation Mercury exemplifies the modern definition of a non-contiguous, non-linear framework (Figure 1).<sup>53</sup> Though German planners obviously did not view battlefield frameworks in the modern sense, the Germans did exemplify how an effective DCS framework can enhance operations. The Germans controlled the European coastlines in Italy and Greece, as well as the Libyan coastline, but the British generally had naval superiority in the Mediterranean. As Crete was located in the middle of

---

<sup>51</sup> FM 3-99, 5-1.

<sup>52</sup> Army Doctrine Reference Publication (ADRP) 3-0, *Unified Land Operations* (Washington, DC: Government Printing Office, 2012), 1-10.

<sup>53</sup> *Ibid.*, 1-10.

Mediterranean, it meant the Germans could not operate with a contiguous fighting front. As a result, follow-on forces and supplies had to either air land onto a secured airstrip on Crete, drop into a secured drop zone, or risk an amphibious assault through enemy-controlled waters.

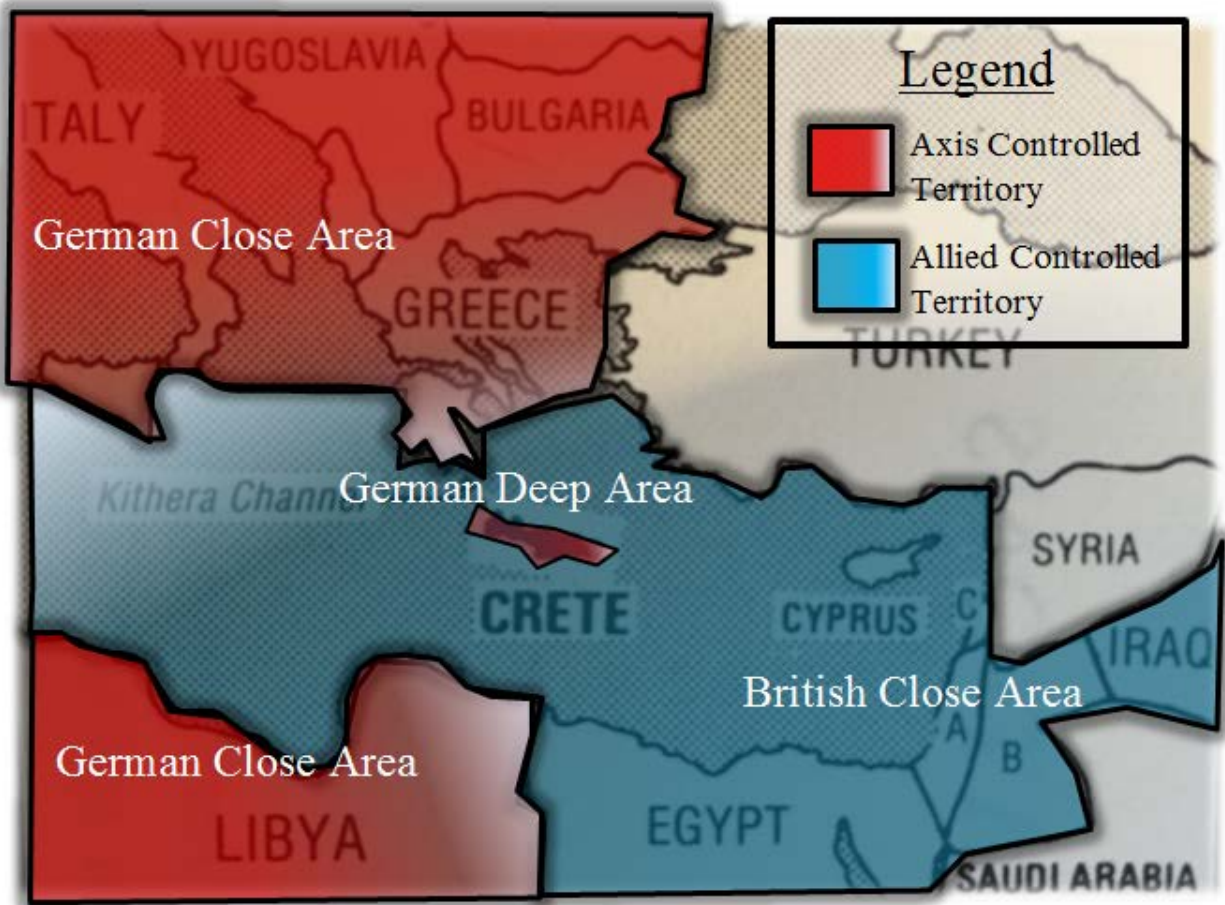


Figure 1: German Operational Framework for Operation Mercury

Source: Graphics produced by author. Map retrieved from Callum MacDonald, *The Lost Battle: Crete 1941* (New York, NY: The Free Press, 1993), x.

As planning for Operation Mercury began, Student had to isolate the objective areas and reduce enemy capabilities on Crete. Knowing the German and Italian naval forces would be unable to defeat the two heavy flotillas the British amassed on the western approaches to Crete, Student turned instead to the

Luftwaffe to isolate the island.<sup>54</sup> Bombing runs on Crete intensified in the first three weeks of May 1941 and produced significant results. Of the 27,000 tons of supplies destined for Crete's defenders during those first three weeks, only 2,000 tons reached the island.<sup>55</sup> Furthermore, the Luftwaffe had been so effective bombing British naval forces during daylight hours that the British navy was restricted to nighttime operations in and around Crete.<sup>56</sup> The ability to isolate Crete during daylight hours was one of the primary driving factors in Student's decision to launch the airborne assault during daylight hours rather than conduct a night time assault. Despite the Luftwaffe's ability to disrupt British naval operations, there was almost no chance that they would be able to prevent the British from destroying any German attempt to execute an amphibious assault to reinforce the airborne effort. In spite of Hitler's insistence on an amphibious landing force, Student had placed almost no emphasis on reinforcements coming through the Kithera Channel and past the British flotilla.<sup>57</sup>

The Luftwaffe isolated Crete by preventing Allied reinforcement by sea, disrupting Allied resupply operations, and setting conditions for the airborne assault. The Luftwaffe also provided devastating close air support throughout the operation while neutralizing British naval support to assist the beleaguered defenders, despite the fact that the entire operation took place near the coast and well within naval surface fire range. Paul Kennedy, a noted World War II historian, highlighted the importance of air superiority at Crete when he stated:

“But the British, having completely intimidated the Italian fleet earlier, did have command of the sea, and Crete was an island. Without airpower, however, that mattered little. The German landing of 3,000 paratroops around Maleme on May 20 unhinged the defending battalions, and the Luftwaffe heavily punished the Royal Navy's efforts to either reinforce the garrison or, just a couple of weeks later, pull off the exhausted troops.”<sup>58</sup>

---

<sup>54</sup> Sadler, 62

<sup>55</sup> Ibid., 61.

<sup>56</sup> Ibid., 62.

<sup>57</sup> Ibid., 47.

<sup>58</sup> Paul Kennedy, *Engineers of Victory* (New York, NY: Random House Publishing, 2013), 226.

After isolating Crete through fighter and bomber operations, the Luftwaffe also delivered all German reinforcements to the island. As the Maleme airhead expanded on the evening of May 21, Ju-58s began to land the desperately needed reinforcing elements of Fifth Mountain Division under General Ringel.<sup>59</sup> This was the turning point in the Battle of Crete, made possible because of the ability of the Germans to operate jointly, reflected in their synchronization and integration of the Luftwaffe and ground forces. Despite a non-contiguous battlefield framework, the Germans were able to leverage their air superiority to negate the risk imposed by the British fleet operating in their deep area. This proved to be one of the most decisive factors in the operation.

For an operational artist, the development of the operational framework is of the utmost importance. Unilateral airborne operations take place in deep battlespace, for if they took place in the close battlespace, they could be reinforced by ground efforts and would not be unilateral. Crete demonstrated that for these types of operations to succeed, at a minimum, assaulting forces must achieve local air superiority over the deep operational area. The greater the degree of air control, the deeper the operations can occur, a concept expressed in US Army doctrine: “At a minimum, the joint force must neutralize the enemy’s offensive air and missile capability and air defense to achieve local air superiority and protection over the planned lodgment... Air interdiction of enemy forces throughout the operational area enhances the simultaneity and depth of the forcible entry operation.”<sup>60</sup>

The Germans themselves, in their postwar assessments, argued for air superiority over deep battlespace as a precursor for a unilateral airborne assault. In a historical appraisal conducted for the US European Commander after World War II, a group of German general officers conducted an appraisal of German airborne operations during the war. They noted that, “The second consideration- and this is

---

<sup>59</sup> Palazzo, 108.

<sup>60</sup> FM 3-99, 1-2.

especially important for airborne operations- is that at least temporary and local air superiority is an absolute necessity. This factor has a decisive influence upon the selection of the objective, at least as far as distance is concerned.”<sup>61</sup> The organization of the operational framework determines the depth that the unilateral airborne assault can occur because it determines how naval and air force assets can be used to achieve air superiority.

Operation Mercury provides tremendous insight into how the operational art principle of the decisive point is important in unilateral airborne assaults. A decisive point is “a geographic place, specific key event, critical factor, or function that, when acted upon, allows a commander to gain a marked advantage over an adversary or contributed materially to achieving success.”<sup>62</sup> While Student and Lohr both acknowledged the decisive point as the seizure of an airfield on Crete, the compromised planning guidance issued by Goering nearly prevented the Germans from achieving the decisive point.

The seizure of an airfield was the decisive point for Operation Mercury, as it would enable follow on forces to air land. These follow-on forces provided the heavy equipment, artillery, and reinforcements necessary to transition the German effort from defensive to offensive operations. However, Operation Mercury had several planning shortfalls that hindered the Germans from achieving the decisive point. First, as discussed above, the Germans did not plan to mass at a single airfield, which delayed their seizure of any aerial lodgment.<sup>63</sup> This was due in part to General Student’s preference for an “oil spot” drop strategy, which kept defenders spread out in order to prevent them from massing one large counter-

---

<sup>61</sup> *Airborne Operations: A German Appraisal* (Washington, DC: Government Printing Office, 1989), 3.

<sup>62</sup> Joint Publication (JP) 5-0, *Joint Operation Planning* (Washington, DC: Government Printing Office, 2011), III-26.

<sup>63</sup> *Airborne Operations*, 5.

attack.<sup>64</sup> German Field Marshall Albert Kesselring, the commander of Command Group West at the end of the war, noted “The exceptionally unfavorable landing conditions [on Crete] should have induced them to land in a single area away from the occupied objectives with their effective defense fire, and then to capture the decisive points (airport and seaport) intact in a subsequent conventional infantry attack at the point of main effort.”<sup>65</sup> Student’s defensively minded strategy delayed the seizure of any airfield on the northern coast of Crete.

A second problem with Crete planning was that the forces dropped at each airfield objective were not large enough to both seize the objective and expand the lodgment. Furthermore, the Germans did not plan to air land the Twenty-Second Infantry Division, which was their specially trained and equipped force designed specifically for air land operations, immediately following an airborne assault. The air landed troops of Fifth Mountain Division were not suited, trained, or equipped to expand an aerial lodgment. As the German after action report noted, “Air-transported troops can be committed only if the success of landing and unloading is guaranteed by a sufficiently large landing zone. These troops are not suited to the purpose of capturing an airhead...The logical conclusion to be drawn from this lesson [Crete] is that parachute troops, who capture the airhead, must be increased in number and supplied with more fire power.”<sup>66</sup> General Student’s oil spot strategy was ill suited to provide the requisite force necessary to secure the decisive point.

These two lessons from German operations on Crete provide the key insights with respect to decisive points. In a unilateral airborne assault, the seizure of an aerial lodgment will most likely be the decisive point of the operation. Therefore, the airborne assault force tasked with seizing the airhead and

---

<sup>64</sup> General Student’s oil spot strategy referred to the idea of oil drops in water. Over time the oil begins to dissipate outwards and grow until eventually they touch one another. He used the metaphor to denote that the German paratroopers would initially drop into isolated locations but would overwhelm local defenses and begin to merge as they assaulted towards their objectives.

<sup>65</sup> *Airborne Operations*, 20.

<sup>66</sup> *Ibid.*, 16.

expanding it must have sufficient combat capability to seize the objective initially and then expand the lodgment.

Subsequently, the airborne assault force must be able to protect the lodgment by defeating enemy counterattacks. Parachute infantry units lack significant anti-armor or heavy weapon capability. Therefore, a unilateral airborne assault plan must address how to defend the decisive point, usually an airfield, in the face of enemy armored defenses and counter attack forces. Fortunately for the Germans, the defenders on Crete had only nine Matilda tanks, which only carried armor piercing rounds that were ineffective against infantry, and sixteen Mark VIB tanks.<sup>67</sup> Armored resistance can quickly overwhelm a light infantry force attempting to seize an airfield, but if the operational artist has established the battlefield framework correctly, close air support will partially mitigate armored threats and key terrain will enable airborne forces to establish defense positions that minimize the advantages of armored forces. Operational artists should select airfield objectives that afford both a large enough drop zone to accommodate the force necessary to gain and maintain the decisive point while affording terrain capable of establishing strong defensive positions that can be supported by air force and naval assets.

Operation Mercury is a superb case study for operational artists examining a unilateral airborne assault. While the German operation was ultimately successful, there are numerous lessons planners can learn from this operation. Operational artists should focus on mass, battlefield framework, and decisive points as the major factors that will largely determine the success or failure of a unilateral airborne assault.

---

<sup>67</sup> Antill, 24.



## Case Study 2: Operation Dragoon

### The Importance Operation Dragoon for Operational Artists

Operation Dragoon, the 1944-Allied invasion of Southern France, is an important case study for a number of reasons.<sup>68</sup> It represented the first joint forcible entry operation in which an airborne assault actually had operational success in shaping the situation for the amphibious force. Though it was not the first operation to combine these types of assault forces, it was, arguably, the most successful. Until Operation Dragoon, the Allies experienced marginal success at utilizing airborne forces as anything more than diversionary forces. Airborne assault examples include Operation Husky, the Allied invasion of Sicily, and Operation Overlord, the Allied invasion of Normandy. Though both these previous operations were successful, assaulting forces had difficulty achieving synergistic effects between airborne and seaborne forces. In the case of Operation Neptune, the dispersion of paratroopers forced them to fight “the Germans in small, uncoordinated groups.”<sup>69</sup> In effect, the paratroopers served as more of a disruption force than a serious shaping operation. However, Operation Dragoon “set the standard for US airborne operations.”<sup>70</sup> By dropping nearly sixty percent of paratroopers on or near their drop zones, the airborne forces not only overcame local defenses at the tactical level, but also, more importantly, successfully achieved operational success by isolating the amphibious forces’ objective.<sup>71</sup> Ultimately, Operation Dragoon proved the doctrinal precept that airborne operations could enable amphibious operations in a

---

<sup>68</sup> The initial codename given to the plan was Operation Anvil but Allied planners switched it to Operation Dragoon after learning that Germans had compromised the codename Operation Anvil. Literature refers to this operation as Operation Anvil, Operation Anvil/Dragoon, and Operation Dragoon. This paper will only reference it as Operation Dragoon to prevent confusion.

<sup>69</sup> John David Colwell Jr., “Soldiers from the Sky: A Comparison of German and US Airborne Doctrinal Development during World War II” (master’s thesis, Hawaii Pacific University, 2005), 102.

<sup>70</sup> *Ibid.*, 105.

<sup>71</sup> *Ibid.*

joint forcible entry capacity.

A second reason Operation Dragoon is a superb case study is that it fundamentally changed the Allied understanding of joint operations and airborne assault timings, the lessons of which are still central concepts in US airborne doctrine today. The Germans learned from Operation Mercury that daylight drops were possible, indeed preferred to nighttime drops, but were only feasible if assaulting forces had air superiority. After Operation Dragoon, the Allies learned this lesson as well. The success of the airborne forces was due largely to the fact that the airborne drops occurred just before daybreak. The ability to consolidate in daylight made concentration quicker since the airborne forces had been somewhat dispersed because of pathfinder teams being unable to establish navigational equipment on the drop zones.<sup>72</sup> The daylight allowed rapid concentration of airborne forces that were then successful in achieving tactical and operational objectives. The Allies had long believed nighttime drops were safer because it reduced the threat to aircraft from both Axis ground and air based air defense systems. In this case, Allied air superiority over southern France enabled bomber aircraft to conduct weeks of preparatory bombardments allowing near daylight airborne drops that reduced risk to the overall airborne plan.

For the modern operational planner, the concepts forged after Operation Dragoon are important for the employment of airborne forces today. General David Perkins, commander of US Army Training and Doctrine Command, outlined the Army's contribution to future fights in the "complex environment" (Figure 2).<sup>73</sup> The 2015 US Army Operating Concept highlights the need for joint forcible entry capabilities and operations in the depth of the combined and joint area of operations (CJOA). General Perkins' graphic assumes that the US Army and joint airborne forces will achieve depth in the CJOA and

---

<sup>72</sup> Huston, 191.

<sup>73</sup> David Perkins, "The Army Operating Concept" (lecture, US Army School of Advanced Military Studies, Kansas, July 17, 2015).

shape the forcible entry in coordination with the US Marine Corps.<sup>74</sup> Furthermore, airborne assaults are capable of achieving several of the concepts identified in the same graphic (see the bullet notes highlighted on the left side of Figure 2). This concept, while adapted to the contemporary operating environment, is no different from Operation Dragoon’s basic premise for achieving forcible entry and challenges associated with its implementation. Therefore, Operation Dragoon provides operational artists key lessons regarding how to employ the operational design principle of effects and the operational art principle of phasing and transitions.



Figure 2: Win in a Complex World Graphic

Source: Graphics produced by author. Image retrieved from General David Perkins, *Army Operating Concept and Force 2025 & Beyond* (Fort Eustis, VA: Government Printing Office, 2014).

<sup>74</sup> In Figure 2, red dashed lines highlight the airborne units and the US Marine Corps amphibious forces are marked by a red dashed box. Their axes of advance merge in the Joint Forcible Entry Objective, denoted by the solid red box.

## Strategic Context of Operation Dragoon

Toward the end of 1943, the Axis situation in Europe had begun to turn in favor of the Allies. British and US forces launched Operation Avalanche in September 1943, which resulted in the successful invasion of the European mainland in southern Italy. Additionally, the Soviets defeated the German invasion and launched a counterattack, which was driving German forces back across the Soviet steppe. With Allied forces now in a position to begin an offensive phase in mainland Europe, the Allied nations met for the Cairo-Tehran Conferences at the end of November 1943 to discuss the subsequent Allied plans for the Western Front.<sup>75</sup> At this point in time, the British still favored a strategy of peripheral attacks, while the United States favored a direct assault into France. The Soviet Union, eager to relieve some of the pressure on the Eastern Front, sided with the United States, and the great powers agreed to simultaneous invasions of northern and southern France, respectively named Operation Overlord and Operation Dragoon.<sup>76</sup>

Planning by Allied Headquarters immediately began, but the situation in Italy forced a delay to Operation Dragoon. As Allied forces advanced northward toward Rome, they met stiff resistance along the German Gustav Line.<sup>77</sup> This resistance halted the Allied advance. Allied planners now faced two problems. First, there was a shortage of amphibious troop transports available for Operation Dragoon since most had moved north to participate in Operation Overlord. Second, since the Allied advance had bogged down in Italy, the required ground forces could not extricate themselves from the Gustav Line and had no location to train and prepare for the invasion of southern France. Consequently, the Allies

---

<sup>75</sup> Combat Studies Institute, "Operation Anvil/Dragoon" (Leavenworth, KS: Government Printing Office, 1984), 11.

<sup>76</sup> *Ibid.*, 11.

<sup>77</sup> The Gustav Line was a series of German defensive belts in Italy that ran from the west to east across the country. These defensive positions were difficult for Allied forces to defeat because the Germans tied into the canalizing and mountainous terrain to great effect. Allied forces had to spend tremendous amounts of time and resources clearing individual defensive positions.

“decided to shelve the plan [Operation Dragoon] and concentrate on a decision in the battle for Rome.”<sup>78</sup>

The Allies successfully broke through the Gustav Line in May 1944 and executed Operation Overlord in June 1944, thereby providing the opportunity to revisit Operation Dragoon.

Despite a successful assault in northern France, the Allies progress there slowed due to the terrain and German defenses. However, the Allied forces in the south had finally seized Rome and were pursuing a disorganized and retreating German Army up the Italian peninsula. With the necessary forces now free to execute Operation Dragoon, and with no competing requirements, the Allies had the necessary troop transports and personnel necessary to execute Operation Dragoon. Accordingly, in May 1944, General Alexander Patch assumed command of the US Seventh Army.<sup>79</sup> The Allied Headquarters told General Patch the purpose of Operation Dragoon was:

“(1) to assist the Normandy attack by engaging German forces that might otherwise be used in northern France; (2) to capture a major port through which large-scale reinforcements could flow; (3) to liberate France; and (4) to join up with the cross-channel invasion for the decisive battle with the German armies of the west.”<sup>80</sup>

The date for the operation was set for the middle of August 1944. The Allies saw Operation Dragoon as a way to acquire alternate deep-water ports that could serve the Allied offensive while simultaneously stretching German defenses on the Western Front and preventing concentration against the forces bottled up in Normandy.

One of the ironies of Operation Dragoon is that in spite of the highly successful outcome, there were numerous factors working against the Allies. The German defenders in southern France were rested, solidly entrenched on the beachheads, and well informed of Allied intentions. Field Marshall Kesselring

---

<sup>78</sup> “The AAF in the Invasion of Southern France” (Washington, DC: Government Printing Office, 1992), 4.

<sup>79</sup> Jacob Devers, “Operation Dragoon: The Invasion of Southern France,” *Military Affairs* 10, no. 2 (Summer 1946): 9.

<sup>80</sup> “The AAF in the Invasion of Southern France,” 3.

and his intelligence officers had noticed the departure of several US units from the pursuit of German forces in northern Italy. In fact, Kesselring's intelligence section noticed the disappearance of "many elite paratrooper and commando-type units and three first-rate infantry divisions from Lt. Gen. Mark W. Clark's Fifth Army."<sup>81</sup> Further intelligence had identified these units as conducting rigorous parachute and amphibious training. Kesselring rightly assumed that the Allies were planning some sort of amphibious assault into southern Europe. This led historians to call Operation Dragoon "the worst kept military secret of the war."<sup>82</sup>

The Germans had several other advantages in southern France. First, the German 19th Army had faced relatively little opposition in the southern sector of France. Second, the 19th Army received a new commander, General Friedrich Wiese, just three months prior, who was widely known as a solid tactician and capable commander. Furthermore, Hitler, unsure of the state of the southern defenses, charged Field Marshall Erwin Rommel to oversee the Atlantic and Mediterranean coastal defenses. Rommel inspected the "South Wall" in France in May 1944. Realizing the defenses to be highly inadequate, Rommel ordered the coastal defenses in the area strengthened immediately. From May until the assault in August, Axis forces worked feverishly on the one hundred mile sector of coastline between Nice and Marseilles. During that time, they had enhanced all coastal fortifications, mined the waters and shoreline of any beach capable of supporting landing craft, and dug miles of trench lines to watch over the beachheads. Furthermore, Wiese, believing an airborne assault would precede any invasion, had ordered that suitable drop zones be sown with impaling stakes to kill paratroopers and destroy gliders.<sup>83</sup> Though not fully complete at the outset of Operation Dragoon, the Allies faced a formidable defensive network and capable

---

<sup>81</sup> William Breuer, *Operation Dragoon: The Allied Invasion of the South of France* (Novato, CA: Presidio Press, 1987), 33.

<sup>82</sup> *Ibid.*, 22.

<sup>83</sup> *Ibid.*, 25.

defenders.

Despite the superb intelligence and motivation from General Rommel, the German defenders also had several weaknesses. First, General Weise had lost three of his divisions, which the German Army tasked to support their defensive operations in Normandy.<sup>84</sup> Since Wiese had to cover the majority of the southern French coastline, he only had three of his eight remaining divisions east of the Rhone River in a position to defend what would be the future Allied objective areas. Second, Hitler had ordered Wiese to hold the French Riviera at all costs. He had also ordered static defensive positions at the beachheads, despite the fact that the terrain was more canalizing to the north and favored a mobile defense. Hitler reinforced his poor defensive decision emphatically to General Wiese when Wiese assumed command of 19th Army. Hitler stated, “There will be no withdrawal. If anything happens along the Riviera you will fight to the last man and the last bullet! Do you fully understand, Herr General?”<sup>85</sup> A third factor was that the 11th Panzer Division, the only armored division in the 19th Army and primary counterattacking force, was located on the western bank of the Rhone River. When ordered to the beachheads on D-Day, 11th Panzer Division would face an onslaught of Allied fighter-bombers and a large wet gap crossing, near Avignon, which effectively prevented their involvement in the German defense against the forcible entry portion of Operation Dragoon (Figure 3, Item 1). Lastly, General Wiese only had 186 planes to provide close air support and defensive counter air. This extremely small Luftwaffe showing faced, as Wiese’s intelligence reported, an Allied air force numbering almost 2,000 warplanes.<sup>86</sup>

#### Allied Execution of Operation Dragoon

Though Operation Dragoon’s initial framework began in 1943, the approval for the order came in

---

<sup>84</sup> Breuer, 22.

<sup>85</sup> Ibid., 24.

<sup>86</sup> Ibid., 23.



July 1944 with an August execution timeframe, giving Allied planners only one month to finalize the plan. The operation called for US VI Corps to conduct an amphibious assault with three infantry divisions and one French armored brigade across three beaches on the southeast coast of France. After successfully establishing a beachhead, these forces would secure the deep-water ports of Toulon and Marseilles and clear the Germans from the remainder of southern France (Figure 3).<sup>87</sup>

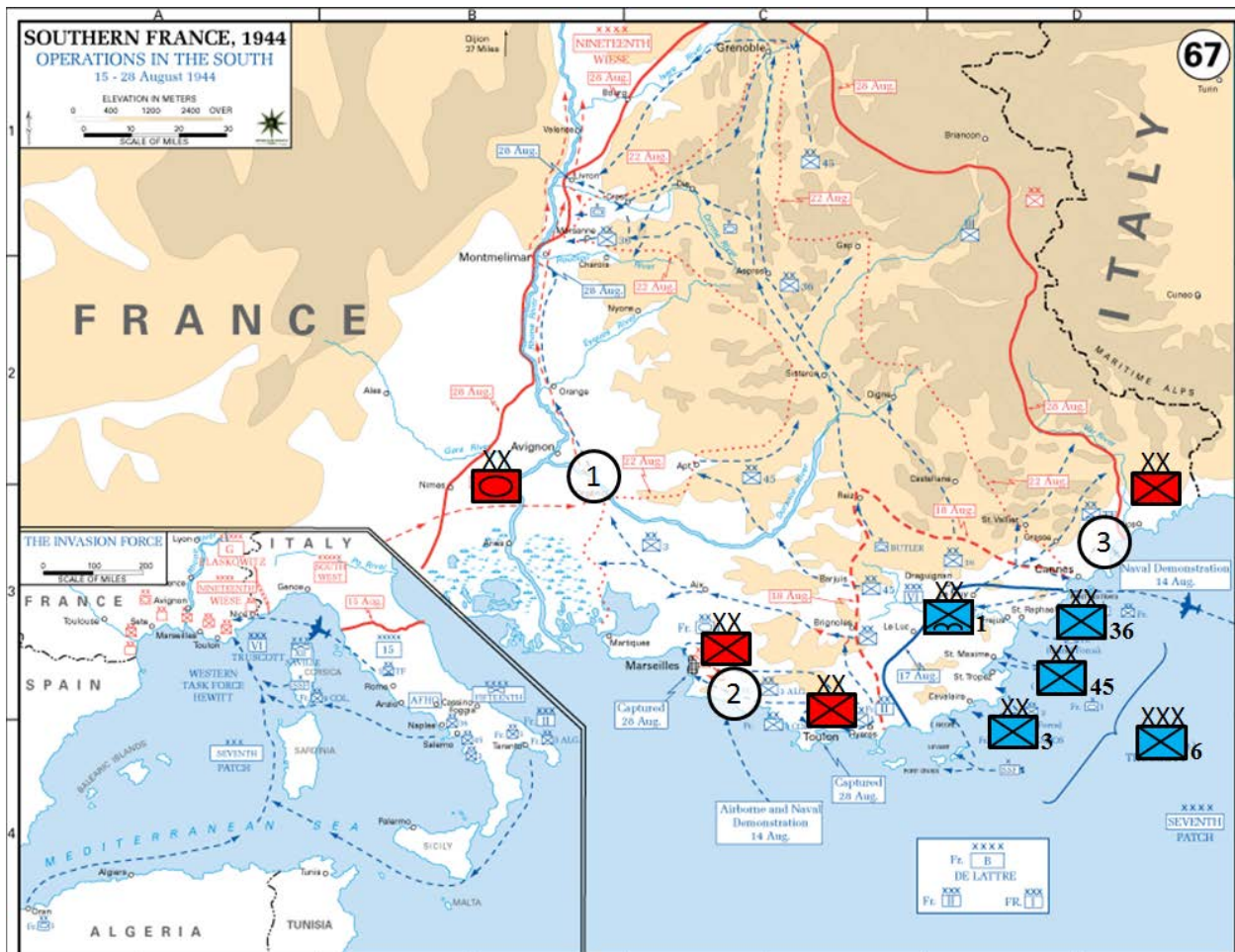


Figure 3: Operation Dragoon, the Allied Invasion of Southern France

*Source:* Graphics added by author. Image retrieved from US Military Academy at West Point History Department, *Map of Operations in Southern France: 15-28 August 1944* (West Point, NY: Government Printing Office, 2015).

<sup>87</sup> Combat Studies Institute, 35.



In order to isolate the amphibious landing areas, VI Corps created an ad hoc provisional airborne division named First Airborne Task Force and Brigadier General Robert Fredrick assumed command of the unit. The FABTF pulled together roughly a division-sized unit comprised of US 517th Parachute Infantry Regiment (PIR), 2nd British Parachute Brigade, the separate US 509th Parachute Battalion (PIB), and various enabler companies and battalions such as artillery, chemical, and anti-tank units.<sup>88</sup> These units had never trained or worked together and had little over a month to prepare for their airborne assault. Since the beachheads could only be accessed via two road networks, one running north through Le Muy and one running west through Les Arcs, the primary objective of the FABTF was to seize these towns to block German reinforcements attempting to interdict the amphibious assaults (Figure 4).

The operation began on August 14, 1944 when the First Special Service Force assaulted onto the islands of Port Cros and Levant in order to disable German coastal guns.<sup>89</sup> Since these guns could range all three amphibious assault beaches, commandos silenced them prior to the arrival of the amphibious force.<sup>90</sup> The Allied planners, eager to syphon off German resistance at the beachheads, conducted two feint operations. The first occurred east of the landing areas near the port of La Ciotat (Figure 3, Item 3). The Allied navy conducted a feint with eight PT boats to deceive the Germans as to the actual landing locations. The dispersed nature of the PT boats, coupled with metal strips dropped from British aircraft, deceived German radar as to the actual number of boats.<sup>91</sup> The Allies conducted one additional feint west of the landing beaches in-between Toulon and Marseilles with five C-47 aircraft dropping roughly six hundred dummy paratroopers with noisemakers (Figure 3, Item 2). German units in the area immediately

---

<sup>88</sup> Thomas Taylor, "The Airborne Invasion of Southern France – Operation Dragoon," The 517<sup>th</sup> PIR Homepage, accessed December 3, 2015, [http://www.517PIR.org/documents/airborne\\_invasion/airborne\\_invasion\\_history.htm](http://www.517PIR.org/documents/airborne_invasion/airborne_invasion_history.htm).

<sup>89</sup> The First Special Service Force was a joint US-Canadian commando unit designed to conduct non-standard missions.

<sup>90</sup> Combat Studies Institute, 35.

<sup>91</sup> Breuer, 102.

sent up a report that “thousands” of paratroopers had landed near the ports. At his headquarters, General Wiese was confused as to the location of the actual Allied assault location. By 0400, “An Allied force had landed at the twin islands of du Levant and Port-Cros and were fighting there. Other heavy clashes had erupted on towering Cap Negre, and the Germans decimated a French naval assault unit near Cannes. A fleet had steamed into the bay at La Ciotat, turned and headed back out to sea, and large numbers of paratroopers had been dropped north of Toulon.”<sup>92</sup> The Germans sent a sizeable force to deal with the paratroopers in the west and awaited the hammer strike of the Allied assault.

While the Special Service Force and demonstration forces executed their operations, at 0030 on August 15, 1944, nine Pathfinder teams of FABTF departed Rome enroute to the French coast. At approximately 0330, all teams exited their aircraft. Unfortunately, for the FABTF, a heavy fog had settled in over the coast and the aircrews were navigating by time rather than by visual indicators. As a result, only the British pathfinder teams near Drop Zone O (Figure 4) had success in establishing the direction finding equipment for the follow on airborne assault main body. Although initial Pathfinder operations reported success, in actuality, the “pathfinder mission was less than 50 percent effective... On one of the three zones navigational aides were established according to plan. Pathfinder troops for a second zone dropped prematurely, but near enough to have aids in operation for some missions late on D-day. The serial intended for the other zones became lost and missed its mark by more than 10 miles.”<sup>93</sup> The failure of the US Pathfinder units to establish drop zone markings and radio direction finding equipment forced the aircrews of the follow-on airborne assaults to navigate and drop using timing and a limited number of visual terrain markings that were visible despite the blanket of fog below.

Just before 0300, the first formations of aircraft departed their airfields in Rome and began the

---

<sup>92</sup> Breuer, 105.

<sup>93</sup> John Warren, “Airborne Missions in the Mediterranean: 1942-1945” (Maxwell AFB, AL: USAF Research Institute, 1955), 95.

aerial movement to southern France. At approximately 0418, the paratroopers of 509th PIB, assigned to Drop Zone C, began Operation Albatross, the airborne assault phase of Operation Dragoon. Pathfinder teams assigned to Drop Zone Charlie failed to mark the drop zone and roughly half the battalion dropped outside the designated drop zone, with one company dropped as far as twelve miles from it.<sup>94</sup> As dawn broke on D-Day, Lieutenant Colonel William Yarborough, the battalion commander of the 509th PIB, had managed to assemble the majority of his battalion, seized the high ground south of Le Muy, and had established blocking positions along highway N7 to deny German forces from Le Muy the ability to reinforce German defenders on the beachhead (Figure 4).<sup>95</sup> Furthermore, 509th PIB had faced relatively little opposition during the drop and even less opposition from the Germans located in Le Muy. In after action reports the 509th PIB attributed this to the advantages of landing in mountainous terrain.<sup>96</sup>

Following closely behind 509th PIB was the 517th Parachute Infantry Regiment (PIR). Colonel Ruppert Grave, commander of 517th PIR, and his regiment began their airborne assault at 0430. Much like 509th PIB's experience, 517th PIR's pathfinder units had failed to mark the drop zones, which spread 517th PIR's battalions over an extensive area around Drop Zone Alpha (Figure 4). In fact, several battalions were still missing significant combat power at the end of D+1. 517th PIB for instance, only had 300 men twenty-four hours after the drop had occurred.<sup>97</sup> Despite the widely scattered drops, most units were able to consolidate rapidly since daylight broke soon after their landing, allowing these units to consolidate, orient on their objective, and execute their mission in daylight. The 517th PIR began blocking the northwest approach to Le Muy as well as the western approach.

Finally, the British 2nd Parachute Brigade began their assault into Drop Zone O (Figure 4) at

---

<sup>94</sup> Warren, 99.

<sup>95</sup> Breuer, 151.

<sup>96</sup> Warren, 102.

<sup>97</sup> *Ibid.*, 99.

0505. Their pathfinders had been able to establish equipment on the drop zone and consequently the British experienced a much higher degree of successful landings in and around the drop area.<sup>98</sup> They rapidly assembled and began their mission to isolate and seize Le Muy. By the middle of the afternoon on D-Day, the British had been successful in isolating the town but were unable to overcome German resistance there.

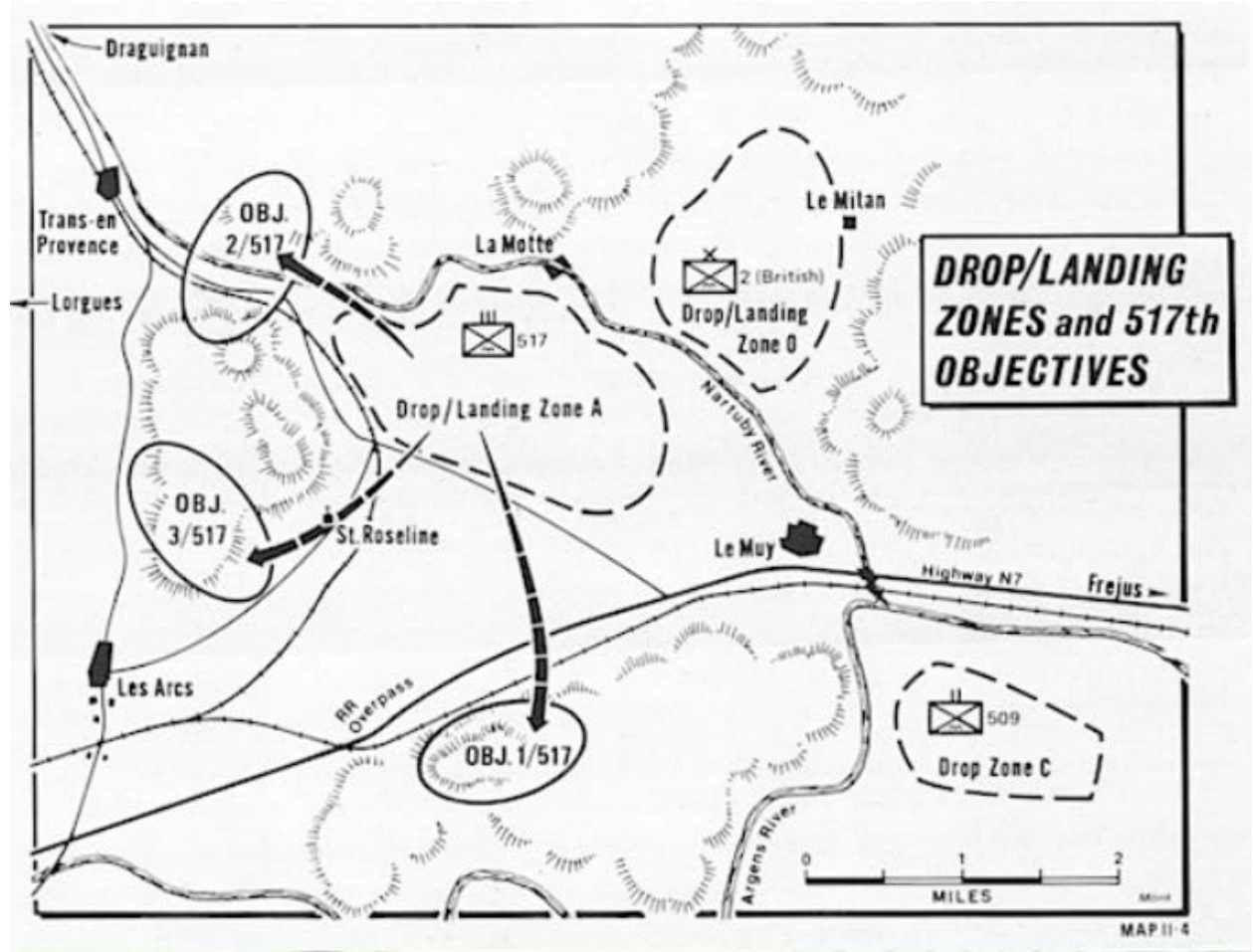


Figure 4: Initial Landing Plan for the First Airborne Task Force

*Source:* Image retrieved from Thomas Taylor, “The Airborne Invasion of Southern France – Operation Dragoon,” accessed December 3, 2015, [http://www.517PIR.org/documents/airborne\\_invasion/airborne\\_invasion\\_history.htm](http://www.517PIR.org/documents/airborne_invasion/airborne_invasion_history.htm).

<sup>98</sup> Warren, 100

The airborne forces were able to achieve the majority of their D-Day objectives rather quickly. Despite the British failure to capture Le Muy, the remainder of FABTF “quickly took Le Mitau, La Motte, Castron, and Les Serres by noon on D-Day.”<sup>99</sup> General Ferdinand Neuling, the German LXII Corps commander responsible for the Operation Dragoon sector of the French Riviera, had previously seen the strategic value of Le Muy and increased the number of German troops in the area. Despite this increase, the 550th Glider Infantry Battalion managed to seize the town by D+1.<sup>100</sup> In addition to seizing the key strategic town of Le Muy, the airborne forces created several other significant problems for the German defenders in the area. First, they had isolated Neuling’s Corps from the rest of 19th Army. Second, airborne troops and Allied bombers had cut the majority of the Wehrmacht’s telephone lines preventing communication between the German Corps and 19th Army headquarters. Lastly, airborne troops were capturing the motorcycle dispatch riders Neuling was using as an alternate communication method to provide direction to his units near Le Muy. More importantly, General Weise was still unsure of the Allied landing area as reports from the field, prior to the loss of communication with German Army Group G, indicated major paratroop drops near Toulon and Le Muy.<sup>101</sup> Consequently, the Germans were hesitant to move forces. Even the decision to move 11th Panzer Division to support LXII Corps was a gamble based on German intelligence at the time.

As the airborne troops began assaulting their objectives, the decisive operation of Operation Dragoon launched. At 0800, three infantry divisions began an amphibious assault onto the Riviera coastline (Figure 3). The amphibious assault went exceedingly well and faced little opposition. General Jacob Devers, an Allied planner for Operation Dragoon and soon to be commander of 6th Army Group, noted, “during the assault and clearing of the beaches, serious organized resistance was encountered only

---

<sup>99</sup> “The AAF in the Invasion of Southern France,” 38.

<sup>100</sup> Breuer, 206.

<sup>101</sup> Ibid., 184.

at one spot – St. Raphael. This was rapidly overcome by the 36th Division, as the full measure of the surprise was realized.”<sup>102</sup> On the morning of D+1, elements of 45th Division linked up with airborne forces in Le Muy, effectively ending the airborne involvement with Operation Dragoon.

#### Operation Dragoon and Operational Art

There are several key lessons operational planners can learn from Operation Dragoon’s airborne assault. Despite the fact that the airborne assault was small compared to other joint forcible entry operations, utilizing only one division as opposed to three in the case of Operations Neptune and Market Garden, it proved the utility of airborne assaults as part of a joint forcible entry operation. Furthermore, with only one US Army division still on airborne status, it is likely that the mission parameters of Operation Dragoon will resemble future parameters given to 82nd Airborne Division, should a joint forcible entry occur. Therefore, Operation Dragoon can provide the operational artist with lessons regarding the operational design principle of effect as well as the operational art concept of phasing and transitions.

Joint Publication 5-0, *Joint Operation Planning*, defines effects as “a physical and/or behavior state of a system that results from an action, a set of actions or another effect. A desired effect can also be thought of as a condition that can support achieving an associated objective...”<sup>103</sup> The key in this definition is that an effect is a condition that supports an objective. In this case, the airborne assault’s effects should enable the amphibious assault to achieve its objective.

FM 3-99, *Airborne and Air Assault Operations*, identifies twelve key principles for successful

---

<sup>102</sup> Devers, 29.

<sup>103</sup> Joint Publication 5-0, *Joint Operation Planning* (Washington, DC: Government Printing Office, 2011), III-20.

joint forcible entry operations.<sup>104</sup> An operational artist can utilize the effects provided by an airborne assault to achieve several of these, as demonstrated by Operation Dragoon. Foremost among these are the airborne assault's ability to isolate the lodgment. FM 3-99 notes isolating the lodgment "makes the continuous landing of troops and material possible and provides maneuver space for subsequent operations."<sup>105</sup> This is arguably the most likely effect of an airborne assault in a joint forcible entry operation. In the case of operation Dragoon, the FABTF secured the only access roads to the beachheads and established blocking positions capable of delaying enemy reinforcements until the amphibious divisions were safely ashore and capable of maneuvering. General Devers reinforced this idea when he stated "the surprise achieved by the landings and cutting of communication lines by the airborne forces prevented proper employment of enemy mobile reserves..."<sup>106</sup>

In a similar vein, a second joint principle is to neutralize enemy forces within the lodgment area.<sup>107</sup> Depending on the size of the enemy opposition and the distance from the drop zones, the effect of an airborne operation can achieve this principle as well. In the case of Operation Dragoon, the FABTF was unable to neutralize opposition immediately on the beachhead, but was able to neutralize opposition in Le Muy. This proved critical as Le Muy represented a chokepoint that could have delayed the Allies while buying time for 11th Panzer Division to continue their march from the west. The US Army understood the concept of utilizing airborne forces to enable follow on forces. FM 31-30, *Tactics and Technique of Airborne Troops*, notes one of the missions of airborne operations is to "seize and hold key

---

<sup>104</sup> Field Manual (FM) 3-99, *Airborne and Air Assault Operations* (Washington, DC: Government Printing Office, 2015), 1-2.

<sup>105</sup> *Ibid.*, 1-3.

<sup>106</sup> Devers, 38.

<sup>107</sup> FM 3-99, 1-3.

terrain in the rear of organized beach defenses in conjunction with ground or naval operations.”<sup>108</sup>

Lastly, JP 5-0 identifies surprise as one of the twelve joint forcible entry principles. More importantly, JP 5-0 denotes that surprise depends upon operational security and military deception.<sup>109</sup> Though the operational security of Operation Dragoon was lacking, the military deception employed was superb. As it applies to this case study, the mere presence of airborne forces in a theater can enable deception operations for joint forcible entry purposes. As was noted above, General Wiese already had solid intelligence as to the size of the assault force in the Mediterranean and the time they would strike. What he lacked was the exact location of where the Allies would land. Believing that the Allies would strike for Toulon and Marseilles, the reports of airborne assaults near Toulon was not surprising to Wiese. The amphibious sites there were suitable and the depth of airborne assault seemed tactically sound. The presence of an airborne capability can cause the enemy to freeze activity for fear that any movement will enable the airborne force to attack an undefended area. The surprise employment of an airborne force, whether it is real or not, will aid in achieving an isolation effect because it can either draw forces away from the actual amphibious landing areas or delay enemy units from moving to reinforce the assaulted area. In the case of Operation Dragoon, “it is doubtful whether the diversion [dummy paratrooper drop] was of much immediate assistance to either the airborne or the amphibious landings. Its chief value lay in discouraging the rapid deployment of German troops and plans which were outside the invasion area to meet the situation.”<sup>110</sup> The airborne threat delayed German movements of reinforcements and bought time for the amphibious force to overwhelm the beachhead defenses and establish the lodgment.

Phasing and transitions are of the utmost importance when dealing with airborne forces. First, the

---

<sup>108</sup> Field Manual (FM) 31-30, *Tactics and Techniques of Airborne Troops* (Washington, DC: Government Printing Office, 1942), 31.

<sup>109</sup> JP 5-0, 1-2.

<sup>110</sup> Warren, 93.



concept of phasing will usually be necessary when conducting any airborne assault, and even more so when it is part of a joint forcible entry. Phasing allows operational artists to arrange “all tasks of an operation that cannot be conducted simultaneously.”<sup>111</sup> A joint forcible entry operation has two elements that will require phasing. The first involves how to sequence the airborne assault with the amphibious assault and the second involves sequencing a limited number of aircraft to deliver the paratroopers, supplies, and required equipment.

With respect to how to phase the amphibious and airborne assault, it is important to understand that whichever element assaults first will “tip off” the enemy. This will enhance the enemy’s ability to react to the other one. Consequently, the operational artist must understand that phasing will determine the depth of the airborne employment, the potential enemy resistance airborne forces will face, and the operational reach of airborne forces. Operation Dragoon exemplifies this argument well. The three choices to phase in an airborne assault were on D-1, after the amphibious assault was initiated, or just prior to the amphibious assault. Planners discarded the first option for fear it would jeopardize the success of the entire operation. The airborne assault would have alerted the Germans as to the location of the amphibious landings and provided the enemy with twenty-four hours to reallocate forces to defend the beachheads. The Allies discarded the second option due to a belief that the Germans would have reinforced the Le Muy area upon seeing an amphibious task force land just twelve miles away.<sup>112</sup> A reinforced Le Muy would have spelled doom for the lightly equipped airborne division. Since the objective of the airborne force was to isolate the beachheads, the third option was the only feasible choice. Perhaps the only argument supporting the commitment of the airborne force after the amphibious force would be if the airborne objective is so far into the enemy’s rear area that linkup with amphibious forces is not possible for several days. Delaying the airborne assault may allow enemy forces in the

---

<sup>111</sup> ADRP 3-0, 4-7.

<sup>112</sup> “The AAF in the Invasion of Southern France,” 27.

airborne assault area to be syphoned off elsewhere and prevent the airborne force from culminating before linkup with ground forces.

The second challenge deals with phasing airborne forces into their objective area. This is necessary for two reasons. First, at a division level or above, there is not enough lift capability in the US Air Force inventory to deliver an entire airborne division with all of its troops and equipment in one airlift.<sup>113</sup> Furthermore, as airborne forces operate for several continuous days, or against significant enemy resistance, they will require aerial resupply. Therefore, planners phase airlifts over time so that the airlifts deliver all troops, equipment, and resupply without compromising the chances of success.<sup>114</sup>

Modern US Army airborne doctrine currently addresses the challenges of phasing an airborne assault by breaking down the operation into five phases. Operational artists can gain some understanding of how to employ combat, combat support, and combat service support units during the initial assault by examining Phase II, the “assault phase,” of FM 3-99. The initial entry force is required to accomplish several tasks by doctrine: achieve surprise, overwhelm the enemy, protect the force, overcome natural and man-made obstacles, provide joint fire support assets, while stabilizing the lodgment to allow the introduction of follow-on forces.<sup>115</sup> While this doctrinal requirement requires the initial airlifts to be heavier with maneuver or combat forces, there are critical enablers such as artillery, engineers, and air defense units that must accompany the first echelon of airborne forces. Subsequent airlifts should carry primarily combat support and service support units capable of enhancing a lodgment. This is especially

---

<sup>113</sup> Devore, 78.

<sup>114</sup> The US Air Force has 158 C-17 aircraft capable of conducting an airlift of airborne forces. Modern calculations estimate that 96 C-17 aircraft are required to drop one complete airborne brigade combat team. Therefore, C-17s can drop roughly one and a half brigade combat teams. To make up the difference, the US Air Force also employs C-130s. There are currently 151 C-130 aircraft in the active US Air Force inventory. Again, modern calculations estimate that it takes at least 111 C-130's to drop an entire airborne brigade combat team. Therefore, C-130s can drop less than one and a half brigades. These two combined airframes can only drop at best the equivalent strength of three airborne brigade combat teams. This still leaves a division headquarters and various enablers unable to assault simultaneously.

<sup>115</sup> FM 3-99, 1-18.

true in the case of a joint forcible entry operation where the amphibious assault force may not be able to make inland progress much past the beachhead for several days as the airborne force will then assume responsibility for establishing, defending, and expanding the aerial lodgment.

Much like Operation Mercury, Operation Dragoon is a terrific case study to understand best practices in a combined airborne and amphibious assault. The operational artist must clearly spell out the effects the airborne assault will achieve and then decide the best method for phasing the airborne assault. These lessons were learned during Operation Dragoon and though it was not perfect, “No other operation in our history has produced more decisive, dramatic, swift, and far-reaching results at so little cost...’Dragoon’ had achieved unsurpassed success.”<sup>116</sup>

### **Case Study 3: Operation Market-Garden**

#### The Importance of Operation Market Garden for Operational Artists

Operation Market Garden (OPMG), the Allied plan to cross the Rhine and enter northern Germany, is arguably the foremost case study for operational artists studying airborne assaults. Market was the Allied codename for the airborne assault portion of the operation. Garden was the Allied codename for the ground assault portion of the operation. Though this paper will describe the ground assault portion the operational art analyzed in this case study will be in respect to the Market portion of the operation. Despite OPMG being a failure for the Allies, operational artists can glean numerous lessons from this case study. OPMG also represents a third method of employment for airborne forces. OPMG incorporated a shaping operation, in the form of a three division airborne assault, intended to secure bridge-crossing objectives that would enable the decisive ground operation to pass rapidly over major river obstacles and enter the industrial heartland of northern Germany.

---

<sup>116</sup> Reuben Jenkins, “Operation ‘Dragoon’ – The Breakthrough,” *Military Review* XXVI, no. 6 (September 1946), 16.

The employment of an airborne assault as a shaping operation, in support of a ground offensive, developed into one of the foundational employment methods for an airborne assault. What is important to note, and why OPMG is a superb case study, is that the employment of airborne forces in this manner differs doctrinally from a joint forcible entry operation, as outlined in case study two. Joint Publication (JP) 3-18, *Joint Forcible Entry Operations*, defines joint forcible entry as “operations [designed to] seize and hold lodgments against armed opposition. A lodgment is a designated area in a hostile or potentially hostile operational area that, when seized and held, makes the continuous landing of troops and materiel possible and provides maneuver space for subsequent operations (a lodgment may be an airhead, a beachhead, or a combination thereof).”<sup>117</sup> In the case of OPMG, and future operations designed like IT, the objective of the airborne forces was not to seize a lodgment for follow-on forces, but rather secure objectives in support of a simultaneous ground offensive. Though the distinction may be slight, the use of airborne forces in OPMG differed from Operation Dragoon, and the distinction is important. While the airborne forces in Operation Dragoon seized terrain the amphibious force would eventually pass through, the primary objective of the airborne force was to prevent, or delay, German counterattack forces from interfering with the subsequent establishment of the beach lodgment and buildup of combat power. In other words, the airborne assault in Operation Dragoon had a different focus than that of OPMG. Furthermore, the use of the airborne forces in Operation Dragoon conformed to the modern definition of joint forcible entry.

For operational artists, OPMG’s airborne assault planning demonstrated that high risk could provide great rewards. OPMG, despite a short planning window, “was the best planned and the most skillfully executed large-scale airborne operation thus far [in World War II].”<sup>118</sup> This naturally begs the question of how the operation could have ended so badly for the Allies if the planning and employment

---

<sup>117</sup> Joint Publication (JP) 3-18, *Joint Forcible Entry Operations* (Washington, DC: Government Printing Office, 2012), vii.

<sup>118</sup> Huston, 43.

was relatively sound given the constraints of intelligence and forces available. This disparity between success in planning and failure in execution is what makes OPMG a terrific case study for operational artists. Though OPMG demonstrates numerous elements of operational art and design, the two most important elements are tempo and culmination. These two elements were the most important in determining the fate of the airborne forces and will be the focus of this case study.

### Strategic Context of Operation Market Garden

In May 1944, Supreme Headquarters Allied Expeditionary Forces had decided on two strategic objectives. The first objective would be to deny Germany the means to continue the war by seizing the industrial heartland of Germany and disrupting the German's ability to prolong the war materially. This aimed at seizing coal and steel resources in the Ruhr Valley in northern Germany (Figure 5, Item 1).<sup>119</sup> To this end, General Dwight Eisenhower, Supreme Allied Commander, directed the second major task, which ordered the Allies to pursue the retreating Germans along a broad front.<sup>120</sup> This left British Field Marshall Bernard Montgomery's 21st Army Group advancing in the northern sector of France, into Belgium, oriented directly on the Ruhr valley (Figure 5, Item 2). Simultaneously General Omar Bradley's 12th Army Group advanced through central France oriented on the Saar valley, which would deny Germans the use of one of their major agricultural areas while also affording the Allies an opportunity to envelop the Ruhr should the northern thrust slow down or fail altogether (Figure 5, Items 3 and 4).<sup>121</sup>

---

<sup>119</sup> David Bennett, *A Magnificent Disaster: The Failure of Market Garden, The Arnhem Operation, September 1944* (Havertown, PA: Casemate Publishers, 2008), 7.

<sup>120</sup> Cornelius Ryan, *A Bridge Too Far* (New York, NY: Simon and Schuster Paperbacks, 1974), 34-35.

<sup>121</sup> Bennett, 6.

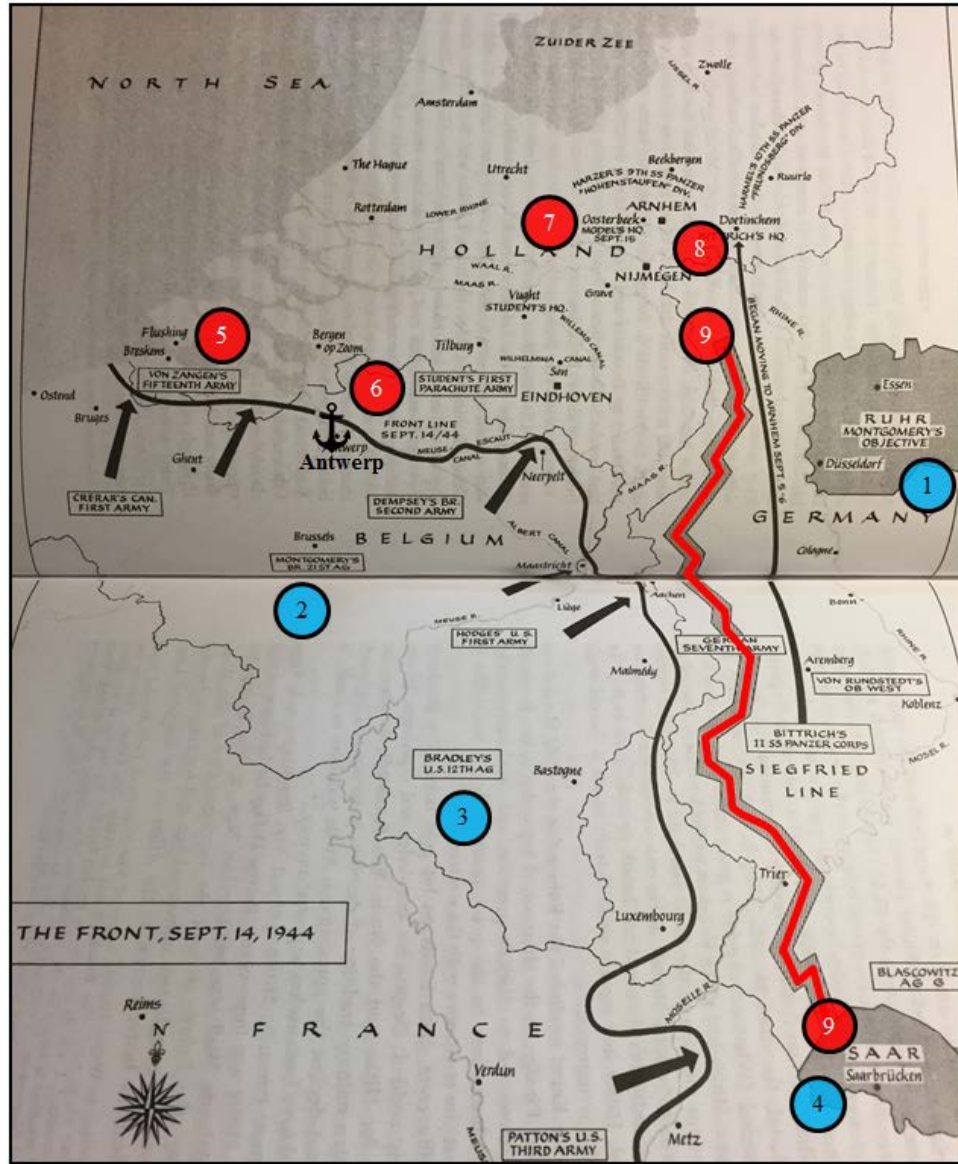


Figure 5: Allied Situation at the Outset of Operation Market Garden

Source: Graphics added by author. Image retrieved from Cornelius Ryan, *A Bridge Too Far* (New York, NY: Simon and Schuster Paperbacks, 1974), 35.

Despite a successful invasion of the European mainland in June 1944, the Allies had bogged down in northern France while executing the subsequent phases of Operation Overlord. Though the Allies would eventually move ahead of the projected timeline for Operation Overlord, the Allied breakout from Normandy only began in earnest toward the end of July 1944, when General George Patton, commander

of the 3rd US Army, punched through German defenses and spilled into Brittany.<sup>122</sup> With their left flank thrown into chaos, the German right flank, anchored on the English Channel, began to suffer heavy losses against the British 21st Army Group as well. By the end of July, the Germans began what numerous authors would later dub “the retreat.”<sup>123</sup> Army Group B, one of the German formations under Army Command West, began a disorganized and chaotic retrograde from France. From this dire situation, the Germans hastily organized a defense in Holland to halt the Allied advance.

Against this backdrop, the Allies’ strategy shifted from a consolidation along the Seine River to pursuit of retreating German forces. The Allies had initially planned to halt on the Seine River in order to move logistical bases forward and consolidate gains, but the mass exodus of German Army Group B provided them with an opportunity to conduct pursuit operations and continue to pressure an already reeling opponent. Military historian Carlo D’Este, in his foreword to *A Magnificent Disaster*, noted, “Halting to regroup at the Seine was suddenly unthinkable... The Allied advances north of the Seine saw gains of as much as fifty miles a day. In early September 1944, the Allies were only prevented from sweeping into Germany by what has been called ‘the tyranny of supply’.”<sup>124</sup> The Allied advance had outrun its logistical capability to support such a pursuit operation. The Allies were still using undeveloped beachheads in Normandy as logistics hubs and this required transportation of all classes of supply to the frontlines, which were growing in length each day. Sir Basil Liddell Hart, one of the foremost innovators in the development of combined arms warfare during the interwar period between World War I and World War II, captured the essence of the problem well when he stated, “In part, the supply difficulties were due to the length of the Allies’ own advance. In part, they were due to the Germans’ strategy in

---

<sup>122</sup> Bennett, 5.

<sup>123</sup> Ibid.

<sup>124</sup> Carlo D’Este, foreword to *A Magnificent Disaster: The Failure of Market Garden, The Arnhem Operation, September 1944*, by David Bennett (Havertown, PA: Casemate Publishers, 2008), xiii.

leaving garrisons behind to hold the French ports... Before the breakout from Normandy, their [the Allies] supplies had to be carried less than twenty miles from the base in order to replenish the striking forces. They now [at the time of OPMG] had to be carried nearly 300 miles.”<sup>125</sup>

As the Allied pursuit continued through August and into September, General Montgomery asked for additional assistance. He wanted a US Army force to secure his right flank and proceed north of the Ardennes forest rather than continue to the south with Bradley’s 12th Army Group. Eisenhower granted his request because he was:

“...particularly anxious to attain the objectives that lay to the north. Montgomery might trap the remaining German reserves in the Pas-de-Calais; he would secure the Channel ports as far as Antwerp; and he would eliminate the flying bomb launching sites in the Pas-de-Calais. Acceding to Montgomery’s request, Eisenhower directed the First U.S. Army to advance alongside the British north of the Ardennes. At the same time, Eisenhower emphasized his desire to gain the objectives in the north by reaffirming his earlier decision to put the airborne forces in the theater at Montgomery’s disposal.”<sup>126</sup>

Montgomery’s push in the north could simultaneously trap up to a German army-size formation, destroy the V2 rocket sites that were attacking Britain from Pas de Calais, and, most importantly, secure the deep-water port at Antwerp, which would shorten Allied lines of communication. To this end, Eisenhower made Montgomery’s force the main effort and task organized him with the 1st US Army, as well as the newly-created First Allied Airborne Army (FAAA), commanded by Lieutenant General Lewis Brereton.

The British were successful in their advance through France and Belgium. By September 4, 1944, the British had not only seized the port of Antwerp and cleared Pas de Calais, but they had driven back the German 15th Army, commanded by General Gustav-Adolf von Zangen, and encircled them at Breskens, just west of Antwerp (Figure 5, Item 5). Despite these successes though, the Allies had new challenges. While Antwerp was in Allied hands, the port itself had a fifty-four mile long approach known

---

<sup>125</sup> Basil Liddell Hart, introduction to *Airborne Carpet: Operation Market Garden*, by Anthony Farrar-Hockley (New York, NY: Ballantine Books, Inc., 1969), 6.

<sup>126</sup> Charles MacDonald, “The Decision to Launch Operation Market Garden,” in *Command Decisions*, ed. Kent R. Greenfield (Washington, DC: US Army Center of Military History, 1987), 434.



as the Scheldt Estuary. German guns along the northern coast of the Scheldt Estuary, and on Walcheren Island, could deny the use of the port to the Allies. Therefore, the Allies would have to clear the Scheldt Estuary before they could establish a viable seaport at Antwerp. This would be extremely difficult given that the encircled German 15th Army, with nearly eighty thousand soldiers, was on the southern bank.<sup>127</sup> Furthermore, the Allies would have to abandon pursuit of German Army Group B. If the Allies ceased the pursuit of Army Group B, the Germans could consolidate the Army Group and establish a prepared defensive position near the German border, which would be more difficult to defeat when the Allies resumed offensive operations after clearing the Scheldt Estuary.

In response to the Allied pursuit of Army Group B, the Germans ordered a hasty defensive perimeter along the Albert Canal in the Netherlands. General Kurt Student's 1st Parachute Army raced to the frontline to form a defensive line along the canal, which was set by September 5 (Figure 5, Item 6). Furthermore, General Walter Model, the commander of Army Command West until September 4 and then subsequently commander of Army Group B, ordered the most fateful decision of the operation. His 2nd SS Panzer Corps had faced some devastating losses against both Allied Army Groups after the Normandy breakout. Model had ordered 2nd SS Panzer Corps to Holland, as it was largely viewed as a quiet sector, to consolidate and refit. As such, 9th SS Panzer Division was in Beekbergen, near Arnhem, with orders to transfer all their mechanized equipment to 10th SS Panzer Division and then move back into Germany to be reconstituted.<sup>128</sup> 10th SS Panzer Division was also refitting near the town of Arnhem

---

<sup>127</sup> Ryan, 44.

<sup>128</sup> Cornelius Ryan noted that although Model had ordered 9th SS Panzer Division to transfer all of their equipment to 10th SS Panzer Division, the commander of 9th SS Panzer Division, in one of the unlucky circumstances of the war for the Allies, deliberately listed his equipment as inoperable and therefore unsuitable for transfer. This meant that rather than having to face one panzer division, the Allies would have to face two panzer divisions. Though both of these divisions were degraded severely, the advantage for the Germans lay in their ability to command and control two separate counterattack forces against the Allied advance.

(Figure 5, Item 7 and 8).<sup>129</sup> The Allies lost the whereabouts and conditions of both the 2nd SS Panzer Corps and its two divisions. Furthermore, Allied intelligence had also lost sight of the 15th German Army pulling back from the Scheldt Estuary toward the very line of bridges the Allies would later be seizing. This lack of intelligence on the location of the armored corps of Army Group B, and movement of 15th Army, would play a major part in the OPMG's failure.

Despite their seemingly overwhelming success, the Allies chose to continue pursuit operations at the expense of the logistical concerns for which they had employed 21st Army Group to Antwerp. Both Allied advances, Montgomery's in the north and Bradley's in the center, required more sustainment than the Allies were capable of supporting, especially with a supply system that still reached back to the Normandy beaches. While the Allies hoped that linkup with the 6th Army Group coming from Italy and southern France would alleviate Patton's supply problems, it had yet to materialize into anything tangible to release the pressure on the line of communication. Though Montgomery had priority, Patton's Army was still making vast gains despite a lack of resources. The problem facing Patton, and the majority of Bradley's Army Group, was that it would soon encounter the Siegfried Line (Figure 5, Item 9).<sup>130</sup> The logistical requirements needed to maneuver against this German defensive line would break the already dysfunctional supply system and provide the Germans time to reorganize themselves. Eisenhower seemed to have an appreciation for this conundrum when he wrote to General George Marshall, the US Military Chief of Staff, and said, "the closer we get to the Siegfried Line, the more we will be stretched administratively, and eventually a period of relative inaction will be imposed upon use. The potential danger is that while we are temporarily stalled the enemy will be able to pick up bits and pieces of forces

---

<sup>129</sup> Ryan, 46.

<sup>130</sup> The Siegfried Line, or West Wall, was a linear defensive network designed by the Germans to counter the French Maginot Line. It ran the length of the German-French, German-Belgium borders and halfway up the Germany-Netherlands border. Though it was widely neglected throughout the opening years of World War II, as German fortunes began to turn unfavorable in later years of the war, they rushed to re-establish it as a final measure to defeat or delay the Allied entrance into Germany.

everywhere and reorganize them swiftly for defending their frontier or the Rhine.”<sup>131</sup>

Though the Allies had secured Antwerp by September 4, Montgomery chose to plan a continued advance over the Rhine and into Germany rather than clear the Scheldt Estuary and open the port for Allied usage. Since 21st Army Group received priority of support as they resupplied themselves from the beaches of Normandy, however, Bradley’s Army Group halted because the line of communication to southern France was not yet established. This would have devastating consequences on the larger Allied supply situation and OPMG itself, a factor the next section will address further. The Allies chose to continue their advance and as a result, “to the astonishment of Rundstedt and Model, to the gratification of Hitler, the allied expeditionary force came to a halt at the very moment when the German forces in the west were spent. From this lost opportunity, out of this circumstance, OPMG was born.”<sup>132</sup> Planners of OPMG hoped to circumvent the Siegfried Line and vault the Allies into the German heartland, with an eye to capturing Berlin and ending the war before the failure to open the Antwerp port facilities would break the already tenuous Allied supply lines.

#### Allied Execution of Operation Market Garden

As alluded to in the previous section, Montgomery and Eisenhower had differing views on the objective of the northern Allied thrust. Montgomery, in a British *coup d’ main*, saw the thrust’s purpose to circumvent the Siegfried Line, capture Berlin, and end the war. Eisenhower saw the thrust as a way to shorten supply lines, capture the Ruhr Valley, and posture forces for a continued advance through Germany.<sup>133</sup> The key difference in these viewpoints was temporal. Montgomery believed a decisive stroke along the northern axis of advance could vault the Allies into Germany and capture Berlin before

---

<sup>131</sup> Farrar-Hockley, 25

<sup>132</sup> Ibid.

<sup>133</sup> Bennett, 8.

the Allied supply lines were broken from the thrust.

In light of his belief that the British 21st Army Group could capture Berlin and end the war, Montgomery set his planners to work on devising a plan that would accomplish the first part of his grand strategy of moving the Allies over the series of river obstacles in Holland and position them for subsequent operations in northern Germany. On September 2, his planning staff began working on a plan to launch a massive ground and airborne assault aimed at the final liberation of Holland. By September 7, Montgomery was ready to launch Operation Comet. Operation Comet initially proposed that the British 1st Airborne Division would secure multiple crossing sites over the Rhine River and enable the 21st Army Group to move into northern Holland.<sup>134</sup> Bad weather and supply problems hampered the operation for days and eventually forced its cancellation on September 10. Additionally, Eisenhower had concerns that launching an airborne assault would divert combat power away from the clearing and opening of the Scheldt Estuary. Montgomery, in a meeting with Eisenhower on September 10, proposed a revised plan for Operation Comet, which he called Market Garden. In the expanded plan, the entire FAAA would “...seize a succession of river crossings in Holland ahead of his [Montgomery’s] troops with the major objective being the Lower Rhine Bridge at Arnhem. Anticipating that the Germans would expect him to take the shortest route and drive northeast for the Rhine and the Ruhr, Montgomery had deliberately chosen a northern ‘back door’ route to the Reich.”<sup>135</sup> Eisenhower, intrigued by the plan and eager to employ the largely idle FAAA, gave initial approval for the plan the same day.

Allied planners finalized OPMG a few days later and Montgomery set September 17, 1944 as D-

---

<sup>134</sup> Ryan, 83.

<sup>135</sup> Ibid., 88.

Day for the operation.<sup>136</sup> The finalized operations order for OPMG called for the US 101st Airborne Division to drop in vicinity of Eindhoven with the task to “facilitate the advance of 30 Corps as far as the R [River] Maas.”<sup>137</sup> Simultaneously, the US 82nd Airborne Division would drop between Grave and Nijmegen to “capture, intact, the bridges over the R [River] Maas and R [River] Waal and to dominate the intervening country.”<sup>138</sup> Further to the north, the British 1st Airborne Division, with attached Polish Brigade, would drop in the vicinity of Arnhem and “capture, intact, bridges over Neder RIJN [River Junction] and dominate the surrounding country.”<sup>139</sup> Of primary importance were the bridges at Nijmegen and Arnhem as these spanned rivers of significant size and distance (Figure 6). If the Germans were able to destroy or render inoperable these bridges, OPMG would fail due to the time required for Allied engineers to either repair or construct a new bridge, during which time the Germans could consolidate and establish defensive positions capable of defeating further Allied attacks. This necessity for speed and simultaneity lent perfectly to the capabilities of an airborne assault.

---

<sup>136</sup> Though the plan for Operation Market Garden was final, there were alterations to the plan based on refinement from subordinate headquarters of 21st Army Group. Specifically, as the First Allied Airborne Army units received their assignments, they began to refine their mission sets and drop zone locations. This aspect of the planning, while significant, is not relevant to the argument of this paper and the details are omitted.

<sup>137</sup> “Operation ‘Market Garden’ 17-26 Sept 1944” (Twenty-First Army Group Headquarters), 7.

<sup>138</sup> Ibid.

<sup>139</sup> Ibid.

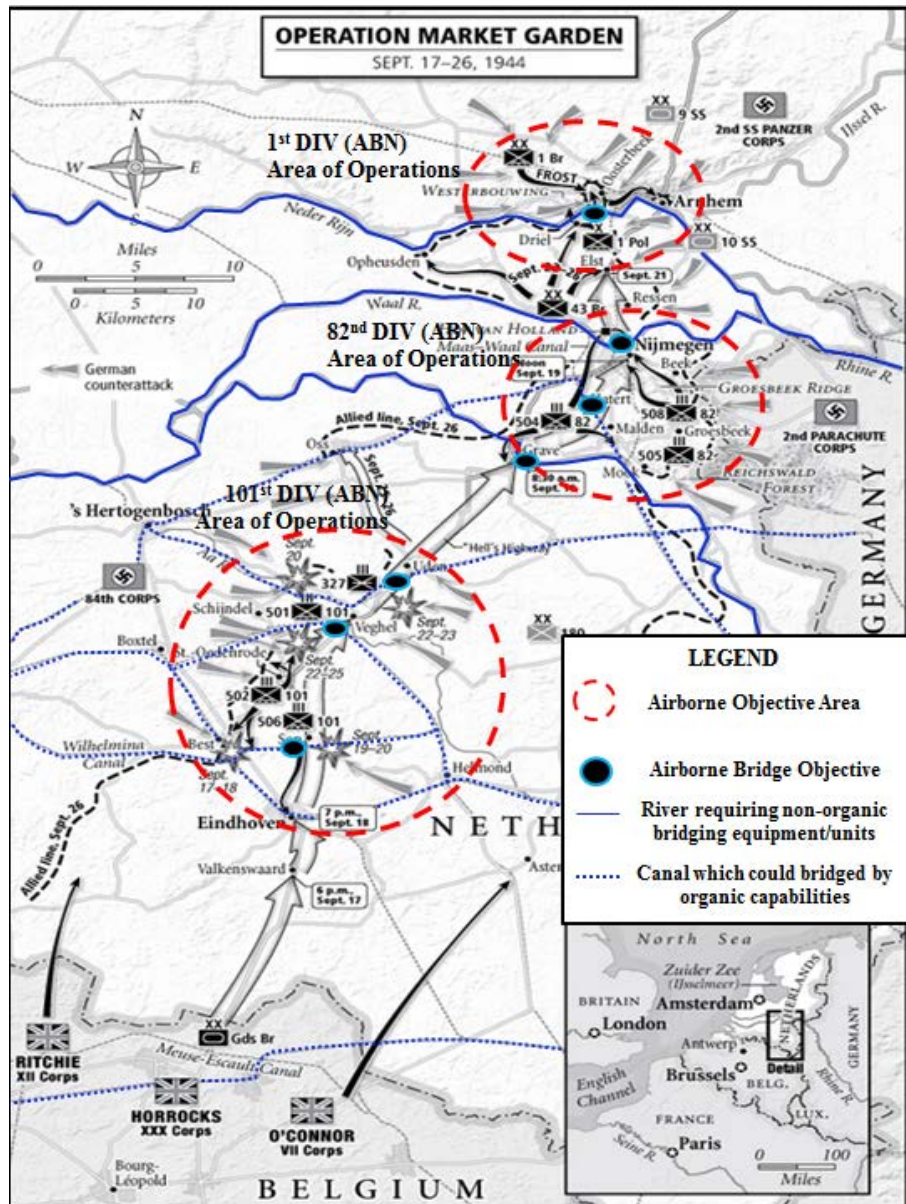


Figure 6: The Execution of Operation Market Garden

Source: Graphics added by author. Image retrieved from Rick Atkinson, *The Guns at Last Light* (New York, NY: Henry Holt and Company, LLC., 2013), 258.

The final plan for OPMG called for an operational area more than sixty miles long that was slated to be completed by D+6, with all parachute troops and equipment dropped by the end of D+2. Delivery of the remaining equipment, either by air landing or by hauling it over ground, would occur no later than D+

5.<sup>140</sup> Due to a lack of night crew proficiency and night airborne linkup training, the D-Day airborne assault would be a daylight drop. Brereton also ordered that only one airlift of troops, believing that two drops would be too taxing on the aircrews, would assault on D-Day, effectively putting only half of each division into the objective area on D-Day. This timetable would later have cascading and deteriorating effects on the airflow of follow-on troops and supplies.

The 101st Airborne Division planned to drop closest to XXX Corps' starting position. The finalized plan called for them to drop into two principle locations with objectives of seizing the bridge over the Wilhelmina Canal at Son, liberating Eindhoven, and securing the bridge over the Willems Canal near Veghel (Figure 6).<sup>141</sup> They were supposed to linkup with XXX Corps no later than D+1.

The 82nd Airborne Division planned to drop northeast of the 101st First Airborne Division. They would also drop into two principle areas with the primary missions of seizing crossings over the Maas Canal near Grave, Maas-Waal Canal, and the Waal River near Nijmegen. They expected linkup with XXX Corps sometime between D+2 and D+3.

Just northeast of the 82nd Airborne Division the British 1st Airborne Division and Polish 1st Airborne Brigade would land and secure a river crossing over the Neder River in the vicinity of Arnhem. Two major drawbacks to the British plans were that the division had to drop nearly five miles west of the bridge, allowing significant enemy reaction time, and the British had only planned on dropping on the north side of the bridge on D-Day. The Polish brigade would assault on D+2 and secure the south side of the Neder River bridge. The final plan called for linkup with XXX Corps on D+5.<sup>142</sup>

By September 16, 1944, the Allied formations began to uncoil and position themselves for the next day's initiation of OPMG. General Student, whose 1st Parachute Army organized along the Albert

---

<sup>140</sup> Farrar-Hockley, 34.

<sup>141</sup> Ryan, 212.

<sup>142</sup> Farrar-Hockley, 34.

Canal, noted in his operational report to General Model that “increased motor transport activity and confirmed armoured preparations [by XXX Corps] strengthen the appreciation... that a heavy attack must be expected shortly.”<sup>143</sup> Additionally, General von Zangen’s 15th Army had escaped the Allied encirclement near Breskens by conducting a water exfiltration to the Walcheren Island and then moving overland into Holland at “a most crucial moment for Montgomery’s Market-Garden operation.”<sup>144</sup> Finally, the Allies received solid intelligence on September 14, 1944 identifying the locations of the “lost” 9th and 10th SS Panzer Divisions in the vicinity of Arnhem. Lieutenant General Walter Smith, Eisenhower’s chief of staff, believed the force of two armor divisions to be more than the British 1st Airborne Division could handle. He made a personal appeal to either bolster the British sector of the operation with another division or delay the entire operation. Montgomery dismissed the warning believing the German units too badly damaged to interfere with the operation and waved aside the objections.<sup>145</sup>

On September 17, 1944, D-Day, at 1025, the better part of three airborne divisions took off from airfields around western Allied occupied Europe. Approximately half to three quarters of each of the three airborne divisions’ combat power conducted the initial airborne assault into Holland. XXX Corps, the main effort of the Garden portion of the operation, began their movement across the Albert Canal at 1400. According to Brereton’s after action report, by the end of D-Day, the 101st Airborne Division had occupied Eindhoven and secured their bridge crossings. The 82nd Airborne Division had secured the bridges over the Maas Canal at Grave and the Maas-Waal Canal and had pushed its forces to the south end of the Nijmegen Bridge. XXX Corps advanced well and was just six miles below Eindhoven at days

---

<sup>143</sup> Farrar-Hockley, 70.

<sup>144</sup> Ryan, 115.

<sup>145</sup> Ibid., 159.



end.<sup>146</sup> Despite these initial success, the British 1st Airborne Division “landed west of Arnhem, ran into stiff resistance almost immediately.”<sup>147</sup> The British were able to get elements of the 1st British Parachute Brigade to the north end of the Neder River Bridge and remove demolition charges but were unable to secure the southern end of the bridge in the face of German resistance.<sup>148</sup>

On D+1, September 18, remaining elements of the British 1st Airborne Division, the 82nd Airborne Division’s artillery, and the 101st Airborne Division’s gliders successfully landed in their respective objective areas.<sup>149</sup> The 101st linked up with XXX Corps and passed them through Eindhoven. The 82nd made little progress this day and continued to pressure the German forces north of the Nijmegen Bridge. The British 1st Airborne’s tenuous position continued to deteriorate. They lost contact with the 1st British Parachute Brigade, who was holding the north end of the bridge, and the remainder of the division “was engaged in heavy fighting west of Arnhem.”<sup>150</sup>

On D+2, September 19, the majority of the remaining airborne forces, minus the Polish Brigade, conducted their assaults at 1500, after morning weather delays. XXX Corps conducted the linkup with the 82nd Airborne Division at 0830 and by mid-afternoon had moved into the southern end of Nijmegen. However, stiff German resistance prevented the capture of the bridge on this day. The British position by D+2 was “serious.”<sup>151</sup> Most of the British aerial resupply had dropped into German hands and the British 1<sup>st</sup> Parachute Brigade was in danger of losing its foothold on the northern end of the bridge. Furthermore,

---

<sup>146</sup> Lewis Brereton, “Narrative of Market Operation” (First Allied Airborne Army Headquarters), 15.

<sup>147</sup> Ibid., 16.

<sup>148</sup> Ibid.

<sup>149</sup> Ibid., 34.

<sup>150</sup> Ibid., 17.

<sup>151</sup> Ibid., 18.

the weather prevented the 1st Polish Parachute Brigade from conducting their assault.<sup>152</sup>

On D+3, September 20, the combined Allied force of XXX Corps and the 82nd Airborne Division secured the Nijmegen bridge by nightfall despite “murderous German fire from an old fort on the north bank of the river.”<sup>153</sup> The British 1st Airborne continued to hold out in Arnhem but again foul weather prevented the deployment of the Polish Brigade. The Germans continued to funnel reinforcements to the southern end of the Neder River Bridge and hope of securing this bridge was now in serious jeopardy.

By D+4, September 21, XXX Corps was moving across the Nijmegen bridge in an effort to relieve the now besieged British 1st Airborne whose position was “extremely critical.”<sup>154</sup> The weather broke long enough for the 1st Polish Brigade to conduct their airborne assault near Driel. However, German resistance on the south side of the Neder River prevented any type of Polish maneuver to secure the southern end of the Arnhem Bridge. Upon their arrival, all the Polish could do was establish a defensive perimeter and wait for XXX Corps to arrive. Lieutenant Colonel John Frost, commander of 2nd British Parachute Battalion and one of the commanders at the north end of the Arnhem Bridge, noted, “They [the Polish Brigade] were to drop south of the bridge... and I dreaded the reception they would have.”<sup>155</sup>

From D+5 until D+8, September 22 – 25, XXX Corps and the British 1st Airborne battled against the 9th and 10th SS Panzer Divisions who had moved up to support elements of the German 1st Parachute Army and German 15th Army along what would later be known as “Hells Highway.” Fierce fighting bogged down the XXX Corps advance and by D+8 the decision to withdraw the airborne forces from

---

<sup>152</sup> Brereton, 18.

<sup>153</sup> Ibid.

<sup>154</sup> Ibid., 19.

<sup>155</sup> Ryan, 398.

Arnhem was made. XXX Corps linked up with the 1st Polish Brigade near Driel and established a ferry system to move the majority of the British 1st Airborne Division to the south of the Neder River and exfiltrated them back to Nijmegen.<sup>156</sup> This ended the primary involvement of the airborne forces in OPMG.

#### Operation Market Garden and Operational Art

Though OPMG failed, Brereton would later note, “Operation Market was a brilliant success.”<sup>157</sup> Other authors have asserted, “In many ways Operation Market was a remarkable and spectacular success.”<sup>158</sup> Despite ruthless fighting by the forces involved in OPMG, both airborne and ground forces faced difficulties from the start. Therefore, this case study provides ample lessons for operational artists utilizing an airborne assault as a shaping operation for a decisive ground offensive. The main tenets of operational art and design, demonstrated in OPMG, are risk and tempo.

Though risk is inherent in every operation in which US forces will ever participate, it is the identification of risk factors and, more importantly, the continual mitigation of those factors that will define whether a plan “exposes enemy weakness” or “recklessly risks forces.”<sup>159</sup> In the case of OPMG, two particular examples of risk affected the airborne forces. These risks were either not mitigated or insufficiently mitigated and thereby prevented the airborne forces from successfully achieving their objectives. These two examples will provide lessons for operational artists.

The first risk identified in planning relates to operational reach. Operational reach in this case was the maximum extent to which the FAAA could extend the operational area of OPMG forces. The ability to envelop vertically an opposing force was the very capability that necessitated the development of

---

<sup>156</sup> Brereton, 27.

<sup>157</sup> Ibid., 32.

<sup>158</sup> Huston, 38.

<sup>159</sup> ADRP 3-0, 4-9.

airborne forces. However, the depth of the vertical envelopment exponentially increases the risk to the airborne force. The inherent isolation airborne forces face upon landing starts an invisible clock against which the ground force offensive races to conduct linkup with the airborne force. This race is vital for two reasons. First, airborne forces rely on surprise and speed to achieve their objectives. Both of these factors diminish quickly as the enemy begins to react to their insertion. Second, and directly related, is that lightly armed airborne forces tend to culminate quickly in the face of enemy opposition because they generally rely solely on aerial resupply until friendly forces open some type of line of communication. The lesson being that the airborne assault has to be limited to a depth that ground forces can reasonably achieve in their advance. Though airborne forces may best secure further objectives, if the airborne forces cannot conduct linkup with ground forces within the timeline of organic airborne sustainment capabilities, those objectives should be relegated to either a different force or a different phase of the operation. Furthermore, airborne assaults should only be to a depth in which joint force enablers can support airborne forces, specifically close air support and aerial resupply aircraft. Failure to address these factors of risk in determining the depth of the airborne assault increases the potential for culmination or defeat of the airborne force.

OPMG demonstrated these lessons well. First, with respect to operational depth, the 21st Army Group planned to drop the “airborne carpet” along a narrow sixty-mile front and into three pockets that were not mutually supporting.<sup>160</sup> The ground forces were supposed to conduct linkup with the British 1st Airborne Division, the deepest element of the airborne assault, no later than D+4. During Montgomery’s briefing to Lieutenant General Fredrick Browning, 1st Airborne Corps Commander, Browning asked “How long do you think we shall have to hold the bridge at Arnhem?” Montgomery replied “two days” to which Browning said “We can hold it for four days...But I think we may be going a bridge too far.”<sup>161</sup> Browning’s assessment meant that ground forces were in a race to achieve linkup with airborne forces in

---

<sup>160</sup> Farrar-Hockley, 36.

<sup>161</sup> Ibid., 36.

four days or else culmination of the airborne force would lead to increasing risk of failure for the entire operation. Furthermore, Allied intelligence underestimated the enemy opposition in the vicinity of Arnhem by failing to address the 9th and 10th SS Panzer Divisions or the 15th Army. This poor friendly to enemy ratio caused culmination to occur much faster than anticipated. However, the Allied plans were rigid and allowed very little room for flexibility in the air movement tables. Therefore, when weather delayed the insertion of the remainder of the airborne forces, specifically 1st Polish Brigade until D+4, the British paratroopers focus shifted from securing the bridge to merely surviving until the ground forces arrived.

Culmination is obviously the other risk-planning factor associated with depth that operational artists must address. In the case of the 1st British Airborne Division, the delay in receiving their follow-on forces due to weather, caused them to culminate faster than the four days Browning had initially estimated they could sustain operations. In its after action report, 21st Army Group noted that the British airborne culminated due to “The accomplishing of the mission assigned to them – a task which becomes progressively more difficult as the enemy recovers from his initial surprise, and, the continual protection of the landing zones, without which operational and administrative build-up collapses.”<sup>162</sup> The British could have mitigated some of this risk by placing their drop zones closer to the Arnhem Bridge itself. The Royal Air Force had chosen drop zones up to eight miles from the Arnhem Bridge due to suspected anti-aircraft batteries and poor terrain. This resulted in a four-hour movement “by which time the enemy defense scheme had been put into effect.”<sup>163</sup> To compound the mistake, the British had chosen to only land on the north side of the bridge, leaving the south side for the Polish to secure on D+2. Failing to isolate the bridge objective meant the British would have a significant water obstacle and entrenched enemy forces between them and the friendly relief force. The lesson learned here is that the time airborne

---

<sup>162</sup> “Operation ‘Market Garden’ 17-26 Sept 1944” (Twenty-First Army Group Headquarters), 114-115.

<sup>163</sup> *Ibid.*, 115.

forces can operate, before culmination, begins to decrease as the distance to drop zone, which airborne units must secure, is increased. Furthermore, failing to mass airborne forces rather quickly will also decrease the amount of time a unit can operate before culmination. 21st Army Group acknowledged this in their after action report noting, “The simultaneous execution of these two tasks demands dispersion, which can only be compensated for by concentrating the full effort of large airborne forces upon a small number of tasks.”<sup>164</sup>

In addition to risk, OPMG highlighted the necessity of tempo in an airborne assault. Tempo here refers to the ability to operate faster than the enemy, as opposed to speed, which is measured against time.<sup>165</sup> By modern doctrine, tempo is critical in preserving conditions favorable to the successful outcome of an airborne assault because continued, “high operational tempo and pressures preserves conditions to hinder the enemy’s ability to regroup, reconstitute capabilities, or reconfigure forces to support new plans.”<sup>166</sup> In order to achieve this tempo it is necessary to pressure the enemy utilizing “continuous and rapid cycling of joint enablers and capabilities under operational level direction.”<sup>167</sup> In the case of OPMG, this meant extra airborne assault lifts on the first day. Key in an airborne assault, as was demonstrated in the Operation Mercury case study, is that joint enablers need to isolate the airborne objectives in order to assist the airborne forces in maintaining a rapid tempo. Without organic transport or armored equipment to support them, airborne forces are extremely limited from a mobility and anti-armor standpoint. When faced against an enemy with potentially superior numbers, armor, and freedom of movement, joint enablers provide tempo by isolating, interdicting, delaying, and disrupting enemy forces

---

<sup>164</sup> “Operation ‘Market Garden’ 17-26 Sept 1944,” 115.

<sup>165</sup> Army Doctrine Reference Publication (ADRP) 1-02, *Terms and Military Symbols* (Washington, DC: Government Printing Office, 2013), 1-58.

<sup>166</sup> FM 3-99, 3-12.

<sup>167</sup> *Ibid.*

massing against the airborne assault force.

OPMG demonstrates this point well. First, the Allies had intelligence noting that at least one panzer division had moved into the Arnhem area. The 504th PIR's Intelligence estimate notes, "It is reported that one of the broken panzer divisions has been sent back to the area north of Arnhem to rest and refit; this might produce some 50 tanks... We may therefore reckon that the forces from Rotterdam to the German frontier might comprise...one panzer division, much the worse for the wear."<sup>168</sup> Though German armor units had been identified in the area of operations, and brought to Montgomery's attention personally by Eisenhower's Chief of Staff General Smith with a recommendation to bolster the British 1st Airborne Division, Montgomery paid it little mind believing the threat to be of low significance based on the situation at the time. The panzer division's maneuverability and firepower, despite their depleted state, "played the critical role in defeating the Allies in Market Garden."<sup>169</sup> The 9th SS Panzer Division was successful in checking the British from seizing the south side of the Neder Bridge. Meanwhile the 10th SS Panzer Division established defensive positions along the route between Nijmegen and Arnhem. This maneuver effectively "barred the way to Arnhem" and was the primary reason that the Allied timetable got so far off schedule.<sup>170</sup> Had the Allies either reinforced the British effort by dropping another division there, such as the unused British 6th Airborne Division, or forced a second airdrop of the Polish Brigade on D-Day, or taken the panzer threat more seriously, they could have utilized joint enablers to isolate and disrupt the panzer formations to increase the operational tempo.

In addition to the panzer divisions, the ability of the German 15th Army to extract two divisions from the Breskin Pocket and reinforce Student's 1st Parachute Army also reduced the operational tempo of the Allied ground forces in relieving the airborne forces. The 15th Army's armor and anti-tank defensive positions along "Hells Highway" called for a systematic clearing of every position by XXX

---

<sup>168</sup> "Intelligence Annex to Field Order 12," (504 PIR Headquarters, September 1944), 2.

<sup>169</sup> Bennett, 47.

<sup>170</sup> *Ibid.*, 49.

Corps forces, which was laborious and time consuming. These units' disruption operations, such as constantly shutting down the highway in the 82nd area of operations, succeeded in buying Model time to arrange and plan his counterattack that would effectively end OPMG. Allied intelligence had reported that 15th Army was extracting units, and had the Allies maintained pressure against von Zangen's organization from September 4 when they seized Antwerp, they could have fixed the 15th Army and enabled the Garden forces to face less resistance on their march to relieve the Market forces. This loss of tempo was ultimately decisive in OPMG. Brereton summed up the challenges of maintaining operational tempo best when he noted, "[The enemy] has the ability to reinforce any threatened area quickly. Therefore, it is vital that the airborne thrust be joined with the ground thrust in a minimum of time to avoid undue losses. The armament of the airborne troops does not permit sustained operations against a prolonged attack by heavy weapons and armored forces."<sup>171</sup>

### **Conclusion**

Strategic and operational planners of World War II saw the concept of airborne operations develop from its infancy to full maturity by the end of the war. At no other point in history was the threat of large-scale vertical envelopment as pronounced as it was then. More importantly, while the conduct of airborne assaults has changed due to the increased levels of air defense capabilities and evolution of opponents with mechanized formations, the fundamental nature of airborne operations has remained relatively unchanged since the Germans and Russians began parachute training in the 1930s. What this means is that the tenets of operational art and design, forged in the crucible of World War II, can assist modern day planners in designing better vertical envelopment plans if the need to conduct a large-scale airborne assault arises. While the preceding sections discussed specific lessons, with respect to operational art and design, the case studies highlighted several overarching themes. These themes transcend their specific case studies and appear to be core principles that any operational artists planning

---

<sup>171</sup> Huston, 45.



airborne assaults should understand.

First, airborne assault operations are inherently a joint endeavor and require the capabilities of all services to complete them successfully. This is not due simply to the fact that the US Army does not have its own organic transport aircraft but rather is a result of the fact that airborne missions seem to bring together all elements of the Department of Defense when employed, as the 2015 US Army Operating Concept highlights. This is a belief that continues today but was founded at the end of World War II when after action reports noted, “although the exact degree of this effect is unknown, it is indicated that best troop delivery performance was achieved as joint training and joint operational planning were increasingly employed.”<sup>172</sup>

From a joint force perspective, the ability to deliver airborne forces is merely one aspect of their requirement. The joint forces also have responsibility to keep “the air open for the approach and supply of the landing formations.”<sup>173</sup> Operations such as Mercury and Market Garden highlighted the necessity of ensuring resupply to airborne troops in the post-airborne assault phases of the operation. Whether done via ground, sea, or air, if the airborne forces are operating beyond their organic supply capabilities, planners have to leverage the joint force to resupply them.

Joint forces also have a responsibility to serve as the close and deep fires for the airborne forces. In the case of the Germans, all “airborne operations took place beyond the range of German artillery.”<sup>174</sup> Furthermore, the German navy was never a serious force capable of supporting joint operations so instead they had to rely on the Luftwaffe. The Luftwaffe supported airborne forces throughout the depth of the operational area. The Luftwaffe initially executed “ground strafing and preparatory bombing of the

---

<sup>172</sup> “A Historical Study of Some World War II Airborne Operations” (Carlisle, PA: US Army War College, 1951), 11.

<sup>173</sup> *Airborne Operations*, 6.

<sup>174</sup> *Ibid.*, 8.

landing areas” in an effort to disrupt the enemy’s ability to respond to the initial airborne assault.<sup>175</sup> Subsequently, the Luftwaffe provided close air support in place of organic indirect fire assets to friendly units upon landing and provided “air attacks upon enemy reserves being rushed toward the airhead” thereby shaping the deep space to prevent the enemy reserves from overwhelming the drop zone.<sup>176</sup>

Lastly, joint forces have to interdict and disrupt the enemy’s joint capabilities. As the Germans demonstrated at Crete, and the Allies demonstrated in southern France, an enemy’s navy or air force can seriously threaten any airborne assault, despite the fact that they are operating in different domains. Operational art is the sequencing of actions in time, space, and purpose to achieve strategic endstates, and part of that sequencing action is to ensure that joint force enablers are able to neutralize the threats to the vertical envelopment force that the airborne assault force is incapable of nullifying themselves.<sup>177</sup>

A second theme that the preceding case studies revealed is that the battlefield framework can have significant impact on the success of an airborne assault. This is especially true when utilizing a deep, close, and security area framework. The depth of the airborne assault is limited by the time it takes to linkup with friendly ground forces or the ability to resupply them, thereby preventing their culmination. OPMG showed that the Allied close area, nearly sixty miles long, extended beyond the capabilities of the ground forces to achieve linkup with FAAA and weather disrupted the Allied ability to aerially resupply them. Consequently, the British culminated and were unable to secure their bridge objective and, arguably, became a liability more than an enabling force.

The Germans at Crete, on the other hand, made up for an unsound ground tactical plan by the organization of their battlefield framework. This is remarkable given the extra constraint of a non-contiguous area of operations. Their use of air forces to interdict and neutralize enemy forces in the deep

---

<sup>175</sup> *Airborne Operations*, 8.

<sup>176</sup> *Ibid.*

<sup>177</sup> ADP 3-0, 9.

battle space, specifically the British navy, while providing aerial resupply in the close battle space, enabled the German airborne forces, albeit with substantial difficulty, to achieve victory. Had the Germans chosen another site even slightly farther from their airbases, thereby extending the deep area, the outcome may have been significantly different.

The psychological aspect of an airborne assault is the third theme that planners must understand and leverage. Perhaps the greatest strength of an airborne assault is not in the actual employment, but rather the threat of its employment. The Germans realized this and stated, “The psychological effect of vertical envelopment is considerably greater than that produced by horizontal envelopment. It can affect the enemy command troops solely by reason of its menace.”<sup>178</sup> The idea behind this concept is that the enemy cannot forward deploy all its forces but has to keep a rather large reserve in order to respond to an airborne threat anywhere in his area of operations. General Student noted after World War II, “the very existence of airborne units within the Allied armies was an important factor for German leaders to consider, for it compelled them to hold out large reserves on all fronts in order to cope with the anticipated use of those forces. This single factor...figured greatly in destroying flexibility in committing German units.”<sup>179</sup>

Operation Dragoon proved this concept. The presence of Allied airborne forces, even ad hoc formations, delayed the Germans from responding to the actual invasion. The threat of an inland airborne assault caused hesitation among German high command that delayed the armored division reserve from being committed eastward and subsequently interfering with Allied forces executing Operation Dragoon. To a lesser extent, the British were also a victim of the psychological threat that an airborne force can induce. Though they knew the Germans planned to conduct an airborne assault on Crete, the nature of the terrain caused them to spread their defenses out to protect the three major airfields located along the

---

<sup>178</sup> *Airborne Operations*, 42.

<sup>179</sup> Huston, 235.

northern coast. In essence, this prevented their ability to mass decisive combat power against any of the airborne forces. Furthermore, they also parceled out the few tanks they had which meant that their reserve was limited in terms of mobility and firepower. James Huston described the psychological effect of the German airborne force when he noted, “[the German airborne force] was the strategic threat and consequent strain on enemy disposition which they created by their presence in a theater.”<sup>180</sup>

Regardless of whether airborne forces are still relevant, or structured properly for the current operating environment, they still provide capabilities that the joint force can leverage. The US Army may lack the current experience in how best to employ a division-size formation or above, but history is full of examples that can provide a solid foundation on the unchanging fundamentals of airborne assaults. Future operational artists can look back at World War II and glean insight into methods for employing operational art and design to formulate effective plans for vertical envelopment.

---

<sup>180</sup> Huston, 234.

## Bibliography

### Primary Sources

Airborne Division Report on Operation "Market": Arnhem 17-26 Sept. 1944. HQ, British First Airborne Division, 1944. Fort Leavenworth Combined Arms Research Library. Closed Stacks.

*Airborne Operations: A German Appraisal*. Washington, DC: Government Printing Office, 1989.

Brereton, Lewis. "Narrative of Market Operation." First Allied Airborne Army Headquarters, 1944. Fort Leavenworth Combined Arms Research Digital Library, R11376.

"Intelligence Annex A to Field Order 12." 504 Parachute Infantry Regiment Headquarters, 1944. Fort Leavenworth Combined Arms Research Library. Closed Stacks. N-12701.

Operations in Holland, September to November 1944 First Allied Airborne Army. First Allied Airborne Army, 1944. Fort Leavenworth Combined Arms Research Library. Closed Stacks.

Operations in Support of Dragoon Mediterranean Allied Air Forces. Casaerta, Italy: HQ, Mediterranean Allied Air Forces, 1944. Fort Leavenworth Combined Arms Research Library. Closed Stacks.

Operation "Market Garden" 17-26 Sept 1944. 21 Army Group HQ. Fort Leavenworth Combined Arms Research Digital Library. N13333.

Report of Airborne Phase (17-24 Sept. 44) Operation "Market," XVIII Corps. US Army XVIII Airborne Corps, 1944. Fort Leavenworth Combined Arms Research Library. Closed Stacks.

*Report on Airborne Operations in Dragoon*. Stout Field, IN: HQ, I Troop Carrier Command, 1944. Fort Leavenworth Combined Arms Research Library. Closed Stacks.

*The AAF in the Invasion of Southern France*. Washington, DC: Government Printing Office, 1992. Fort Leavenworth Combined Arms Research Library. Closed Stacks.

### Secondary Sources

"A Historical Study of Some World War II Airborne Operations." Carlisle, PA: WSEG Staff Study 3, 1951. Fort Leavenworth Combined Arms Research Library. Closed Stacks. N-17309.1.

Antill, Peter D. *Crete 1941: Germany's Lightning Airborne Assault*. New York, NY: Osprey Publishing Ltd., 2005.

Army Doctrine Publication 3-0, *Unified Land Operations*. Washington, DC: Government Printing Office, 2012.

Army Doctrine Reference Publication 1-02, *Terms and Military Symbols*. Washington, DC: Government Printing Office, 2013.

- Army Doctrine Reference Publication 3-0, *Unified Land Operations*. Washington, DC: Government Printing Office, 2012.
- Atkinson, Rick. *The Guns at Last Light*. New York, NY: Henry Holt and Company, LLC., 2013.
- Bennett, David. *A Magnificent Disaster: The Failure of Market Garden, the Arnhem Operation, September 1944*. Haverstown, PA: Casemate Publishers, 2008.
- Breuer, William B. *Operation Dragoon*. Novato, CA: Presidio Press, 1987.
- Center for Military History. *Airborne Operations: A German Appraisal*. Washington, DC: Government Printing Office, 1989.
- Colwell, John David Jr. "Soldiers from the Sky: A Comparison of German and US Airborne Doctrinal Development During World War II." Master's thesis, Hawaii Pacific University, 2005.
- Combat Studies Institute. *Operation Anvil/Dragoon*. Fort Leavenworth, KS: Combat Studies Institute, 1984.
- Devers, Jacob L. "Operation Dragoon: The Invasion of Southern France." *Military Affairs* 10, no. 2 (Summer 1946): 2-41.
- Devore, Marc R. *When Failure Thrives: Institutions and the Evolution of Postwar Airborne Forces*. Fort Leavenworth, KS: The Army Press, 2015.
- Farrar-Hockley, Anthony. *Airborne Carpet: Operation Market Garden*. New York, NY: Ballantine Books Inc., 1969
- Field Manual 3-99, *Airborne and Air Assault Operations*. Washington, DC: Government Printing Office, 2015.
- Field Manual 31-30, *Tactics and Techniques of Airborne Troops*. Washington, DC: Government Printing Office, 1942.
- Fleet Marine Force Reference Publication (FMFRP) 12-11, *German Tactical Doctrine*. Washington, DC: Government Printing Office, 1989.
- Gordon, John IV, Agnes G. Schaefer, David A. Shlapak, Caroline Baxter, Scott Boston, Michael McGee, Todd Nichols, Elizabeth Tencza. *Enhance Army Airborne Forces: A New Joint Operational Capability*. Santa Monica, CA: RAND Corporation, 2014.
- Huston, James A. *Airborne Team*. Washington, DC: Government Printing Office.
- \_\_\_\_\_. *Out of the Blue*. West Lafayette, IN: Purdue University Studies, 1972.
- Jenkins, Reuben. "Operation 'Dragoon' – The Breakthrough." *Military Review* XXVI, no. 6 (September 1946): 10-16.
- Joint Publication 3-18, *Joint Forcible Entry Operations*. Washington, DC: Government Printing Office, 2012.

- Joint Publication 5-0, *Joint Operation Planning*. Washington, DC: Government Printing Office, 2011.
- Kennedy, Paul. *Engineers of Victory*. New York, NY: Random House Publishing, 2013.
- Kiriakopoulos, G.C. *Ten Days to Destiny*. New York, NY: Franklin Watts, 1985.
- MacDonald, Callum. *The Lost Battle Crete 1941*. New York, NY: The Free Press, 1993.
- MacDonald, Charles. "The Decision to Launch Operation Market Garden." In *Command Decisions*, edited by Kent R. Greenfield, 434. Washington DC: US Army Center of Military History, 1987.
- Murray, Williamson. "Airborne Comes of Age." *World War II* (March 2004): 26-42.
- Palazzo, Albert. *Battle of Crete*. Bayswater, Australia: Shannon Books Pty Ltd., 2007.
- Perkins, David G. "The Army Operating Concept." Lecture, US Army School of Advanced Military Studies, Kansas, July 17, 2015.
- Ryan, Cornelius. *A Bridge Too Far*. New York, NY: Simon and Schuster Paperbacks, 1974.
- Sadler, John. *Operation Mercury: The Battle for Crete 1941*. Barnsley, South Yorkshire: Pen and Sword Books Ltd, 2007.
- Taylor, Thomas. "The Airborne Invasion of Southern France – Operation Dragoon." 517th PIR Homepage. Accessed December 3, 2015. [http://www.517PIR.org/documents/airborne\\_invasion/airborne\\_invasion\\_history.htm](http://www.517PIR.org/documents/airborne_invasion/airborne_invasion_history.htm).
- Thornton, Rod. *Organizational Change in the Russian Airborne Forces: The Lessons of the Georgian Conflict*. Carlisle Barracks, PA: Strategic Studies Institute, 2014.
- Trueman, C.N., "Paratroopers and World War II." The History Learning Site of the United Kingdom. Last modified May 22, 2015. Accessed November 1, 2015. <http://www.historylearningsite.co.uk/world-war-two/famous-battles-of-world-war-two/the-battle-of-arnhem/paratroopers-and-world-war-two>.
- US Military Academy at West Point History Department. "Operations in Southern France, 15-28 August 1944 & The Invasion of Southern France." Accessed December 3, 2015. <http://www.westpoint.edu/history/SiteAssets/SitePages/World%20War%20II%20Europe/WWIIEurope67.gif>.
- Warren, John C. *Airborne Operations in World War II, European Theater*. Maxwell AFB, AL: USAF Research Studies Institute, 1956.