



Jimmy Doolittle

The Commander behind the Legend

Benjamin W. Bishop
Lieutenant Colonel, USAF



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This study evaluates Jimmy Doolittle's performance as an operational air commander. As one of the most well-known Airmen of the twentieth century Doolittle is the subject of a significant number of books and articles. Despite their many virtues, these efforts have largely overlooked a very important portion of his life—his command of the Eighth Air Force. This study seeks to fill that gap. It draws upon multiple sources, including the mature body of biographical literature, archival documents, and Doolittle's personal and military records. The study reveals that in January 1944, prior to his assumption of command of the Eighth Air Force, Doolittle lacked the administrative skills and bureaucratic experience typical of most senior officers. His legendary raid on Tokyo had, however, demonstrated his technical expertise, courage, and strong personal leadership. In evaluating Doolittle's operational effectiveness as Eighth Air Force commander, the study assesses his efforts to gain air superiority in Western Europe, manage aircrew rotation, and improve the effectiveness of bombing in close proximity to friendly forces. It concludes that Doolittle's aggressive, yet mature, command demeanor placed effectiveness above efficiency and extracted the highest profit from his forces in their effort to defeat the enemy. The evaluation progresses with an appraisal of Doolittle's influence on tactical and technical innovation. In this arena, he had mixed success innovating technically, but his tactical initiatives significantly enhanced the air offensive against Germany. The final portion of the study explores Doolittle's leadership, examining his command environment his leadership approach, and the measures he took to sustain the morale of his command. The analysis reveals that Doolittle adroitly managed his force's morale while remaining steadfast in his determination to defeat the Luftwaffe. The overall conclusion is that behind Jimmy Doolittle's daring and dashing facade was a measure of humility that fostered his growth as a general officer. Although his technical expertise forged trails in aviation history, it was Doolittle's moral qualities that most significantly hastened the demise of the Luftwaffe. This finding suggests that while it is indeed prudent to foster the technical education of future senior leaders, it is even more important to nurture leaders of courage, boldness, and humility.

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The Commander behind the Legend

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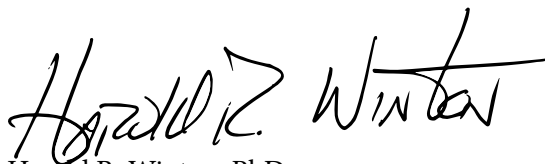
Foreword

Air forces in general, and the US Air Force in particular, place great value on the technical proficiency of their officer corps. This penchant has a very understandable basis—the raw capabilities in air, in space, and now in cyberspace emanate from machines, and very complex machines at that. Thus, to be without cutting-edge technology and leaders who grasp both the potentialities and limitations of such technology would be to place oneself at a severe disadvantage. Emerging developments such as remotely piloted aircraft, artificial intelligence, and almost instantaneous global communications networks have accelerated this proclivity over the last two decades.

James Harold “Jimmy” Doolittle would seem to be a poster child for the technologically proficient Air Force leader—and in many respects he was. In 1922, while still a young officer, he made America’s first coast-to-coast flight of less than 24 hours, a feat made possible by a number of technical modifications he made to his De Havilland DH-4B aircraft. As a master’s student at MIT, his investigations into the relationship of in-flight acceleration, or “g-loading,” on aircraft structures provided valuable data not only to the Army Air Service, but also to the wider aviation community. His 1925 studies of the effects of wind velocity gradients on aircraft performance earned him one of the nation’s first doctorate degrees in aeronautical sciences. And the technical modifications he had made to the B-25B Mitchell bomber enabled the 18 April 1942 raid on Japan that made Doolittle, then a lieutenant colonel, a national hero.

The genius of the present study, however, is to look behind the legend to discover the commander whose leadership of the “Mighty Eighth” Air Force as the American instrument of the Combined Bomber Offensive against Germany has been largely obscured by his daring raid launched from the deck of the USS *Hornet*. The author, Lt Col Benjamin Bishop, concludes that while Doolittle’s technological knowledge was important in his command of the Eighth Air Force, his moral qualities of courage, boldness, and humility were vital. This finding confirms an oft-stated truth that character is the great arbiter of military leadership, and it is one the Air Force would do well to heed.

Colonel Bishop's *Jimmy Doolittle: The Commander behind the Legend* received the First Command Financial Planning Award for best SAASS leadership or ethics thesis of 2012. It is a persuasive exemplar for those who believe that military thought and practice are enhanced through inspired scholarship.

A handwritten signature in black ink that reads "Harold R. Winton". The signature is written in a cursive style with a large, stylized initial "H" and a long horizontal stroke at the end of the name.

Harold R. Winton, PhD
Professor of Military History and Theory
School of Advanced Air and Space Studies

About the Author

Lt Col Benjamin Bishop entered the Air Force as a distinguished graduate of the Reserve Officer Training Corps program at Purdue University, where he was awarded a bachelor of science degree in computer and electrical engineering. He also holds a master of engineering degree in space operations from the University of Colorado and a master of science degree in cyber warfare from the Air Force Institute of Technology. Lieutenant Colonel Bishop is a senior pilot with more than 1,900 fighter hours in the F-15E and is a graduate of the US Air Force Weapons School. Following graduation from the School of Advanced Air and Space Studies (SAASS), he assumed the position of director of operations, 422nd Test and Evaluation Squadron, Nellis AFB, Nevada.

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Most importantly, I want to express my sincere appreciation to my wife and children for their love, patience, and prayers during the long hours devoted to writing this thesis. Their support is what ultimately made this work possible.

Benjamin Bishop
Lieutenant Colonel, USAF

Abstract

This study evaluates Jimmy Doolittle's performance as an operational air commander. As one of the most well-known Airmen of the twentieth century, Doolittle is the subject of a significant number of books and articles. Despite their many virtues, these efforts have largely overlooked a very important portion of his life—his command of the Eighth Air Force. This study seeks to fill that gap. It draws upon multiple sources, including the mature body of biographical literature, archival documents, and Doolittle's personal and military records.

The study reveals that in January 1944, prior to his assumption of command of the Eighth Air Force, Doolittle lacked the administrative skills and bureaucratic experience typical of most senior officers. His legendary raid on Tokyo had, however, demonstrated his technical expertise, courage, and strong personal leadership. In evaluating Doolittle's operational effectiveness as Eighth Air Force commander, the study assesses his efforts to gain air superiority in Western Europe, manage aircrew rotation, and improve the effectiveness of bombing in close proximity to friendly forces. It concludes that Doolittle's aggressive, yet mature, command demeanor placed effectiveness above efficiency and extracted the "highest profit" from his forces in their effort to defeat the enemy. The evaluation progresses with an appraisal of Doolittle's influence on tactical and technical innovation. In this arena, he had mixed success innovating technically, but his tactical initiatives significantly enhanced the air offensive against Germany. The final portion of the study explores Doolittle's leadership, examining his command environment, his leadership approach, and the measures he took to sustain the morale of his command. The analysis reveals that Doolittle adroitly managed his force's morale, while remaining steadfast in his determination to defeat the Luftwaffe.

The overall conclusion is that behind Jimmy Doolittle's daring and dashing façade was a measure of humility that fostered his growth as a general officer. Although his technical expertise forged trails in aviation history, it was Doolittle's moral qualities that most significantly hastened the demise of the Luftwaffe. This finding suggests that while it is indeed prudent to foster the technical education of future senior leaders, it is even more important to nurture leaders of courage, boldness, and humility.

Abbreviations

AAF	Army Air Forces
ACTS	Air Corps Tactical School
AFHRA	Air Force Historical Research Agency
B.T.O.	bombing through overcast
CBO	Combined Bomber Offensive
EAC	Eastern Air Command
<i>g</i>	<i>g</i> -force (italicized to distinguish from “gram”)
JP	Joint Publication
MIT	Massachusetts Institute of Technology
mph	miles per hour
NAAF	Northwest African Air Forces
NACA	National Advisory Committee for Aeronautics
OES	Operational Engineering Section
R&R	rest and recuperation
T.I.	target indicator
USSTAF	US Strategic Air Forces in Europe

Chapter 1

Introduction

James Harold “Jimmy” Doolittle was one of the most influential Airmen of the twentieth century. He is the only individual to have been awarded both the Medal of Honor and the Presidential Medal of Freedom, America’s highest military and civilian honors, respectively. His accomplishments include pioneering instrument flight, setting multiple aviation speed records, and leading the daring raid on Tokyo that bears his name. Doolittle, however, led more than airstrikes in World War II. Following his “thirty seconds over Tokyo,” this reserve officer rose in less than two years from lieutenant colonel to lieutenant general and commanded one of the largest air armadas ever assembled—the Eighth Air Force.¹ As leader of the “Mighty Eighth,” Doolittle oversaw the most extensive bombing campaign ever conducted. Historians have treated his performance in command favorably, and he is widely considered to have been an “outstanding combat leader.”² But it is important to note that this glowing reputation had already been established by the time Doolittle took command of the Eighth Air Force. For example, in 1943, in the first of many Doolittle biographies, Carl Mann claimed, “this is the man of simplicity and courage” whose men attest that they “will go any place he wants to lead . . . any time!”³

This feeling was not, however, universal in the Army Air Forces (AAF) at the opening of World War II. Some officers resented the fact he had left the service for a high-paying civilian position during the interwar period to “feather his nest.”⁴ Others viewed his years as a world-renowned air racer as inadequate preparation for the responsibilities of higher command.⁵ Furthermore, there was a strong impression among his peers that Doolittle’s meteoric rise in rank in World War II was due to his close personal relationship with Gen Henry “Hap” Arnold. As one of Arnold’s favorites, Doolittle was perceived by some as enjoying special privileges.⁶ Finally, although the raid on Tokyo was a significant accomplishment, it did not necessarily reflect an aptitude to command at the operational level of war.⁷ Gen Dwight Eisenhower was initially unimpressed with Doolittle and only reluctantly accepted him as a subordinate after being pressured by Generals Arnold and George Marshall.⁸ According to one recent historian, Eisenhower’s reservations proved justified, because early in the African campaign, Doolittle’s Twelfth Air Force “lacked experience and exhibited an indiscriminate appetite for targets.”⁹

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Which of these perceptions of Doolittle as a senior-level commander is more accurate? Has history perhaps been too kind in its treatment of his command efficacy? In short, just how effective was Jimmy Doolittle as commander of the Eighth Air Force in World War II?

This question is relevant because the academic community has largely overlooked Doolittle's performance as a wartime commanding general. As Richard Davis observed in 1993, "Doolittle badly needs a good biography. The current works on him range in quality from execrable to acceptable."¹⁰ In 2001, Phillip Meilinger observed, "We have yet to see a serious study that looks closely at his career and its effect on American airpower. . . . No one has addressed the issue of Doolittle's beliefs on the proper employment of airpower."¹¹ How is it that historians and biographers have neglected the commander of the largest air force in history? One reason is that Doolittle's other legendary accomplishments, both in and out of uniform, have drawn scholarly attention away from his pivotal role in the Combined Bomber Offensive (CBO). Most scholarly work on Doolittle's influence on World War II centers on the daring raid he led on Tokyo. Another reason is that most of the academic review of the US portion of the CBO has concentrated at the tactical and strategic levels of war, thus ignoring Doolittle's important intermediate command role. Richard Davis and David Mets have each written seminal studies of Doolittle's superior, Carl Spaatz.¹² Likewise, countless narratives illustrate daring accounts of the men who flew bombing missions in the Eighth Air Force.¹³ This is not an uncommon occurrence in the historical study of war. As Harold Winton observes in his account of Army commanders in the Battle of the Bulge, "there seems to be a human fascination with military history written at two levels: the very top and the very bottom."¹⁴

The few studies examining Doolittle's performance as an operational commander are limited by a reliance on subjective accounts and a natural bias toward this charismatic figure. Lowell Thomas and Edward Jablonski's 1976 biography is based largely on the source these men considered "most reliable, and often most objective," Doolittle himself.¹⁵ The general's most prolific biographer, Carroll "C. V." Glines, has published numerous accounts of Doolittle's life, including the coauthored memoir, *I Could Never Be So Lucky Again*. While entertaining and thoughtful, the memoir, published in 1991, is an account of World War II events penned four decades after they occurred. Hence, the autobiography "does not offer a frank appraisal of Doolittle's effectiveness as a combat commander."¹⁶ Carl von Clausewitz himself cautioned against relying upon autobiographies for critical analysis. The Prussian military theorist noted that memoirs "treat such matters pretty broadly, or, perhaps deliberately with something less than candor."¹⁷

Dik Daso's more recent *Doolittle: Aerospace Visionary* is a concise, well-researched treatment, but it fails to challenge the conventional wisdom regarding Doolittle's command performance found elsewhere in the literature. Joanna Doolittle Hobbes, the general's granddaughter, has provided the latest addition to the literature, *Doolittle: Master of the Calculated Risk*. Although this enjoyable book provides noteworthy insight into his personal life, it is understandably biased in favor of its subject.

In sum, there currently exists no critical assessment of Jimmy Doolittle's performance as Eighth Air Force commander in World War II. This study seeks to fill that gap.

Examining Doolittle's command also provides a unique opportunity to study the effectiveness of an officer who had an unconventional military career. Doolittle's ascent to the rank of lieutenant general, which included time spent in academia and industry, defied the conventional path of officer development. Instead of gaining a professional military education, he pursued engineering degrees, including a doctor of science from the Massachusetts Institute of Technology.¹⁸ Furthermore, he commanded a numbered air force with virtually no military staff experience. While his peers were gaining valuable experience in the military bureaucracy, Doolittle flew in air races and lived on a comfortable income as an employee of Shell Petroleum Corporation. Thus, by conventional standards, Doolittle was not, in January of 1944, prepared to command the world's largest concentration of airpower. Or was he? Answering this question has significant relevance to the preparation of Air Force leaders for future command.

This study critically analyzes Jimmy Doolittle's performance as the commander of Eighth Air Force in World War II. Clausewitz defines critical analysis as the "application of theoretical truths to actual events."¹⁹ The present work emulates Clausewitz's guidance by constructing an analytical framework with which to assess Doolittle's performance. According to Clausewitz, the first step in this process is the discovery and interpretation of evidence regarding the event. These facts are then traced back to causal factors. Finally, the commander must be evaluated according to how well he or she applied the available means to achieve the desired end.²⁰ To be useful, this evaluation must account for Doolittle's perspective at the time of his command.²¹ Clausewitz contends that although complete objectivity is unattainable, attempting to reach it induces necessary humility to the process of criticism.

Clausewitz further argued that critical assessment should evaluate a commander's possession of an enigmatic trait referred to as "genius." In *On War*, he submits that this "harmonious combination of elements" is comprised of two components: "intellect and temperament."²² Building on Clausewitz's insights,

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this study examines Doolittle's intellectual capacity and temperament for air command by evaluating three categories of performance: operational effectiveness, technical and tactical innovation, and leadership.

One measure of an operational commander's aptitude is the effective application of resources. Gen Douglas MacArthur famously remarked, "There is no substitute for victory."²³ Harry Yarger similarly averred, "Efficiency is subordinate to effectiveness in strategy."²⁴ These two dicta reflect the imperative for an operational-level commander to achieve the assigned mission. This study uses MacArthur's observation in assessing this factor. This is not to dismiss the importance of efficiency in military operations. The British theorist J. F. C. Fuller valued efficiency and placed it at the epicenter of his military theory. In his treatise, *The Foundations of the Science of War*, Fuller argues that all resources used in war should be expended at "the highest profit."²⁵ Yarger also acknowledged the value of efficiency, stating that "good strategy is both effective and efficient."²⁶ In that spirit, this study addresses both operational effectiveness and efficiency with an emphasis on the former.

Innovation is another essential activity of operational-level command. Often considered primarily an intellectual skill, effective innovation requires a moral strength as well. Like any command decision, innovation involves the risk of making a wrong decision. Innovation also requires eschewing the prevailing wisdom. As Stephen Peter Rosen has observed, "The lack of precedent makes wartime innovation risky, and with the risk often comes a justified aversion."²⁷ This study evaluates Jimmy Doolittle's aptitude as an operational innovator by addressing five issues: specific problems the Eighth Air Force encountered while Doolittle was in command, how he perceived and defined those problems, what actions (if any) he took to resolve the problems, the results of his actions, and any adverse, unintended consequences of his innovations.

Doolittle's leadership is the final area evaluated. Lord Moran defined military leadership as "the capacity to frame plans which will succeed and the faculty of persuading others to carry them out in the face of death."²⁸ The evaluation of Doolittle's operational effectiveness described above addresses the first half of Lord Moran's injunction. This portion of the study explores Doolittle's persuasiveness. Leadership is often considered the ability to motivate others to accomplish the mission, which is obviously an important facet. However, motivation is a skill that affects emotional feelings. In contrast, persuasion's role in leadership appeals to people's reason. This investigation assesses Doolittle's ability to persuade both his subordinates and his superiors as to the value of his policies.

The following chapter is a historical narrative of Jimmy Doolittle's life leading up to his assumption of command of the Eighth Air Force. This account

draws largely upon the mature secondary literature that investigates his life and the raid on Tokyo. This assessment includes a review of his leadership experiences before 1944. It also addresses what he missed by not attending either the Command and General Staff School of the Army War College or the Air Corps Tactical School (ACTS). This chapter answers the question, based on what we know about Doolittle prior to 1944, of what are reasonable expectations of his performance as commander of the Eighth Air Force Europe.

Chapter 3 assesses Doolittle's operational effectiveness and whether or not he made the best possible use of the resources allocated to him, given his command environment. It begins by discerning what is similar and different about commanding the Eighth Air Force compared with Doolittle's previous leadership roles and then addresses questions regarding his effectiveness at the operational level of war. What was Doolittle's approach to achieve air superiority over Western Europe? What role did he play in changing the length of bomber crew tours? How did he adjust to the mission of close air support?

Next, chapter 4 investigates Doolittle's tactical and technical innovation in the Combined Bomber Offensive. How influential was he in shaping the tactical employment of the Eighth Air Force? How pivotal was his role in changing the tactical use of escort fighters in early 1944? What was Doolittle's function in the implementation of technological advances? How well did he blend technical and tactical innovation in his attempt to improve the effectiveness of radar bombing?

The penultimate chapter examines Doolittle's performance in leading the men and women of the Eighth Air Force. This analysis begins by examining his command environment and leadership style. It then assesses how he coped with a decline in aircrew morale. Did any decisions regarding the innovative and efficient use of airpower hinder his ability to lead his men? How well did he sustain the Eighth's military spirit?

The concluding chapter synthesizes the answers to the above questions, drawing appropriate conclusions regarding Jimmy Doolittle's effectiveness as a numbered air force commander and discusses the implications of these findings for contemporary and future Air Force leaders.

Evidence for this investigation comes from numerous sources. The Air Force Historical Research Agency (AFHRA) files provided intimate insight into the operations of the Eighth Air Force from the perspective of 1944. The AFHRA also houses many of Doolittle's recorded oral histories, which offer insight into his perception of events. However, the earliest of these interviews dates back only to 1968, almost 25 years removed from the events themselves. The large collection of correspondence housed in his personal papers that reside in the Doolittle Library at the University of Texas at Dallas offsets this

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disadvantage. The Library of Congress also holds manuscript collections and official documents giving the perspectives of Doolittle's supervisors and peers, including the personal papers of Generals Arnold and Spaatz. These resources include officer assessment reports, correspondence, interviews, and personnel records. Finally, the National Personnel Records Center at St. Louis houses Doolittle's military records, which provide official insights into his professional career.

Clausewitz wisely asserts, "If a critic wishes to distribute praise or blame, he must put himself exactly in the position of the commander."²⁹ Hence, we must attempt to get inside the mind of Jimmy Doolittle. This requires us to look back at his life prior to arriving in England in January 1944.

Notes

1. The quote refers to the title of a book by Doolittle raider Capt Ted W. Lawson and the 1944 MGM movie starring Spencer Tracy as Lt Col Jimmy Doolittle.

2. Phillip S. Meilinger, *Airmen and Air Theory: A Review of the Sources* (Maxwell AFB, AL: Air University Press, 2001), 30.

3. Carl Mann, *Lightning in the Sky: The Story of Jimmy Doolittle* (New York: Robert M. McBride & Co., 1943), 256.

4. James H. Doolittle and Carroll V. Glines, *I Could Never Be So Lucky Again* (New York: Bantam Books, 1992), 150.

5. Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York: Random House, 1993), 181.

6. Doolittle and Glines, *I Could Never Be So Lucky Again*, 201.

7. The Department of Defense defines the operational level of war as "the level at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives within theaters or other operational areas." Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 31 December 2010, 271.

8. Doolittle and Glines, *I Could Never Be So Lucky Again*, 277.

9. Douglas Porch, *The Path to Victory: The Mediterranean Theater in World War II* (New York: Farrar, Straus, and Giroux, 2004), 399.

10. Richard G. Davis, Carl A. Spaatz and the Air War in Europe (Washington, DC: Center for Air Force History, 1993), 688 n9.

11. Meilinger, *Airmen and Air Theory*, 29–30.

12. Davis, *Carl A. Spaatz and the Air War in Europe*; and David R. Mets, *Master of Airpower: General Carl A. Spaatz* (Novato, CA: Presidio Press, 1997).

13. Among some of the better accounts are Donald L. Miller, *Masters of the Air: America's Bomber Boys Who Fought the Air War against Nazi Germany* (New York: Simon & Schuster, 2007); Bert Stiles, *Serenade to the Big Bird: A New Edition of the Classic B-17 Tribute* (Atglen, PA: Schiffer Publishing, 2007); and Harry H. Crosby, *A Wing and a Prayer: The "Bloody 100th" Bomb Group of the U.S. Eighth Air Force in Action over Europe in World War II* (New York: HarperCollins, 1994).

14. Harold R. Winton, *Corps Commanders of the Bulge: Six American Generals and Victory in the Ardennes* (Lawrence: University Press of Kansas, 2007), 6.

15. Lowell Thomas and Edward Jablonski, *Doolittle: A Biography* (Garden City, NY: Doubleday & Co., 1976), 352.
16. Meilinger, *Airmen and Air Theory*, 30.
17. Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Peret, reprint ed. (Princeton, NJ: Princeton University Press, 1989), 164.
18. Doolittle and Glines, *I Could Never Be So Lucky Again*, 518.
19. Clausewitz, *On War*, 156.
20. Ibid.
21. Clausewitz, *On War*, 164.
22. Ibid., 100.
23. Quoted in Richard H. Rovere and Arthur Schlesinger Jr., *General MacArthur and President Truman: The Struggle for Control of American Foreign Policy* (New Brunswick, NJ: Farrar, Straus, and Giroux, 1951), 227.
24. Harry R. Yarger, *Strategy and the National Security Professional: Strategic Thinking and Strategic Formulation in the 21st Century* (Westport, CT: Praeger Security International, 2008), 153.
25. J. F. C. Fuller, D.S.O., *The Foundations of the Science of War* (London: Hutchinson and Co., 1926), 201.
26. Yarger, *Strategy and the National Security Professional*, 153.
27. Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca, NY: Cornell University Press, 1991), 25.
28. Lord Moran, *The Anatomy of Courage*, 2nd ed. (London: Constable, 1966), 180.
29. Clausewitz, *On War*, 164.

Chapter 2

The Shaping of a Commander

Through summarizing Jimmy Doolittle's life prior to his command of the Eighth Air Force—including the formative experiences in his childhood and early armed forces career, his time in commercial industry as an employee of Shell Oil, and his experiences early in World War II—we can better establish a reasonable expectation of his performance as commander of the Mighty Eighth.

Early Life and Career

James Harold Doolittle was born 14 December 1896 near San Francisco, California. He was the only child of Rosa Shepard, a stern disciplinarian, and Frank Henry Doolittle, a carpenter described by his son as a “loner in spirit.”¹ Shortly after Jimmy's birth, his father left for the Alaskan frontier. Rosa and her son joined Frank two years later, and the boy spent his formative years in the isolated mining town of Nome, Alaska. Under the tutelage of his father, Jimmy acquired a skill for carpentry and design.² Frank also sparked a yearning for travel and exploration by taking his 11-year-old son on a trip to California. The younger Doolittle later recalled that the trip to the “outside” changed his perspective “right then and there.”³

Nome's frontier environment fostered a competitive spirit that Doolittle carried throughout his life.⁴ Smaller than his peers, he battled bullying with an aggressive onslaught of punches. He gained a reputation as a daring brawler by besting older and bigger boys. He also excelled in gymnastics and spent hours practicing aerial stunts, developing a keen sense of balance and coordination.⁵ He continued his athletic endeavors after Rosa moved him back to California in 1908 without Frank, winning the amateur boxing championship of the Pacific Coast in 1912 and earning money by entering professional tournaments.⁶ He later competed as a member of the University of California School of Mines boxing team and gymnastics club.⁷

The rough boxer met a refined woman in California who changed his life—Josephine Daniels. In stark contrast to Jimmy, “Joe” grew up in a cultured family from Louisiana and was a top student. Not surprisingly, Doolittle's rough reputation did not please her family. Undeterred, he used his earnings from professional boxing to court her. His persistence paid off, and they were married on Christmas Eve 1917. Throughout their 71-year marriage, Joe's

measured, disciplined, and friendly demeanor grounded Jimmy's desire for independence and adventure.⁸ His love for Joe inspired him to seek stability in his life and obtain the means to support his new bride.

Following a failed venture to Alaska in search of employment with his father, Doolittle enrolled in a junior college and later transferred to the University of California. After completing three years toward a degree in mining engineering, the gravity of World War I drew him to an Army recruiter's office. He elected to join the aviation branch because working with "mechanical things" appealed to him more than "the idea of going into the trenches."⁹ Doolittle entered the army as a "flying cadet" and began pilot training at Rockwell Field on San Diego's North Island. He graduated from flight school on 5 March 1918 and received his commission as a second lieutenant in the Signal Reserve, Aviation Section. After advanced flight instruction at Gerstner Field, Louisiana, he returned to California to serve as a combat and gunnery instructor at Ream Field, an auxiliary airport south of Rockwell.¹⁰ Doolittle petitioned his commander for a transfer to the contested skies over France, but his pleas were denied. He served the rest of World War I training other pilots for combat.

Doolittle excelled as a young fighter pilot. His superior balance gained as a tumbler and his quick reflexes developed from boxing provided an advantage in aerial combat.¹¹ His competitive spirit enhanced these skills. Aware that inept flying would undermine his credibility, he practiced tirelessly. He later reflected that he "perfected [his] flying skills" during this period.¹² Doolittle's reputation as a capable pilot quickly spread and made an impression on two fellow lieutenants who figured significantly later in his career—Ira C. Eaker and Carl "Tooley" Spaatz.¹³

Doolittle did not limit his quest for aerial credibility to the cockpit. Given his small stature and experience as a gymnast, he decided to experiment with wing-walking. Slow, tentative step by slow, tentative step, he developed the ability to cling to the aircraft wings during flight. He reasoned it would be simple to progress from riding on the aircraft wing to its axle and bet a fellow instructor that he could ride between the aircraft wheels during a landing.¹⁴ His bet paid off in the form of five dollars and increased respect from his peers. Doolittle's supervisors, however, did not condone his daring exploits. The stunt garnered the attention of the new district supervisor, Col Henry "Hap" Arnold.¹⁵ Despite these aerial antics, Arnold recognized the younger man's talent as an aviator and rated him as "an exceptionally fine instructor and pilot" who possessed "good judgment with quick thinking."¹⁶

In July 1919 the Army Signal Corps assigned Doolittle to Kelly Field near San Antonio, Texas, where he was promptly confined to post for "stunting" a

de Havilland DH-4.¹⁷ His time at Kelly, however, was brief; in October he joined Flight A of the 90th Aero Squadron at Eagle Pass on the Rio Grande.¹⁸ The “Dicemen” had the tedious task of patrolling the Mexican border. Doolittle introduced some excitement into the missions by flying between two narrowly spaced pylons supporting the Pecos River High Bridge.¹⁹ Although he carefully surveyed the bridge prior to the stunt, once again, a commander did not approve of his daring spirit. Accordingly, his efficiency report reflected the performance of an above-average pilot with “one serious drawback,” an “inclination to occasionally use poor judgment; i.e. take exceptional and unnecessary risks in flying.”²⁰

In 1922 Doolittle focused his penchant for daring aerial endeavors onto a feat that advanced the aviation community. He obtained approval from the chief of the Air Service, Gen Mason M. Patrick, to attempt a cross-country flight in less than 24 hours. As with many of his earlier “stunts,” Doolittle planned the mission methodically. First, he developed technical modifications to enhance the range of his DH-4 aircraft. As a recent graduate of the Air Service Mechanics School, he understood the complex workings of aircraft engines and systems. He visited the Air Service test facility at McCook Field in Dayton, Ohio, where he consulted engineers on his proposed modifications. Returning from Dayton, he presented the ground crew at Kelly his plans to modify his DH-4B's front seat with an additional 240-gallon fuel tank and a 24-gallon oil tank. To accommodate the new fuel configurations, he added a slight camber to the upper wing and streamlined the bottom of the aircraft. He also installed a lifting body on the landing gear to reduce drag. Other modifications included additional support ribs, tighter stitching, a customized coating, and varnish to strengthen the wings.²¹ Doolittle acquired a new flight instrument being tested at McCook, a turn-and-bank indicator. Finally, he designed the first “pilot dehydration tube” to accommodate his personal needs for the long flights.²² Based on engine data from test flights, Doolittle calculated he could safely fly for 13 hours without landing for fuel.

Doolittle also prepared himself for the mission. He trained vigorously, flying from Kelly Field to both San Diego and Florida to familiarize himself with the route.²³ During these flights, he documented terrain details and aircraft performance in his notebook. He considered pilot fatigue his biggest obstacle. Consequently, he planned his flight from east to west, into prevailing winds, because the westerly route offered him three additional hours of daylight. Doolittle also arranged for a plane from Rockwell Field to escort him into California and help him remain alert during the last hours of the mission. Finally, he prepared himself physically with regular exercise and “abstinence from all injurious habits.”²⁴

THE SHAPING OF A COMMANDER

By 6 August 1922, Doolittle's extensive technical, physical, and mental preparation had given him "implicit confidence" in his ability to fly coast-to-coast in less than 24 hours. However, an error of "overconfidence" delayed his mission for nearly a month.²⁵ His preparation failed to account for the hazards of taking off from Pablo Beach, Florida, in darkness. As a crowd watched, Doolittle's DH-4 roared toward the rising tide at 9:40 p.m. EST, but a wave caught the wheels, causing the aircraft to crash. He emerged from the wrecked aircraft unharmed but humbled.²⁶

With permission for a second attempt granted by General Patrick, a determined Doolittle refurbished the aircraft. At 9:52 p.m. EST on 4 September 1922, with lanterns to guide the takeoff roll, he safely departed from Pablo Beach. After an "uneventful flight" of 10 hours and five minutes, Doolittle landed at Kelly Field at 6:57 a.m. CST. After fueling, maintenance work, and a large breakfast, he climbed into the airplane and departed at 8:07 a.m. CST for the second leg of his flight.²⁷ He joined with two Rockwell-based aircraft over Yuma, Arizona, who followed him in for a formation landing at Rockwell Field. The entire trip covered 2,163 miles with an elapsed time of 22 hours, 30 minutes.²⁸

Doolittle's daring cross-country flight had a profound effect on both the aviation industry and his career. First, as he concluded in his official report, the flight demonstrated the feasibility of conducting long-range flights. He noted that both the Liberty engines and a pilot in "good physical condition," could endure the demands of such a flight.²⁹ Doolittle's successful flight also demonstrated the attributes of thorough, innovative planning and solid physical endurance. His accomplishment garnered praise from his superiors and peers alike, and he was later awarded a Distinguished Flying Cross for the achievement.³⁰ The experience gained from planning this feat would serve him well when he later led a mission that would change the landscape of World War II.

Doolittle's next assignment took him to McCook Field in Dayton and the Air School of Applications to attend a one-year course in engineering.³¹ His transcontinental flight caused him to miss the first week of class, but he quickly caught up and mastered the essentials of aeronautical engineering.³² He learned new methods to reduce aerodynamic drag, increase engine efficiency, and enhance airborne equipment.³³ The course encouraged Doolittle to test his knowledge on a fleet of modern aircraft. McCook Field was pilots' heaven. During his tenure there, Doolittle added nine different types of aircraft to his flying experience.³⁴ His superiors recognized Doolittle's competence as a test pilot and rated him as "one of the four best students" in the school.³⁵

His achievements at McCook Field provided Doolittle the opportunity to continue his technical education at the Massachusetts Institute of Technology

(MIT). MIT accepted him into its engineering program after the University of California granted him a bachelor of arts degree for his three years of undergraduate studies and subsequent coursework at McCook.³⁶ The Army granted him two years of detached service from McCook to pursue his studies. The Doolittles moved to Cambridge, and he enrolled at MIT in the fall of 1923. To maintain his flying currency, he periodically returned to Dayton.³⁷

At MIT, Doolittle investigated a problem that plagued aircraft in the mid-1920s—structural failure. His master's thesis, "Wing Loads as Determined by the Accelerometer," and the subsequent paper he submitted to the National Advisory Committee for Aeronautics (NACA), labeled *Report No. 203: Accelerations in Flight*, advanced the understanding of structural effects of in-flight acceleration, also known as "g-loading" and measured in g,s (i.e., one g equals the normal force of gravity on a stationary object). Doolittle derived an equation to determine the maximum theoretical load an aircraft could achieve in flight. To test his hypothesis, he flew a Fokker Pursuit PW-7 biplane through a series of maneuvers and collected data with a new instrument called an accelerometer.³⁸ His tests were cut short, however, when he discovered stress fractures in the wings, which he had nearly ripped off the airplane. Nevertheless, he had collected sufficient data to confirm his predictions.³⁹ Based on these results, he concluded that pursuit aircraft could exceed 12 g,s in a dive recovery. Because aircraft were designed to withstand only 8.5 g,s, Doolittle concluded, "It is obvious that any of the modern pursuit planes can be failed in a vertical dive if the stick is pulled back rapidly enough and the elevators are effective."⁴⁰ Consequently, he recommended a new design standard of 12 g,s be adopted to increase safety in pursuit aircraft. He also documented the physiological influence of acceleration forces. He discovered pilots could tolerate high g-loads for short periods of time. He rightly observed, however, that "accelerations of the order of 4.5 g,s, continued for any length of time, result in a complete loss of faculties."⁴¹ The Air Corps recognized that his tests obtained "scientific data of great and permanent importance" and awarded Doolittle a second Distinguished Flying Cross in 1929.⁴² MIT also approved his work and awarded him with a master of science degree in 1924, a year ahead of schedule.

Doolittle used his remaining year at MIT to pursue doctoral studies. His dissertation investigated the effects of wind on flight characteristics. Many experienced pilots claimed it was easier to fly into the wind than away from it; others disagreed, claiming there was no difference. To address this divergence, Doolittle conducted 292 flights in four types of aircraft. He concluded that "theory and experiment indicate that neither wind velocity nor wind velocity gradient exert an influence on airplane performance in straight level flight."⁴³

In other words, the latter opinion was correct. Following an initial rejection for modifications, his research was accepted. In June 1925, MIT awarded Doolittle one of the first doctor of science degrees in aeronautical sciences.

After Doolittle returned to McCook Field, he was selected to compete in the 1925 Schneider Cup seaplane race.⁴⁴ The Air Service provided a Curtiss R3C racing aircraft equipped with the most advanced technology of the time, including a 610-horsepower (hp) Curtiss V-1400 engine. During the race, Doolittle employed the innovative technique of climbing during straight-aways and using steep, descending turns around the pylons. Using this method, he won the race and set a new seaplane record with an average speed of 232.573 miles per hour (mph). However, he was not satisfied that he had extracted the maximum performance from the R3C. Therefore, after making some technical modifications, he flew the course again the following day and broke his own record with an average speed of 245.713 mph.⁴⁵

Winning the Schneider Cup enhanced Doolittle's reputation as a capable and daring aviator. General Patrick dispatched a letter of commendation lauding the race as "one of the most able demonstrations I have ever witnessed."⁴⁶ *New York Times* editorials commented on the irony of an Army pilot beating two naval aviators in a seaplane race.⁴⁷ Billy Mitchell believed that the media coverage of Doolittle's success at the Schneider Cup overshadowed his own court-martial proceedings. Jimmy Doolittle was becoming a household name.⁴⁸ C. M. Keyes, president of Curtiss-Wright Aircraft Company, recognized that Doolittle's growing international fame would make him an ideal salesman for the new Curtiss P-1 Hawk pursuit plane. Keyes convinced the Air Service to release Doolittle from service to demonstrate the capabilities of the P-1 in South America. In the spring of 1926, he boarded a ship for Santiago, Chile.⁴⁹

Doolittle arrived in Chile on 23 May 1926 and engaged in preflight festivities at the officers' club of El Bosque, the military airport near Santiago.⁵⁰ Emboldened by a "delightful, powerful drink called a pisco sour," he attempted to "make character" with his Chilean colleagues by demonstrating a feat of gymnastic prowess on a window ledge.⁵¹ The ledge gave way, and he fell two stories, breaking both ankles. Dreading the reception he would receive from his colleagues at McCook and his corporate sponsors at Curtiss, Doolittle considered his options. "Embarrassment overcame pain," and he convinced the doctors to cut his casts to below the knees so he could control the rudder pedals with a set of newly fashioned bootstraps.⁵² Doggedly determined, Doolittle was carried to the aircraft and flew aerial demonstrations in Chile, Bolivia, and Argentina. The flights accomplished their intended effect, and Curtiss sold several Hawks in South America.⁵³

Although his accident in Chile resulted in a “50% loss of flexion” in both ankles, Doolittle was returned to flying status at McCook Field after six months of recuperation in Walter Reed General Hospital.⁵⁴ At McCook he continued his duties as a test pilot and avid flier. His extensive experience flying in the Dayton area and acute powers of observation gave him confidence navigating in poor weather. He later recalled that while flying around McCook, “I knew instantly where I was, even if I could only see relatively a few feet ahead.” His commander, however, rebuked Doolittle for flying in “weather that no one else would fly in.”⁵⁵ His efficiency report of 30 July 1928 reflects “Satisfactory” performance and an officer whose “heart is only in flying and consequently, engineering assignments are not very desirable.”⁵⁶

Ironically, Doolittle’s penchant for flying in adverse weather provided him an opportunity to achieve one of the biggest engineering advances in aviation history. In January 1926, Harry F. Guggenheim encouraged his father, Daniel, to establish a fund for the promotion of aeronautics. The endowment spurred many of aviation’s early achievements, including Charles Lindbergh’s historic solo crossing of the Atlantic in 1927.⁵⁷ Although flight operations were commonplace in the late 1920s, inclement weather limited pilots who predominantly flew “by the seat of their pants.” Harry Guggenheim established the Full Flight Laboratory to “encourage perfection of control in a fog . . . [and] finance a study of and a solution to fog flying.” The fund’s vice president, Emory S. “Jerry” Land, a Navy captain, selected Doolittle to head the laboratory. Land justified his selection by noting that Doolittle possessed “a technical education that has given him a distinct advantage in the development of new equipment.”⁵⁸

In the fall of 1928, Doolittle moved to Mitchel Field on Long Island, New York. His charge was to develop the technology and flying techniques required to take off and land aircraft in the blind. After initial testing, he concluded that instrument flying required three types of accurate information: altitude, heading, and aircraft attitude. To solve the problem of altitude, Doolittle tested a new device that “was an order of magnitude more accurate than earlier altimeters.”⁵⁹ He sketched a diagram of an instrument to solve the latter two problems. The drawing provided the inspiration for the Sperry Gyroscope Company to build the first artificial horizon and the directional gyroscope.⁶⁰ The design of these instruments set the standard in aviation.

To achieve the goal of making a blind landing, Doolittle also required new ground equipment. The team installed fan and homing beacons on the airfield. The former caused an instrument rod to vibrate when the aircraft flew past the airfield boundary, providing a measure of distance. Another cockpit instrument used the beacons to display course information via two vibrating rods. With practice, Doolittle became adept at discerning his position relative

to an inbound course. To conduct a blind landing, he approached Mitchel Field at 200 feet, as indicated by his new altimeter. When he passed the outer edges of the field, he retarded the throttle and began a steady descent toward the ground until he landed. After methodically practicing the maneuver, Doolittle found that he “made better landings this way than . . . [visually] without the instrumentation.”⁶¹

On 24 September 1929, with Lt Benjamin Kelsey in the front seat as a safety observer, Doolittle took off, flew a set course, and landed safely while under an instrument hood. Guggenheim witnessed the 15-minute flight and declared it history’s first “blind flight.”⁶² Doolittle considered his participation in the early blind-flying experiments his “most significant contribution to aviation.”⁶³ As Dik Daso observed, by developing blind flight, Doolittle had “applied science to modify technology in a successful effort to solve a practical problem.”⁶⁴

After the success of the blind-flying experiments, fiscal reality forced Doolittle to consider his future. The modest pay of a first lieutenant made it difficult to support both his ailing mother and his mother-in-law. He could earn three times his military pay working for a civilian company as a test pilot. Thus, primarily for monetary reasons, he resigned his regular commission and joined Shell Oil as chief of its aviation division. Doolittle maintained his connection to the Air Service by applying for a reserve commission in the Specialist-Reserve. He was promptly accepted into the reserves as a major, bypassing the rank of captain.⁶⁵

Civilian Life

Doolittle left the Army Air Service on 15 February 1930. The next day, he loaded his family into a \$25,000 Lockheed Vega provided by Shell for his travel. Overloaded with baggage, the aircraft failed to get airborne and crashed into a snow bank. The startled family emerged from the wreck unhurt; however, a headline in the local paper, “Doolittle’s First Civilian Hop in 12 Years Fails; Ex-Army Pilot Crashes in Snow Before Start,” stung his pride. Again, overconfidence had led to a life-threatening mishap. Doolittle reported to his first day of work as a civilian “a very humble individual.”⁶⁶

The primary reason Shell Oil hired the celebrity pilot was to bask in his fame. In the 1930s, the best place to promote one’s employer as an aviator was on the racing circuit. Doolittle entered the 1931 inaugural Bendix cross-country air race with a new Laird Super Solution airplane. The course began in Burbank, California, and terminated in Cleveland, Ohio. The race offered a first-place prize of \$7,500 and an additional \$2,500 bonus to anyone who set

a new transcontinental record by continuing to New York. It was just the sort of challenge Doolittle savored.

Shortly after midnight on 4 September 1931, seven pilots departed Burbank. Among those competing was Capt Ira Eaker, a promising young Army officer who had continued Doolittle's instrument research. Nine hours, 10 minutes, and 21 seconds after Doolittle departed Burbank, he landed in Cleveland.⁶⁷ Unsure of his victory, he refueled his aircraft and continued to New York, despite poor weather conditions, arriving there 11 hours and 11 minutes after his early morning takeoff from Burbank. That day, Doolittle secured another significant footnote in the history of aviation by becoming the first man to traverse the continent in less than 12 hours. His work was not, however, complete. He returned to Cleveland to rejoin Joe and their two sons. He then called his supervisor, Shell vice president Alexander Fraser, who invited him to a celebration of his latest feat. Never one to turn down a party, Doolittle flew the Super Solution to St. Louis that evening. As Daso remarked, through these feats of aviation endurance, "Doolittle was demonstrating the practicality of air travel."⁶⁸

Doolittle turned to another contest of speed to accomplish his next aviation milestone. He entered the 1932 Thompson Trophy race, flying the notorious Gee Bee Super Sportster R1 racer. At the time Doolittle arrived at Bowles airport, near Springfield, Massachusetts, the R1 had already killed one pilot, and another lay in the hospital severely injured. Indeed, the aircraft was built for speed, not safety. Doolittle's engineering eye surveyed the 18-foot-long racer with small, stubby wings and a 750-hp Wasp engine.⁶⁹ Although he "didn't trust this little monster," he was confident he could safely harness its immense power.⁷⁰ He described flying the unstable aircraft as "like balancing . . . an ice cream cone on the tip of your finger."⁷¹ Nevertheless, his carefully managing the temperamental airplane paid dividends. In the Thompson race trials, Doolittle set a new world speed record of 309.040 mph. Although flying cautiously, he easily won the Thompson race with a more modest performance of 252.686 mph, still a race record.⁷² Doolittle later reflected that he flew the R1 because "it was the fastest airplane in the world at the time." He acknowledged, however, that the R1 was the "most dangerous airplane" he ever flew, and it "had a profound effect" on his thinking.⁷³ Consequently, the leading race pilot of his day made a decision that may have saved his life—he retired from air racing.

Finished with racing, Doolittle used his position at Shell Oil to advocate production of high-octane aviation fuel. One-hundred-octane fuel significantly increased engine performance, and he felt that producing such fuel would benefit Shell and the armed forces. But Shell faced "a chicken or the egg

dilemma.” Aircraft were not designed to use high-octane aviation fuel because it was not then affordable. Oil companies did not produce the fuel because so few aircraft used it.⁷⁴ Because aviation fuel was not Shell’s primary source of revenue and the company faced the fiscal realities of the Great Depression, some employees condemned the proposed investment as “Doolittle’s million-dollar blunder.”⁷⁵ Similarly, some senior military officials considered the development of high-octane fuel unnecessary. In May 1936, Doolittle used his reserve status to conduct a study “on the availability of 100 octane gasoline to meet needs of Army and Navy in war.”⁷⁶ The cumulative effects of Doolittle’s academic credentials, McCook Field test data, and personal connections convinced Shell executives to invest in the refineries necessary to produce 100-octane aviation fuel in large, affordable quantities. In November 1936, an Army committee followed suit and recommended the adoption of 100-octane fuel for combat aircraft. As demand increased, so did production. By 1938, Shell was producing 100-octane fuel at a cost of 17.5 cents per gallon—only 2.5 cents more than traditional 87-octane fuel.⁷⁷ The investment paid off handsomely for Shell Oil and for Allied pilots fighting the German Luftwaffe several years later.

His duties at Shell also provided an opportunity to foresee the impending war in Europe. Because Shell was a global company, Doolittle maintained close contact with European aviation industries, making annual visits to Europe to meet with aviation leaders.⁷⁸ During a trip to Germany in 1939, he observed a significant change in the aircraft industry. On 28 July he penned an entry in his personal notebook that income tax in Germany was 35 percent and that, although luxury items were cheap, food and other necessities were expensive. He speculated that everyone in Germany “spends their dough and [sic] keeps it in circulation.”⁷⁹ The following day he noted “wood piled up over areas several acres in extent. . . . Von Wunce [his German escort] advised they were for paper and textiles but looked like they might be used for trenches.”⁸⁰ On 10 August he also noted, “Germany 340,000 tons of aviation gasoline. In 1939 imported 110,000–120,000 tons. In 1940 a new 600,000 (±40,000) ton [sic] going in 1940.”⁸¹ Doolittle concluded from these observations that Germany was mobilizing for war.

When he returned to the United States, Doolittle contacted his friend Hap Arnold. Since first meeting at Rockwell Field, Arnold and Doolittle had maintained a close relationship. Their correspondence clearly indicates their mutual fondness.⁸² This visit with Doolittle’s former commander, however, was much more serious. Doolittle told Arnold of his belief that war with Germany was inevitable and asked to return to active duty.⁸³ Arnold agreed and soon

issued orders directing Major Doolittle to report to active duty for a period of one year.⁸⁴ He would serve for more than six.

Early World War II Career

General Arnold recognized that Doolittle had acquired unique skills and put him to work coordinating industrial support for the expanding Army Air Forces (AAF).⁸⁵ Following an assignment to Indianapolis, he moved to Detroit to oversee the transition of the Motor City's industrial production from cars to aircraft. Doolittle described the job as managing a "shotgun wedding between the aviation and automobile industry."⁸⁶ The car manufacturers were not interested in building aircraft, and the aviation industry did not want to encourage new competition. Doolittle employed his technical expertise, personal charisma, and tact to mediate between the two communities. He found the dynamics fascinating and remarked that his time in Detroit "was the most interesting period of my career."⁸⁷ His efficiency report for this period remarked, "most energetic and resourceful in accomplishing a project, even to the point of disregarding regulations and following the usual channels of military authority."⁸⁸

On 2 January 1942, Doolittle reported to Washington as a new lieutenant colonel for duties as the director of operational requirements on General Arnold's staff. Arnold had him evaluate the Martin B-26 Marauder medium bomber, which had developed a reputation as a dangerous aircraft. After a series of flight tests and stability demonstrations, Doolittle concluded that the plane was safe; the problem was training. He recommended continued production of the B-26, with new training to prepare its pilots.⁸⁹ Pleased with the results, Arnold gave Doolittle the assignment that would immortalize him as a national hero—the raid on Tokyo.

The famous "Doolittle Raid" originated in the Oval Office. After the "day of infamy" attack on Pearl Harbor, Pres. Franklin D. Roosevelt pressed his joint chiefs for a plan to bomb the Japanese homeland to raise national morale.⁹⁰ The idea of launching an Army medium-range bomber from an aircraft carrier did not come from Doolittle but from a Navy submarine captain named Francis Low. Low raised the idea with his boss, ADM Ernest King, chief of naval operations, who directed him to contact CAPT Donald Duncan, a veteran naval aviator. On 17 January 1942, Duncan and King met with General Arnold, and the idea was put into motion. Arnold tapped Doolittle to plan the mission and train the aircrew for the raid. To expedite the process, he granted Doolittle "first priority on anything you need to get the job done."⁹¹

Doolittle faced significant technical challenges in planning the Tokyo raid. The Army and Navy agreed early on that the North American B-25B Mitchell bomber was the best aircraft for the mission because it provided the optimal combination of range and short-takeoff performance.⁹² Additionally, its 67.5-foot wingspan enabled it to be launched from an aircraft carrier.⁹³ However, the typical range of a B-25 was only 1,300 statute miles. The mission required the aircraft to fly more than 2,400 statute miles.⁹⁴ Unlike Doolittle's transcontinental flights, there would be no opportunity to refuel. He had to make significant design modifications to the aircraft.

As he had done 20 years prior, Doolittle traveled to Dayton to confer with engineers regarding his plans to extend the plane's range. They agreed on several design changes. First, he decided to install three additional fuel tanks, increasing the B-25's fuel load from 696 to 1,141 gallons.⁹⁵ To reduce weight, he removed radio equipment, the sensitive Norden bombsight, and the rear-facing machine guns. He also installed cameras to document the historic raid.⁹⁶ He calculated that the improvements extended the range of the B-25 to 2,400 statute miles flying at 5,000 feet. In January 1942, he sent 24 B-25Bs to Minneapolis, Minnesota, for modification according to these requirements.⁹⁷

With the technical modifications under way, Doolittle turned his attention to selecting aircrew. His first task was to identify the squadrons with the most experience flying the B-25. The answer was the 17th Bomb Group, consisting of the 34th, 37th, and 95th Bomb Squadrons and the associated 89th Reconnaissance Squadron, all stationed in Pendleton, Oregon.⁹⁸ Doolittle queried the units for volunteers interested in an unspecified, dangerous mission. Because every crew member volunteered, Doolittle asked the commanders for a list of the most-qualified personnel. He then chose the 89th Reconnaissance Squadron commander, Maj John A. "Jack" Hilger, to serve as his deputy.⁹⁹ Interestingly, he did not select the 17th Group commander, a full colonel who outranked him, to participate in the mission.¹⁰⁰ Because Doolittle had yet to be designated to lead the raid, he eliminated any potential competition for that assignment. He was determined to lead the raid himself and eventually gained Arnold's permission to do so.¹⁰¹

The airplanes and crews arrived at the Valparaiso Bombing and Gunnery Base, now Eglin Air Force Base, near Fort Walton Beach, Florida, between 17 February and 3 March.¹⁰² Because the mission's primary objectives were political rather than tactical, Doolittle elected a low-altitude attack with incendiary bombs. To conserve fuel, he planned for the aircraft to take off and fly individually to their targets. Therefore, the crews immediately began practicing overwater navigation, night flying, and low-altitude bombing. The Navy dispatched LT Henry L. "Hank" Miller to instruct the pilots on carrier operations.

The pilots meticulously practiced the delicate art of taking off with a heavily laden B-25 at a nearby auxiliary field.¹⁰³ To minimize the takeoff roll, they coaxed their aircraft into the air “almost in a stall.”¹⁰⁴

The pilots had little time to perfect these complex maneuvers. On 25 March, the airplanes were flown to Sacramento Air Depot for final inspection and then to Alameda Naval Air Station near San Francisco. Once the aircraft were loaded onto the USS *Hornet*, the carrier left port on 2 April. Only after they were under way did Doolittle reveal the true nature of the mission to the enthusiastic crews. He allowed crews to select their own targets but provided specific instructions not to bomb the emperor’s palace.¹⁰⁵ He also ordered the crews to land in China, as planned, and not divert to Russia. Both directives underscored the political significance of the raid.

In the early morning of 18 April 1942, Japanese picket boats intercepted the carrier fleet.¹⁰⁶ Before the *Hornet* left harbor, Doolittle and ADM William F. “Bull” Halsey had discussed the possibility of premature discovery and decided the aircraft would launch if there were even a remote chance of success. Doolittle’s mission required the element of surprise, and Halsey needed the deck clear to launch fighters in the event of an enemy attack. The launch had been planned for that evening, and the B-25s were 250 miles farther from their targets than planned when they climbed into the air. From that distance, there was no guarantee they could reach landing fields in China.¹⁰⁷ Fifteen other crews followed Doolittle with full knowledge they might not survive. Doolittle reached Tokyo, released four 500-pound bombs, and flew on toward China. A providential tailwind allowed him to reach the mainland. He could not, however, acquire the radio beacon intended to guide him to the landing field. Out of gas, he ordered his crew to bail out.

As Doolittle collected his thoughts in China, he assessed the mission as a tactical failure. He assumed every aircraft on the mission was probably lost. He was right. One crew disobeyed orders and diverted to Russia. The other 15 crews had bailed out of their aircraft. The 16 bombers, intended for delivery to the Tenth Air Force in China, were a total loss.¹⁰⁸ In Washington, however, Arnold quickly recognized the mission’s strategic success despite its tactical failure. As word of the raid spread, the nation rejoiced with the first good news of the war. Additionally, stung by the unforeseen attack, Japanese air defenses retrenched to defend the homeland, setting in motion events that would eventually lead to the decisive Battle of Midway.¹⁰⁹

Doolittle was uniquely qualified to lead the raid on Tokyo. The mission drew on his technical expertise in aviation, developed as a trained engineer, test pilot, and transcontinental flyer. He rapidly formulated a technical plan and acquired the necessary resources. Additionally, Doolittle understood the

political ramifications of the mission. He knew the president's intent was to send a political message, not to achieve tactical destruction. As Daso observed, Doolittle's mission eschewed "almost every accepted doctrinal idea for bombardment openly held by the [Army Air Forces]."¹¹⁰ That was perhaps, in part, because Doolittle left the Army for Shell and never attended the Air Corps Tactical School where strategic bombing doctrine was formulated and taught. For whatever reason, Doolittle's plan fulfilled President Roosevelt's vision for retribution against the Japanese homeland. He had clearly trained his men well to accomplish the mission. Interestingly, no crew member on the Tokyo raid, including Doolittle himself, had any prior combat experience.¹¹¹ Finally, Doolittle exhibited a great deal of personal courage and sound leadership during the raid. He was aware of the personal risk incurred by taking off from the *Hornet*. He did not hesitate and, more importantly, the crews that followed him did not either. The great significance of the mission and Doolittle's inspired leadership created a bond between the aircrew members that survived for decades. Seventy years later, the few surviving raiders meet annually to commemorate their historic mission.¹¹²

While still in China, Doolittle received the news that he had been promoted to brigadier general, bypassing the grade of colonel. He also received orders directing him to "proceed on or about May 5, 1942, from Chungking, China, to Washington, D.C., by the most expeditious method, reporting upon arrival to the Commanding General, Army Air Forces, for instructions."¹¹³ When Doolittle arrived in Washington, President Roosevelt personally presented him the Medal of Honor under the watchful eyes of Generals Arnold and Marshall and his wife Joe. Doolittle later recollected that "I believe that General Arnold gave me more credit than was due, and I believe General Marshall gave me more credit than was due, as a result primarily of the Tokyo raid."¹¹⁴ Despite this modesty, Doolittle's accomplishments thrust him into the ranks of the Army's senior leaders.

Searching for a job commensurate with Doolittle's new rank, Arnold submitted his name to Gen Douglas MacArthur for command of the Fifth Air Force in the Pacific. MacArthur, however, chose Gen George C. Kenney. Doolittle was assigned instead to command the newly formed Twelfth Air Force under Gen Dwight Eisenhower. The Twelfth was created to support Operation Torch—the invasion of North Africa. Ike was reluctant to accept the unproven "wild stunt pilot" as an air commander.¹¹⁵ He requested instead Carl Spaatz, Walter H. Frank, or Ira Eaker.¹¹⁶ Arnold and Marshall responded by insisting Doolittle was qualified for the position; Ike was stuck with him.¹¹⁷

Eisenhower had good reasons for his doubts. Doolittle did not have the credentials of a typical flag officer in 1942. When he took charge of the nascent

Twelfth Air Force, he had not commanded “anything bigger than about a flight.”¹¹⁸ While his peers gained valuable command experience during the 1930s, Doolittle was increasing profits for Shell Oil. Additionally, Doolittle possessed no military staff experience and lacked the professional military education that his fellow career officers had received. He never attended the Army’s Command and General Staff School, which prepared middle-grade officers for staff assignments to corps and division levels. Hence, Doolittle never received formal training in Army combined arms tactics, command and staff functions, or duties of a general staff at the corps level.¹¹⁹ Missing the Army War College prevented him from receiving instruction in the practice of high-level command.¹²⁰ Finally, because he did not attend the Air Corps Tactical School, Doolittle never received explicit instruction in the industrial web theory that provided the doctrinal foundation for the strategic bombing campaign against Germany.¹²¹ He would have to learn a great deal on the job.

Doolittle assumed command of the Twelfth Air Force on 23 September 1942 and acted quickly to acquaint himself with the duties of leading a numbered air force.¹²² Unlike his previous command, which consisted of 16 B-25s, initial plans for the Twelfth Air Force included two heavy-bombardment groups, two P-38 fighter groups, two British Spitfire groups, one troop-carrier group, one light-bombardment group, and three medium-bombardment groups.¹²³ He later observed, “I was a brand new Air Force Commander . . . so there were a great many things I had to learn, and I endeavored to learn them very rapidly.”¹²⁴ Doolittle relied heavily on his staff during these stressful weeks, especially his director of staff, a young colonel named Hoyt S. Vandenberg. Doolittle later recalled that a competent leader utilizes his staff as a “two-way street” to direct and receive advice.¹²⁵ Indeed, he commented in a letter to Arnold that “I have the best staff, the best commands and the smoothest-running organization in the Air Force.”¹²⁶

Based on advice from Doolittle and Spaatz, Eisenhower decided the Twelfth Air Force would be built around a core cadre of aircrews provided from the Eighth Air Force. Indeed, much to Eaker’s dismay, the Twelfth cost valuable combat experience and resources drawn away from the strategic bombing efforts in Europe. Nevertheless, the majority of the Twelfth Air Force’s commands were activated in the United States and shipped to England.¹²⁷ Consequently, as the Allied force prepared for the invasion of North Africa, Doolittle advised Eisenhower on 4 October that his Airmen were inadequately trained to support the attacking forces. He mitigated this risk by committing his best-trained crews to the invasion effort and subsequently training additional crews in Africa.¹²⁸

Doolittle's efforts to prepare his newly born air force were complicated by the disorganized command structure under which Operation Torch was planned. Contrary to airpower doctrine, Allied air forces were organized during Torch as two separate air commands. These commands were divided according to nationality, operational roles, and the projected division of ground forces into the US 5th and the British 1st Armies.¹²⁹ Doolittle's Twelfth Air Force would support the former, and the Eastern Air Command (EAC) under Air Marshal Sir William Welsh would assist the latter.¹³⁰ The EAC possessed definite plans to aid the 1st Army in seizing Algiers after the Torch landings. Although the Twelfth was three times the size of the EAC, the Torch concept of operations provided Doolittle no corresponding guidance beyond supporting the attack on Bizerte. Ten days prior to the invasion, this ambiguity led Spaatz to question "what, when, and where" the Twelfth was to do in Africa after the landing.¹³¹

Although the Torch landings provided the Allies a viable foothold in North Africa, offensive momentum subsequently stagnated over the winter of 1942–43. The inefficient employment of airpower did not help the cause. Indeed, the early operations of Doolittle's command were plagued by poor communications and inadequate coordination between his units and the ground forces they supported. Furthermore, his command had no organic intelligence capability and relied exclusively on the British for critical information.¹³² At the end of 1942, the Twelfth Air Force was struggling to maintain its combat strength. Doolittle reported that his entire striking force consisted of 270 aircraft, a mission-capable rate of only 48 percent.¹³³ The Twelfth Air Force had failed to achieve air superiority or institute a system to provide effective air support to ground forces.

Despite the slow progress of air efforts in Africa, Ike recognized Doolittle's potential as a commanding general. As 1942 came to a close, Doolittle was nominated for promotion to major general. Eisenhower approved, saying the promotion was "fully justified and I recommend it to be accomplished at once."¹³⁴ On his efficiency report, Eisenhower ranked Doolittle sixth among 18 air commanders. The evaluation described Doolittle as "impulsive, dashing, keen and energetic. Is gaining essential experience in requirements of position involving high rank and in my opinion will develop marked in value as an Air Force commander."¹³⁵ In other words, Doolittle's efforts had earned Ike's confidence, but the young general still had much to learn.

The indecisive air campaign of 1942–43 indicated that the Army Air Forces also had much to learn about the organization of airpower. On 3 December, Eisenhower appointed his favorite air general, Carl Spaatz, as acting deputy commander in chief for air of the Allied forces in North Africa. Spaatz's duties

were to coordinate air operations between the Twelfth Air Force and the EAC.¹³⁶ His experience as a seasoned general provided the new command a much-needed level of administrative expertise; however, his influence was limited by a lack of command authority.¹³⁷ Deliberations during the Casablanca conference restructured the Allied command organization. The Allied commanders consolidated all the air forces in the Mediterranean theater under one commander. The Allied leaders agreed that Eisenhower's deputy, Air Chief Marshal Arthur Tedder, would command all air assets in the theater as head of the Mediterranean Air Command.¹³⁸ Furthermore, a single airman under Tedder would command all aircraft in the Northwest African campaign. These changes did not, however, occur overnight. Between 5 January and 18 February 1943, the Allied command hierarchy underwent several restructurings. The first placed Spaatz in command of both the Twelfth and the EAC as commander of the Allied Air Force.¹³⁹ On 30 January, the Allied Support Command was added to Spaatz's organization.¹⁴⁰ On 18 February, this arrangement was abandoned, and Spaatz emerged as commander of the newly formed Northwest African Air Forces (NAAF).¹⁴¹ This structure rendered the Twelfth an air force in "name only."¹⁴² With his beloved Twelfth effectively gone, Doolittle was reassigned as the commander of the Northwest African Strategic Air Force under Spaatz.

Doolittle considered the reassignment a demotion and began to doubt his future as an air commander. On 5 February 1943, he sent two letters to Joe: one handwritten and one typed. In the former, he referred to the latter as a "short report of my downfall."¹⁴³ The typed letter explained that he was "losing the major part of my command" but that he felt "no resentment over the change, only a very keen disappointment that I have failed my gang." He blamed his failure on a lack of political awareness and noted, "Now I at least appreciate the power of politics, realize that it must be moulded in one's favor and understand that in some instances, nothing can be done about it by the individual involved."¹⁴⁴ Interestingly, the handwritten note said, "I think Lowell [Thomas] will want to see the letter as its contents will have an effect on his book."¹⁴⁵ Lowell Thomas was his biographer. Doolittle was apparently already concerned that his performance in North Africa would detract from his legacy.

Disappointed in the limited reach of his new duties, Doolittle resorted to his skills as a pilot to inspire his men. Between 9 and 17 February, he flew six combat missions with the groups under his command.¹⁴⁶ These accounted for more than a quarter of the combat sorties he flew during the entire war.¹⁴⁷ Doolittle would show up unannounced to serve as a copilot.¹⁴⁸ He also insisted on flying every aircraft in his command. These feats of personal bravery

inspired his men and helped maintain the morale of his units during the harsh battles of 1943.

Doolittle gradually learned the art of higher-echelon command, and his superiors recognized his progress. Despite its name, the Northwest African Strategic Air Forces did not conduct a strategic bombardment campaign. Instead, it interdicted the Axis flow of logistics and supplies.¹⁴⁹ As 1943 progressed, Doolittle's forces slowly gained air superiority in northern Africa and conducted a moderately successful interdiction campaign against German supply lines. His confidence began to grow. On 4 April he wrote Joe, "I've let both him [Arnold] and Gen Marshall, who had confidence in me, down here but we are doing better now and am going to vindicate their confidence in me yet."¹⁵⁰ The following day, his forces conducted a successful raid that claimed 48 enemy kills in the air and 100 aircraft destroyed on the ground. On 6 April, Doolittle was awarded the Silver Star for the mission's success.¹⁵¹ Spaatz sent Doolittle a letter on 13 June commending his command's role in obtaining the surrender of the Italian islands of Pantelleria and Lampedusa.¹⁵² In Doolittle's efficiency report of 26 July 1943, Spaatz commented that he was "competent, industrious, ambitious, and an outstanding leader of fighting men."¹⁵³ On 6 August 1943, Eisenhower awarded Doolittle the Distinguished Service Medal.¹⁵⁴ In a personal letter accompanying the award, Ike noted, "You have shown the greatest degree of improvement of any of the senior United States officers in my command."¹⁵⁵ Arnold also recognized the performance and expressed further confidence in Doolittle by selecting him to command the newly formed Fifteenth Air Force.

The Fifteenth Air Force was activated on 1 November 1943 in the Lycée Carnot campus in Tunis, Tunisia.¹⁵⁶ Its mission was to conduct strategic bombing against southern Germany. The Fifteenth would attack German targets beyond the reach of the England-based Eighth Air Force using B-17s based near Foggia, Italy. The force collected for this mission consisted of 11 combat groups and more than 20,000 men.¹⁵⁷ As the commander of yet another new air force, Doolittle's first order of business was to deploy his forces to Italy. This proved to be no small task. Italian airfields were not designed to support four-engine bombers, and poor weather hindered efforts to ready the fields. Thus, all of the B-17s were not transferred until the end of December.¹⁵⁸

As Doolittle's forces were arriving in place, he received word that his command in the Mediterranean would be brief. During a November meeting in Cairo, President Roosevelt and Prime Minister Churchill agreed that Eisenhower would become the supreme commander of the Allied Expeditionary Forces on 1 January 1944. Tedder would continue to serve as his deputy and follow him to Europe. Ike selected Spaatz to command the newly formed US

Strategic Air Forces in Europe (USSTAF). This placed him in command of the Eighth and Fifteenth Air Forces. Spaatz recommended that Doolittle replace Eaker as the commander of the Eighth Air Force and the latter be moved to Italy to take the position vacated by Tedder—command of the Mediterranean Allied Air Forces. Spaatz considered his proposal a promotion for Eaker and believed his diplomatic skills and command experience would serve him well in the position.¹⁵⁹ Arnold, however, had additional motives for reassigning Eaker. The chief had become dissatisfied with what he saw as poor progress of the Eighth Air Force's strategic bombing efforts in the fall of 1943.¹⁶⁰ Allied forces had failed to achieve air superiority over Europe, and the Eighth Air Force's attrition rate remained alarmingly high. Arnold believed that fresh faces in the Eighth would bring new ideas with which to fight the Luftwaffe.¹⁶¹ The December reorganization provided Arnold an opportunity to infuse new blood into the Mighty Eighth without casting a shadow over himself, Eaker, or the AAF efforts in Europe.¹⁶² Thus, on 18 December Arnold notified Eaker of his new assignment by official cable. Eaker considered the reassignment a firing. Though artfully disguised, it was.¹⁶³ Eaker begged Arnold to reconsider, but he was adamant. The move shattered a friendship of 25 years.¹⁶⁴ Interestingly, the official Air Force history commented that "if Arnold's dissatisfaction over the rate of Eighth Air Force operations entered into the decision, the record apparently has left no evidence of it."¹⁶⁵ Whatever the evidence of Arnold's true motives, Doolittle became the new commander of the Eighth Air Force effective 5 January 1944.

Conclusions

Reflecting on Doolittle's life up to January 1944 suggests several things about his likely performance as Eighth Air Force commander. His technical skills and moral courage had provided him success throughout his aviation career. His established reputation as a skilled, daring pilot gave him opportunities to expand the limits of aviation. His methodical approach to these challenges mitigated the risks and enhanced his opportunities for success. These trends were exemplified in his transcontinental records and multiple air race victories. Furthermore, Doolittle's influence on the production of 100-octane aviation fuel indicates an ability to use both personal charisma and solid data to garner support for a cause. The combination of technical expertise, moral courage, and sound personal leadership was evident in the successful raid on Tokyo.

The success of the Doolittle Raid thrust him into leadership roles for which he was not nearly so well equipped—high command. Administrative deficiencies

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in his early command demonstrated Doolittle's lack of staff experience and professional military education. In North Africa he eventually overcame his shortcomings by relying on a skillful staff and by learning from his mistakes. Because his forces were still relatively small, he was able to exploit his personal strengths of charisma and leadership to strengthen his command. Also, despite early mistakes, Allied forces were able to overwhelm the German resistance and achieve air superiority. The war in Europe, however, would be a different story. The Eighth Air Force was the largest air armada ever assembled. Doolittle would not be able to rely as heavily as he had previously on the skills that brought him early success. As 1944 began, the operative question remained, "would Doolittle's ability to learn offset his lack of experience in high command?" In other words, could he continue his tradition of effectiveness, innovation, and leadership at the operational level of war? To answer these questions, one must eschew the common anecdotes of Doolittle's performance as the Eighth Air Force commander and closely evaluate his ability to use his forces effectively in the Combined Bomber Offensive.

Notes

1. Dik Alan Daso, *Doolittle: Aerospace Visionary* (Washington, DC: Brassey's, 2003), 3; and James H. Doolittle and Carroll V. Glines, *I Could Never Be So Lucky Again* (New York: Bantam Books, 1992), 22.
2. Gen Jimmy Doolittle, interview by Dr. Edgar F. Puryear Jr., 7 February 1977, AFHRC call no. K239.0512-1405m, tape 1, side 1, 7.
3. Doolittle and Glines, *I Could Never Be So Lucky Again*, 22–23.
4. Doolittle later commented that he believed respect and a reputation for winning were an essential part of effective leadership. Doolittle, interview by Puryear, 1977, tape 1, side 1, 2–3.
5. Doolittle and Glines, *I Could Never Be So Lucky Again*, 20, 21.
6. "Questions for the Examination of Applicants, Aviation Section, Single Officers Reserve Corps," 2 October 1917, official military personnel file of James H. Doolittle, National Archives and Records Administration, 01 Service Documents.pdf, 7.
7. *Ibid.*, 6.
8. Joe Doolittle died on 24 December 1988, the couple's 71st wedding anniversary. Doolittle and Glines, *I Could Never Be So Lucky Again*, 37–38.
9. Doolittle, interview by Puryear, 1977, tape 1 side 1, 9.
10. Doolittle and Glines, *I Could Never Be So Lucky Again*, 37–41.
11. Doolittle, interview by Puryear, 1977, tape 1 side 1, 10.
12. Doolittle and Glines, *I Could Never Be So Lucky Again*, 42.
13. *Ibid.*, 55.
14. *Ibid.*, 47.
15. H. H. Arnold, *Global Mission* (New York: Hutchinson & Co., 1951), 75–76.
16. Special Efficiency Report for Emergency Officers, 28 April 1920, Period covered 13 March 1919–30 May 1919, Doolittle military personnel file, National Archives, 08 Efficiency Records.pdf, 4.

17. Daso, *Doolittle*, 2.
18. Although not noted in his autobiography, according to official Air Force records, the 90th Aero Squadron was stationed at Sanderson, Texas, from 29 November 1919. Flight A operated from Eagle Pass. <http://www.afhra.af.mil/factsheets/factsheet.asp?id=10541>.
19. Doolittle and Glines, *I Could Never Be So Lucky Again*, 57.
20. Efficiency Report dated 20 January 1920, Doolittle military personnel file, National Archives, 08 Efficiency Records.pdf, 2.
21. Daso, *Doolittle*, 13.
22. Doolittle and Glines, *I Could Never Be So Lucky Again*, 67.
23. *Ibid.*, 66.
24. James H. Doolittle, "Report of Cross Country Flight to Chief of Air Service," 19 September 1922, Doolittle military personnel file, National Archives, 01 Service Documents.pdf, 92.
25. Doolittle, "Report of Cross Country Flight," 93–94.
26. When Doolittle asked if he was injured in the crash, he responded "no but my feelings are." Doolittle and Glines, *I Could Never Be So Lucky Again*, 68.
27. Doolittle, "Report of Cross Country Flight," 94.
28. Doolittle and Glines, *I Could Never Be So Lucky Again*, 68–71.
29. Doolittle, "Report of Cross Country Flight," 94.
30. Daso, *Doolittle*, 16.
31. The Air School of Applications would later become the Air Force Institute of Technology, which still resides at Wright-Patterson AFB in Dayton, Ohio.
32. Doolittle, "Report of Cross Country Flight," 92.
33. Doolittle and Glines, *I Could Never Be So Lucky Again*, 80.
34. *Ibid.*, 75.
35. A. H. Hoble, Memorandum Request for Assignment, 3 May 1923, Doolittle military personnel file, National Archives, 01 Service Documents.pdf, 101.
36. Copy of Diploma, 22 December 1922, Doolittle military personnel file, National Archives, 01 Service Documents.pdf, 100.
37. Doolittle and Glines, *I Could Never Be So Lucky Again*, 81.
38. James H. Doolittle, "Wing Loads as Determined by the Accelerometer" (master's thesis, MIT, 1924), 4.
39. Doolittle recorded accelerations that were within 3.5 percent of his calculations. Doolittle, "Wing Loads as Determined by the Accelerometer," 22.
40. *Ibid.*
41. J. H. Doolittle, *NACA Report No. 203: Accelerations in Flight* (Washington, DC: National Advisory Committee for Aeronautics, 1925), 388, <http://naca.central.cranfield.ac.uk/reports/1925/naca-report-203.pdf>.
42. Doolittle and Glines, *I Could Never Be So Lucky Again*, 86.
43. *Ibid.*, 88–89.
44. Daso, *Doolittle*, 19.
45. Doolittle and Glines, *I Could Never Be So Lucky Again*, 99–100.
46. Mason M. Patrick to James H. Doolittle, letter, 6 November 1925, Doolittle military personnel file, National Archives, 07 Awards, Decorations, and Commendations.pdf, 4.
47. Doolittle and Glines, *I Could Never Be So Lucky Again*, 99–100.
48. Arnold, *Global Mission*, 91.
49. Daso, *Doolittle*, 21.

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50. Lt Gen James Doolittle, interview by Brig Gen George W. Goddard, 20 July 1967, AFHRC call no. K239.0512-998 C.1, 7.
51. Doolittle and Glines, *I Could Never Be So Lucky Again*, 106; and Medical Board Proceedings, Exhibit "A," 27 January 1927, Doolittle military personnel file, National Archives, 01 Service Documents.pdf, 123.
52. Doolittle and Glines, *I Could Never Be So Lucky Again*, 108.
53. Daso, *Doolittle*, 22.
54. Efficiency Report dated 25 September 1928, Doolittle military personnel file, National Archives, 08 Efficiency Records.pdf, 41.
55. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 19–20.
56. Efficiency Report dated 30 June 1928, Doolittle military personnel file, National Archives, 08 Efficiency Records.pdf, 40.
57. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 7–8.
58. Doolittle and Glines, *I Could Never Be So Lucky Again*, 125–26.
59. *Ibid.*, 136.
60. *Ibid.*, 129.
61. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 10–11.
62. *Ibid.*, 12–13.
63. Doolittle and Glines, *I Could Never Be So Lucky Again*, 141; and Logbook entry, 24 September 1924, Doolittle Papers, Series XVI, Box 1, Special Collections Department, McDermott Library, University of Texas at Dallas.
64. Daso, *Doolittle*, 31.
65. Doolittle and Glines, *I Could Never Be So Lucky Again*, 149.
66. *Ibid.*, 153.
67. Daso, *Doolittle*, 34.
68. *Ibid.*
69. *Ibid.*, 35.
70. Doolittle and Glines, *I Could Never Be So Lucky Again*, 168; and Daso, *Doolittle*, 36.
71. Doolittle and Glines, *I Could Never Be So Lucky Again*, 168.
72. Daso, *Doolittle*, 35–36.
73. Doolittle and Glines, *I Could Never Be So Lucky Again*, 170–71.
74. Lt Gen James H. Doolittle, interview, 23 June 1965, AFHRC call no. K239.0512-623, 11.
75. Doolittle, interview by Puryear, 1977, tape 2 side 1, 13.
76. Efficiency Report dated 2 June 1936, Doolittle military personnel file, National Archives, 08 Efficiency Records.pdf, 54.
77. Doolittle and Glines, *I Could Never Be So Lucky Again*, 176–78.
78. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 35.
79. Entry for 28 July 1939 in personal notebook, James H. Doolittle Papers, Series XVI, McDermott Library.
80. Entry for 29 July 1939 in *ibid.*
81. Entry for 10 August 1939 in *ibid.*
82. J. H. Doolittle to Maj Gen H. H. Arnold, letter, 7 March 1939, Henry Harley Arnold Papers, Box 13, Reel 13, Library of Congress.
83. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 35–36.
84. Special Orders No. 149, 25 June 1940, Doolittle Papers, Series I, Box 2, McDermott Library.
85. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 28.

86. *Ibid.*, 39.
87. *Ibid.*
88. Efficiency Report dated 30 June 1941, Doolittle military personnel file, National Archives, 08 Efficiency Records.pdf, 56.
89. Doolittle and Glines, *I Could Never Be so Lucky Again*, 209–11.
90. Eric Larrabee, *Commander in Chief: Franklin Delano Roosevelt, His Lieutenants, and Their War* (Annapolis, MD: Naval Institute Press, 1987), 365.
91. Doolittle and Glines, *I Could Never Be so Lucky Again*, 216, 218–19.
92. Daso, *Doolittle*, 46.
93. On 1 February, two B-25s departed from the deck of the newly commissioned USS *Hornet* aircraft carrier to confirm this capability. Doolittle and Glines, *I Could Never Be So Lucky Again*, 212, 221.
94. Daso, *Doolittle*, 46–47.
95. Doolittle and Glines, *I Could Never Be So Lucky Again*, 222–23.
96. Daso, *Doolittle*, 48.
97. Doolittle and Glines, *I Could Never Be So Lucky Again*, 224.
98. *Ibid.*
99. *Ibid.*
100. Doolittle, interview by Puryear, 1977, tape 2, side 2, 2.
101. Doolittle and Glines, *I Could Never Be So Lucky Again*, 230.
102. *Ibid.*, 225.
103. The B-25s were loaded to a gross weight of 31,000 pounds—2,000 pounds above the maximum load. *Ibid.*, 226.
104. Daso, *Doolittle*, 49.
105. *Ibid.*, 55.
106. Craig Nelson, *The First Heroes: The Extraordinary Story of the Doolittle Raid—America's First World War II Victory* (New York: Penguin Books, 2003), 118–20.
107. Daso, *Doolittle*, 54.
108. Doolittle and Glines, *I Could Never Be So Lucky Again*, 219.
109. Larrabee, *Commander in Chief*, 366.
110. Daso, *Doolittle*, 59.
111. *Ibid.*, 64.
112. George Tanber, “Surviving ‘Doolittle Raiders’ Recount Wartime Bombing of Japan,” *Reuters.com*, 19 April 2012, <http://www.reuters.com/article/2012/04/19/us-usa-doolittle-reunion-idUSBRE83I04J20120419>.
113. Special Orders Number 35, 4 May 1942, Doolittle Papers, Series I, Box 2, McDermott Library.
114. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 55.
115. Doolittle, interview by Puryear, 1977, tape 1 side 2, 2.
116. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 43.
117. Doolittle later remarked that if Eisenhower refused his appointment, then any failings in Africa would reflect his decision making. However, if Doolittle failed it would reflect poorly on Marshall and Arnold. Gen James H. Doolittle, interview by Prof. Ronald Schaffer, 24 August 1979, AFHRC call no. K239.0512-1206, 22.
118. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 49.
119. Harold R. Winton, *Corps Commanders of the Bulge: Six American Generals and Victory in the Ardennes* (Lawrence: University Press of Kansas, 2007), 15.

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120. Ibid., 20.
121. The Air Corps Tactical School developed industrial web theory in the 1930s. The theory professed that scientific analysis could identify key points in an adversary's industrial war-making capacity. Targeting these vital centers would cause a nation's military effort to collapse. This methodology provided the theoretical basis for the Combined Bomber Offensive. Jeffery G. Barlow, *Revolt of the Admirals: The Fight for Naval Aviation 1945–1950* (Washington, DC: Government Reprints Press, 2001), 12–13.
122. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointblank, August 1942 to December 1943* (1949; Washington, DC: Office of Air Force History, 1983), 52.
123. Ibid., 51.
124. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 49.
125. Ibid., 23.
126. J. H. Doolittle to Lt Gen H. H. Arnold, letter, 21 October 1942, Henry Harley Arnold Papers Box 13, Reel 13, Library of Congress.
127. Craven and Cate, *Europe: Torch to Pointblank*, 52.
128. Ibid., 58–59.
129. Ibid., 53–54.
130. Ibid., 62.
131. Ibid., 54.
132. Doolittle, interview by Burch, Fogelman, and Tate, 1971, 49.
133. Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, DC: Center for Air Force History, 1993), 171.
134. Quoted in Doolittle and Glines, *I Could Never Be So Lucky Again*, 303.
135. Efficiency Report dated 4 January 1943, Doolittle military personnel file, National Archives, 08 Efficiency Records.pdf, 61.
136. Davis, *Carl A. Spaatz*, 143.
137. Ibid., 185.
138. Doolittle and Glines, *I Could Never Be So Lucky Again*, 313.
139. James Doolittle to Joe Doolittle, letter, 4 April 1943, Doolittle Papers, Series IX, Box 64, Folder 23, McDermott Library.
140. Davis, *Carl A. Spaatz*, 179.
141. Doolittle and Glines, *I Could Never Be So Lucky Again*, 312.
142. The Twelfth Air Force remained an administrative headquarters for the US Army units of the NAAF. Spaatz assumed command of the Twelfth AF on 1 March, and it was reactivated as a fighting command later in 1943. Craven and Cate, *Europe: Torch to Pointblank*, 167.
143. James Doolittle to Joe Doolittle, handwritten letter, 5 February 1943, Doolittle Papers, Series IX, Box 64, Folder 23, McDermott Library.
144. Ibid.
145. James Doolittle to Joe Doolittle, typed letter, 5 February 1943, Doolittle Papers, Series IX, Box 64, Folder 23, McDermott Library.
146. Logbook Entries, February 1943, Doolittle Papers, Series XVI, Box 1, McDermott Library.
147. Including the raid on Tokyo, Doolittle flew 22 combat missions in World War II. Logbook Entries, 1942–1945, Doolittle Papers, Series XVI, Box 1, McDermott Library.
148. Doolittle and Glines, *I Could Never Be So Lucky Again*, 306.

149. Richard G. Davis, "Take Down That Damned Sign!" *Airpower History* 40, no. 4 (Winter 1993), 18.
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Chapter 3

Operational Effectiveness

Doolittle assumed command of the Eighth Air Force on 6 January 1944.¹ As the AAF's most prestigious air force, the Eighth dwarfed his previous commands.² With a massive complement of 211,222 Airmen, it was more than five times the size of the Fifteenth Air Force.³ The Eighth Air Force consisted of more than 4,200 combat aircraft organized into 25.75 heavy-bomber groups, four medium-bomber groups, 13 fighter groups, two troop-carrier groups, and a reconnaissance group.⁴ Doolittle also had to cope with the rapid expansion of his forces. During 1944 the Eighth's bomber forces grew by 50 percent. By December Doolittle commanded 39 heavy-bomber groups and 15 fighter groups.⁵

Doolittle clearly understood the magnitude of the task before him. On 14 January he wrote to Joe noting, "This command was a great compliment and indicated confidence on the part of Hap [Arnold] and Tooe [Spaatz]. . . . It is the biggest, most difficult, and most interesting job I've ever had." Six days later he confided, "It's a *big* job. Big, at least measured by my standards and capabilities" (emphasis in original).⁶ He expressed similar feelings in a letter to his friend from North Africa, Lt Gen George Patton, confiding,

I have a bigger and more interesting job, but at the same time it is infinitely more difficult than the one I had down below. Down there the problem was to make something out of nothing. Up here it requires an equal or greater amount of ingenuity to effectively utilize the almost unlimited resources at one's disposal. Down there, where you were not "under the guns," any modest success was apparently appreciated. Up here miracles are confidently anticipated. Have been a little slow in getting my Miracle Department organized but hope for the best.⁷

Doolittle's apprehension is a common occurrence among military men who rise to senior positions. As commanders rise in rank, their effectiveness frequently diminishes because the burden of increased responsibility dampens their boldness. Clausewitz noted this trend, observing that "conscious of the need to be decisive, [commanders] also recognize the risks entailed by a wrong decision; since they are unfamiliar with the problems now facing them, their mind loses its former incisiveness" (emphasis in original).⁸ Doolittle recognized this phenomenon in his own son, James H. Doolittle Jr., who was experiencing strain as a flight leader. In a 26 December 1944 letter to Joe he wrote,

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[Jim] looks fine but the responsibility of being a Flight Leader has been bothering him some. It's a bit hard for a kid to take on responsibility all at once. In peacetime one assumes obligations gradually. In war time our mistakes mean the loss of some of our buddies and it's a bit hard for some of these kids to have responsibility forced on them before they feel that they have the knowledge and experience necessary to enable them to safely assume it. Told Jimmer that he was one stop from the bottom and that I was only a couple from the top and that one's obligations and responsibilities grew with each command echelon. The results of a mistake on his part affected about six planes and 36 crew members. From now on it would get tougher. That was merely one of the prices we pay for competence—more is expected of us. And so on into the night.⁹

The considerably increased scope of leading the Eighth Air Force suggests that Doolittle would face unfamiliar problems. How well did he cope with his expanded responsibilities? This chapter assesses one significant component of that question, Doolittle's operational effectiveness, by reviewing his efforts to achieve the air superiority required for the Allied invasion of Normandy and to increase the efficiency of his available aircrew and concludes by examining the measures he took to enhance the effectiveness of the Eighth Air Force's bombing in close proximity to friendly ground forces.

Air Superiority over Western Europe

When Doolittle assumed command, the Eighth Air Force's primary mission was to gain air superiority over Western Europe. At the Tehran Conference of 1943, Allied leaders had agreed that Operation Overlord, the invasion of northern France, would occur in 1944. Arnold understood that a prerequisite was air superiority over the Normandy lodgment area. Thus, on Christmas Day 1943, he sent Doolittle a personal letter stating, "Therefore, my personal message to you—this is a MUST—is to destroy the enemy air force wherever you find them, in the air, on the ground and in the factories."¹⁰ Doolittle's immediate superior, Carl Spaatz, reinforced this order with an operational directive dated 11 January 1944 instructing the Eighth Air Force to attack the Luftwaffe "in the air and on the ground."¹¹

Arnold had high expectations for his Eighth Air Force commanders. Success of the AAF's largest air command had broad implications for future prospects of an independent air force. Because strategic bombing was the *raison d'être* of a separate air force, failure of the Mighty Eighth would jeopardize Arnold's goal of service independence. When Ira Eaker failed to produce results, Arnold promptly replaced him. Arnold revealed his ruthlessness in a letter to George Marshall. As D-day approached, he argued, "[we should] scrutinize in cold blood our leaders . . . and remove or insist upon removing

each one concerning whom we have the slightest doubt.”¹² Doolittle had little room for error.

Unlike his predecessor, Doolittle benefited from having Arnold’s highest priority for resources. In 1943 Eaker had competed with the Mediterranean campaign for materiel. Thus, he could marshal only several hundred bombers for strikes against Germany.¹³ For example, on the 14 October raid against Schweinfurt, Eaker launched 320 heavy bombers and 196 limited-range P-47 Thunderbolt fighters as escorts.¹⁴ These shortages led official Air Force historian Arthur Ferguson to conclude, “Through most of 1943 the Eighth Air Force did not have enough strength, either in bombers or . . . in long-range escort to do the job assigned to it.”¹⁵ Doolittle, on the other hand, was able to dispatch a force of more than 660 heavy bombers within a week of taking command.¹⁶ Moreover, the bombers benefited from having 592 fighter escorts, including long-range P-38 Lightning fighters from the 20th and 55th Fighter Groups.¹⁷

These expanding resources gave Doolittle confidence. On 19 January he wrote to his subordinate commanders, “Our constantly increasing force, the increasing range of our fighter planes, and our new and improved technical equipment, if *properly employed*, will permit us to hit the desired targets in Germany and still substantially reduce our percentage losses in spite of the frantic efforts of the Hun fighters to stop us” (emphasis added).¹⁸ Arnold provided Doolittle the resources needed to accomplish his assigned mission. A question, however, remained—could Doolittle employ them effectively?

Doolittle believed that striking German industry was the most efficacious means of achieving his mission. Such attacks not only decreased the enemy’s production capacity but also forced the Luftwaffe to present battle. By compelling the Luftwaffe to resist its bomber/fighter formations, the Eighth could overwhelm and defeat it. Doolittle summarized his concept by declaring that the Eighth Air Force’s mission was “to drop the greatest number of bombs with the highest possible precision on the most vital enemy targets while suffering the minimum losses, and to destroy the Hun in the air.”¹⁹ Underlying Doolittle’s approach to defeating the Luftwaffe was the concept of attrition through unrelenting offensive action.

The new, aggressive approach represented a significant departure from the Eighth’s previous method of operations. Eaker had adopted a policy of group rotation to preserve his modest force from the adverse effects of attrition warfare.²⁰ This practice, Eaker believed, provided sufficient rest for aircrews and reduced the risk of losing an unsustainable number of bombers on a single mission. Doolittle’s concept of “maximum effort” overturned this mentality. When favorable weather conditions allowed, Doolittle demanded that the

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Eighth muster all its forces. During his first commanders meeting, Doolittle declared, "on days when full operation is possible, it is desired to hit the enemy with every airplane at our disposal." When weather was less favorable, the Eighth maintained pressure on the enemy by launching smaller raids to attack through cloud layers. To implement his operational concept, Doolittle abolished the practice of group rotation and declared that nonoperational periods due to poor weather were sufficient for recuperation.²¹ He managed his resources by distinguishing between "maximum effort" and "maximum continuous effort." The former applied to "critical" operations, defined by "a requirement for participation by every operational aircraft for which a competent crew can be supplied." Moreover, all available P-51 Mustang fighter-bomber pilots would support these missions with long-range fighter escorts; if necessary, airplanes would be borrowed from the Ninth Air Force. Missions of "a non-critical nature" would be supported by "maximum continuous effort." These attacks would employ approximately 40 percent of the available force.²²

Doolittle understood that he did not have much time to implement this approach. Eisenhower ordered that 60 days prior to the planned invasion of Normandy, the Eighth would devote its full attention to supporting Overlord.²³ Doolittle, therefore, estimated that he had until 1 April to conduct a concentrated strategic-bombing campaign that would bring the Luftwaffe to battle. Accordingly, during an 8 February commanders meeting, he impressed upon his subordinates the "need for urgent attention" to the strategic-bombing mission.²⁴ Doolittle emphasized the point in a subsequent letter to his division commanders: "The Air Force is now approaching the most critical phase of the war with Germany. During the next few months it is mandatory that we secure complete air superiority over the German Air Force in this Theater. In order to accomplish this end in the time allotted, we must adopt every expedient to improve the effectiveness of the Air Force and to keep it at a high level of operational efficiency."²⁵

The closing days of February gave Doolittle the opportunity to employ offensive action to its full potential. On 19 February, Allied meteorologists forecast an extended period of favorable weather over Europe beginning the following day. Spaatz, therefore, ordered the Eighth and Fifteenth Air Forces to conduct a massive, coordinated attack on the German aircraft industry.²⁶ Doolittle initiated the so-called Big Week on 20 February, marshaling all available resources to inflict a maximum-effort attack against Germany. The mission included more than 1,000 heavy bombers, which struck aircraft plants in 11 German cities.²⁷ Over the ensuing six days, the Eighth flew continuous missions against the Luftwaffe, pausing operations only on the 23rd because of poor weather.²⁸ During Big Week, 3,894 Eighth Air Force bombers

dropped a total of 8,340.5 tons of ordnance on the German aircraft industry.²⁹ The week's missions also claimed 600 enemy kills. In six days Doolittle had nearly equaled the bomb tonnage expended by the Eighth Air Force in all of 1943.³⁰ These powerful strikes noticeably hampered the German war machine. The air raids damaged or destroyed 75 percent of the factories that produced 90 percent of Germany's aircraft. In response Nazi officials ordered dispersal of the aircraft industry, which appreciably reduced its efficiency. Although German aircraft production eventually recovered from the bombings, Big Week delayed fighter production at a critical moment in the air war.³¹

The results of Big Week pleased Arnold. On 26 February, he sent a congratulatory cable to Spaatz declaring that the US Strategic Air Forces in Europe's (USSTAF) "Heavy Bomber units have opened and are carrying on the greatest air offensive in history."³² He informed Spaatz that he believed the air offensive was approaching its climax and requested the following message be relayed to the Eighth:

With a relentless determination that demands the respect of everyone in the Army Air Forces you are driving home an attack which is destroying the very vitals of Germany. The strongest defenses that a desperate enemy can devise are not stopping you. Your losses have been heavy. Enemy losses have been far heavier. Your attacks on Regensburg, Leipsig [*sic*], Gotha, Bernberg, and other vital fighter factories are wiping out German fighter production and laying the foundation for final and decisive operations in the future. I commend all ranks in your Command from top to bottom for the super job you are doing. I wish you all the best luck in continuing to carry this destruction through the heart of Germany.³³

In March Doolittle maintained pressure on the Luftwaffe with continued strikes against the German economy. On 4 March he sent a force of 502 heavy bombers to conduct the first US bombing of Berlin.³⁴ The intent of this mission was not simply to attack the capital but also to compel the Luftwaffe to resist.³⁵ He followed the initial strike against Berlin with subsequent large-scale raids on 6 and 8 March.³⁶ To enhance the likelihood of contact with the enemy, Doolittle ordered his forces to eschew deception tactics and fly directly to their targets.³⁷ He explained his rationale to his commanders by saying, "it is now a case of either the Hun will fold or we will fold."³⁸ Doolittle maintained the high operational tempo as summer approached. In May, the Eighth dropped 36,000 tons; it nearly doubled that amount in June, employing almost 60,000 tons of ordnance in support of the Allied invasion.³⁹

Doolittle's operational methods were not without cost. During the first quarter of 1944, the bomber groups endured significant losses. The Eighth Air Force lost 158 heavy bombers during the six days of Big Week alone.⁴⁰ Total losses in February constituted nearly 20 percent of Doolittle's available force. The following months were not much better. In March, the Eighth lost 23.3

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percent of its bomber force, and in April the Luftwaffe destroyed a quarter of the Eighth's heavy bombers.⁴¹ These heavy losses compelled Doolittle to notify Arnold that "the replacement rate of both airplanes and crews will have to be increased to insure that this Air Force may maintain its effective strength level."⁴²

The results obtained from Doolittle's offensive justified these costs because the expanding supply of materiel from the zone of interior offset the combat attrition. Although Doolittle's losses in March exceeded 23 percent, the Eighth suffered only a 3.3 percent decrease in its sortie rate.⁴³ In contrast, the resource-constrained Luftwaffe simply could not afford to continue the bloody air battle of attrition. In the first two months of 1944, the Allied forces killed or disabled one-third of the German air force's (GAF) fighter pilots.⁴⁴ These figures led Arthur Ferguson to observe, "It was the result of battles, especially during those of the Big Week, that the GAF was for the first time forced to admit defeat. . . . [And] by 1 April 1944 the GAF was a defeated force."⁴⁵

Doolittle clearly achieved the goal of air superiority for Overlord. While planning for the Normandy invasion, Allied intelligence officers anticipated the attacking forces would face resistance from 1,100–1,250 German aircraft. On 6 June 1944, the Luftwaffe conducted only 100 sorties, and the Allies established the beachhead under virtually complete air superiority.⁴⁶ This domination of the sky enabled Eisenhower to tell his invasion forces, "If you see fighting aircraft over you, they will be ours."⁴⁷ The lack of air resistance also permitted Doolittle to observe the Normandy landings personally from a P-38 with no concern for enemy aircraft. During the previous five months, the Eighth Air Force's onslaught had forced the German fighters to battle in the air. British air chief marshals Arthur Tedder and Trafford Leigh-Mallory agreed that the Eighth's daylight raids had forced the Germans to prioritize their assets to the defense of the Reich, thus conceding the skies over western France.⁴⁸ The demise of the German fighter force marked a turning point in the war.⁴⁹ The official Air Force history concluded, "The defeat was brought about by attrition of the German fighter forces in the air and on the ground, by the consequent deterioration in quality of the German fighter pilots, and by attacks on German aircraft production."⁵⁰ Thus, by 6 June 1944, Doolittle had accomplished the mission assigned by Arnold—emasculating of the German air force.

Effective Use of Aircrews

Doolittle's increased operational tempo placed a significant strain on all of the Eighth Air Force's people—particularly on those who flew. In early 1944, the Eighth did not receive enough replacement aircrew to offset combat

losses. In March mounting losses had decreased the average number of crews assigned to B-24 Liberator heavy bomber groups from 66 to 62 and the number of crews in B-17 groups from 64 to 57.⁵¹ Although the Eighth Air Force had 1,415 operational heavy bombers on hand in April, crew shortages reduced its effective strength to 1,066.⁵² By July the number of assigned personnel decreased from more than 211,000 to 199,461.⁵³ Thus, to implement his concept of maximum effort, Doolittle had to increase the effectiveness of his assigned personnel.

Early in his command, Doolittle recognized the need to modify the Eighth's policies regarding aircrew rotation. When he took over, it was standard practice to return a bomber crew to the zone of interior after it had completed a combat tour of 25 missions. As sortie rates increased, however, aircrews began completing tours in as few as eight weeks. Because four months were required to train a bomber crew, Doolittle believed the rotation policy had become unsustainable.⁵⁴ Moreover, bomber crews, in his opinion, did not achieve an "acceptable level of skill" until completing 10 missions, and reached the "peak of their efficiency" around 20 missions.⁵⁵ Doolittle's instincts were accurate. Statistically, a crew's first 10 missions were the most dangerous, while the final five sorties posed the least risk.⁵⁶

Therefore, on 30 January Doolittle instituted his first modification to the Eighth's crew rotation policy. Henceforth, crews that completed an operational tour did not automatically return to the zone of interior. Instead, they could be assigned to command or staff positions.⁵⁷ Doolittle dispatched a letter to his division commanders explaining his reasoning: (1) the zone of interior had completed its expansion program and no longer required experienced personnel to form new units; (2) operations in support of Overlord required an average of two missions per day for each assigned aircraft, which rendered the 25-mission limit impractical; (3) the introduction of long-range fighter escorts reduced bomber losses and, accordingly, increased the number of crews completing their combat tours; and (4) the extension of combat tours would increase the average experience of aircrews, which, in turn, would enhance the effectiveness of the force.⁵⁸

Doolittle's amendment of crew rotation practices anticipated a similar change in policy that Arnold directed for the entire AAF. In a letter of 11 February, Arnold informed Doolittle about a servicewide shortage of qualified aircrew. The shortfall had several causes. First, the AAF had more aircraft than originally planned. This fortunate development permitted Arnold to enlarge operational squadrons, which, in turn, required additional aircrews. More importantly, however, Arnold noted that air force commanders were

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prematurely returning qualified aircrews to the United States after an arbitrary number of missions. Arnold's directive is worth citing at length.

If you have made any policies or understandings that combat personnel will be returned to the United States after fulfilling such arbitrary conditions as I have just described, those policies will be rescinded at once. Our combat personnel must understand that we plan to use combat crews in accord with war demands. Policies covering relief for combat crews must be an overall Army Air Force [*sic*] matter, based in all war zones upon the importance of our operating and human considerations. Such relief has to be a flexible proposition, for our leaders to determine, based on the time, and place, and means available, and the conditions of the individual himself, and above all on the waging and winning of the war.

You, as an Air Force Commander, must always have the authority to relieve your combat crews on any basis you may see *fit to the extent that replacements and means are available to you* [emphasis in original]. But a sharp distinction must be drawn between this privately held consideration of a commander for his men and the existence of announced inflexible policies which in effect become a irrevocable [*sic*] pledge from the commander to his men that jeopardizes his bringing his full available strength against the enemy when and where he has the vital need to do so.⁵⁹

Arnold's guidance became an important topic for discussion in the Eighth Air Force commanders meeting of 2 March. Brig Gen Earle "Pat" Partridge read the letter aloud to the group, spurring a heated discourse. Doolittle settled on a policy that required bomber crews to fly 30 sorties and fighter pilots to accumulate 200 hours before they would be eligible for reassignment.⁶⁰ He articulated the policy change in a 4 March letter to his commanders and informed them that Eighth Air Force Memorandum 75-1, dated October 1943, would be revised to reflect the new requirements, effective 15 March 1944.⁶¹ To ease the shock of the change, Doolittle established a method for crediting sorties on a sliding scale for crews that completed 15 or more sorties.⁶² For instance, crews having flown 23 missions were credited with 28 under the new policy.⁶³ The same day, Doolittle penned a letter to Arnold explaining his rationale and stating that he agreed with the chief's assessment of the situation: "The policies which were in effect in this Air Force with respect to the relief of combat crew personnel from combat duty were sound at the time of their inauguration, but under current conditions, are now recognized as needing revision and we were endeavoring to arrive at a solution which would permit an extension in the length of the combat tour without adversely affecting the present high morale of the personnel involved." He further noted that instead of automatically transferring to the zone of interior, combat crews would merely "be *eligible* for relief" (emphasis in original) after completing an operational tour. Doolittle indicated that crews would be offered a reprieve from combat operations only to "provide time for suitable rest and recuperation

[R&R].” Following the R&R period, he considered crews to again be eligible for a combat assignment.⁶⁴

During spring 1944, operational requirements compelled Doolittle to demand even more from his aircrews. In April he announced that the number of assigned aircrews to each bomber group would be increased to 96. This level of manning provided the desired 2:1 crew-to-aircraft ratio.⁶⁵ A shortage of personnel, however, continued to plague the Eighth Air Force.⁶⁶ Consequently, Doolittle announced that he was considering further extending the length of the combat tour. Resistance from his commanders persuaded him to delay the extension.⁶⁷ Nevertheless, by July Doolittle ordered that to earn credit for an operational tour, bomber crews would have to complete 35 missions and fighter pilots would have to log 300 hours.⁶⁸

When Doolittle first extended the operational tour, his commanders reported that the change “had produced some depreciation in morale.”⁶⁹ The considerable losses stemming from his concept of maximum effort also contributed to a degradation of the Eighth’s morale. This worried Doolittle. He therefore devoted considerable time and effort to mitigating the problem of lagging morale. Chapter 4 closely examines the steps he took. It is sufficient to note here that to increase the effectiveness of his available aircrews, Doolittle had to balance the demands of the mission and his superiors with the strength of his Airmen’s spirit.

Therefore, Doolittle instituted a “lead crew” program to improve morale and increase operational effectiveness. He directed bomb group commanders to nominate eight exceptional aircrews as lead crews. These elite crews wore special combat patches with gold borders, which distinguished them from their peers. During combat missions, the crews led the bomber formations.⁷⁰ To offset the increased danger associated with these duties, Doolittle reduced the tour length for lead crews from 35 to 30.⁷¹ Upon completion of a tour, the crews were entitled to a 30-day period of R&R in the United States. After this leave, however, Doolittle expected the crews to resume their places in the Eighth as lead crews and instructors.⁷²

In July 1944, Arnold articulated a new service-wide policy regarding the relief of aircrews from combat. The policy stipulated that aircrews would be relieved from combat duty only “after positive evidence of combat fatigue.” Doolittle observed Arnold’s directive by mandating that flight surgeons evaluate crews for combat fatigue after they had completed 35 missions and fighter pilots after 300 hours.⁷³ By doing so, he artfully complied with Arnold’s directive but kept faith with his Airmen by not having to revoke his own policy.

By summer 1944, loss rates declined, and the number of replacement crews increased sufficiently to resume the practice of sending crews to permanent

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assignments in the zone of interior after they completed a combat tour.⁷⁴ In June, the Eighth lost 280 heavy bombers and another 324 in July.⁷⁵ The losses, though substantial, were compensated by the growing supply of men and materiel from the zone of interior. During the 20 July commanders meeting, Brig Gen John Samford, Doolittle's chief of staff, noted that to maintain the 96 authorized crews per group ratio, the Eighth had to send a large number of crews home to "offset the replacements coming in."⁷⁶ By autumn, the supply of aircrews had increased even further, allowing Doolittle to delegate the authority to relieve crews to his division commanders. The only guidance he provided was that aircrews had to fly between 25 and 35 sorties before reassignment.⁷⁷

The subsequent results of Doolittle's increase in combat tour lengths are indefinite. He claimed that the policy increased the Eighth's survival rate and bombing accuracy.⁷⁸ Bombing accuracy did improve from 29 percent hitting within 1,000 feet of the designed target to 40 percent in June and 45 percent by the end of the summer.⁷⁹ Although this study cannot establish a causal link between these results and an increase in combat tour duration, it is clear that Doolittle's decision led to an increase of average crew experience in the Eighth. Despite a resultant decrease in morale, he persevered in his decision. This was in no doubt aided by Arnold's insistence on eliminating an arbitrary number of missions as criterion for relief from combat. However, Doolittle also took positive steps to ameliorate Arnold's more draconian measures. In short, Doolittle balanced the demands of the mission, the directives of his superiors, and the capabilities and welfare of his aircrews.

Close Air Support

Following the invasion of Normandy, Allied ground forces became embroiled in a brutal fight with the Wehrmacht. The prolific hedgerows of northern France provided the Germans excellent defensive positions, and fierce enemy resistance stalled Allied efforts to expand the lodgment area. Allied leaders searched for ways to break the stalemate in Normandy. Directing the power of the Eighth Air Force's strategic bombers against the German defenses seemed logical and prudent. The commander of the First Army, Lt Gen Omar N. Bradley, noted, "Realizing the great power we had in our Air Force, I wanted to secure someplace where we could use a great mass of power to virtually wipe out some German division opposing part of our line and then punch a hole through."⁸⁰

Thus, in the summer of 1944, Doolittle had to employ his strategic bombers in direct support of ground forces, a role for which crews were neither

equipped nor trained. He remarked in his autobiography that in July 1944, “bombing in close support of ground troops was not the mission of the Eighth and my men were not trained for it. They were trained for high altitude bombing; close air support of ground troops was not a feasible mission for the Eighth.”⁸¹ Moreover, the USSTAF system of command and control was not structured to cope with the dynamic conditions that accompany the mission of close air support. As Richard Davis noted, “This foray into large-scale close air support presented unique and unanticipated command, control, and technical problems to the Eighth Air Force . . . as they sought to fulfill obligations for which they lacked methods and training.”⁸² To assess whether the Eighth was effective under Doolittle in providing close air support to friendly ground forces, this study addresses a single measure that was, at least partially, within his control: the risk to friendly ground troops from air bombardment of opposing forces.

The battle around Caen provided the war’s first opportunity to use heavy bombers in close support of ground forces. Stout German armored resistance held Canadian and British forces at bay in the area surrounding the French town. On 8 July, aircraft from both RAF Bomber Command and Maj Gen Elwood R. “Pete” Quesada’s 9th Tactical Air Command pummeled the northern portion of the town and enemy troop positions to its south.⁸³ Although the Allied forces gained control of a significant portion of the town and the air assault did not cause any friendly casualties, the bombing did not appreciably degrade the German resistance.⁸⁴ Therefore, the plan for Operation Goodwood, an attempt to break out from Caen, required additional air support. Field Marshal Bernard Montgomery requested the striking power of the Eighth Air Force.

However, the Eighth’s first close-air-support mission did not meet Montgomery’s expectations. On 18 July, Doolittle dispatched between 570 and 644 B-24s from the 2nd Bombardment Division to drop 1,410 tons of ordnance in an effort to clear the way for the attacking forces.⁸⁵ But most of the B-24s missed their targets, and a majority of the bombs were scattered across the countryside. Consequently, Allied forces faced determined resistance from the enemy residing in the target area. In contrast, the Eighth’s British cousin, RAF Bomber Command, had considerable success at Caen. The British strikes proved accurate and effective, destroying an entire Panzer company.⁸⁶

The Eighth had much to learn from Bomber Command’s success. The British had implemented the tactic of using a “master bomber” to control airborne operations. The designated aircraft would loiter over the target for the entire operation to provide timely adjustments to the striking bombers. The Eighth did not adopt these methods for the next close-air-support mission.

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Nor was close support of ground troops a topic of discussion during the 20 July commanders meeting.⁸⁷ A series of unfortunate events, however, soon brought the issue vividly to Doolittle's attention.

Airpower was a vital component of Bradley's plan for breaking out from the Normandy beachhead. In an operation code-named Cobra, Bradley concentrated four divisions against a single German armored division. He selected the point of attack, in large part, due to the presence of a conspicuous road connecting St. Lô and Périers that would serve as the demarcation line between the Americans and the Germans. He also envisioned an air attack being made parallel to the enemy lines that would decimate the German resistance defending a one-by-five-mile rectangle immediately in front of his forces.⁸⁸ To increase the concentration of the bombing efforts, Bradley wanted the attacks to occur within the span of one hour. The long, straight St. Lô-Périers road, Bradley reasoned, would clearly distinguish between the friendly and enemy positions. He thus considered 800 yards of separation sufficient distance between friendly troops and the heavy bombers' target.⁸⁹

Significant misunderstandings developed during the process of transforming Bradley's concept into an operational plan. Because the mission was in support of ground forces, the commander of the Allied Expeditionary Air Force, Air Chief Marshal Leigh-Mallory, led the air operation. Bradley briefed the ground scheme of maneuver for Operation Cobra to Leigh-Mallory and other air commanders on 19 July, just days before the planned assault.⁹⁰ Leigh-Mallory had little experience planning operations with heavy bombers. Thus, many problems with Bradley's plan were not properly addressed during the discussion. For example, citing the dispersion of bombs from high-altitude bombing, air commanders called for a 3,000-yard safe separation distance, but Bradley consented only to 1,200 yards.⁹¹ Moreover, Brig Gen Orvil Anderson, Doolittle's operations officer, argued that the parallel attack was not feasible. Leigh-Mallory dismissed the objection, and Bradley left the meeting convinced that the aerial attack would occur parallel to friendly lines.⁹² Unlike Anderson, Leigh-Mallory was unaware of the physical impossibility of channeling 1,500 aircraft through the short side of the target area in the 60 minutes required.⁹³ Furthermore, flying parallel to the German lines exposed Doolittle's bombers longer to German flak than would flying perpendicular.

The first mission to support Operation Cobra did not go well. To meet the demand for concentrated fire, Eighth Air Force planners, unaware of Bradley's expectation of a parallel attack, designed the mission with a flight path perpendicular to the battle lines. The perpendicular plan was never communicated to Bradley. Leigh-Mallory, apparently also unaware of the perpendicular attack plan, scheduled the initial assault for noon on 24 July, despite a

poor weather forecast. Clouds completely obscured the target area, leading Leigh-Mallory to cancel the mission, but he did not do so until just before the planned attack, a common practice with tactical operations. This created much confusion among the heavy-bomber formations. Because ground forces had no direct radio contact with the attacking bombers, the cancellation message had to be relayed through Eighth Air Force Headquarters in England. Thus, when Doolittle received Leigh-Mallory's cancellation order, his bombers were only seven minutes from the target area; they could not be recalled.⁹⁴ Of the 1,586 bombers dispatched that day, 343 found breaks in the weather and attacked their targets.⁹⁵ Compounding the misunderstanding about parallel versus perpendicular attack, a lead bomber inadvertently released a portion of its bomb load over friendly lines. Following the cue of their lead aircraft, the 15 accompanying bombers released their weapons in unison. In another incident, a B-17 accidentally bombed a Ninth Air Force airfield at Chippelle. These mishaps killed 16 soldiers and injured 64.⁹⁶

The Eighth Air Force's performance did not please Bradley. He did not understand why the formations had not conformed to his request to attack parallel to the battle lines. He exasperatedly remarked, "What worries me more than anything else is the fact that those heavies came in over our heads instead of parallel to the Périers road. I left Stanmore [RAF Stanmore Park, near London] with a clear understanding that they would fly parallel to the road."⁹⁷ Nor was Eisenhower impressed with the Eighth's performance. He said pointedly, "I don't believe [heavy bombers] can be used in support of ground forces. That's a job for artillery. I gave them a green light this time. But I promise you it's the last."⁹⁸ Interestingly, amidst the flurry of activity during Operation Cobra, Ike took time on 26 July to add a handwritten annotation to Doolittle's 30 June efficiency report. Spaatz, who made the evaluation, rated Doolittle as 2nd of 10 lieutenant generals. Eisenhower disagreed. He penned, "in my opinion General Doolittle ranks in the middle third of lieutenant generals."⁹⁹

A favorable forecast for 25 July provided the Eighth another opportunity to support Operation Cobra. During the mission planning, Doolittle's headquarters explained to Bradley that a parallel attack would require 2.5 hours instead of the one he requested. Bradley thus "decided to accept the additional risk of perpendicular-to-the-road bombing."¹⁰⁰ With the previous day's fratricide in mind, Doolittle took precautions to minimize the potential for premature weapons releases. Two hours prior to the mission, a reconnaissance aircraft flew over the assault area to ascertain weather conditions and make recommendations to the Eighth Air Force aircrews. The visual attacks were planned for the lowest feasible altitude while still reducing the risk of flak. Artillery also fired red smoke shells at two-minute intervals to mark the target boundar-

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ies.¹⁰¹ Finally, Doolittle planned to observe the mission firsthand from the cockpit of a P-38.¹⁰²

Despite Doolittle's precautions, confusion again prevailed on 25 July. A total of 1,507 heavy bombers struck the enemy lines around St. Lô, dropping more than 3,300 tons of ordnance. After a majority of the force had been launched, a cloud base rolled in over the target at the planned delivery altitude of 15,000–16,000 feet. This compelled bombardiers to recalculate their bombing solutions and adjust their sights. The lowering of the attack altitude also loosened bomber formations, which led to scattered bombing patterns. Moreover, the artillery smoke rounds proved ineffective in marking the target area; a southerly wind dispersed the markings among the surrounding smoke and haze that billowed from the battlefield.¹⁰³ Finally, the St. Lô–Périers road that Bradley had picked as a visual marker, so prominent on the map, was much less obvious from the air.¹⁰⁴

Given the challenging conditions, the bombing of enemy forces at St. Lô was surprisingly accurate but still caused friendly losses. As official Air Force historian Robert George remarked, “Technically viewed, the bombing was good.” Analysis by the Operational Research Section concluded that bombing errors were better than expected, given the mission circumstances. Only 2–4 percent of more than 1,500 bombers missed their targets. The errors that did occur, however, were costly. Amid the chaos, 35 heavy bombers from the Eighth dropped their ordnance over American lines. The stray bombs killed 102 US soldiers and wounded 380.¹⁰⁵ An investigation attributed the short bombs to “a misunderstanding of briefing instructions . . . [and] a misinterpretation of target markers”—personal errors.¹⁰⁶ Among the dead was Lt Gen Lesley J. McNair. His fate was tinged with irony. McNair had been a vocal critic of the AAF's lack of training for close air support.¹⁰⁷ The following day Doolittle flew a P-38 to offer Bradley his personal condolences.¹⁰⁸ Doolittle clearly understood that “technically good” was not good enough for close air support.

Doolittle responded to the problems of fratricide by directing his staff to investigate methods of reducing friendly casualties. Familiar with the British operations, Doolittle apparently told his subordinates to seek advice from their RAF counterparts. Col Benjamin Kelsey, commander of the Eighth's operational engineering section, submitted a memorandum to Doolittle on 30 July addressing the issue.¹⁰⁹ His report made several recommendations: (1) establish the aiming point with pathfinder aircraft using radar, not visual, targeting devices; (2) use friendly antiaircraft artillery to fire colored bursts to denote the bomb line; (3) include an RAF-developed target indicator (T.I.) bomb, which burst at 4,000 feet and burned for five minutes, in each aircraft's bomb load to maintain a “continual carpet of markers” in the target area; (4)

use portable navigation instruments to indicate friendly troop locations; and (5) establish an “airborne liaison director” to maintain radio contact with the ground forces and the attacking bomber formations.¹¹⁰ The following day, another memorandum, titled “Marking of Target Area in Support of Ground Forces,” was submitted to Doolittle’s operations officer, Orvil Anderson. Similar in many respects to Kelsey’s suggestions, the report recommended the use of portable navigation aids, searchlights and ground panels on friendly locations, T.I. bombs, and improved radio communications between ground and air forces.¹¹¹ The latter memorandum concluded with suggestions submitted by the 2nd and 3rd Bombardment Divisions. Both units believed that having additional time to attack the target area would improve bombing accuracy and stated a preference for making attacks perpendicular to the battle lines.¹¹²

These recommendations reflected the Eighth Air Force’s coordination with the RAF. Kelsey closed his report by recommending the pathfinder aircraft be used as a “master bomber” to maintain awareness of the target marking and to direct adjustments in the operations.¹¹³ Similarly, the report proposed using RAF Mosquito aircraft to mark targets for US heavy bombers.¹¹⁴

Meanwhile, the passage of time and the successful breakout from Normandy brought about by Operation Cobra eased Bradley’s displeasure. On 28 July, he told Eisenhower, “This operation could not have been the success it has been without such close cooperation of the Air. In the first place the bombardment we gave them last Tuesday was apparently highly successful, even though we did suffer many casualties ourselves.”¹¹⁵ Eisenhower echoed Bradley’s sentiments in a letter of 2 August to Doolittle:

I know how badly you and your command have felt because of the accidental bombing of some of our own troops. . . . Naturally, all of us have shared your acute distress that this should have happened. Nevertheless, it is quite important that you do not give the incident an exaggerated place either in your mind or in your future planning.

All the reports show that the great mass of the bombs from your tremendous force fell squarely on the assigned target, and I want you and your command to know that the advantages resulting from the bombardment were of inestimable value. I am perfectly certain, also, that when the ground forces again have to call on you for help you not only be ready as ever to cooperate, but will in the meantime have worked out some method so as to eliminate unfortunate results from the occasional gross error on the part of a single pilot or a single group.¹¹⁶

Doolittle’s response to Eisenhower’s consolatory remarks summarized his plan to mitigate the risk of losses to friendly troops. He opened his letter of 5 August with a firsthand account of the incident and the results of his formal investigation and followed with his proposals for the conduct of future bomber operations in support of ground forces. He advised Eisenhower that in such operations, his forces would properly mark the target area with T.I.

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bombs. He also emphasized the importance of friendly marking devices, such as colored antiaircraft artillery rounds, ground panels, and navigation beacons. A senior air commander, Doolittle noted, would control future missions and maintain contact with ground forces. Finally, Doolittle insisted on the use of air liaison officers to assist in the planning of future ground-support operations. He closed his letter by asserting, "We are anxious to vindicate ourselves with a perfect job next time."¹¹⁷ Perfection, however, would have to wait.

Unbeknown to Doolittle, the same day he penned his response to Eisenhower, Spaatz committed the Eighth's heavy bombers to support Montgomery's 1st Canadian Army south of Caen as part of Operation Totalize.¹¹⁸ Doolittle ensured his planners took great care during the short time available to prepare for the operation. Scouting planes were used to reconnoiter the area and report on weather conditions. Despite increased exposure to enemy anti-aircraft artillery and the difficulties of managing the congested airspace, Doolittle ordered the bombers to fly parallel to the enemy lines to mitigate the risk of short bombs. Much to his dismay, the ground troops were positioned only 1,500 yards from the target.¹¹⁹ Doolittle and his deputy, Partridge, also flew fighter aircraft to control the operation personally.¹²⁰ Doolittle had his P-51 modified to include a special radio to communicate with the bombing division commanders. The radio, however, failed during the flight, and he found himself again a helpless observer.¹²¹

The Eighth Air Force's support of ground forces again produced US casualties. Doolittle launched 497 heavy bombers that dropped 764.8 tons of general-purpose bombs and 723 tons of fragmentation ordnance against enemy troop positions.¹²² The loads of three groups fell wide of the intended target. Doolittle commissioned a special investigation to determine the causes of the errant bombs. The 15 August report concluded that in the first instance, flak struck the lead aircraft, setting it aflame. When the pilot jettisoned his ordnance, the accompanying aircraft dropped their bombs as well. In another incident, a lead bombardier misidentified a smoke column over friendly lines as the target. The final incident was attributed to improper crew selection. The group commander had assigned an inexperienced lead crew that subsequently misidentified the target area.¹²³ Although some of the reasons for the errors proved difficult to prevent, the mishaps killed 25 Canadians and wounded 131.¹²⁴

Doolittle's frustration with the planning of ground-support operations was palpable in a 10 August memorandum he sent to Spaatz, titled "Direct Support of Ground Troops by the Eighth Air Force." In the three-page report, Doolittle explained that the Eighth's support of the D-day invasion produced no fratricide because he was provided ample time to prepare his forces. In

contrast, the subsequent missions were “done with insufficient time for preparation.” He also outlined the reasons for the mishaps and his plan to improve results through improved training in close air support. Doolittle acknowledged that the training would decrease his command’s efficiency in strategic bombing but said the risk “must be accepted.” Before closing, he noted, “If we are to do as good a job as the ground troops do in our support of them, we have to know what is to be done as soon as they do and must have our people in the planning from start to finish.”¹²⁵

Operation Queen, conducted in November, gave Doolittle an opportunity to realize his full vision for ground-support operations. On 21 October, Spaatz met with Bradley to discuss an attack plan to cross the Roer River. Success of the operation would provide a base from which to launch an assault over the Rhine into Germany. Unlike previous operations, Doolittle had time to prepare his forces for the operation. Close-air-support operations were discussed at length during the 1 November commanders meeting.¹²⁶ On 7 November, he dispatched 535 heavy bombers and 148 fighters on a “special practice mission” against a target in England to rehearse the techniques.¹²⁷ During the operation, 64 anti-aircraft artillery pieces deployed colored shells to denote the bomb line. Friendly troops also marked their location with large ground-marking panels and a string of barrage balloons. Truck-mounted navigation beacons were placed along friendly lines. Finally, the safety margin from bombing aim points to friendly troops was expanded to 3,600 yards, over twice the distance used in St. Lô.¹²⁸

Doolittle’s extensive efforts to mitigate friendly losses finally paid dividends. The mission in support of Operation Queen was the largest air-ground coordinated assault of the war. On 16 November, 1,191 heavy bombers dropped 4,120 tons of ordnance on enemy positions. Clouds, smoke, haze, and even snow again hindered the visual release of bombs over the battlefield. The aircrews coped well, however, and Allied casualties were limited to one soldier killed and three wounded. Moreover, the destruction rendered by the aerial onslaught was vast. Several fortified villages and enemy positions were completely destroyed.¹²⁹ Richard Davis aptly noted, “In its preparations and execution Queen showed how far the Eighth Air Force had come in its ground support role.”¹³⁰

Doolittle’s use of heavy bombers in direct support of ground troops illuminates his effectiveness as a commander. Following the first incident of fratricide, he became personally involved in the efforts to mitigate the dangers to ground personnel. He directed his staff to formulate solutions and placed himself in a position to witness the follow-on operations firsthand. He also exhibited a certain measure of humility by compelling his subordinates to

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seek the advice of their British counterparts. Moreover, he understood the opportunity cost of training his forces for close air support instead of strategic bombing. Although Doolittle was unable to implement his plans to prevent friendly losses on 8 August, his solutions ultimately proved effective in the successful support of Operation Queen. In summary, despite repeated frustration, Doolittle successfully implemented institutional change that allowed his strategic bombing force to safely support ground forces.

Conclusions

Several observations emerge from assessing Doolittle's use of the Eighth Air Force's resources. First, his concept of attrition through maximum effort indicates a predisposition to aggressive action. This mentality resembles a Clausewitzian approach to force employment. The Prussian theorist shunned the practice of maintaining a strategic reserve, contending that a strategic-level commander should commit all available resources to winning a decisive battle.¹³¹ Similarly, Doolittle felt the spring of 1944 offered a decisive opportunity for winning the air war over Western Europe. Indeed, his determined attacks transformed the character of Eighth Air Force operations, much to Arnold's approval. His aggressive approach cost the Eighth dearly in loss of aircraft and crews, but it also forced the enemy to offer battle in the air over Germany. Doolittle's instincts were right; the ensuing aerial attrition broke the Luftwaffe's back.¹³²

This aggressiveness led Doolittle to demand maximum effort from his aircrews. He upended the extant policies of tour length to obtain the personnel needed to support his increased tempo of operations. Doolittle's instincts were validated by Arnold's demand for evaluation of the way in which qualified aircrews were employed. The increased tour length, however, combined with mounting losses, led to a significant degradation in unit morale in the spring of 1944. The measures Doolittle took to mitigate these adverse consequences are further addressed in Chapter 5. Suffice it to say here, he pushed his crews to their limit while artfully balancing the needs of the mission, the demands of his superiors, and the welfare of his men.

Doolittle also performed admirably when confronted with a mission his forces were ill-equipped to perform. High-altitude bombing in close proximity to friendly ground forces is a complex task that continues to challenge the technologically advanced air forces of the twenty-first century. Nevertheless, following the fratricide at St. Lô, Doolittle marshaled his staff to develop procedures to reduce the risks of bombing in close support of ground forces. Although these methods required time to implement, they ultimately proved

effective in the air bombardment supporting Operation Queen. Perhaps the most significant aspect of this episode, however, was Doolittle's willingness to accept a non-doctrinal use of airpower to enhance overall force effectiveness. The Air Corps Tactical School instructors would have cringed at using heavy bombers to support ground forces. But the overall effects of Cobra and Queen, despite the fratricide accompanying the former, hastened the end of the Wehrmacht.

This evaluation indicates that, in the areas studied, Doolittle effectively applied available resources to achieve his assigned missions. He grasped the impact of the abundant means at his disposal and forced the Luftwaffe into an air battle of attrition. His demanding nature extracted much from his men and was not without cost in blood and spirit. Nevertheless, Doolittle walked the fine line of pushing his crews hard without overextending their capabilities. Although he could drive and lead his men to perform, he had less success in avoiding friendly casualties with the use of heavy bombers in close support of ground forces. Nevertheless, the efforts that he and his staff took gradually reduced mission risks to acceptable levels. In short, Doolittle's Clausewitzian approach to economy of force achieved what was arguably the "highest profit" by inflicting significant losses upon the Luftwaffe and ground targets while simultaneously reducing the losses of his own and other Allied forces.

Notes

1. History, Headquarters Eighth Air Force, 1–31 January 1944, vol. 1, AFHRC call no. 520.01 V.1, 1.
2. Richard G. Davis, "Take Down That Damned Sign!" *Airpower History* 40, no. 4 (Winter 1993): 18.
3. Memo to Chief of Staff, "Administrative highlights," n.d., Doolittle Papers, Box 16, 1944–45 Military Correspondence, Library of Congress (LOC). The Fifteenth Air Force had 4,873 officers and 32,867 enlisted men in December 1943. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointblank, August 1942 to December 1943* (1949; new imprint, Washington, DC: Office of Air Force History, 1983), 571.
4. Craven and Cate, *Europe: Torch to Pointblank*, 639.
5. Memo to Chief of Staff.
6. James Doolittle to Joe Doolittle, letter, 14 January 1944, Doolittle Papers, Series IX, Box 64, Folder 23, Special Collections Division, McDermott Library, University of Texas at Dallas.
7. Maj Gen James H. Doolittle to Lt Gen George S. Patton, letter, 1 February 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
8. Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (1976; reprint, Princeton, NJ: Princeton University Press, 1989), 164.
9. James Doolittle to Joe Doolittle, letter, 23 December 1944, Doolittle Papers, Series IX, Box 64, Folder 23, McDermott Library.

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10. Quoted in Dik Alan Daso, *Doolittle: Aerospace Visionary* (Washington, DC: Brassey's, 2003), 80–81.
11. Quoted in Richard Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, DC: Center for Air Force History, 1993), 300.
12. Gen H. H. Arnold to Gen George C. Marshall, letter, n.d., Arnold Papers, 1944 Correspondence, LOC.
13. James H. Doolittle and Carroll V. Glines, *I Could Never Be So Lucky Again* (New York: Bantam Books, 1992), 347.
14. Roger A. Freeman, *Mighty Eighth War Diary* (New York: Jane's, 1981), 126; and Davis, *Carl A. Spaatz*, 362.
15. In Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 3, *Europe: Argument to VE Day, January 1944 to May 1945* (1949; new imprint, Washington, DC: Office of Air Force History, 1983), 65–66.
16. History, Headquarters Eighth Air Force, 1–31 January 1944, vol. 1, AFHRC call no. 520.01 V.1, 16.
17. *Ibid.*; and Kent D. Miller, *Fighter Units & Pilots of the 8th Air Force: September 1942–May 1945*, vol. 1 (Atglen, PA: Schiffer Military History, 2001), 38.
18. Doolittle to VIII Fighter Command and Bomber Divisions, letter, 19 January 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
19. Minutes, Commanders Meeting, 21 January 1944, AFHRC call no. 520.01 V.2, 2. Allied forces used the term *Hun* as a disparaging name for German forces.
20. Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York: Random House, 1993), 280.
21. Minutes, Commanders Meeting, 21 January 1944, 2.
22. Minutes, Commanders Meeting, 8 February 1944, 1–2.
23. Davis, *Carl A. Spaatz*, 306.
24. Minutes, Commanders Meeting, 8 February 1944, 1.
25. Doolittle to VIII Fighter Command and all Bombardment Divisions, letter, 17 February 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
26. Davis, *Carl A. Spaatz*, 319, 322.
27. History, Headquarters Eighth Air Force, 1–29 February 1944, vol. 1, AFHRC call no. 520.01 V.1, 43–44.
28. Craven and Cate, *Europe: Argument to VE Day*, 38.
29. History, Headquarters Eighth Air Force, 1–29 February 1944, vol. 1, 3.
30. Interestingly, the RAF, which flew at night, only destroyed 13 enemy aircraft during Big Week. Davis, *Carl A. Spaatz*, 326.
31. Craven and Cate, *Europe: Argument to VE Day*, 45.
32. Gen H. H. Arnold to Gen Carl Spaatz, cable, 26 February 1944. Spaatz Papers, I-13, February 1944, LOC.
33. *Ibid.*
34. History, Headquarters Eighth Air Force, 1–31 March 1944. AFHRC call no. 520.01 V.1, 33–34.
35. Davis, *Carl A. Spaatz*, 416.
36. Craven and Cate, *Europe: Argument to VE Day*, 51–53.
37. Davis, *Carl A. Spaatz*, 416.
38. Minutes, Commanders Meeting, 22 March 1944; and History, Headquarters Eighth Air Force, 1–31 March 1944, vol. 2, 2.

39. Craven and Cate, *Europe: Argument to VE Day*, 302.
40. History, Headquarters Eighth Air Force, 1–29 February 1944, 43–44.
41. Davis, *Carl A. Spaatz*, 377–78.
42. Maj Gen J. H. Doolittle to Gen H. H. Arnold, letter, 4 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
43. Davis, *Carl A. Spaatz*, 377.
44. *Ibid.*, 338.
45. Craven and Cate, *Europe: Argument to VE Day*, 63, 66.
46. Davis, *Carl A. Spaatz*, 413.
47. Quoted in Craven and Cate, *Europe: Argument to VE Day*, 58.
48. Craven and Cate, *Europe: Argument to VE Day*, 166.
49. Davis, *Carl A. Spaatz*, 414.
50. Craven and Cate, *Europe: Argument to VE Day*, 58–59.
51. Doolittle to Arnold, letter, 4 March 1944.
52. Brig Gen Orvil Anderson to Gen Carl Spaatz, letter, 3 April 1944. Spaatz Papers, Box I-90, LOC.
53. Memo to Chief of Staff. This assertion counters Richard Davis's claim that by May 1944 the strength of the Eighth Air Force exceeded 400,000. Davis, *Carl A. Spaatz*, 380; and Davis, "Take Down That Damned Sign!" 18. The error is likely due to a misreading of Craven and Cate, *Europe: Torch to Pointblank*, 640, which ambiguously states, "During the next six months the AAF in ETO [European Theater of Operations] would more than double in size, and by May 1944 it would have over 400,000 troops." This statement does not reflect the Eighth Air Force alone, but instead, indicates the combined strength of all numbered air forces in Europe.
54. Davis, *Carl A. Spaatz*, 380.
55. Doolittle and Glines, *I Could Never Be So Lucky Again*, 359.
56. Mark K. Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (Essex, UK: Routledge, 1995), 46.
57. Davis, *Carl A. Spaatz*, 380; and Minutes, Commanders Meeting, 8 February 1944, 4.
58. Doolittle to VIII Fighter Command and all Bombardment Divisions, letter, 17 February 1944.
59. Gen H. H. Arnold to Maj Gen J. H. Doolittle, letter, 11 February 1944. Spaatz Papers, File I-90, LOC.
60. Minutes, Commanders Meeting, 2 March 1944, AFHRC call no. 520.01 V.1, 3.
61. Doolittle to VIII Fighter Command and all Bombardment Divisions, letter, 4 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
62. History, Headquarters Eighth Air Force, 1–30 April 1944, vol. 1, AFHRC call no. 520.01 V.1, 5, 3.
63. Doolittle to VIII Fighter Command and all Bombardment Divisions, letter, 4 March 1944.
64. Doolittle to Arnold, letter, 4 March 1944.
65. Craven and Cate, *Europe: Argument to VE Day*, 306.
66. History, Headquarters Eighth Air Force, 1–31 May 1944, vol. 1, AFHRC call no. 520.01 V.1, 4.
67. Minutes, Commanders Meeting, 6 April 1944, AFHRC call no. 520.01 V.2, 2.
68. History, Headquarters Eighth Air Force, 1–31 July 1944, vol. 1, AFHRC call no. 520.01 V.1, 3.
69. History, Headquarters Eighth Air Force, 1–31 March 1944, vol. 1.

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70. Ibid., 6.
71. Luftwaffe fighters frequently targeted the lead aircraft in an attempt to disrupt bomber formations. History, Headquarters Eighth Air Force, 1–31 July 1944, 2.
72. Ibid.
73. Ibid., 3.
74. Minutes, Commanders Meeting, 20 July 1944, AFHRC call no. 520.01 V.2, 3.
75. Craven and Cate, *Europe: Argument to VE Day*, 303.
76. Minutes, Commanders Meeting, 20 July 1944, 3.
77. Minutes, Commanders Meeting, 23 September 1944, AFHRC call no. 520.01 V.1.
78. Doolittle and Glines, *I Could Never Be So Lucky Again*, 360.
79. Craven and Cate, *Europe: Argument to VE Day*, 305.
80. As quoted in Davis, *Carl A. Spaatz*, 464.
81. Doolittle and Glines, *I Could Never Be So Lucky Again*, 375.
82. Davis, *Carl A. Spaatz*, 453.
83. Ibid., 460; and Craven and Cate, *Europe: Argument to VE Day*, 207–8.
84. Craven and Cate, *Europe: Argument to VE Day*, 208; and Davis, *Carl A. Spaatz*, 461.
85. There is some discrepancy in the sources regarding the number of bombers that participated in the mission. The Eighth Air Force Headquarters narrative history reports that 644 B-24s were dispatched. In contrast Davis and Craven and Cate claim that only 570 flew. History, Headquarters Eighth Air Force, 1–31 July 1944, 64; Davis, *Carl A. Spaatz*, 462; and Craven and Cate, *Europe: Argument to VE Day*, 208.
86. Davis, *Carl A. Spaatz*, 462.
87. Minutes, Commanders Meeting, 20 July 1944.
88. Craven and Cate, *Europe: Argument to VE Day*, 232.
89. Davis, *Carl A. Spaatz*, 463–65.
90. The operation was originally scheduled for 21 July and postponed until 24 July because of weather. Davis, *Carl A. Spaatz*, 465, 469.
91. Ibid., 465.
92. Ibid., 467–68.
93. Ibid., 471.
94. Ibid., 469–70.
95. History, Headquarters Eighth Air Force, 1–31 July 1944, vol. 1, 70.
96. Craven and Cate, *Europe: Argument to VE Day*, 230. There is some disagreement regarding the number of soldiers killed. Davis contends that 25 soldiers were killed and 131 wounded. Davis, *Carl A. Spaatz*, 470.
97. As quoted in Davis, *Carl A. Spaatz*, 470.
98. As quoted in *ibid.*, 474.
99. Efficiency report dated 30 June 1944. National Archives and Records Administration, Official military personnel file of James H. Doolittle, 08 Efficiency Records.pdf.
100. As quoted in Davis, *Carl A. Spaatz*, 471.
101. Craven and Cate, *Europe: Argument to VE Day*, 232.
102. Logbook entry, 25 July 1944, Doolittle Papers, Series XVI, Box 1, McDermott Library.
103. Craven and Cate, *Europe: Argument to VE Day*, 233.
104. Years later General Quesada criticized himself for not inspecting the road personally prior to the attack. Davis, *Carl A. Spaatz*, 474–75.
105. Craven and Cate, *Europe: Argument to VE Day*, 233–34.

106. History, Headquarters Eighth Air Force, 1–31 July 1944, 71; and Craven and Cate, *Europe: Argument to VE Day*, 234.
107. Davis, *Carl A. Spaatz*, 474.
108. Logbook entry, 26 July 1944, Doolittle Papers, Series XVI, Box 1, McDermott Library.
109. The operational engineering section was a part of Doolittle's staff devoted to investigating, testing, and implementing technical modifications to aircraft. It is discussed in greater detail in chapter 4.
110. Col Benjamin Kelsey to Maj Gen J. H. Doolittle, letter, 30 July 1944, Doolittle Papers, Box 19, LOC.
111. Conroy to Anderson, letter, 31 July 1944, Doolittle Papers, Box 19, LOC.
112. *Ibid.*
113. Kelsey to Doolittle, letter, 30 July 1944.
114. Conroy to Anderson, letter, 31 July 1944.
115. As quoted in Davis, *Carl A. Spaatz*, 479.
116. Gen D. D. Eisenhower to Maj Gen J. H. Doolittle, letter, 2 August 1944, Doolittle Papers, Box 18, LOC.
117. Maj Gen J. H. Doolittle to Gen D. D. Eisenhower, letter, 5 August 1944, Doolittle Papers, Special Correspondence, LOC.
118. Davis, *Carl A. Spaatz*, 479; and History, Headquarters Eighth Air Force, 1–30 August 1944, vol. 1, 38.
119. Davis, *Carl A. Spaatz*, 480.
120. Doolittle flew a P-51 and Partridge a P-47. Logbook entry, 8 August 1944, Doolittle Papers, McDermott Library; and Partridge, interview by Strum and Ahmann, 23–25 April 1974, AFHRC, 407–8.
121. Doolittle and Glines, *I Could Never Be So Lucky Again*, 378.
122. History, Headquarters Eighth Air Force, 1–30 August 1944, vol. 1, AFHRC call no. 520.01 V.1, 38–39.
123. *Ibid.*
124. Craven and Cate, *Europe: Argument to VE Day*, 251.
125. Maj Gen J. H. Doolittle to Gen Carl A. Spaatz, letter, 10 August 1944, Doolittle Papers, Box 18, LOC.
126. Minutes, Commanders Meeting, 1 November 1944, AFHRC call no. 520.01 V.2, 2.
127. History, Headquarters Eighth Air Force, 1–30 November 1944, vol. 1, AFHRC call no. 520.01 V.1, 74.
128. Davis, *Carl A. Spaatz*, 516.
129. Craven and Cate, *Europe: Argument to VE Day*, 631–32.
130. Davis, *Carl A. Spaatz*, 515.
131. In Clausewitz's paradigm of perspectives on war, the level of strategy roughly parallels the late twentieth/early twenty-first century's operational level of war. Clausewitz, *On War*, 213.
132. Donald Caldwell and Richard Muller, *The Luftwaffe over Germany: Defense of the Reich* (St. Paul, MN: Greenhill Books, 2007), 186–89.

Chapter 4

Tactical and Technical Innovation

Clausewitz famously observed that although the essence of war is immutable, its character is constantly changing.¹ Furthermore, Sun Tzu stated, “of the five elements, none is always predominant.”² In other words, in war “the only constant is constant change.”³ Innovation enables a commander to adapt to these changes and, thus, is an appropriate indicator of command performance. This chapter begins with an appraisal of Doolittle’s influence on tactical and technical innovation, explores his efforts to revise tactics in response to the problem of aircraft attrition, assesses his role in technical innovation by responding to aircraft mechanical problems, and closes by analyzing his ability to blend tactical and technical innovation in an attempt to mitigate the effects of poor weather on bombing operations.

Tactical Innovation

Doolittle’s decision to change the tactics of fighter escorts is widely addressed in the literature. In his autobiography, he describes a scene in which he directed Maj Gen William Kepner to alter the primary mission of VIII Fighter Command from protecting bombers to destroying German fighters. Hanging in Kepner’s office was a sign that read: “THE FIRST DUTY OF THE EIGHTH AIR FORCE FIGHTERS IS TO BRING THE BOMBERS BACK ALIVE.” Doolittle ordered Kepner to “take down that damned sign” and replace it with one that stated: “THE FIRST DUTY OF THE EIGHTH AIR FORCE FIGHTERS IS TO DESTROY GERMAN FIGHTERS.”⁴ Although varying accounts exist of the dramatic story, all agree that Doolittle ordered Kepner to remove the sign.⁵

Doolittle was just one of many who believed in using fighters offensively. Kepner, likewise, considered fighters offensive weapons that should pursue and destroy enemy aircraft. Although he did not agree with Ira Eaker’s policy, the limited quantity and range of available fighters in the fall of 1943 gave him little choice; he conceded that the escorts had to “stick close to the bombers.” Doolittle’s superior, Gen Carl Spaatz, also believed in an offensive approach. His operational directive of 11 January 1944 ordered the Eighth Air Force to attack German fighters “in the air and on the ground.” Accordingly, historian Richard Davis attributes equal credit to Spaatz and Doolittle for deciding to use fighters more offensively. Moreover, Spaatz’s directive echoed the sentiment of

his superior, Gen Hap Arnold. On 3 November 1943, Arnold sent a memorandum to Gen George Marshall recommending that Allied air forces “seek out and destroy the German Air Force in the air and on the ground without delay. The defensive concept of our fighter commands and air defense units must be changed to the offensive.”⁶ Arnold’s Christmas Day message of 1943 reiterated this view. The order “to destroy the enemy air force wherever you find them” left little to Doolittle’s imagination as to what was expected.⁷

Doolittle also possessed a crucial resource that his predecessor had lacked. November 1943 marked the arrival of the P-38 long-range fighter, and the following month brought the highly anticipated P-51 Mustang long-range fighter-bomber. By March 1944 both aircraft carried wing tanks, extending their respective ranges to 585 and 850 miles. As commander of VIII Fighter Command, Kepner observed that the latter’s remarkable range and performance made it “the only satisfactory answer” to German air defenses.⁸ Moreover, by February of 1944, the more numerous P-47 Thunderbolt fighters also benefited from new external fuel tanks, which increased their range from 375 miles to a respectable 475 miles.⁹ The extended ranges not only allowed these aircraft to accompany bombers over greater distances but also allowed more flexibility in their employment.

So how instrumental was Doolittle in the shift in tactics? Did he play “the decisive” role or did he merely execute the orders of his superiors?

When Doolittle assumed command, the Eighth Air Force faced a serious problem of attrition. Between July and November 1943, it lost 64 percent of its aircrews. This trend continued into 1944. In January, only 26 percent of bomber crew members finished the 25 missions required to return to the United States. Fifty-seven percent ended up dead or missing, and the remaining 17 percent transferred for administrative purposes, succumbed to combat fatigue, or died outside of combat.¹⁰ These heavy losses seriously degraded the Mighty Eighth’s operational effectiveness. The unit had not attempted a deep-penetration mission into Germany in clear weather since the bloody 14 October 1943 raid on Schweinfurt.¹¹ In the official account of the Army Air Forces’ history, Arthur Ferguson remarked, “the Eighth Air Force had for the time being lost air superiority over Germany.”¹²

Doolittle’s first large-scale mission illustrated the difficulty of bombing the German industrial base. On 11 January 1944, 663 aircraft from 12 combat wings attacked aircraft factories in Oschersleben, Halberstadt, and Brunswick, Germany.¹³ The mission did not go well. Deteriorating weather conditions hampered the flight rendezvous, and Doolittle ordered a partial recall of the 3rd Bombardment Group. Amid the confusion, only a third of the dispatched bombers struck their primary targets.¹⁴ Moreover, the bomber crews

faced more than 275 enemy interceptor aircraft, and their fighter escort “was not exceptionally good.” The mission lost 60 heavy bombers, equal in number to the 14 October mission over Schweinfurt.¹⁵ To make matters worse, the Eighth mismanaged the press release of the mission, making it appear it was trying to hide a disaster.¹⁶ Doolittle’s command of the Eighth Air Force was not off to an auspicious start.

Following the 11 January mission, Doolittle’s primary concern became degrading the effectiveness of German fighters. In a letter of 14 January to Arnold, he said, “this is the most critical period in the battle for air supremacy over Europe.”¹⁷ Similarly, in a letter of 19 January to Spaatz, Doolittle concluded, “A study of the missions which have been conducted by this Air Force recently reveals that enemy fighters have caused the majority of the losses incurred by our bombardment units.”¹⁸ Indeed, in the early months of 1944, the Luftwaffe was devastating the Eighth’s bomber formations. The 11 January mission debrief reported that German single-engine fighters were equipped with belly fuel tanks which enabled them to attack for extended periods of time.¹⁹ Furthermore, twin-engine Ju-88 multirole aircraft and Me-110 heavy fighters attacked bombers with rockets, while remaining clear of the 50-caliber defensive fire. The German fighter tactics were shrewd. The deadly rocket attacks shredded concentrated bomber formations. However, if bombers loosened their formation in response to the rockets, they became more vulnerable to attack from the single-engine fighters.²⁰ Doolittle believed the solution to this problem was to take the fight to the enemy. The fighters had to be cut loose.

Available evidence demonstrates that Doolittle had a direct influence on changing fighter tactics in the Eighth Air Force. In his memoirs, he claimed responsibility for changing the fighter tactics, which he considered “the most important and far-reaching military decision I made during the war.”²¹ Minutes from a 21 January commanders meeting show that Doolittle “emphasized that the fighter role of protecting the bombardment formation should not be minimized, but our fighter aircraft should be encouraged to meet the enemy and destroy him rather than be content to keep him away.”²² Moreover, in a postwar interview, Gen Pat Partridge confirmed that the offensive fighter posture was Doolittle’s idea.²³

The decision to “let the fighters loose” marked an innovation in fighter tactics. The prevailing AAF doctrine discouraged escort fighters from pursuing enemy aircraft. AAF Field Manual 1-15, *Tactics and Technique of Air Fighting*, dated 10 April 1942, stated the mission of close escorts “precludes their seeking to impose combat on other forces except as necessary to carry out their defensive role.” The Eighth Air Force under Eaker’s command had

closely followed this guidance. To conserve his bomber force, Eaker prohibited his fighters from pursuing the Luftwaffe.²⁴ Discussion held during an Eighth Air Force commanders meeting in September 1943 illustrates this bomber-centric philosophy. The commanders agreed that the fighters' priority was escorting the bombers, not destroying German fighters.²⁵ The defensive policy frustrated fighter pilots. It ceded the initiative to German fighter pilots and wasted the escorts' offensive potential.²⁶ For example, on 3 November 1943, P-38s achieved their first aerial victories in the European theater with no losses. However, the number of kills was limited to three because strict rules of engagement prevented the fighters from pursuing enemy aircraft.²⁷ Doolittle's pursuit policy changed the Eighth's fighter philosophy and "stood official doctrine on its head."²⁸ Fighter escorts were transformed from passive defenders to aggressive attackers.

The offensive tactics also optimized the use of fighter escorts. Fighters performing close escort had previously rendezvoused with bomber formations and followed them to the target or to the limits of their range. Because fighters cruised at a higher speed than bombers, the "little friends" weaved to stay in position. These maneuvers wasted fuel and reduced the fighter's escort range. Shortly after Doolittle arrived, the Eighth implemented a relay escort system. Under the new policy, a fighter group rendezvoused with bomber formations and escorted them for 150–200 miles until they transferred escort responsibilities to another group. The new tactic optimized the use of the three different types of fighters in the Eighth Air Force: P-47s escorted the formations during the shallow-penetration portions of the mission, P-38s during the medium-penetration, and the P-51s assumed escort duties for the deepest portion of the route.²⁹

The new tactic also enabled a new role for fighter aircraft—strafing ground targets. Returning fighters, free from their escort duties, began to drop to low altitude in search of targets of opportunity. Doolittle expressed interest in the practice, and on 8 February, he accepted a report from Kepner on low-altitude fighter operations.³⁰ He incentivized the tactic by awarding aerial victories for aircraft destroyed on the ground.³¹ On 2 March, he inquired about the feasibility of conducting fighter sweeps under low cloud ceilings.³² These conditions, common in Europe, often prohibited large-scale bombing operations. Accordingly, in April, Doolittle ordered fighter sweeps when weather precluded bomber attacks. These missions proved successful, and the number of enemy aircraft destroyed on the ground increased from one in January to 40 in February, 113 in March, and 712 in the first two weeks of April.³³

Doolittle also intervened in Eighth Air Force bomber tactics. He issued guidance to Bomber Training Command to teach his incoming pilots to fly

tighter formations, noting that these pilots “would loosen them up if found necessary.”³⁴ His rationale is evident in a 19 January letter to Spaatz. Using mathematical reasoning, Doolittle explained how a loose bomber formation exponentially increased the area fighters had to defend, which in turn reduced the effectiveness of the escort. He also emphasized the importance of formation integrity, tighter spacing between formations, and a reduced speed to allow slow aircraft to maintain position.³⁵ He reemphasized the final point in a 22 March 1944 commanders meeting in which he proposed a slower egress of combat formations from the target area to protect stragglers.³⁶ His concerns were reasonable. Over half the Luftwaffe’s heavy-bomber kills were against aircraft that fell out of formation.³⁷

Doolittle’s involvement in fighter and bomber tactics enhanced Eighth Air Force operations. By the end of January, his fighter pilots had abandoned close escort in favor of “ultimate pursuit” of the enemy, and bombers were flying tighter formations.³⁸ A report comparing tactics of the Eighth to its sister unit, the Fifteenth Air Force, documented the tactical differences. The evaluation claimed combat conditions for the Fifteenth were “very similar to those existing within the Eighth Air Force.” The document indicates, however, that Eighth Air Force bomber pilots flew tighter formations. The Fifteenth’s extended formations made “the work of the escort infinitely more difficult and that of the enemy interceptors far simpler.” The analyst also noted that fighter pilots in the Eighth Air Force had “adopted a more aggressive policy.”³⁹

Doolittle’s implementation of aggressive tactics was not, however, without risk. The bomber community believed that the change would increase their attrition rate by unnecessarily exposing bombers to enemy fighters. This is why he considered this decision his “most controversial.”⁴⁰ He acknowledged that the Eighth might encounter a temporary increase in losses. On 2 March, Doolittle cautioned his commanders that the neutralization of enemy fighters would “not necessarily show immediately and the crews should be so advised.”⁴¹ Indeed, in early 1944 bomber forces sustained heavy losses. In February, the Eighth lost 299 heavy bombers—one-fifth of its forces. Maj Gen Curtis LeMay complained that such losses reduced his division’s efficiency.⁴² The arrival of spring did not bring appreciable improvement. A 27 April raid on Berlin lost 63 bombers, nearly as many as the 69 lost on the strike of 6 March. Moreover, bomber attrition due to enemy fighters climbed from 178 in March to 314 in April.⁴³

Bomber crews, however, were not the only ones who suffered losses due to the aggressive tactics; strafing the enemy countryside was also dangerous business. Antiaircraft artillery was especially effective against low-flying aircraft, and Germans placed disused aircraft in the open to lure unsuspecting

pilots into deadly crossfire.⁴⁴ The tactics worked. Fighter pilots suffered a casualty rate five times higher while strafing targets on the ground than battling Luftwaffe fighters in the air.⁴⁵

Despite the losses, the Eighth Air Force's aggressive tactics wrested the initiative of aerial combat from the Luftwaffe. Before February 1944, German fighters usually waited for fighter escorts to leave before commencing an attack. The Eighth's escort relay system rendered this tactic ineffective. Moreover, twin-engine Ju-88s and Me-110s proved no match for the nimble, aggressive US fighters.⁴⁶ By the end of March, the large fighters and their feared rocket attacks seldom impeded the Eighth's daylight strikes. The Luftwaffe began to deteriorate rapidly. Between March and April, the German air force replaced virtually all its fighter aircraft and suffered a 40 percent turnover in pilots.⁴⁷ Meanwhile, the Eighth's losses declined by 100 bombers in May, and the trend continued for the remainder of the war. One can partially attribute these results to the aggressive escorts that hunted down small formations of German fighters.⁴⁸ Maj Gen Adolph Galland, commander of the German fighter force, commented in his memoirs that US fighters "were no longer glued to the slow-moving bomber formation, but took action into their own hands. Whenever our fighters appeared, the Americans hurled themselves at them. They went over to low-level attacks on our airfields. Nowhere were we safe from them, and we had to skulk on our own bases. During takeoff, assembling, climb and approach to the bombers, when we were in contact with them, on our way back, during landing, and even after that the American fighters attack with overwhelming superiority."⁴⁹

A number of conditions contributed to the defeat of the Luftwaffe in the spring of 1944. As noted in the previous chapter, the industrial strength of the United States had risen to a point in 1944 that the Eighth Air Force was provided the resources necessary to implement Doolittle's tactic. He also possessed long-range fighters of sufficient quantity and quality to challenge the Luftwaffe over German skies. As Richard Davis rightly observed, "Spaatz, Doolittle, and Kepner had the 'escort strength' their predecessors lacked, and could thus place their fighters in loose escort."⁵⁰ Also unlike his predecessor, Doolittle possessed adequate numbers of heavy bombers to sustain a strategic-bombing campaign against the German heartland. Moreover, he enjoyed the support of both superiors and subordinates who shared his offensive mentality.

These factors, however, should not detract from Doolittle's pivotal role in changing the tactical operations of the Eighth Air Force. He perceived the problem posed by German fighters and implemented innovative tactical solutions. His direct involvement in fighter and bomber tactics countered the standing Eighth Air Force policy and official doctrine. Even when faced with

increasing losses, Doolittle remained firm in his decision. His aggressive spirit inspired tactical innovation and contributed to the eventual collapse of the Luftwaffe.

Technical Innovation

Doolittle also worked to overcome significant technical deficiencies of several aircraft within his command. Examining his role in technical innovation provides an opportunity to assess the value of a commanding general who is also a trained aeronautical engineer.

Soon after assuming command, Doolittle developed an organic capability to test and implement technical ideas within the Eighth Air Force. The official history states that he “recognized the urgent need for a special staff section to consolidate technical requirements, assist the inspector or A-4 sections in trouble-shooting and the solution of minor problems, and to act generally as the intermediate link between the combat units and the established engineering activities of the Material and Service Commands.”⁵¹ To achieve this end, Doolittle activated the Operational Engineering Section (OES) on 21 February. The mission of the new section was to “collect, coordinate, test and evaluate desires of combat units and of this Headquarters in the development, use and adaptation of their equipment.”⁵² Accordingly, the section coordinated all plans for aircraft modifications.⁵³ Doolittle expected that his OES would increase the performance of aircraft and provide recommendations for improvement.⁵⁴

One of the first OES tasks was to identify the source of P-38 engine problems. In the Pacific theater, the twin-engine fighter had earned the respect of fighter pilots—friendly and enemy alike. In England, however, the Lightning had severe engine problems. During one period, the P-38J variant experienced a nearly 50-percent mechanical failure rate.⁵⁵ Moreover, half the P-38 combat losses were attributed to engine problems.⁵⁶ This deficiency of the P-38 cost the Eighth dearly on its second mission to Berlin. During the raid, the 55th Fighter Group, flying P-38s, was forced to return early due to an excessive number of engine failures.⁵⁷ German fighters exploited the resulting escort gap by downing 20 bombers from the 3rd Bombardment Division in less than 30 minutes.⁵⁸

It was thus no surprise when Doolittle selected Col Benjamin S. Kelsey, a fellow MIT graduate and experienced test pilot, to lead the newly formed OES.⁵⁹ The general had known Kelsey since the 1920s—he had been Doolittle’s safety observer on the first official blind flight. In the 1930s, Kelsey served at Wright Field as chief of the Fighter Project Branch.⁶⁰ He flew the first P-38 test flight and remained directly involved in the aircraft’s testing.⁶¹

TACTICAL AND TECHNICAL INNOVATION

A week after its initiation, the OES provided Doolittle several insights into the P-38 problems. A report titled “P-38 Engine Failures” noted that the 76 recent engine failures had occurred exclusively in the P-38J. The previous model, the P-38H, suffered no such failures; therefore, the likely cause was an engine modification that accompanied the J-model upgrade. The report further speculated that the engine troubles were likely due to a deficiency in the carburetor which produced an “abnormally low fuel mixing temperature” in the colder European climate. This resulted in an overly lean fuel mixture, which, in turn, caused a connecting rod in the engine to fail, resulting in engine fires. The report offered several recommendations to mitigate the problem, including modifying the engine’s power settings and sealing an intercooler grill. These modifications were thought to ameliorate the P-38s engine problems, “but not sufficiently to call it a final ‘fix.’” The report surmised that higher-octane fuel could also reduce engine difficulties until a permanent design solution was implemented.⁶²

Doolittle made quick use of his staff’s findings. The day after he received the report, he dispatched a letter to USSTAF with the subject line “Special Fuel for P-38J’s.” He explained the OES’s discoveries and recommended acquiring high-octane fuel for P-38 operations.⁶³ In a commanders meeting the following day, Doolittle announced that arrangements had been made to secure two million gallons of special fuel for the ailing P-38s.⁶⁴ On 6 March, the engine manufacturer—the Allison Division of General Motors Corporation—acknowledged the problem and announced measures it was taking to rectify the malfunctions.⁶⁵

However, as D-day approached, P-38 engine problems continued to degrade Eighth Air Force operations. On 23 March, Doolittle increased the number of P-38s per group from 75 to 90 to reduce the impact of the engine troubles.⁶⁶ He also experienced the engine problem personally. On 30 March, his plane had an engine fire shortly after takeoff, and he had to make an emergency landing.⁶⁷ In his logbook, he recorded a 10-minute flight in a P-38 with the remark “threw con-rod in port engine.”⁶⁸ The same day the OSE submitted a report updating him on efforts to improve the P-38’s carburetor.⁶⁹ Because of Doolittle’s reservations about P-38 reliability, on 6 April he prohibited the airplane from escorting valuable F-5 reconnaissance aircraft, which were themselves a variant of the P-38.⁷⁰ At the same meeting, Partridge announced that B-17s were being used for weather reconnaissance, suggesting continued maintenance problems with the P-38s.⁷¹

Doolittle ultimately chose to circumvent the P-38’s deficiencies by replacing it with the P-51. By the end of June, three months of testing had failed to resolve the engine troubles. On 27 June, Allison Engines dispatched a letter to

Kelsey proposing a detailed test plan to investigate the engine failures.⁷² On 14 July 1944, Doolittle composed a scathing letter to Arnold stating that the deficiencies of the P-38 had created a “general lack of confidence in the airplane.” Among his many recommendations was the insistence on a complete redesign of the carburetor.⁷³ Doolittle’s condemnation of the P-38 coincided with the transition of three of the four VIII Fighter Command’s P-38 groups to P-51s.⁷⁴ The 479th Fighter Group continued to fly P-38s until its final squadron converted to P-51s in October 1944.⁷⁵

The P-38 was not the only aircraft to dissatisfy Doolittle. The B-24 was also plagued by poor performance. By the beginning of 1944, the B-24 had undergone several modifications to enhance its survivability. These changes included increased defensive firepower, armor plating, bulletproof glass, and larger, self-sealing fuel tanks. The added capability came, however, with a corresponding increase in weight; the aircraft now exceeded its design weight by 6,000 pounds.⁷⁶ The added bulk created stability problems that caused combat-loaded B-24s to “wallow” at high altitude. Thus, B-24s flew 2,000 to 4,000 feet lower than the B-17s, which made them more vulnerable to enemy fighters.⁷⁷ In a comparison of the B-24 and the B-17 conducted in April 1944, the Statistical Control Division concluded that the B-24 was “approximately 79% more vulnerable.”⁷⁸ This realization was not lost on the aircrews. Because enemy fighters tended to focus on B-24s, B-17 crews somewhat trenchantly jested that they preferred an escort of Liberators to “little friends.”⁷⁹

Doolittle took quick action to correct the B-24’s technical deficiencies. In January he directed the removal of the ball turrets from 26 B-24D aircraft. This modification improved stability by shifting the plane’s center of gravity back to its design location. The reduced weight also increased its high-altitude fuel efficiency, speed, and handling.⁸⁰ To improve performance further, Doolittle ordered the removal of the waist-gunner station and moved minor equipment to the forward portion of the aircraft.⁸¹ In January he increased the Eighth’s capacity to modify aircraft by realigning its three base air depots to allow each to specialize in a limited number of airframes. This enabled the depots to develop “production line” techniques that improved efficiency. The number of bombers modified more than doubled from 350 in February to 840 in March.⁸²

Doolittle also sought help from Washington to remedy the B-24 problems. On 14 February he sent a letter through Spaatz to Arnold, addressing “B-24 Modification and Design.” He described the problem by saying, “Efforts to increase the ability of the B-24 to protect itself against enemy fighters through an increase in its defensive fire power have seriously reduced the performance of this aircraft.” He noted that the performance problems degraded operations

by precluding mixed formations of B-24s and B-17s. He also noted that the defects undermined the confidence of his crews. Doolittle submitted specific design changes that would, in his opinion, “assure [the B-24’s] continued usefulness.”⁸³ Spaatz generally agreed with his subordinate’s recommendations. However, the USSTAF commander did not want upgrades to interfere with the supply of new airplanes. Spaatz remarked, “Although I am in general concurrence with Doolittle’s comments, I must say that I cannot sponsor any extensive modifications or redesign program in the B-24 airplane which would prejudice the now scheduled deliveries to this theater.” Nevertheless, Spaatz agreed that the “modifications should be put into a long-range program . . . to improve this airplane.”⁸⁴ Several weeks passed with no response from Washington. Meanwhile, from 20 to 25 February, Doolittle dispatched B-24s on missions to Germany in support of Big Week, and in early March, the Liberators flew three strikes against Berlin. The B-24s continued to suffer higher losses than the B-17s. For example, on the 24 February raids on Schweinfurt and Gotha, he lost 33 out of 239 B-24s but only 11 out of 238 B-17s.⁸⁵

By March Doolittle realized that Washington would not rectify the B-24 inadequacies. He hoped that his maintenance depot, with direction from his OES, would be able to mitigate the problems, but he lacked an engineer with sufficient B-24 experience to oversee the endeavor. He therefore drafted a letter to Arnold with the subject: “Assignment of Officer for B-24 Modifications.” His impatience was palpable. Doolittle argued that B-24s would soon comprise half his heavy bomber force and that “the effectiveness of the B-24 unit is . . . not satisfactory.”⁸⁶ With the impending invasion of Europe just over the horizon, he pleaded for a plan that would increase the effectiveness of his B-24 force by June. This urgency mandated that aircraft modifications occur at the theater maintenance depot. Referring to his modification program, he noted that he had “taken action to initiate certain changes to improve its performance,” and requested a B-24 test pilot to oversee technical modifications made in the field.⁸⁷

Recognizing his own impassioned state, Doolittle sought the advice of his superior. He sent Spaatz a draft of his letter with a handwritten memo stating, “while this letter contains only a statement of certain unfortunate facts it is felt that it may antagonize Gen Arnold and defeat it’s [sic] purpose. May I have your reactions before transmittal?”⁸⁸ Spaatz agreed that field modifications could perhaps mitigate B-24 problems without impeding production flow. He elected not to forward Doolittle’s abrasive letter to Arnold, but instead dispatched a more temperate request for a qualified B-24 specialist to oversee field modifications. He summarized his request by stating, “we feel that under

proper engineering guidance many corrective changes can be made at the stations and in the Base Depots.”⁸⁹

Meanwhile, Doolittle’s 14 February letter detailing the ineffectiveness of the B-24 had caught the Air Staff’s attention. In a 13 March correspondence, which passed Spaatz’s letter in transit, Arnold remarked that the recommendations concerning the B-24 were “most welcome and appreciated.” Arnold agreed to implement efforts that incorporated Doolittle’s recommendations into the production of new aircraft. He advised, however, that he was balancing the “best practicable compromise” between the demands of current operations, future requirements, and production capability.⁹⁰ This implied that B-24 modifications would not arrive in time for D-day. In addition to Arnold’s response was a letter from Maj Gen H. A. Craig, assistant chief of staff for operations, commitments, and requirements. Craig reassured Doolittle that the Air Staff was “aware of the deficiencies in the B-24 and that we are doing everything in our power to improve the airplane through modification and redesign.”⁹¹ Problems with the B-24 led Arnold to direct Craig to conduct a comparative analysis of the AAF’s heavy bombers. Craig concluded in May that statistics “overwhelmingly favor the B-17 over the B-24.” Consequently, he recommended an increase in production of the former and a curbing of the latter.⁹²

Doolittle’s design recommendations were ultimately realized in the production of the B-24L and M models. The L variant, designed in response to the AAF’s demand to reduce weight, replaced the heavy Sperry ball turret with a ring mount consisting of two .50 caliber machine guns. Other modifications removed the A-6B tail turret in favor of a twin .50 caliber mount. The B-24M incorporated further weight savings with a new version of the tail-turret and open waist-gunner positions. Cockpit visibility was also improved with a new windshield design. Consolidated Aircraft built 1,667 B-24Ls and 2,593 B-24Ms during the course of the war. A B-24N variant incorporating a single tail to improve stability was under contract when the war ended in 1945. Sadly, the B-24L and M models arrived in the field too late to have a significant effect on the outcome of the war.⁹³

To compensate for the delay, Doolittle made several organizational changes to offset the B-24’s deficiencies. In summer 1944, he reassigned B-24s to all special operations units. Henceforth, B-24s conducted all radio countermeasure, night leaflet drops, and Carpetbagger missions. This policy allocated a greater number of B-17s to bombing operations. In addition, B-24 groups in the 3rd Division transitioned to B-17s, further reducing the impact of the less effective B-24.⁹⁴

Despite his inability to fully rectify problems with the B-24 and the P-38, Doolittle remained committed to the OES concept. In June he recommended to Spaatz that it become a standard component of each air force headquarters. Arnold, however, rebuffed the plan because he did not approve of a large engineering and modification center within the field commands. He believed that such organizations duplicated the functions performed by Materiel Command and USSAF.⁹⁵ In a 12 July letter to Spaatz, Doolittle attempted to assuage Arnold's concerns by emphasizing the section's operational utility. He contended that the true purpose of the section was to gather technical suggestions from combat crews and forward them to higher command. Doolittle justified the existence of his OES by claiming "experience to date has proven that this section has been most useful to this Air Force and to the USAAF and makes possible the most effective and timely use of our equipment." He pushed his point further by requesting an additional 21 officers and 83 enlisted personnel to support the expansion of the section.⁹⁶ Spaatz again supported his innovative subordinate. He forwarded Doolittle's appeal to Arnold on 1 August with the assessment that "I see no tendency toward creating a 'little Wright Field' out of this section."⁹⁷ Doolittle thus kept his engineering section, but it did not become the AAF standard.

The events surrounding the modification of P-38s and B-24s suggest that a commanding general with engineering expertise can positively influence technical innovation. Doolittle was intimately involved in Eighth Air Force efforts to innovate technically. His engineering skills allowed him to identify technical problems and provide practical solutions. Spaatz's correspondence during World War II reveals that recommendations for aircraft modifications originated almost exclusively from the Eighth Air Force; similar proposals did not emerge from the Mediterranean theater. This is perhaps because Eaker was a lawyer, not an engineer. Doolittle's ability to identify technical problems suggests that engineering expertise at the higher echelons of command can foster technical innovation. Not surprisingly, the Eighth Air Force's narrative history noted that "studies that have been made of the modification of aircraft in the European Theater have indicated that the practice grew out of operational necessity rather than in accordance with carefully prepared plans."⁹⁸

Nevertheless, Doolittle's attempts to foster technical innovation also reflect an element of naïveté. Arnold's lack of enthusiasm for Doolittle's OES indicates the latter's failure to appreciate the problems of large-scale production and design. The massive size of the Eighth Air Force prevented Doolittle from achieving his full vision of technical innovation. His technical recommendations, insightful as they were, had little strategic effect on the war in Europe. His design recommendations did not materialize in time to be of significant

use for the Eighth Air Force. Spaatz, the more experienced general, saw what Doolittle was unable to grasp. He supported his subordinate's efforts but did not allow Doolittle's technical enthusiasm to restrict the flow of materiel that maintained the Eighth's operational capability.

Blended Innovation

Marginal weather conditions were a crucial problem for the Eighth Air Force in World War II. Doolittle's predecessor, Ira Eaker, created the 482nd Bomb Group in an attempt to mitigate the effects of poor weather on operations.⁹⁹ The unit flew heavy bombers equipped with a new ground-mapping radar called H2X, or "Mickey." The system was derived from the British H2S radar, which had proven useful for identifying targets at night. "Pathfinders" from the 482nd led formations by using their radar to locate targets obscured by clouds. The poor European weather forced Eaker to use the pathfinder force extensively; 482nd aircrews led 17 of 20 missions in the final two months of 1943.¹⁰⁰

At the beginning of 1944, however, attempts to conduct bombing operations through clouds showed little promise.¹⁰¹ The Eighth Air Force had only 12 B-17s equipped with H2X.¹⁰² Furthermore, radar missions conducted during the last two months of 1943 were not successful. A photographic study concluded that less than 4 percent of the formations dropped bombs within one mile of their designated target. The official Air Force history rightly noted that "any increase in accuracy, it was evident, would depend on the acquisition of more and better equipment manned by more and still better-trained men than had hitherto been available."¹⁰³ In other words, improvement of blind-bombing operations required a blend of technical and tactical innovation. Thus, it is appropriate to ask, did Doolittle improve the capacity of the Eighth Air Force to operate in marginal weather?

Soon after he assumed command, Doolittle implemented measures to improve radar bombing training and tactics. On 14 January, he arranged an exchange with the RAF of 12 B-17s for 12 de Havilland Mark XXX Mosquitoes. Each British airplane was equipped with H2X and a 16-mm video camera to record the radar display.¹⁰⁴ During his first meeting with subordinate commanders, Doolittle explained that the Mosquitoes would "obtain target material for H2X operations, permitting better understanding of the target possibilities and permitting the operating crews to study the prospective target just as they will see it."¹⁰⁵ In the following meeting, he supported a recommendation to discontinue the tactic of bombing based on a previous formation's pathfinder. Instead, he ordered that each formation be equipped with at least two H2X

pathfinders and insisted that the size of the formations would increase as necessary to accommodate the limited number of H2X aircraft. Doolittle directed Brig Gen Orvil Anderson to lead a meeting on dispersing H2X aircraft from Curtis LeMay's 482nd Group in the 3rd Division.¹⁰⁶

Meanwhile, Spaatz lobbied for resources to support his subordinate's emphasis on radar bombing. In a 14 January letter to Arnold, Spaatz declared that the H2X system "offers enormous possibilities for further intensification of the bombing offensive against Germany." Spaatz supported his claim by reporting that H2X permitted the Eighth Air Force to operate in weather conditions that would have previously precluded missions. He drove his argument home by closing his letter with, "*The most critical need of the Strategic Air Forces is for more Pathfinder aircraft. A few H2X airplanes now will profit our cause more than several hundred in six months*" (emphasis in original).¹⁰⁷

Doolittle also used tactical innovation to cope with the European weather conditions. The operational environment of early 1944 had validated his emphasis on radar bombing. Between 1 January and 15 February, only six of the Eighth Air Force's 21 missions were conducted under visual conditions.¹⁰⁸ Doolittle, however, hoped to increase opportunities for visual bombing. On 2 March, he asked his commanders for ideas regarding "scouting out targets while in Germany." The inquiry led to a new policy that encouraged bomber formations to strike alternate targets visually if clouds obscured the primary objective. In the following meeting, Brig Gen Robert Williams outlined the concept of passing weather information from scouting fighters to bombers.¹⁰⁹ Kepner approved of the idea and agreed to develop the concept further.¹¹⁰ Doolittle eventually made it a standard operating procedure for a formation of fighters to assess weather conditions prior to launching a mission. He assigned former bomber pilots, who understood the weather requirements for large-strike formations, to fly these missions.¹¹¹ He emphasized the sharing of weather information throughout the year.¹¹²

As D-day approached, Doolittle appealed for more resources to improve his command's ability to bomb through clouds. In March he sent a report to Spaatz titled, "Utilization of Improved B.T.O [bombing through overcast] Equipment by Eighth Air Force."¹¹³ The document highlighted the continued importance of radar bombing, even in the coming summer months. Doolittle contended, however, that a shortage of H2X aircraft, inadequate training, and the inherent inaccuracy of radar bombing limited the tactic's effectiveness. He therefore requested an additional 54 radar-equipped heavy bombers, an H2X ground-training system to facilitate the preparation of navigators, and "improved radar bombing equipment" to improve radar accuracy.¹¹⁴ Spaatz concurred with Doolittle's requests and forwarded them to Arnold with a strong

endorsement.¹¹⁵ Doolittle also sought assistance from the British, and in March, he expanded the H2X training program by arranging the delivery of 102 more Mosquito aircraft.¹¹⁶

Doolittle also pushed his subordinates to improve radar-bombing capability. He opened an April commanders meeting by stating, “We must increase our effectiveness in the use of [H2X].”¹¹⁷ The ensuing staff coordination reflects his interest in H2X operations. First, Doolittle tasked his deputy to “find out how many additional navs [navigators] we need to put two (Mickey and DR [dead reckoning]) in each pathfinder.” He also ensured that his subordinates were familiar with H2X operations. He told Partridge, “I want every Div, Wing, and Group C.O. to go up on a H2X practice flight and see what the instrument shows. . . . Then I want Div, Wing, and Group Ops, Execs, and finally all leaders. (I feel that there is insufficient ‘first hand’ info—all the way down the command on the possibilities and limitations of H2X).”¹¹⁸ Doolittle’s attention to radar bombing was clearly heeded. As a result of his prodding, in April “a good deal of emphasis was placed upon furthering the H2X training program.”¹¹⁹

The Eighth’s focus on H2X operations proved important during the bombing campaign leading up to D-day. Railroad marshaling yards, which proved easy to identify on radar, became frequent targets for the Eighth. Doolittle anticipated the possibility of having to drop bombs through the weather on the day of the invasion. He prepared for this contingency by sending his forces to bomb coastal targets in the weeks leading up to D-day.¹²⁰ His instinct was accurate. On 6 June, 1,083 Eighth Air Force bombers dropped 2,944 tons of bombs through a solid cloud layer against targets on the beaches of Normandy. Although the accuracy of the H2X was sufficient to avoid fratricide, the delayed release points beyond the coastline—ultimately sanctioned by Eisenhower—seriously degraded the effectiveness of these missions.¹²¹

In some respects, Doolittle’s efforts to overcome the limitations of European weather can be considered a disappointment. Blind bombing never achieved the accuracy of visual bombardment. Over half of the blind-bombing missions were assessed as “near failures or worse.”¹²² Further studies concluded that the circular error of probability of H2X bombings exceeded two miles. Although the Eighth and Fifteenth Air Forces used identical H2X equipment, the latter’s accuracy was twice the former’s. Official Air Force historians speculated this disparity was due to a more comprehensive training program of pathfinder crews in the Fifteenth Air Force.¹²³ While a comparative analysis of the two air forces is beyond the scope of this study, this evidence suggests that, despite Doolittle’s efforts, the Eighth did not fully exploit the technical effectiveness of H2X. Furthermore, Doolittle’s demand for improved radar systems

was not realized in time to enhance bombing accuracy in the European theater. The necessary technical innovation simply took too much time to develop.

Nevertheless, Doolittle's emphasis was well placed. H2X was a critical factor in the Combined Bomber Offensive. Although strikes guided by radar were less precise than visual bombing, the technology provided more opportunities for attack.¹²⁴ By the end of 1944, Doolittle's and Spaatz's requests for more H2X systems were fulfilled, and 78 percent of the Eighth's bomb groups were equipped with two H2X crews. This capability proved crucial during the winter of 1944–45. During the last quarter of 1944, 80 percent of Eighth Air Force missions used a blind-bombing technique.¹²⁵ In the first two weeks of February 1945, 80 percent of missions also used radar bombing. Despite the relative inaccuracy of radar bombing, by the end of the month Germany ceased to be an industrial nation.¹²⁶ Richard Davis argued that H2X's "contribution to the weight of the U.S. bombing effort in 1944–1945 was second only to the success of the U.S. long-range fighter escorts in preserving the bombers themselves."¹²⁷ In other words, analysts may consider Doolittle's efforts to spur innovation a tactical failure, but those efforts ultimately contributed noticeably to strategic success.

Conclusions

Assessing Doolittle's ability to innovate in the Eighth Air Force provides several insights into his performance as a commander. First, his propensity for offensive action and his strong moral courage helped spur a tactical innovation. Solid documentary evidence supports the widespread notion that he "let the fighters loose" to pursue the Luftwaffe aggressively. Although Doolittle was not the only individual with these beliefs, one cannot discount his pivotal role in this innovative tactic. His involvement in bomber tactics also enhanced the discipline and execution of the Eighth's striking formations. The first move countered official air doctrine and many opinions in his command. Mounting losses in February and March of 1944 cast further doubt on the tactic. Nevertheless, Doolittle remained steadfast, and his determination hastened the destruction of the Luftwaffe.

Doolittle's ability to innovate technically was less successful. His strong engineering expertise helped identify aircraft technical problems and determine potential solutions. Many of his suggestions, however, were not realized in time to enhance air operations in the European theater. Simply put, at the scale of a numbered air force, Doolittle could not replicate the level of technical innovation that had brought him success during his transcontinental

flights and the raid on Tokyo. His impatience for aircraft modification reflects both an aggressive spirit and a lack of appreciation for the scale of change required in very large organizations. To his credit, however, Doolittle sought the wisdom of his experienced superior, Carl Spaatz, to moderate his less temperate requests. This self-awareness and growing political savvy reflect his continued growth as a general officer.

A slightly different reality comes through in Doolittle's attempts to innovate in ways that blended technology and tactics. His efforts to improve the accuracy of radar bombing did not achieve a great degree of tactical success. The advanced technology he requested was not ready in time to produce a significant effect. His efforts to improve training, although helpful, also failed to produce breakthrough results. Nevertheless, his strong and persistent emphasis on radar bombing did increase the capacity of the Eighth Air Force to strike Germany in inclement weather. Here Doolittle appears to have instinctively grasped that an increase in the magnitude of relatively accurate bombing would be more effective than striking fewer targets with greater accuracy. Here, too, he was more interested in results than in adhering to doctrine.¹²⁸

This analysis suggests that a senior leader educated as a trained engineer can have a considerable influence on promoting technical innovation. In wartime, however, these attributes may not produce a strategic effect. Nevertheless, a leader's ability to spur tactical innovation can have positive, significant effects. Although this skill requires an intellectual element, it also demands qualities of character and temperament such as moral courage and an offensive orientation. In short, the lessons that helped Doolittle innovate most effectively were perhaps learned as much in the boxing ring as they were in an MIT classroom.

Notes

1. Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (1976; reprint, Princeton, NJ: Princeton University Press, 1989), 88.
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3. Samuel B. Griffith, "An Introduction to Sun Tzu," in Sun Tzu, *The Art of War*, trans. by Griffith (New York: Oxford University Press, 1963), 28.
4. James H. Doolittle and Carroll V. Glines, *I Could Never Be So Lucky Again* (New York: Bantam Books, 1992), 352–53.
5. Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York: Random House, 1993), 507 n60; Doolittle and Glines, *I Could Never Be So Lucky Again*, 352–53; Gen Earle Partridge, interview by Tom Strum and Hugh N. Ahmann, 23–25 April 1974, USAF Oral History Collection, AFHRC call no. K239.0512-729 C.1, 238–39; and Lowell Thomas and Edward Jablonski, *Doolittle: A Biography* (Garden City, NY: Doubleday & Company, 1976), 266–69.

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6. Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, DC: Center for Air Force History, 1993), 299–302.
7. Dik Alan Daso, *Doolittle: Aerospace Visionary* (Washington, DC: Brassey's, 2003), 3; and Doolittle and Glines, *I Could Never Be So Lucky Again*, 80–81.
8. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 3, *Europe: Argument to VE Day, January 1944 to May 1945* (1949; new imprint, Washington, DC: Office of Air Force History, 1983), 11.
9. Davis, *Carl A. Spaatz*, 362.
10. *Ibid.*, 288.
11. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 2, *Europe: Torch to Pointblank, August 1942 to December 1943* (1949; new imprint, Washington, DC: Office of Air Force History, 1983), 705–6.
12. *Ibid.*, 705.
13. History, Headquarters Eighth Air Force, 1–31 January 1944, AFHRC call no. 520.01 V.1, 16.
14. Craven and Cate, *Europe: Argument to VE Day*, 23.
15. History, Headquarters Eighth Air Force, 1–31 January 1944, 16.
16. Davis, *Carl A. Spaatz*, 304.
17. Maj Gen James H. Doolittle to Gen H. H. Arnold, letter, 14 January 1944, Doolittle Papers, Box 16, Special Correspondence, Library of Congress (LOC).
18. Doolittle to Spaatz, letter, 19 January 1944, Doolittle Papers, Box 19, LOC.
19. History, Headquarters Eighth Air Force, 1–31 January 1944, 16.
20. Craven and Cate, *Europe: Argument to VE Day*, 10.
21. Doolittle and Glines, *I Could Never Be So Lucky Again*, 353.
22. Minutes, Commanders Meeting, 21 January 1944, AFHRC call no. 520.01 V.2, 2.
23. Partridge, interview, 23–25 April 1974, 239.
24. Davis, *Carl A. Spaatz*, 360.
25. *Ibid.*, 298.
26. Perret, *Winged Victory*, 272.
27. Craven and Cate, *Europe: Argument to VE Day*, 10.
28. Davis, *Carl A. Spaatz*, 360.
29. *Ibid.*, 361.
30. Minutes, Commanders Meeting, 8 February 1944, AFHRC call no. 520.01 V.2.
31. Davis, *Carl A. Spaatz*, 365. However, when aerial kills began to attract attention of the press, Doolittle insisted that kills be distinguished between aerial and ground victories. Minutes, Commanders Meeting, 6 April 1944, AFHRC call no. 520.01 V.2, 4.
32. Minutes, Commanders Meeting, 2 March 1944, AFHRC call no. 520.01 V.2, 2. Interestingly, in this same meeting, Curtis LeMay asked Kepner if fighter aircraft could suppress flak to support low-altitude bomber operations at 2,000–3,000 feet. LeMay was already contemplating the tactics he would eventually employ against Japanese cities.
33. Davis, *Carl A. Spaatz*, 367, 379.
34. Doolittle to Partridge, staff correspondence, 17 February 1944, Doolittle Papers, Box 19, LOC.
35. Doolittle to Spaatz, letter, 19 January 1944.
36. Minutes, Commanders Meeting, 22 March 1944, AFHRC, 3.
37. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, AFHRC call no. 520.01 V.2, 52.
38. Davis, *Carl A. Spaatz*, 360.

39. James A. Goodson, Report of observation, 17 April 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
40. Doolittle and Glines, *I Could Never Be So Lucky Again*, 353.
41. Minutes, Commanders Meeting, 2 March 1944, 2–3.
42. Ibid; and Davis, *Carl A. Spaatz*, 323.
43. Davis, *Carl A. Spaatz*, 393.
44. Mark K. Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (Essex, UK: Routledge, 1995), 45.
45. Davis, *Carl A. Spaatz*, 367.
46. Williamson Murray, *Strategy for Defeat: The Luftwaffe 1933–1945* (Maxwell AFB, AL: Air University Press, 1983), 242.
47. Davis, *Carl A. Spaatz*, 394.
48. Ibid., 370.
49. Ibid., 360.
50. Ibid.
51. History, Headquarters Eighth Air Force, 1–31 July 1944, vol. 1, AFHRC, 179a.
52. Eighth HQ to USSAF, letter, 12 July 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
53. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 21.
54. Eighth HQ to USSAF, letter, 12 July 1944.
55. Roger A. Freeman, *Mighty Eighth War Diary* (New York: Jane's, 1981), 183, 297.
56. Davis, *Carl A. Spaatz*, 321.
57. Freeman, *Mighty Eighth War Diary*, 195.
58. Davis, *Carl A. Spaatz*, 371.
59. History, Headquarters Eighth Air Force, 1–31 July 1944, 179b.
60. Benjamin S. Kelsey, *The Dragon's Teeth?: The Creation of United States Air Power for World War II* (Washington, DC: Smithsonian, 1982), 7.
61. Davis, *Carl A. Spaatz*, 707 n113.
62. OES Report dated 28 February 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
63. Doolittle to Spaatz, letter, 1 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
64. Minutes, Commanders Meeting, 2 March 1944, 4.
65. R. L. Jahnke (UK assistant zone manager, Allin Division, General Motors Corp.) to Partridge, letter, 6 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
66. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 64.
67. Doolittle and Glines, *I Could Never Be So Lucky Again*, 369.
68. Logbook Entries, March 1944, Doolittle Papers, Series XVI, Box 1, McDermott Library.
69. Col Cass Hough to Commanding General HQ Eighth AF, memorandum, 30 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
70. Minutes, Commanders Meeting, 6 April 1944, 5.
71. Ibid., 3.
72. T. S. McCrae (assistant chief engineer) to Kelsey, letter, 27 June 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
73. Doolittle to Arnold, letter, 14 July 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
74. Freeman, *Mighty Eighth War*, 183, 297.

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75. The 479th Fighter Group flew its final P-38 mission on 9 October 1944. The 436th Fighter Squadron was the last to convert to P-51s. Kent D. Miller, *Fighter Units & Pilots of the 8th Air Force: September 1942–May 1945*, vol. 1 (Atglen, PA: Schiffer Military History, 2001), 139, 475.

76. Arnold to Spaatz, letter, 13 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.

77. Kelsey, *Dragon's Teeth*, 133.

78. Statistical Control Division, "Statistical Comparison B-17–B-24 Models," 3 April 1944. National Archives, Record Group 18, Box 727, 7. Acquired from the private collection of Dr. Richard Muller.

79. Doolittle to Arnold, letter, 14 February 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.

80. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 8.

81. Doolittle to Arnold, letter, 14 February 1944.

82. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 4, 8.

83. Doolittle to Arnold, letter, 14 February 1944.

84. Spaatz to Arnold, letter, 18 February 1944, National Archives, Record Group 18, Box 727.

85. Craven and Cate, *Europe: Argument to VE Day*, 39.

86. Doolittle to Arnold, letter, 13 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.

87. *Ibid.*

88. *Ibid.*

89. Spaatz to Arnold, letter, 16 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.

90. *Ibid.*

91. Craig to Doolittle, letter, 14 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.

92. Maj Gen H. A. Craig to Gen Hap Arnold, memorandum, 22 March 1933. National Archives, Record Group 18, Box 727. Acquired from the private collection of Dr. Richard Muller.

93. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 6, *Men and Planes* (1955; new imprint, Washington, DC: Office of Air Force History, 1983), 207.

94. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 65. Carpetbagger missions were special missions flown to support the Office of Strategic Services (OSS). Pilots frequently flew these missions at night and transported agents and supplies into and out of occupied German territory.

95. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 21–22.

96. Doolittle to USSTAF, letter, 12 July 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.

97. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 21–22.

98. *Ibid.*, 3.

99. Perret, *Winged Victory*, 273.

100. Gen Carl Spaatz to Commanding General Army Air Forces, letter, 14 January 1944, Spaatz's Papers, LOC, I-13 January 1944.

101. Craven and Cate, *Europe: Argument to VE Day*, 20.

102. Davis, *Carl A. Spaatz*, 296–98.

103. Craven and Cate, *Europe: Argument to VE Day*, 20.

104. History, Headquarters Eighth Air Force, 1944–1945, vol. 2, 63.

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105. Minutes, Commanders Meeting, 21 January 1944, AFHRC call no. 520.01 V.2.
106. Minutes, Commanders Meeting, 8 February 1944, AFHRC, 4.
107. Spaatz to Commanding General Army Air Forces, letter, 14 January 1944.
108. Ibid.
109. Minutes, Commanders Meeting, 22 March 1944, 3.
110. In his memoirs, Doolittle credits Col Budd Peaslee with conceiving the idea of using fighters to scout the weather. Doolittle and Glines, *I Could Never Be So Lucky Again*, 357.
111. Craven and Cate, *Europe: Argument to VE Day*, 305.
112. In a December 1944 commanders meeting, Doolittle stressed the proper utilization of scouting aircraft and the coordination of all information between the three divisions. Minutes, Commanders Meeting, 9 December 1944, AFHRC, 2.
113. Lindsey L. Braxton for the Commanding General to Commanding General USSAFE, letter, 22 March 1944. Spaatz Papers, I-13, April 1944, LOC.
114. Ibid.
115. Spaatz to Arnold, letter, n.d. Spaatz Papers, I-13, April 1944, LOC.
116. History, Headquarters Eighth Air Force, 1–31 March 1944, vol. 1, 66.
117. Minutes, Commanders Meeting, 6 April 1944, 1.
118. Doolittle to Partridge, handwritten note, n.d. Spaatz Papers, I-13, April 1944, LOC.
119. History, Headquarters Eighth Air Force, 1–30 April 1944, vol. 1, 47.
120. Craven and Cate, *Europe: Argument to VE Day*, 169–70.
121. Ibid., 190.
122. Ibid., 667.
123. Ibid., 723.
124. Davis, *Carl A. Spaatz*, 296–98.
125. Craven and Cate, *Europe: Argument to VE Day*, 666–67.
126. Ibid., 728.
127. Davis, *Carl A. Spaatz*, 297.
128. Doolittle's emphasis on H2X bombing reflects a de-emphasis on strategic bombing doctrine and, in practice, closely resembled the RAF bombing concept. Doolittle acknowledged this reality and, in his autobiography, remarked that toward the end of the war, the British and American approaches to bombing "made little practical difference." Doolittle and Glines, *I Could Never Be So Lucky Again*, 349.

Chapter 5

Leading the Mighty Eighth

Lord Moran defines military leadership as “the capacity to frame plans which will succeed and the faculty of persuading others to carry them out in the face of death.”¹ The previous two chapters explored the first element of Moran’s dictum by evaluating Doolittle’s operational effectiveness and capacity to innovate. This one addresses the latter part. According to Mark Wells, heavy-bomber missions in the Mighty Eighth were “the most hazardous military operations which have been conducted over a sustained period.”² How well did Doolittle persuade his men to carry out his orders in the face of such danger?

This chapter examines the command environment in which Doolittle operated and identifies specific leadership challenges he faced in the Eighth Air Force. It then explores his leadership, paying particular attention to his interaction with immediate subordinates. Though not related to Moran’s definition, it also assesses his ability to persuade his supervisors of the wisdom of his various initiatives, an important but often neglected aspect of leadership. Finally, the chapter evaluates measures Doolittle took to sustain the morale and military spirit of his command.

Command Environment

When Jimmy Doolittle assumed command of the Eighth Air Force, he encountered many leadership challenges. Replacing a very popular commander, Ira Eaker, was perhaps the first. Eaker had served in the Eighth since its inception and led its first independent attack against marshaling yards at Sotteville-lès-Rouen on 17 August 1942.³ He had nurtured the Eighth from a nascent force into a mature, powerful, fighting air force. Understandably, Eaker held a deep affection for his subordinates in the Eighth and his British counterparts. The feelings were mutual. Because Doolittle brought only his deputy commander, Brig Gen Earle “Pat” Partridge, and his personal aide from the Fifteenth Air Force, he had to earn the respect of his new staff. In a letter of 20 January to his wife, Doolittle remarked: “Miss the old gang and their knowledge of my policies and methods. Miss particularly the confidence that they always indicated in me. . . . I’m faced with the job that any new commander has when assuming a new command—selling himself. After selling Doolittle, peddling his ideas will be easy.”⁴ He also had to win the confidence of the British. Air Chief Marshal Charles Portal, chief of the air staff, attempted to

persuade Gen Hap Arnold to retain Eaker in England: "To move him now that we approach the climax of the air war over western Germany would be a grave mistake. I therefore greatly hope that when the final decision is made you will feel able to leave Eaker here."⁵ Similarly, during Doolittle's ceremonial meeting with King George VI on 4 February, the monarch remarked, "We're certainly sorry to lose Eaker!"⁶ Doolittle even received a cool reception from his British counterpart, Air Chief Marshal Arthur Harris.⁷

Because of the strategic importance of the Eighth Air Force's mission, Doolittle had little control over prioritization of targets for the Combined Bomber Offensive. The strategic focus of the campaign was arbitrated between his military and political superiors. The resultant priorities of the CBO were, in turn, formalized in the strategic-air directive issued by Air Chief Marshal Tedder. USSTAF headquarters, under Gen Carl Spaatz, translated this directive into a campaign plan and issued the Eighth an approved target list. This required Doolittle to employ his forces in a manner he sometimes considered inefficient. For example, during the famous "oil versus transportation" debate of 1944, he committed a significant amount of heavy-bomber sorties to the French railway system. Unlike raids against German industry, these targets did not degrade aircraft production nor generate a significant level of German fighter resistance. Moreover, due to the perceived threat posed by the German long-range weapons program, Tedder frequently elevated the status of Crossbow, the effort to counter German vengeance weapons, to the highest priority of the CBO.⁸ These strategically important, but to Doolittle diversionary, missions further reduced the resources he could marshal against the Luftwaffe.⁹ They not only detracted from the Eighth Air Force's quest for air superiority over Europe but also, as discussed later, diminished the morale of its men.

The large size of the Eighth Air Force limited Doolittle's ability to inspire his men through personal interaction. In previous command positions, he went to great lengths to connect with his subordinates. During preparation for the strike on Tokyo, he established a close personal relationship with each of his fellow raiders. Following the mission, he wrote every man's family. Similarly, in North Africa, he maintained a constant interaction with the aircrews by visiting the bases and flying combat missions. He also sent letters to the next of kin of each service member killed in his command. When he assumed command of the Eighth, however, these practices were no longer feasible. He lamented in a letter to Joe, "Since coming here I am afraid I have had to stop some of the things I did below due to the size of this Command. . . . There just aren't enough hours in the day for me to accomplish this and all the other jobs too."¹⁰

The increased command responsibilities also prevented Doolittle from leading his men in the air. In North Africa he regularly flew combat missions, and his units benefited from the inspiration of their commander. In England, however, his new position entitled him access to Ultra, the code-breaking program that deciphered German Enigma messages. Because of the sensitivity of this program, Spaatz could not risk Doolittle's capture. Thus, he could no longer fly combat missions. Moreover, the increased administrative duties reduced his opportunity to fly in training sorties. During the first six months of 1944, Doolittle logged 59 hours and 25 minutes of flight time. In contrast, he had accumulated 109 hours and 55 minutes in the last three months of 1943.¹¹ The reduction in flight time concerned him. In April he confided to Joe, "One of the restrictions of this job is that I don't get as much flying anymore. Used to get a lot in the Mediterranean but not here. . . . In any case it looks like the hour a day average that I've flown for the last twenty-six years goes in the discard from now on. A certain amount of prestige and flying confidence goes with it."¹²

These concerns were justified, because Airmen expected their commanders to lead by example. Successful officers in the Eighth Air Force typically possessed a certain level of aviation competence. Leaders who failed to exhibit proficiency in the air frequently failed in their command responsibilities. Junior Airmen would criticize their shortcomings and undermine their credibility, using deprecating terms such as "weak sisters."¹³ Moreover, subordinates expected their commanders to demonstrate courage. Commanders who failed to accompany their men in combat risked losing the loyalty of their subordinates.

Doolittle, however, was no ordinary commander. He benefited from a reputation as a skilled pilot and decorated war hero. Furthermore, his aerial accomplishments of the 1920s and '30s made him one of the most famous men in all of aviation. The daring raid on Tokyo, which earned him the Medal of Honor, reinforced his standing as a brave and skillful aviator. These credentials provided a valuable cachet of respect with men of all ranks under his command.¹⁴ Doolittle was not above fostering this image to inspire his men with an occasional flash of showmanship. One account describes him delivering a speech to a bomber group to commemorate its 200th mission. Following the stirring oratory, Doolittle strode from the stage to a waiting P-51. The 3,600-man crowd watched as he took off and made a low pass over the field, followed by a slow roll, before departing toward the horizon. Although Doolittle never accompanied his men on strikes against Germany, few would question the aerial competence or courage of their new commander.

Nevertheless, rhetoric and bravado were not sufficient means with which to lead the men of the Eighth Air Force. Because the AAF had been rapidly expanded for World War II, most officers and enlisted men were not career Airmen. Therefore, given the harsh and dangerous environment of strategic bombing, successful leaders in the Eighth could not simply resort to military tradition and authority as motivational tools. These Airmen demanded engagement and explanation from their superiors. In other words, they “wanted to know what they were doing, and why.”¹⁵ To succeed as commander of the Eighth Air Force, Doolittle had to convince his men that his orders made sense and that the risks he made them take were worth taking. The question at hand is, how well did he do so?

Leadership Style

When Doolittle assumed command of the Eighth Air Force, he relied on the leadership techniques he had learned during his previous assignments. As in North Africa, he trusted his staff to manage day-to-day operations in the headquarters. For example, he delegated a large portion of detailed planning to his deputy for operations, Brig Gen Orvil Anderson.¹⁶ Doolittle also placed a great degree of confidence in the judgment of his immediate subordinates. He dispatched Partridge on an assignment to the Pentagon with the charge, “whatever you decide on the spot, put my name on it, and that’s that.”¹⁷ Additionally, a review of minutes from the Eighth Air Force commanders meetings reveals that Doolittle seldom made a significant policy change without consulting his junior commanders.

Doolittle did, however, reserve certain matters to himself. Among these were responding to specific requests from his superior commanders.¹⁸ He used these interactions to influence the conduct of the air operations in Europe. For example, during the oil-versus-transportation debate, he expressed solidarity with his immediate superior, Carl Spaatz. He supported Spaatz’s opposition to the transportation plan, noting, “I most heartily concur in the analysis on the transportation targets. Not only are the critical points too numerous, but the damage done is easily repaired and therefore is of only temporary value.”¹⁹

In another instance, Doolittle used his command influence to shape the execution of Operation Crossbow. In June he successfully alleviated some of the operational demands of Crossbow, insisting that his forces strike only targets confirmed by aerial reconnaissance. His position, supported by Harris, persuaded the British authorities to endorse a plan allowing the Eighth to strike oil depots rather than German V-1 launch facilities.²⁰ Later in the war,

Doolittle resisted demands to strike Crossbow targets on at least two occasions. On 15 August, he planned a mission to attack industrial targets near Leipzig. When Tedder asked why Crossbow missions were not scheduled in accordance with the bombing directives, Doolittle retorted that no suitable targets existed near Leipzig. Likewise, on 18 August, Doolittle justified committing the bulk of his forces against targets in France rather than Crossbow, stating that he considered the former to be more important. His arguments on both these instances were apparently persuasive, as the record provides no indication of significant objection from Tedder.²¹

When Arnold attempted to intervene in the Eighth Air Force's management of its fighter pilots as a result of two incidents in the Pacific, Doolittle demonstrated an ability to persuade his superiors in Washington as well. Over the span of three days in March 1944, Lt Gen George C. Kenney lost two of his top-scoring aces, Col Neel Kearby and Capt Thomas Lynch. Arnold worried that the ensuing publicity would undermine public opinion and degrade pilot morale.²² Arnold, therefore, asked Kenney to reconsider exposing high-scoring aces to the dangers of combat. Arnold wrote, "I do very insistently want you to weigh very carefully the potential value of your heroes." Moreover, Arnold was "deeply concerned" over a statistic that revealed all aces in the Pacific were flight commanders or higher. He believed this reflected a tendency for flight leads to accrue enemy kills at the expense of wingmen and overall unit effectiveness. Arnold sent Doolittle a copy of the letter, pointedly noting, "I believe you should be aware of my line of thought, and I would very much like to have your ideas on the subject."²³

Before formulating the response to Arnold's letter, Doolittle sought the advice of his subordinates. He forwarded a copy of Arnold's correspondence to Kepner, requesting his thoughts on the matter.²⁴ In a detailed letter of 29 March, Kepner defended the Eighth Air Force's management of fighter aces. The leader of VIII Fighter Command argued that because his organization encouraged aggressiveness, assertive pilots emerged as flight leaders. Kepner maintained that he assigned aces to leadership positions to foster an aggressive spirit throughout the command, not to increase individual combat records. Kepner substantiated his argument by citing VIII Fighter Command combat statistics for March 1944. Over 51 percent of enemy kills were claimed by wingmen, not flight leaders.²⁵

Armed with Kepner's evidence, Doolittle gently rebuffed Arnold's suggestion that high-scoring fighter pilots should return to the zone of interior. In a letter of 1 April, Doolittle noted that his command sought the destruction of the enemy by developing a "high overall efficiency based primarily on teamwork." Although the Eighth stressed unit records over individual achieve-

ment, Doolittle acknowledged that heroes inevitably emerged. He explained that he assigned these men “to improve teamwork and to raise the effectiveness of all the fighter pilots.” An unfortunate, but necessary, consequence was that “some leaders will therefore inevitably be killed.” He ended his response by cautioning that an increase in strafing operations would likely result in the loss of more aces: “In ground strafing individual skill does not give immunity from enemy fire to the same degree that it does in air combat and, as these attacks must be properly led, especially if large, some leaders will be lost.”²⁶ Doolittle’s detailed response assuaged Arnold’s concerns, and aces in the Eighth Air Force continued to fly combat sorties. His closing words, however, were prophetic. By the end of the war, 10 of 25 Eighth Air Force aces had ascended to group or squadron command, and nine of these leaders were lost in combat. Moreover, antiaircraft artillery downed all but one of the aces lost in Europe.²⁷

In summation, Doolittle’s leadership style suited his command environment. His interactive instincts offset his administrative weakness by utilizing the strengths of his subordinates. This approach was also popular among his junior commanders. Partridge later remarked, “I liked Doolittle the first minute I saw him. . . . You don’t get a boss like that very often.”²⁸ Maj Gen Ramsay D. Potts, who served as the Eighth’s director of bomber operations, likewise argued, “Doolittle was the ideal Commander of the Eighth Air Force.”²⁹ Doolittle also quickly earned the admiration of his British counterparts.³⁰ He successfully used convincing appeals to mitigate restrictions to his command environment. The ability to persuade his superiors provided Doolittle wider latitude to employ his forces as he saw fit.

Military Spirit in the Eighth Air Force

A force’s military spirit is an important element of combat effectiveness. Napoleon famously remarked that “in war, the moral is to the physical as three is to one.”³¹ Clausewitz agreed, stating that “the moral elements are among the most important in war.” He asserts that “military spirit” is one of the principal moral elements and cautions that its absence often leads to outcomes that “fall short of the efforts expended.”³² This reality extends to the realm of air combat. The official Air Force history of World War II used the term “morale” to describe this intangible quality: “[Morale] denotes an attitude of mind which, when favorable, leads to the willing performance of duty under all conditions, good or bad, and which when unfavorable, leads to the unwilling or poor performance, even perhaps to non-performance, of duty under the same good or bad conditions.”³³ Doolittle agreed with this assessment. In March he told his subordinate commanders that morale directly

influenced combat effectiveness. He attributed a myriad of operational deficiencies to low morale, including poor bombing accuracy, excessive abort rates, defection of aircrew to neutral countries, and emotional casualties.³⁴ Clausewitz, however, aptly noted that “we should take care never to confuse the real spirit of an army with its mood.”³⁵ The latter is transitory, the former a steadfast determination to triumph. The failure to discern the difference frequently results in leadership problems, not solutions.

Leadership is generally recognized as a critical element in sustaining the military spirit of a fighting unit. This reality was universally acknowledged in World War II.³⁶ Thus, it is appropriate to consider what Doolittle did that either contributed to this quality or detracted from it.

The Eighth Air Force experienced a decline in morale soon after Doolittle assumed command. Morale typically suffers when men begin to doubt their chances of surviving a war. An Eighth Air Force study conducted in February 1944 confirmed this reality, discovering a correlation between decreased morale and increased attrition rates.³⁷ As previously noted, the Eighth's morale—especially among its bomber crews—waned when Doolittle extended the operational tour length to 30 missions. The math was simple. “Barrack room accountants” figured that with a historic attrition rate of 5 percent, only 277 of 1,000 men would survive a combat tour of 25 missions. When Doolittle increased the requirement to 30, the number dropped to 215; a subsequent tour length of 35 missions implied that only 165 men would ever see their families again. Consequently, resentment of Doolittle simmered among many who felt that his policy change violated their “contract.”³⁸ His modification of fighter-escort tactics did not help matters. Many bomber crews felt this change unnecessarily exposed them to enemy fighters.

The decline in morale was not unexpected. In early 1944, Doolittle anticipated attrition rates would increase when he instituted attritional warfare and “let the fighters loose.”³⁹ Moreover, in a letter of 17 February he informed his commanders that the extension of combat tours “might well have a serious effect on morale.”⁴⁰ Arnold also feared that lengthening operational tours would damage the Eighth's military spirit. In his letter of 11 February he cautioned, “This radical change in Personnel Policy will present difficult problems, particularly insofar as morale is concerned. It will be a challenge to and a very great test of personal leadership all the way down the line. . . . I have absolute faith also in the intelligence and good, hard, common sense of the American fighting man in understanding the necessity for the change and accepting it. I know I can count on you.”⁴¹

Like Arnold, Doolittle believed in his men's judgment and appealed to their intellect as a means of improving morale. He opened his 2 March

commanders meeting by emphasizing the importance of keeping ground crews and other noncombat personnel informed on the progress of the war. Later that month, he reminded his commanders that “they are dealing with intelligent men. They should have explained to them what we are doing and why we are doing it.”⁴² There was considerable wisdom in Doolittle’s words. Surveys of aircrews showed a direct link between a belief in the value of strategic bombing and combat effectiveness.⁴³ In March, the intelligence directorate (A-2) of Doolittle’s staff began publishing a monthly report to inform aircrew on the progress of the air campaign. The report included the number of German aircraft destroyed, the effect of air operations on the enemy’s strength, and “other items that would be of value for the crews to know.”⁴⁴

The manner in which Doolittle announced the increasing of combat tours to 30 missions also reflects this mentality. In a memorandum of 4 March to his division commanders, he included a lengthy excerpt from Arnold’s 11 February letter directing the service-wide extension of combat tours:

A dangerous corollary had grown up. . . . That is that the completion of one operational tour means that combat crews will not subsequently be sent back to an active theater of war. Some men are coming home with that idea, and some of the trainees and replacement crews ready to go for their first time have already picked it up. It is again beyond reason that a trained fighting man, seasoned, rested, and able, should be consigned to a permanent homeland job because he has once already been in combat. This wrong impression must be unmistakably corrected. *Experienced combat personnel are a vital asset in winning this war, and they have got to be used as needs dictate.*⁴⁵ (emphasis added)

Doolittle noted that the increase of combat tours was not unique to the Eighth Air Force, but instead, was in response to a servicewide shortage of aircrews. Airmen in all AAF commands were sharing in this burden. He further explained that the Eighth Air Force loss rate had declined appreciably. He supported his argument with a statistical summary of operations from August 1942 to February 1944.⁴⁶ The numbers showed a significant decrease in combat attrition. Doolittle closed by stating, “This substantial decline, in great degree, is due to the present efficiency of our fighter escort, the constantly increasing size of the attacking bomber force, and a substantial falling off in the Hun fighter strength. It is anticipated that, in the near future, the loss rates will be further reduced as the combat strength of our forces continues to increase.”⁴⁷

Doolittle also offered his men the promise of an extended leave in the United States upon completion of an operational tour. Kepner submitted the idea during a 2 March commanders meeting.⁴⁸ Two days later Doolittle petitioned Arnold: “My commanders expressed the positive opinion, and I agree, that were it possible to give crew members a short period of leave within the

United States, many crews would be willing and able to return thereafter to active combat operations.”⁴⁹ Much to Doolittle’s surprise, his superiors approved the proposal, and crews returned to resort locations such as Atlantic City, New Jersey; Miami Beach, Florida; and Santa Monica, California, for rest and relaxation. The policy, however, did not succeed as well as Doolittle had intended. The promise of returning to combat led many crew members to not enjoy their month in the United States.⁵⁰ Moreover, because of discipline problems among returning Airmen, Arnold ordered Doolittle to take “immediate and adequate measures . . . to improve the attitude, conduct, and military bearing of AAF personnel being returned to this country.”⁵¹ Fortunately, as noted earlier, an increase in the supply of aircrews allowed Doolittle to abandon this practice by the summer of 1944. Henceforth, only lead crews who volunteered were returned to the United States for extended leave.⁵² When a subordinate later proposed reinstating the extended leave policy, he dismissed the idea.⁵³ Doolittle was a man who learned from his mistakes.

The Eighth Air Force’s policies concerning aircrew morale did not overlook the problem of emotional casualties. The increase of combat losses led to a corresponding increase in combat exhaustion. One study revealed a direct correlation between the number of emotional casualties and the rate of attrition: one Airman was permanently grounded for battle fatigue for every two bombers that failed to return from combat.⁵⁴ During a discussion of the problem with his subordinate commanders, Doolittle emphasized the importance of flight surgeons in assessing the mental health of aircrew. He insisted that the patients receive firm, but humane, treatment. He believed flight surgeons should never “develop sympathy, but should commend when a good job is done and condemn a bad job.”⁵⁵ That same month, Doolittle formally ordered his flight surgeons to account for the amount of stress endured by an individual before rendering a judgment on the strength of his character.⁵⁶ He also mitigated the detrimental effects of combat exhaustion by removing those undergoing evaluation from their units.⁵⁷ Despite the extreme hardships endured by Eighth Air Force aircrews, only one percent of Airmen in the command were permanently grounded for cowardice.⁵⁸ This suggests Doolittle’s efforts limited the adverse influence of emotional casualties and helped his organization come to terms with the issue.

Doolittle also implemented measures to ensure that men who excelled in combat were promptly rewarded. He entrusted major generals under his command with the authority to award decorations up to and including the Distinguished Flying Cross (DFC).⁵⁹ This policy change reduced the bureaucratic delay in processing award nominations. Indeed, under Doolittle, the Eighth dispensed a plethora of awards to its deserving aircrew. Air Medals

were presented for crews that finished five or six missions. In all, the Eighth Air Force awarded more than 441,000 such decorations.⁶⁰ Doolittle, however, also took measures to maintain the fairness and integrity of combat medals. In April he standardized the decoration policies to preclude any perception of inequity.⁶¹ Although the policy was developed at the Eighth's headquarters, its application was left to the discretion of subordinate commanders. Therefore, before the policy was implemented, Doolittle appointed Kepner chairman of a meeting of the division commanders to "discuss their individual interpretations of existing regulations in order that their application of authority would be uniform."⁶² Moreover, Doolittle discontinued the practice of awarding a DFC for the completion of a combat tour. Instead, the decoration was reserved for an Airman who downed an enemy aircraft or for bomber crews that had endured a particularly onerous mission.⁶³

Doolittle also addressed the morale-sapping problem of frostbite. Because the air environment was extremely harsh, frostbite was a serious problem. Bomber crews operated with open windows and temperatures as low as 50 degrees below zero.⁶⁴ Fighter pilots also had to cope with the physiological effects of altitude. All pursuit aircraft lacked pressurized cabins, and because of its wing-mounted engines, the P-38's cockpit was notoriously cold in flight. Not surprisingly, in early 1944, frostbite was a "major cause of casualties" in the Eighth Air Force.⁶⁵ Anoxia (lack of oxygen), the bends (release of nitrogen from the blood caused by decreased air pressure at high altitude), and frostbite accounted for 12,200 aircrew removals in the Eighth.⁶⁶ Doolittle, therefore, paid close attention when his subordinates complained of the problem. In early February, LeMay informed Doolittle that the 3rd Bomber Division lacked sufficient electrically heated flight clothing.⁶⁷ Doolittle charged Partridge to work with USSTAF to rectify the situation. A month later, however, General Williams also complained of a shortage of heated flight gear, and Kepner inquired about the status of gloves and spats for his P-38 pilots.⁶⁸ Doolittle responded that if his logistics directorate (A-4) did not obtain the equipment, he would send someone to Washington to fix the problem in person. Indeed, Doolittle soon dispatched Partridge to the Pentagon to "look into the winter flying equipment business"⁶⁹

The coordinated efforts of the Eighth Air Force's commanders reduced the problem of frostbite for aircrews. Because of Doolittle's attention to his subordinates' needs and subsequent intervention, the Eighth soon possessed an adequate supply of heated flight suits. Doolittle also ordered the installation of windows to enclose waist-gunner positions and radio hatches on his heavy bombers. These measures reduced frostbite to a "minor cause" of casualties.⁷⁰ A survey conducted during World War II revealed that fighting spirit was

highest among men who believed that their commanders were sympathetic to their needs.⁷¹ Doolittle knew this instinctively. He told his commanders that “he thought electronically heated suits, reduction in frostbite, spats for P-38 pilots, etc. were all items tending to increase morale.”⁷² He was right.

Operations during summer 1944 required considerable sacrifice by the Eighth Air Force. Bomber crews suffered from high casualty rates, occasional lapses in escort coverage, and a brutal pace of operations. These factors led many Airmen to the brink of exhaustion.⁷³ Doolittle’s extension of the combat tour length to 35 missions did not help. Moreover, the initiation of V-1 attacks against the United Kingdom in June caused the Eighth to devote more missions to Crossbow targets. In July and August, the Eighth committed 4,266 sorties and 10,891.6 tons of ordnance to the operation. These figures accounted for more than 20 percent of the missions and 27 percent of the weapons dropped during the two-month period. To their frustration, the Eighth’s efforts did not reduce the rate of vengeance attacks against Britain.⁷⁴ The adverse effects of these fruitless missions on morale worried Doolittle. He told his subordinate commanders, “The problem within our organization is the effect on the morale of our personnel caused by our having to do a lot of things they may feel are not basically sound.”⁷⁵

In July 1944, a memorandum on the disposition of aircrew interned in Switzerland confirmed Doolittle’s concerns. In World War II it was an acceptable practice for critically damaged bombers that could not return to a friendly base to divert to a neutral country. The crews and their airplanes remained under the protection of the host government for the remainder of the war. By July, 94 crews had diverted to Sweden and another 101 were interned in Switzerland. William W. Corcoran, a consulate officer in Sweden, wrote a controversial memorandum that implied aircrew morale was “very bad indeed.”⁷⁶ Corcoran claimed that the Airmen he interviewed had intentionally diverted to avoid further combat. The Airmen also harbored resentment for Doolittle because, as Corcoran reported, the commanding general sent his men to a most certain death.⁷⁷ In response to Corcoran’s letter, Doolittle admitted to his commanders that “there is probably some justification for some of these cases and that we must do everything possible to correct these conditions.”⁷⁸

Doolittle, therefore, instituted additional policy changes to reduce the perceived decline in morale. He understood that a hospitable living environment could bolster spirits. In March he made improving his Airmen’s facilities a “main point” in his efforts to sustain morale.⁷⁹ Later in the war he emphasized that “crews must have proper amount of rest and relaxation . . . to insure their continued effectiveness.”⁸⁰ Correspondingly, in July, he instituted a special services program. This initiative provided each Eighth Air Force unit with a special

services officer, who devised “ways and means to provide extra-curricular activities that would improve morale and thus forestall the development of unhealthy mental attitudes.”⁸¹

Doolittle also used the media to enhance morale. In summer 1944, he ordered the release of more information regarding the exploits of individual aircrew. He also petitioned Spaatz to increase publicity efforts and asked that he attribute mission results to the Eighth Air Force rather than simply to the USSTAF.⁸² Spaatz approved the request and promised to increase public-relations endeavors.⁸³ Moreover, Doolittle invited journalists and newsmen to observe his Airmen’s bravery. The crews enjoyed watching the newsreels and documentaries, even if they were at times factually inaccurate.⁸⁴

By fall 1944, the threat to operations of sinking morale had passed. In August an investigation revealed that aircraft in Switzerland had diverted for legitimate reasons. The thorough inquiry dispelled the claims of disobedience of Corcoran’s earlier report. The findings suggested that diplomatic interrogators had simply misinterpreted the typical nonchalance exhibited by American aircrew. Inspection of the aircraft also revealed significant battle damage.⁸⁵ Postwar analysis revealed that of the 166 bombers flown to Switzerland, only 71 were repairable. And these salvageable aircraft, on average, required 200 hours of maintenance to return to flying condition. These results inspired Spaatz to vehemently refute previous accusations of wrongdoing. He wrote Arnold, “We resent the implications by a non-military interrogator that any of these crews are cowards, are low in morale or lack the will to fight. Such is base slander against the most courageous group of fighting men in this war.”⁸⁶ Doolittle’s men who diverted to Switzerland may have been relieved to be out of the war, but that did not make them cowards. Moreover, another investigation, commissioned by Arnold, concluded in September that morale in the Eighth had increased significantly.⁸⁷

Doolittle’s actions to improve morale were admirable. His efforts to share the rationale behind his decisions resonated well with the men of the Eighth Air Force. His men also appreciated learning about the effects of their attacks on the enemy, whether that information came from intelligence reports or newsreels. His treatment of combat exhaustion reflected a firm, yet humane, approach to the psychological toll of combat. The Eighth’s award system also contributed to sustaining morale.⁸⁸ Finally, Doolittle recognized the importance of living conditions and implemented effective measures to improve them.⁸⁹ His leadership ability influenced many young Airmen. Theodore Milton, a B-17 pilot in the Eighth during World War II who later became chief of staff, Tactical Air Command, remarked that “Doolittle impressed all of us. He had a great combination of flamboyance and common sense, which we all liked.

... We all thought that he was a tremendously effective commander.”⁹⁰ Indeed, Doolittle’s efforts to maintain morale were indicative of an effective leader.

Conclusions

Several noteworthy observations emerge from evaluating Doolittle’s leadership in the Eighth Air Force. First, he encountered a demanding command environment that inhibited the influence of several of his leadership strengths. He could not rely on his personal charisma and flying ability to persuade his men to act, but he adopted a leadership style that accommodated these challenges. His empowerment of his immediate subordinates earned their admiration and helped compensate for his administrative shortcomings. Moreover, the relationship with his subordinate commanders gave him an excellent resource for advice. Consequently, it is no surprise that many of the ideas Doolittle implemented did not originate with him but with those at lower echelons. His leadership acumen is also reflected in his relationship with his superiors. He was a loyal subordinate, but he frequently convinced his leaders to support his vision for how to employ and lead the Eighth Air Force. The persuasiveness of such appeals exemplifies a leader with keen political awareness and strong interactive skills. Doolittle had learned from his missteps in North Africa.

When considering his influence on morale, however, one must not overlook the effect of Doolittle’s operational effectiveness and innovative accomplishments. As Clausewitz observed, the first means of increasing military spirit is a “series of victorious wars.”⁹¹ In other words, there is no substitute for success. As noted previously, by fall 1944 the Luftwaffe’s effectiveness had declined significantly. Accordingly, by September Doolittle’s major challenges regarding morale had passed. Thus, his aggressive assault on the Luftwaffe may have ultimately been his most effective means of improving morale. Fittingly, Craven and Cate’s description of the Eighth’s morale in September 1944 states, “Not only were the Airmen confident of their airplanes, their methods, and themselves, but they felt sure they were doing more to win the war than either the ground forces or the RAF.”⁹²

Doolittle’s leadership exhibits an instinctive understanding of the distinction between the mood of his forces and their military spirit. He never altered the employment of his forces in response to declining morale. As noted earlier, he remained steadfast in his operational decisions despite the darkening mood of his forces. He did not, however, discount the importance of morale; he devoted significant time and effort to enhance the well-being of his men. Perhaps the greatest testament to Doolittle’s leadership is that although he

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extracted a great amount of effort from his men, the Mighty Eighth's military spirit never faltered.

Notes

1. Lord Moran, *The Anatomy of Courage*, 2nd ed. (London, UK: Constable, 1966), 180.
2. Mark K. Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (Essex, UK: Routledge, 1995), 101. German U-boat missions are now generally acknowledged as the most dangerous operations in World War II. Nevertheless, in 1944 bomber operations in Europe were widely considered the most hazardous of any mission in the Army.
3. Robin Neillands, *The Bomber War: The Allied Air Offensive against Nazi Germany* (New York: Overlook Press, 2001), 179.
4. James Doolittle to Joe Doolittle, handwritten letter, 20 January 1944, Doolittle Papers, Series IX, Box 64, Folder 23, McDermott Library.
5. Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, DC: Center for Air Force History, 1993), 276.
6. James H. Doolittle and Carroll V. Glines, *I Could Never Be So Lucky Again* (New York: Random House, 1991), 350.
7. Buckingham Palace to Doolittle, letter, 25 January 1944, Doolittle Papers, Box 19, Special Correspondence, Library of Congress (LOC); and Doolittle and Glines, *I Could Never Be So Lucky Again*, 350.
8. Operation Crossbow targeted all phases of Germany's long-range weapons program. A majority of the Eighth's Crossbow targets were small launch and transportation facilities. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 3, *Europe: Argument to VE Day, January 1944 to May 1945* (1949; new imprint, Washington, DC: Office of Air Force History, 1983), 85, 103.
9. From December 1943 to June 1944, Crossbow requirements diverted 17,600 tons of ordnance and 5,950 sorties from Operation Pointblank. Craven and Cate, *Europe: Argument to VE Day*, 105.
10. James Doolittle to Joe Doolittle, handwritten letter, 9 March 1944, Doolittle Papers, Series IX, Box 64, Folder 23, McDermott Library.
11. Logbook Entries, November 1943–June 1944, Doolittle Papers, Series XVI, Box 1, McDermott Library.
12. James Doolittle to Joe Doolittle, handwritten letter, 15 April 1944, Doolittle Papers, Series IX, Box 64, Folder 23, McDermott Library.
13. Wells, *Courage and Air Warfare*, 138–40.
14. Maj Gen Ramsay D. Potts, "Reminiscences: Doolittle and the Mighty Eighth," *Airpower History* 40, no. 4 (Winter 1993): 28.
15. Wells, *Courage and Air Warfare*, 146.
16. Potts, "Doolittle and the Mighty Eighth," 28.
17. Gen Earle Partridge, interview by Tom Strum and Hugh N. Ahmann, 23–25 April 1974, USAF Oral History Collection, AFHRC call no. K239.0512-729 C.1, 350.
18. Potts, "Doolittle and the Mighty Eighth."
19. Doolittle to Spaatz, letter, 11 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
20. Craven and Cate, *Europe: Argument to VE Day*, 529–30.

21. *Ibid.*, 536–37.
22. Thomas E. Griffith Jr., *MacArthur's Airman: General George C. Kenney and the War in the Southwest Pacific* (Lawrence: University Press of Kansas, 1998), 221.
23. Hap Arnold to George C. Kenney, letter, 20 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
24. Doolittle to Kepner, letter, n.d., Doolittle Papers, Box 19, 1944 Operational Records, LOC.
25. Kepner to Doolittle, letter, 29 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
26. Doolittle to Arnold, letter, 1 April 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
27. Wells, *Courage and Air Warfare*, 45.
28. Partridge, interview, 23–25 April 1974, 350.
29. Potts, “Doolittle and the Mighty Eighth.”
30. Doolittle and Glines, *I Could Never Be So Lucky Again*, 351.
31. David G. Chandler, *The Campaigns of Napoleon: The Mind and Method of History's Greatest Soldier*, vol. 1 (New York: Simon & Schuster, 1966), 155.
32. Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (1976; reprint, Princeton, NJ: Princeton University Press, 1989), 188–89.
33. Wells, *Courage and Air Warfare*, 89.
34. Minutes, Commanders Meeting, 22 March 1944, AFHRC, 2.
35. Clausewitz, *On War*, 189.
36. Wells, *Courage and Air Warfare*, 137.
37. *Ibid.*, 102.
38. *Ibid.*, 104.
39. Minutes, Commanders Meeting, 2 March 1944, AFHRC call no. 520.01 V.2, 3.
40. Doolittle to VIII Fighter Command and all Bombardment Divisions, letter, 17 February 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
41. Arnold to Doolittle, letter, 11 February 1944, Spaatz's Papers, File I-90, LOC.
42. Minutes, Commanders Meeting, 22 March 1944, 2.
43. Wells, *Courage and Air Warfare*, 98. The crews that believed strongly in the value of strategic bombing reported more target damage than those that did not appreciate the worth of the missions to Germany.
44. Minutes, Commanders Meeting, 22 March 1944, 3.
45. Arnold to Doolittle, letter, 11 February 1944.
46. Doolittle to VIII Composite Command and Bombardment Divisions, letter, 4 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
47. *Ibid.*
48. Minutes, Commanders Meeting, 2 March 1944, 3.
49. Doolittle to Arnold, letter, 4 March 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
50. Craven and Cate, *Europe: Argument to VE Day*, 306.
51. Arnold to Doolittle, letter, 3 April 1944, Doolittle Papers, Box 19, 1944 Operational Records, LOC.
52. History, Headquarters Eighth Air Force, 1–31 July 1944, vol. 1, AFHRC call no. 520.01 V.1, 6.
53. Minutes, Commanders Meeting, 1 November 1944, AFHRC call no. 520.01 V.2, 2.

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54. Wells, *Courage and Air Warfare*, 102.
55. Minutes, Commanders Meeting, 22 March 1944, 3.
56. Wells, *Courage and Air Warfare*, 170.
57. Minutes, Commanders Meeting, 6 April 1944, AFHRC call no. 520.01 V.1, 6; and History, Headquarters Eighth Air Force, 1–31 April 1944, vol. 1, AFHRC call no. 520.01 V.1, 5.
58. Wells, *Courage and Air Warfare*, 161.
59. Minutes, Commanders Meeting, 22 March 1944, 3.
60. Wells, *Courage and Air Warfare*, 152.
61. History, Headquarters Eighth Air Force, 1–31 April 1944, vol. 1, 5.
62. Minutes, Commanders Meeting, 6 April 1944.
63. Wells, *Courage and Air Warfare*, 152.
64. *Ibid.*, 62; and History, Headquarters Eighth Air Force, 1944–1945, vol. 2, AFHRC call no. 520.01 V.1, 50.
65. Col W. E. Musser, “Eighth Air Force under the Command of Lt. Gen. J. H. Doolittle: Major Materiel and Maintenance Problems Encountered and Action Taken to Solve Them,” n.d, Doolittle Papers, Box 18, 1945 Operational Records, LOC.
66. Wells, *Courage and Air Warfare*, 83 n7.
67. Minutes, Commanders Meeting, 8 February 1944, AFHRC call no. 520.01 V.2.
68. Minutes, Commanders Meeting, 2 March 1944, 3–4.
69. Partridge, interview, 23–25 April 1974, 350.
70. Musser, “Major Materiel and Maintenance Problems.”
71. Wells, *Courage and Air Warfare*, 151.
72. Minutes, Commanders Meeting, 22 March 1944, 2.
73. Craven and Cate, *Europe: Argument to VE Day*, 306.
74. *Ibid.*, 532–33.
75. Minutes, Commanders Meeting, 20 July 1944, AFHRC call no. 520.01 V.2, 2.
76. Wells, *Courage and Air Warfare*, 107; and Minutes, Commanders Meeting, 20 July 1944, 2.
77. Wells, *Courage and Air Warfare*, 107.
78. Minutes, Commanders Meeting, 20 July 1944, 2.
79. Minutes, Commanders Meeting, 22 March 1944, 2.
80. Minutes, Commanders Meeting, 1 November 1944, AFHRC call no. 520.01 V.2, 2.
81. Minutes, Commanders Meeting, 20 July 1944, 2; and History, Headquarters Eighth Air Force, 1–31 July 1944, vol. 1, 4–5.
82. History, Headquarters Eighth Air Force, 1–31 July 1944, vol. 1, 5.
83. Minutes, Commanders Meeting, 20 July 1944, 2.
84. Wells, *Courage and Air Warfare*, 151–52.
85. Craven and Cate, *Europe: Argument to VE Day*, 307.
86. Wells, *Courage and Air Warfare*, 107–8.
87. Craven and Cate, *Europe: Argument to VE Day*, 306.
88. Wells, *Courage and Air Warfare*, 153.
89. *Ibid.*, 148.
90. *Ibid.*, 143.
91. Clausewitz, *On War*, 189.
92. Craven and Cate, *Europe: Argument to VE Day*, 307.

Chapter 6

Conclusions and Implications

The numerous books, articles, and films documenting Jimmy Doolittle's legendary life, laudable as they are, have largely overlooked a significant portion of his career—his command of the Eighth Air Force. This study addressed that historical omission with a critical assessment of Doolittle's performance as an operational air commander in combat. The appraisal reviewed his life prior to assumption of command of the Eighth and then addressed his operational effectiveness, innovative abilities, and leadership performance. This framework has penetrated the mystique of Doolittle to discover the commander behind the legend.

Early in his career, Doolittle's technical expertise, competitive spirit, and moral courage helped cultivate his reputation as a talented and daring pilot. Transcontinental flights, airspeed records, academic degrees, and the first blind flight adorned his impressive résumé of aviation accomplishments prior to World War II. Gen Hap Arnold recognized Doolittle's skills and gave him the mission for which he was uniquely qualified—the raid on Tokyo. Doolittle accomplished this mission through an impressive combination of tactical and technical innovation and strong personal leadership. His efforts achieved strategic effects that shaped the landscape of World War II in the Pacific. His triumph immortalized Doolittle as one of history's most daring warriors and launched him into the senior echelons of military rank, for which he was at the time less well prepared.

In North Africa, Doolittle had to adapt rapidly to the challenges of high command. Success at the squadron level initially eluded him as commander of a nascent numbered air force. His lack of staff experience and professional military education hindered his adjustment to such responsibilities. Nevertheless, the relatively small size of his forces permitted his personal leadership to compensate for his shortcomings in other areas. He also demonstrated a capacity to learn from his subordinates and, more importantly, his own mistakes. His ability to overcome a steep learning curve eventually earned the confidence of his superiors, who deemed him worthy of commanding the Mighty Eighth. In January 1944 Doolittle still lacked the administrative skills and bureaucratic experience typical of senior officers. He had, however, exhibited a tradition of achieving operational effectiveness, instituting innovation, and employing strong personal leadership.

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Doolittle's success in achieving operational effectiveness demonstrates the utility of his aggressive, yet mature, command demeanor. In spring 1944, he grasped an opportunity to decisively defeat the Luftwaffe and mustered the full weight of his forces to pressure the German air defenses. To enable his vision of maximum effort, Doolittle drove his men to the brink of exhaustion. The effort, however, proved worth the cost. By 6 June 1944, the Eighth had swept German fighters from the skies of Western Europe, contributing significantly to the success of Operation Overlord.

His response to fratricide of friendly ground forces during close-air-support operations, although less dramatic, reflects a sound understanding of the primacy of effectiveness over efficiency. The measures Doolittle implemented increased the risk to his aircrews and diminished their proficiency in strategic bombardment. Nevertheless, they ultimately reduced risk to friendly ground personnel. They also notably contributed to the larger effort of defeating the German armed forces. In short, he was not afraid to place effectiveness above efficiency to extract the "highest profit" from his forces.

Doolittle's efforts to innovate offer a different perspective of his command performance. His propensity for offensive action and noteworthy moral courage again emerged as beneficial qualities. Although he was not the only air commander with an offensive mind-set, Doolittle's pivotal role in letting the fighters loose was perhaps the necessary catalyst that hastened the Luftwaffe's destruction. His ability to innovate technically, however, was less successful. Much to his chagrin, he could not replicate the degree of technical improvement he had achieved as a junior officer. The scale of a numbered air force was simply too large to adopt his technical visions. Ironically, the Eighth probably benefited most from the technical efforts of Mister, not Lieutenant General, Doolittle. His arguably most significant technical innovation—the development of 100-octane fuel—occurred when he was employed by Shell Oil. Doolittle's approach to blending innovative technology and tactics was reflected in his efforts to improve the accuracy of radar bombing. Although these endeavors did not achieve significant tactical success, they enabled the Eighth to maintain pressure on the German economy despite the poor European weather, contributing noticeably to both operational and strategic success. In sum, Doolittle's technical knowledge, which was so crucial to his earlier achievements, proved to be of mixed value. The Eighth Air Force, however, benefited significantly from its commander's moral courage.

Doolittle's leadership of the Eighth Air Force offers another important measure of his command performance. He adopted a command style that flourished in the highly demanding environment for which he had not been formally prepared. His engaging approach earned him the admiration of

superiors and subordinates alike. Thus, he enjoyed sufficient latitude to implement his vision for how the Eighth Air Force should fight. His stewardship of his men's military spirit was also laudable. The specific efforts he implemented to improve the well-being of his men reflected a broad view regarding their welfare. Doolittle grasped the subtle, yet important, difference between his command's mood and its military spirit. His aggressive, persuasive leadership never compromised the latter for the former. He instinctively sensed that defeating the Luftwaffe was the best way to maintain his Airmen's military spirit, and he was right.

Jimmy Doolittle's enviable list of achievements has given him a rightful place among prominent aviation pioneers and military leaders alike. Historians have, accordingly, treated his performance as commander of the Eighth Air Force favorably. A critical assessment of this performance confirms this widely held impression. The Eighth Air Force's domination of the Luftwaffe was the ultimate testament to Doolittle's operational effectiveness. His accomplishments, however, were also reflected in the effective use of his aircrews and the efforts to mitigate risk to friendly ground forces during close-air-support operations. Although Doolittle had mixed success innovating technically as an air force commander, his tactical improvements significantly enhanced the air offensive against Germany. Finally, his leadership acumen was demonstrated in his ability to manage the transitory shifts of his force's morale while remaining steadfast in his determination to defeat the Luftwaffe.

The lessons of Doolittle's performance as Eighth Air Force commander are surprisingly relevant in the twenty-first century. Although modern air forces do not marshal air formations consisting of thousands of heavy bombers, today's numbered air force commanders encounter many of the same challenges that Doolittle faced in January 1944. For instance, the debate over the best application of airpower in support of friendly ground forces persists to this day. The role of tactical and technical innovation in airpower also remains a paramount concern of senior-level air commanders. Moreover, the ability to persuade associates, both superior and subordinate, to take appropriate action they otherwise might not take is a timeless leadership quality.

It is thus appropriate to contemplate the qualities that benefited Doolittle in his command of the Eighth Air Force. The aggressive spirit and moral courage that propelled him to fame as a junior officer were also necessary to his success as an air force commander. Doolittle's offensive mentality and moral fortitude underpinned his operational effectiveness, innovative successes, and effective leadership. These qualities were complemented by an essential dose of humility that enabled him to grow in his command. Although he often made mistakes, he acknowledged his errors, internalized the lessons,

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and emerged a better commander. This capacity to develop as a commander was perhaps his most impressive attribute.

These facets of Doolittle's command persona have several implications for the professional development of senior Air Force officers. First, a senior leader educated as an engineer can have a considerable influence on promoting technical innovation, especially when afforded sufficient time and latitude. Combat, however, rarely offers these luxuries; thus, technical expertise offers fewer benefits to the numbered air force commander. This study suggests that during times of war, qualities such as aggressiveness, moral courage, and humility are paramount. Accordingly, while it is appropriate for the Air Force to foster technical skills in the development of its junior officers, it must not overlook the less tangible leadership qualities required among successful leaders. Although Doolittle's career did not follow a typical path, he performed admirably. Perhaps the Air Force would benefit from more senior leaders who have nontraditional career paths.

This study illustrates that behind Doolittle's daring and dashing façade was a measure of humility that fostered his growth as a general officer. Although his technical expertise forged trails in aviation history, his moral qualities more significantly hastened the demise of the Luftwaffe. As Clausewitz observed, in war these moral qualities are the "the real weapon, the finely honed blade."¹ Doolittle's leadership tempered the blade of the Eighth Air Force. We would be wise to learn from his example.

Note

1. Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (1976; reprint, Princeton, NJ: Princeton University Press, 1989), 185.

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