

**The Twelfth US Air Force**  
***Tactical and Operational Innovations in  
the Mediterranean Theater of Operations,  
1943-1944***

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## **Abstract**

This paper analyzes the participation of the US Twelfth Air Force in the Mediterranean theater of operation from 1943 to 1944 and also studies the coalition and joint operations required in the air campaign. Coalition and joint warfare provides numerous command, control, and coordination problems that are not easily de-conflicted. The requirements of the coalition air campaign in the Mediterranean theater provided significant challenges to the leadership of the US Army Air Forces (AAF). Prewar Army Air Corps doctrine focused on strategic bombing and aerial interdiction. Airmen lacked a well thought-out tactical support doctrine and had no doctrine for supporting amphibious operations. The mission of the AAF in the North African and Italian campaigns was the winning of air superiority. The Twelfth Air Force had to adopt new tactics and operational techniques to support the Allied landings at Sicily, Salerno, and Anzio, Italy, against the formidable German Luftwaffe.

The Mediterranean theater was the first theater to encounter the use of precision-guided munitions in the form of radio-controlled glide bombs dropped by the Luftwaffe. The Mediterranean theater was designated a secondary theater of war, resulting in the Twelfth Air Force operating with inadequate resources, as aircraft and crews were periodically reassigned to units supporting the Combined Bomber Offensive in the European theater of operations. While supporting the Mediterranean theater, the Twelfth Air Force operated alongside the British Royal Air Force (RAF) and was routinely tasked with supporting operations of both the US Fifth and British Eighth Armies. This provided significant command, control, and communication (C3) problems that had to be addressed to optimize the effectiveness of Allied airpower.

The goal of this paper is to highlight the lessons learned from the selected operations and their applicability to twenty-first-century warfare. The author will examine the development of tactics and operational procedures that were unique to this theater of war and the leadership challenges encountered in a coalition or joint command structure. This study will also examine the effectiveness of combined air operations with the RAF in support of the amphibious landings conducted by the US Fifth and British Eighth Armies at Sicily, Salerno, and Anzio, Italy.



## ***About the Author***

Maj Matthew G. St. Clair received a regular commission in the US Marine Corps after graduating from the Virginia Military Institute in 1989. After completing The Basic School, Quantico, Virginia, he was designated an infantry officer and attended the Infantry Officer course. He served as a rifle platoon and weapons platoon commander, rifle company executive officer, and company commander in the 2d Marine Division, Camp Lejeune, North Carolina. Major St. Clair also served as the assistant operations officer for the 22d Marine Expeditionary Unit, Camp Lejeune. Following his tour with the 22d Marine Expeditionary Unit, he was assigned to the Marine Corps Recruit Depot, Parris Island, South Carolina, where he served as a battalion executive officer, 2d Recruit Training Battalion, and the director of the Drill Instructor School. In July of 2003 he was reassigned to the 4th Marine Expeditionary Brigade (Antiterrorism), Camp Lejeune.





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## Chapter 1

### **Introduction**

*The inherent flexibility of air power, is its greatest asset. This flexibility makes it possible to employ the whole weight of the available airpower against selected areas in turn; such concentrated use of the striking force is a battle winning factor of the first importance. Control of available air power must be centralized and command must be exercised through the air force commander if this inherent flexibility and ability to deliver a decisive blow are to be fully exploited. Therefore, the command of air and ground forces in a theater of operations will be vested in the superior commander charged with the actual conduct of operations in the theater, who will exercise command of air forces through the air force commander and command of ground forces through the ground force commander. The superior commander will not attach army air forces to units of the ground forces under his command except when such ground force units are operating independently or are isolated by distance or lack of communication.*

—War Department Field Manual (FM) 100-20  
July 1943

This paper analyzes the operations of the Twelfth Air Force in the Mediterranean theater from 1943 to 1944, specifically targeting the three Allied amphibious operations in Sicily, Salerno, and Anzio, Italy. These Allied landings illustrate a wide range of tactical and operational innovations, doctrine, and coalition air warfare. In the interwar years, the Army Air Corps (AAC) gave virtually no thought to supporting amphibious operations. Yet, before the end of World War II, doctrine would be developed for such operations.

Amphibious assaults are the most complex of all military operations to execute, demanding detailed coordination and planning between the Army, Navy, and Air Force. Allied planners in the Mediterranean theater had few historical models to follow in early 1943. The large amphibious landings conducted in North Africa in 1942 experienced minimal resistance from the Vichy French both on the ground and in the air. The French defense against the assault troops was sporadic, never mounting a serious air or naval threat.<sup>1</sup>

The US Marine Corps (USMC) conducted a successful amphibious assault on Guadalcanal, 7 August 1942. In 1920 Marine planners, directed by Commandant General John Lejeune, gave considerable thought to the support of offensive amphibious operations; but it would be late 1943

before they trained seriously for these types of operations.<sup>2</sup> The *Tentative Manual for Landing Operations*, published by the USMC in 1934, served as the foundation for the Corps' amphibious doctrine in World War II.<sup>3</sup> The amphibious doctrine developed by the USMC emphasized the role of close air and naval gunfire support in making a significant contribution to the successes on Guadalcanal and subsequent landings in the Pacific. The rapid establishment of an airfield on Guadalcanal allowed Marine aviators to support operations ashore from an airfield close to the front lines. In the Mediterranean the long distance from various airfields to the battle area limited the time-on-station for airmen supporting operations in Sicily and Italy. The Marine assault of Guadalcanal and supporting landings on Tulagi and Gavutu Islands proved that amphibious forces, supported by air and naval gunfire, could be successful against an opposed landing.<sup>4</sup>

Many US Army planners were reluctant to embrace the idea of conducting amphibious operations, believing that landings against an opposed shore had little chance of success.<sup>5</sup> The British were not strong advocates of amphibious operations because their failures at Gallipoli, Turkey, in 1915 and Dieppe, France, in 1942 continued to haunt them. Amphibious landings would be critical to the operational success of the Allies in the Mediterranean. At this time Gen Dwight D. Eisenhower and his commanders had limited experience in their planning and coordination, and Airmen had not developed a doctrine to support them. The learning curve would be steep—innovation, essential.

The story of the Twelfth Air Force in support of the Allied landings contains some valuable lessons for today's coalition warfare environment, as well as, issues of air-ground coordination, close air support (CAS), and the strategic effects of airpower. This paper is not intended to be an operational history of the Twelfth Air Force. It follows the early evolution of tactical and operational techniques, procedures used, and the development of doctrine that influenced the organization of the USAF. Throughout my research of the Mediterranean theater, I observed that most scholarly works focused on the ground operations of the US Fifth and British Eighth Armies. The research was conducted through the use of primary sources located in the Air Force Historical Research Agency, Maxwell AFB, Alabama, while secondary sources were mainly used for amplification.

There are numerous fine studies of the Allied campaigns in the Mediterranean theater. Wesley Frank Craven and James Lea Cate have written several studies on the participation of the AAC in *The Army Air Forces in World War II*, Vol. 2, *Europe: Torch to Pointblank, August 1942 to December 1943*, and *The Army Air Forces in World War II*, Vol. 3, *Europe: Argument to V-E Day, January 1944 to May 1945*. These books are excellent sources to obtain an overall assessment of the contribution made by the Army Air Forces (AAF) during World War II. Albert N. Garland and Howard Smyth's *Sicily and the Surrender of Italy* (1993), provides a detailed study of ground operations in the Sicilian campaign, but air operations only receive brief summaries. This is also true of Ernest F. Fisher's *Cassino to the Alps*

(1993). However, both remain excellent sources to learn about the numerous strategic, operational, and tactical issues that challenged the Allied forces. Samuel E. Morison's *History of United States Naval Operations in World War II: Sicily-Salerno-Anzio* (1954) is an excellent account of naval operations in support of the three major amphibious landings conducted in the Mediterranean theater. Morison provides some descriptions of air operations but fails to give Allied airmen appropriate credit. Besides the works of Craven and Cate, these books do not provide a thorough assessment of Allied air operations in the Mediterranean theater, and none provide a detailed account of the Twelfth Air Force.

This paper begins with a discussion of prewar AAC doctrine, Allied strategy in the Mediterranean theater, command structure, and US–British relationships. Chapter 2 discusses the initial employment of the Twelfth Air Force in North Africa and the difficulties encountered in supporting ground operations, command and control issues (C2), and the reorganization of all air forces in the Mediterranean. Chapter 3 focuses on the Allied amphibious invasion of Sicily, strategic implications, and the role of the Allied air force. Chapter 4 studies the amphibious assault of Salerno, Allied strategy, strategic bombing of Pantelleria Island, and the tactical and technical innovations used. Chapter 5 looks at the second reorganization of the Allied air forces in the Mediterranean, reorganization of the Twelfth Air Force, the amphibious assault of Anzio, and the tactical and technical innovations implemented. Chapter 6 analyzes the effectiveness of the air campaign in the Mediterranean theater by analyzing the tactics, techniques and procedures adopted, and their relevance to the twenty-first century. This work attempts to answer the following questions: What was the prewar AAC doctrine, and was it effective in the Mediterranean theater? Did the Airmen of the Twelfth Air Force have to develop new techniques and procedures in order to meet the challenges of coalition/joint operations? How did the British Royal Air Force (RAF) influence AAC doctrine? Was AAC doctrine adjusted to capture lessons learned from the Mediterranean theater? Did the Twelfth Air Force transition successfully from a strategic to a tactical air force? Was the Allied command structure effective, and if not, what changes were made? Were the tactics employed successful?

A study of the Twelfth Air Force and its contribution to the Mediterranean theater offers many lessons learned for the modern soldier, Airmen, and sailor supporting coalition or joint operations. At the conclusion of this paper, issues of interest in today's joint environment are addressed. The Twelfth Air Force entered the war with no combat experience, untested doctrine, and tactics that frustrated AAC officers and ground commanders alike. As the war in the Mediterranean progressed, the Airmen in the Twelfth Air Force developed effective doctrine and tactical innovations that made significant contributions to the success of the Allied strategy, establishing precedents employed today. In the end, a study of the Twelfth Air Force in the Mediterranean theater provides examples of the importance of sound doctrine, innovation, and leadership.

## INTRODUCTION

### Notes

(All notes appear in shortened form. For full detail, see appropriate entry in the bibliography.)

1. Millett, "Assault from the Sea," 92; and Mortensen, *A Pattern for Joint Operations*, 56.
2. Millett, "Assault from the Sea," 85; Spector, *Eagle against the Sun*, 24–28; and Taylor, "American Experience in the Southwest Pacific," 298.
3. Spector, *Eagle against the Sun*, 27.
4. Millett, "Assault from the Sea," 91; Spector, *Eagle against the Sun*, 190–91; and Taylor, "American Experience in the Southwest Pacific," 300–301.
5. Spector, *Eagle against the Sun*, 26. Many naval officers also believed amphibious landings against an opposed shore could not be successful.

## Chapter 2

### **Allied Air Operations in North Africa**

*The Soldier commands the land forces, the Airman commands the air forces; both commanders work together and operate their respective forces in accordance with a combined Army Air plan, the whole operation being directed by the Army commander.*

—Air Vice Marshal Sir Arthur Coningham

The first major offensive against the Axis forces conducted by American and British troops occurred on 8 November 1942 in French North Africa. During Operation Torch over 95,000 Allied forces landed in Algeria and Morocco compelling the Vichy French to sign an armistice and support the Allied coalition.<sup>1</sup> The rapid reinforcement of German forces from Italy to Tunisia would soon overshadow the initial success of Torch. The stage was set for a bloody campaign in which Allied commanders were to learn valuable lessons that would be applicable throughout the war.

Operation Torch and the eventual Allied victory in Tunisia were executed with considerable friction between the Americans, British, and Free French forces. Initial procedures regarding command and control (C2), doctrine, logistics, and employment of airpower were not universally agreed upon, which caused considerable debate between the planning staffs and air and ground commanders. However, the doctrine and procedures developed by the end of the African campaign served as the basic model for future campaigns in Sicily, Italy, and northwest Europe.<sup>2</sup> The doctrine advocated by American Airmen for the use of airpower laid the foundation for significant changes to the AAF standing field regulations for air superiority, interdiction, and CAS missions. The Twelfth Air Force and the RAF's Eastern Air Command were initially unable to achieve air superiority due to poor coordination of the overall air effort, frustrating Allied commanders. "Allied ineffectiveness resulted from the absence of all-weather air fields. . . a shortage of aircraft, trained crews, fuel, spare parts, and munitions; poorly coordinated employment of bombardment, ground support, and air defense aviation; dispersal of air assets due to subordination of aviation to ground force requirements; as well as inadequate air-ground and interallied air cooperation. Personality conflicts between air and ground commanders also hampered development of operational teamwork."<sup>3</sup> It became imperative for General Eisenhower to resolve these issues and develop doctrine that provided for the effective employment of air assets to gain and maintain air superiority and provide CAS to ground commanders.<sup>4</sup>



## **AAF Doctrine Prior to Operation Torch**

Prewar doctrine for the employment of airpower for the AAF and RAF focused on strategic bombing and aerial interdiction; thus both air forces were organized around a substantial fleet of bombers. However, the Mediterranean theater had few strategic (industrial) targets for airmen to attack. What it did have were vital transportation centers, especially ports, which could be effectively targeted by Allied bombers. The long-range American heavy bombers were ideal weapons to strike the vulnerable transportation network that the Axis armies required for their supplies.

What American and British airmen lacked was well thought out doctrine for tactical support and amphibious operations. Allied planners had to adjust their current doctrinal mind-set and adopt C2 procedures allowing the integration of all aircraft. Airmen were required to develop air plans in support of winning air superiority, interdiction, CAS, and strategic bombing, not only in North Africa, specifically Tunisia, but also in the central Mediterranean.<sup>5</sup> The British Desert Air Force had been operating in the Middle East since 1940 and gained valuable combat experience, but the Twelfth Air Force arrived in North Africa as an inexperienced and hastily organized unit.

Maj Gen Carl Spaatz, commander of the US Eighth Air Force, was directed to organize, train, and equip a new air force, consisting primarily of Eighth Air Force units, to support Operation Torch. This new air force was designated as the Twelfth Air Force, code named JUNIOR. Brig Gen James H. Doolittle arrived in England on 6 August 1942 to command the Twelfth Air Force which consisted of two heavy bomb groups, two P-38 and two Spitfire groups, three medium bomb groups, one transport group, and one light bomb group.<sup>6</sup> US heavy bombers in the Mediterranean theater gave the Twelfth Air Force the capability to hit vital interdiction targets deep in Italy, as well as Axis airfields in Southern France.

On 24 October 1942 Headquarters Twelfth Air Force deployed to North Africa, employing a doctrine well versed in strategic bombing, using pre-war tactical doctrine, and having no doctrine for amphibious operations, as the AAF had not developed it. Additionally, issues of C2, tactics, doctrine, and coordination with the British had been overlooked. The Twelfth entered the war with a doctrine giving the supported ground commander control of air assets assigned to support his maneuver while relegating the imperative mission of gaining and maintaining air superiority to a lesser priority.

During operations in North Africa, the AAF used three primary doctrinal publications specifying employment of air forces: Field Manual (FM) 1-5, *Employment of Aviation of the Army* (1940); FM 1-10, *Tactics and Techniques of Air Attack* (1942); and FM 31-35, *Aviation in Support of Ground Forces*, 1942. FM 1-5 addressed the major principles of gaining and maintaining air superiority and centralized command. It neither emphasized air as an offensive weapon, nor identified specific procedures and requirements for CAS, maritime operations, or air-interdiction missions. The

manual did stipulate that “combined operations of air and ground forces must be closely coordinated by the commander of the combined force and all operations conducted in accordance with a well defined plan.”<sup>7</sup> FM 1-10 addressed CAS, maritime interdiction, and bomber escort missions, but the procedures identified were not realistic in terms of effectiveness.<sup>8</sup> FM 31-35 was a joint ground and air attempt at stipulating a doctrine for air support. The manual paid only slight attention to the techniques of CAS, ignoring procedures for battlefield operations and prioritization of targets and missions.<sup>9</sup>

FM 31-35 essentially subordinated the role of the air force with the requirements of the ground force commander. According to the manual “the ground force commander, in collaboration with the air support commander, decides the air support required. . . . The final decision as to priority to targets rests with the commander of the supported unit. . . . The decision as to whether or not an air support mission will be ordered rests with the commander of the supported unit.”<sup>10</sup> The air force commander served a dual function. As commander of all air units in-theater, he tasked individual units as required. As a staff officer he served as the Army staff air support advisor, providing advice on the effective employment of aircraft in support of ground operations.<sup>11</sup> Air and ground forces were encouraged to work as a team and demonstrate a cooperative attitude.<sup>12</sup> The relationship at the Army level basically worked as designed; however, at the lower command echelons the command-relationship issue remained controversial.

The US Army organized its ground units into army, corps, division, and combat teams. The AAF was organized into numbered air forces; air support command; fighter, bomber, reconnaissance groups; and squadrons that created separate chains of command for each unit. Army commanders below the army level could not order their own air support. They had to submit a request through the appropriate command channels for air support that would either be approved or disapproved by the army commander or his direct representative, the air support commander.<sup>13</sup> Commanders at the brigade, division, and corps levels expressed continual dissatisfaction with the requirement for approval of air requests at the army level and the long interval between the request for air and time-on-target. The ground commanders espoused that the most efficient means to ensure unity of command and timeliness of support was to place all combat power, to include air assets, under the control of the ground force commander.<sup>14</sup> British and American commanders had to deal with the issue of controlling air assets. The British Desert Air Force gained extensive experience against the Luftwaffe in Egypt and developed a harmonious relationship with the British Eighth Army. However, the British Eastern Air Command’s initial deployment to North Africa resembled that of the Twelfth Air Force.

The Eastern Air Command was hastily assembled from various units located in Britain and sent to North Africa. Unable to benefit from the lessons learned by the Desert Air Force, as they had not been promulgated to the appropriate British air staffs, the Eastern Air Command found itself

addressing issues similar to those of the Twelfth in regard to C2 and doctrine in support of ground operations. British and American airmen advocated centralized command of all air assets by the air commander, while most ground commanders believed that they should control ground support aircraft to prevent airmen from tasking these aircraft with other missions.<sup>15</sup> The air forces supporting the Allied invasion of North Africa had little time to train and prepare for the unique support that would be required during Operation Torch. Airmen of the Twelfth Air Force and Eastern Air Command would have to develop many tactical and joint procedures, while simultaneously convincing ground commanders the importance of adopting the principle of a centralized air command.

### **Operation Torch and the Invasion of Tunisia**

The Twelfth Air Force was organized into three functional components to support Operation Torch: Twelfth Bomber Command, Twelfth Fighter Command, and the Twelfth Air Support Command (ASC) which was organized as an independent and self-sustaining air force within the Twelfth consisted of both fighter and bomber aircraft.<sup>16</sup> D-day for Torch was set for 8 November 1942, and General Eisenhower organized the ground assault forces into a Western Task Force, Eastern Task Force, and Central Task Force.<sup>17</sup> To support the ground scheme of maneuver, the Torch air plan consisted of two air forces: the Twelfth, designated the Western Air Force, and the British Eastern Air Command, each having separate tasks, areas of operations, and responsibilities.<sup>18</sup>

General Eisenhower, consistent with current Army doctrine and frustrating to American Airmen, did not designate a senior AAF officer to command the air forces supporting Torch. General Doolittle commanded the Twelfth, and Air Marshal Sir William Welsh commanded the Eastern Air Command. The headquarters of the two air forces were not collocated, contributing to C2 and coordination problems for providing effective air support. Neither commander was able to develop a clear understanding of events taking place ashore. The Eastern Air Command provided air support to the Eastern Task Force while the XII ASC provided support to the Western Task Force and elements of the Twelfth Fighter and Bomber Commands supported the Central Task Force.<sup>19</sup> At H hour the naval task forces provided air support, but as the assault forces advanced inland, capturing enemy airdromes, the air task forces assumed responsibilities for air support ashore, as directed by the separate ground task force commanders.<sup>20</sup>

Subordinating the air assets under the control of the ground task force commanders and the lack of unity of command of air assets prevented Eisenhower's air planners from developing a coordinated air plan to support the theater of operations. Individual ground commanders saw the enemy to their front and associated air operations as the most vital area of the campaign and wanted the air forces in their area to exclusively support them. Ground commanders agreed that gaining and maintaining air supe-

riority, as advocated by airmen, was essential; but none wanted to give up tactical air support to achieve it.<sup>21</sup>

During the first weeks of fighting ashore, ground commanders continually complained about being attacked by German Stuka dive-bombers and demanded that the air force provide them with air umbrellas to cover their front. The air umbrellas were often expected to last for several days, during which fighter aircraft constantly circled the battlefield in an effort to ambush the striking Stukas. Using fighters as air umbrellas diverted pilots from engaging enemy targets on the ground and conducting reconnaissance missions. "As long as 'air support' units operated at the beck and call of the ground force commander, the machinery did not exist for shifting air effort from area to area and from target system to target system according to an over-all strategic plan."<sup>22</sup> Air commanders argued that the most efficient way to eliminate the Stuka threat was to concentrate the air effort on gaining air superiority by attacking the enemy airfields. Many ground commanders were not familiar with the capabilities of individual aircraft and often assigned missions to aircraft that could not effectively execute the mission, often suffering a severe loss in aircraft and crews.

The ineffective use of aircraft for air umbrellas and defensive missions began taking a tremendous toll on aircraft maintenance, as there were few airdromes close to the front. By December 1942 there were three airdromes, two over 100 miles away for fighters supporting the forward troops, while the B-17s had to fly over 630 miles from airfields in Oran, Algeria, to reach the front. The distance of the airfields to the front severely limited the number of sorties flown and increased the rate of mechanical failures.<sup>23</sup> The Luftwaffe, however, was able to maintain air superiority, in part, due to the proximity of airdromes in Sicily and Sardinia, as well as having all-weather airfields they controlled in Tunisia. The locations allowed the Luftwaffe to provide timely air support and fly more sorties per aircraft than the Allies.<sup>24</sup> While the Germans reaped the benefits of air superiority in the winter of 1942 to 1943, the Allied air forces remained subordinated to the ground commanders, executing an uncoordinated air campaign with minimal effectiveness.

During the first four months of Torch, the Twelfth flew over 10,254 sorties with only 418 sorties dedicated to fighter sweeps and 2,388 sorties to bombing missions (fig. 1). There were 4,534 sorties dedicated to escort missions, while the remainder included patrol, scramble, strafing, reconnaissance, maritime, and miscellaneous missions.<sup>25</sup> It was evident that the ground commanders were not utilizing the limited air assets of the Twelfth offensively but rather defensively. The C2 and coordination problems of the Allied air effort during the initial phases of Torch required a significant reorganization of the air force command structure to achieve unity of command and synchronize the efforts of all available air assets in theater.



**Figure 1. P-38 of 14th Fighter Group, Youlen Las Daines Airfield, North Africa** (Reprinted from US Army Center of Military History, Carlisle Barracks, PA)

### **Reorganization of the Allied Air Forces**

By December 1942 Eisenhower had grown increasingly frustrated over the problems coordinating the air efforts of the Twelfth Air Force and the British Eastern Air Command. The time had come to embrace the theory put forward by American and British airmen. He informed Gen George C. Marshall, chief of staff, US Army, that in order to better coordinate his air assets, a single air commander was required, and he recommended Lt Gen Carl A. Spaatz to fill the position.<sup>26</sup> On 5 January 1943 General Spaatz was appointed the air commander in chief, Allied Air Forces of Torch, commanding the Twelfth Air Force, Eastern Air Command, and various French air units.<sup>27</sup> The British, concerned with Spaatz's inexperience in commanding a force of this magnitude, insisted that his chief of staff come from the RAF.<sup>28</sup> This was the first of several organizational changes that led to the emergence of a unified air effort for the final months in North Africa.

In mid-January 1943 several steps were taken to synchronize Torch air assets. The Twelfth was assigned responsibility for providing air support to American ground forces in North Africa, while the Eastern Air Command provided support to the British First Army. On 22 January Brig Gen Laurence Kuter was appointed commander of the Allied Air Support Com-

mand, responsible for ensuring coordination between the air and ground commanders.<sup>29</sup> The organizational changes improved unity of command and offered a higher degree of flexibility but still did not achieve the operational advantages of a single combined air headquarters. Another issue to be addressed was the activity of the Desert Air Force supporting Gen Bernard Montgomery's Eighth Army. By early 1943 the Desert Air Force, operating from airfields in east Tunisia, began to interfere with missions of the Torch air forces.<sup>30</sup> It became apparent that it was time to reorganize all air assets in the Mediterranean theater and designate one Allied airman as the overall air commander.

### **Creation of the Northwest African Air Force**

In January 1943 Pres. Franklin D. Roosevelt and Prime Minister Winston Churchill met at Casablanca, Morocco, to discuss the direction of Allied strategy after the Tunisian campaign. Among many issues decided upon was the reorganization of the air forces supporting Torch. The combined chiefs of staff agreed that to optimize the combat power of the Eastern Air Command and the Twelfth Air Force they should be organized into one air force. On 3 February General Spaatz ordered the formation of a planning committee to make recommendations as to the exact composition required for a single air force.<sup>31</sup> The planning committee recommended that a combined American and British headquarters be formed. The suggested designated was the Northwest African Air Command (NAAC), consisting of the following subordinate commands: Twelfth Air Force, to include all Allied heavy and medium bombers, and long-range fighters; Tunisian Air Command (TAC); Coastal Defense Command (CDC); Moroccan Air Command (MAC); and a consolidated Air Service Command (ASC).<sup>32</sup>

The NAAC would not remain the senior air headquarters in the Mediterranean. Roosevelt and Churchill decided at Casablanca to designate General Eisenhower as the commander in chief of the Mediterranean theater of operations and adopt the organizational command structure used by the British Desert Air Force and the Eighth Army. In accordance with this doctrine, which maintained equal parity between ground and air commanders, one army officer would be responsible for all ground forces and one airman would be responsible for all air operations.<sup>33</sup> Gen Billy Mitchell and many other early AAC pioneers had advocated this doctrine since the end of World War I.<sup>34</sup> British air chief marshal Sir Arthur Tedder was designated as the commander in chief, MAC, which commanded all aviation assets in the Mediterranean. Tedder's command included the Northwest African Air Force (NAAF), formerly the Northwest African Air Command, under General Spaatz; Middle East Air Command, under Air Chief Marshal Sir Sholto Douglas; and RAF Malta Command, under Air Vice Marshal Sir Keith Park.<sup>35</sup>

The NAAF was officially activated on 18 February 1943.<sup>36</sup> The NAAF was further organized into six subordinate units: Northwest African Strategic

Air Force (NASAF), commanded by General Doolittle; Northwest African Tactical Air Force (NATAF), commanded by Air Marshal Sir Arthur Coningham; Northwest African Air Service Command (NAASC), commanded by Brig Gen Delmar H. Dunton; Northwest African Coastal Air Force (NACAF), commanded by Air Vice Marshal Lloyd; Northwest African Training Command, commanded by Brig Gen John K. Cannon; and Northwest African Photographic Reconnaissance Wing, commanded by Lt Col Elliot Roosevelt.<sup>37</sup> All Twelfth Air Force units and personnel were assigned to one of the subordinate commands of the NAAF; the Twelfth for all practical purposes ceased to exist. The only Twelfth Air Force unit to maintain its identity was the XII ASC assigned to the NATAF.<sup>38</sup> General Spaatz expressed his concern about the future status of the Twelfth Air Force to General Eisenhower since it had been absorbed by the NAAF. Eisenhower directed that the Twelfth would remain as an administrative headquarters for all US Army units in NAAF, and at the discretion of Spaatz, all US Army personnel of the NAAF staff were assigned corresponding members of the Twelfth Air Force staff. On 1 March 1943 General Spaatz assumed command of the Twelfth Air Force (fig. 2).<sup>39</sup>

### A Final Analysis of Tunisia

General Eisenhower’s combined British and American Allied Force Headquarters influenced the creation of the NAAF. The establishment of joint units below the command level allowed the NAAF to optimize the exchange of ideas and tactical and technical procedures while supporting a coordinated air effort. The concept of designating separate, yet coordinated, strategic and tactical air forces would allow the Allies to assign the appropriate air assets, en masse, to vital targets supporting both the strategic objectives of the campaign as well as the tactical support required by ground operations. Giving the air commanders coequal status with the ground commander ensured that valuable air assets would not be used inefficiently. The air commander was responsible for supporting the overall air cam-

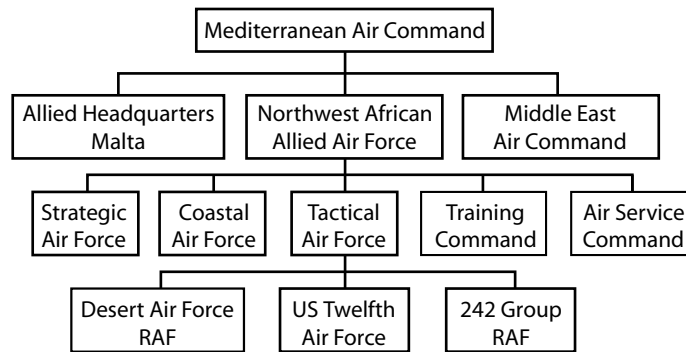


Figure 2. Mediterranean Air Command, February 1943 (Reprinted from History of the Twelfth Air Force, vol. 5)

paign as required. However, it took several months for the potential of the NAAF to be embraced by ground commanders who still argued for control of air support assets. General Spaatz remained frustrated with the inefficient use of air assets by ground commanders and wrote a letter to General Arnold expressing his concern:

It has become evident that what we consider the Air Support Command and the air support forces are not adequate for the purpose either in composition or organization, and by their very term give an erroneous impression to the ground army. When the battle situation requires it, all units, including medium and heavy bombardment must support ground operations. Air support of the ground forces on the other hand, cannot be made effective in the face of air supremacy, superiority and under certain conditions, even parity on the part of the enemy's air forces. It follows from this that in order for the army to advance, the air battle must be won first. . . . Since air formations can move freely in the air without regard to terrain, it is evident from the above that the control of the air units must be centralized and cannot be divided into small packets among several armies or corps.<sup>40</sup>

Although the reorganization of Allied air assets in Tunisia did not immediately resolve all coordination problems between air and ground commanders, its impact would influence future air force organizations in the war, as the AAF organized units into strategic and tactical air forces.<sup>41</sup>

During the early months of Torch the Allies were not able to direct the full force of their airpower against the Axis forces. This was partly due to the separate battles being fought by the individual task forces, lack of airfields, poor weather, and the lack of coordinated effort in providing theater support. The creation of the NAAF allowed for the implementation of a coordinated air campaign that provided increased operational and tactical flexibility. The quest for air superiority became the priority and an offensive mind-set dominated the employment of air assets. The airpower theory embraced by airmen and the experience gained in North Africa led to the publication of FM 100-20, *Command and Employment of Air Power*, in July 1943. FM 100-20 directed that "the gaining of air superiority is the first requirement for the success of any major land operation . . . land forces operating without air superiority must take such extensive security measures against hostile air attack that their mobility and ability to defeat the enemy land forces are greatly reduced. Therefore, air forces must be employed primarily against the enemy's air forces until air superiority is obtained."<sup>42</sup> FM 100-20 established three priorities for the tactical air force: (1) air superiority which directed attacks against enemy aircraft in the air and on the ground, (2) interdiction, and (3) support to ground forces in the main battle area engaged in attacking objectives to their immediate front.<sup>43</sup> This doctrine set the precedent for future air operations and would receive its initial test during Operation Husky, the invasion of Sicily.

The new system of C2 for air assets in the Mediterranean theater was implemented in preparation for the invasion of Sicily. Air Chief Marshal Sir Arthur Tedder would command all air forces in the theater, leaving no doubt as to who was responsible for the overall air campaign. Principal air



support for the invasion would come from Coningham's Tactical Air Force that included the Desert Air Force, XII ASC, British 242 Group, and the tactical bomber force. If Coningham required additional aircraft, he could request support directly from Spaatz, who directed the overall NAAF effort. The commanders of the Desert Air Force and XII ASC supported separate ground task forces. Coningham maintained centralized control of all planning and advocated the need to treat the separate task forces as one invasion force in order to exploit the inherent flexibility of available airpower.<sup>44</sup> This allowed Coningham to determine the priority for the tactical air effort. The ground commanders would not control any portion of the air effort and would send air-support requests directly to the headquarters of the tactical air force in support. General Doolittle would be responsible for directing the strategic bombing campaign. This system of C2 required the air and ground commanders to conduct continuous integrated planning to maintain situational awareness and optimize employment of available power.

#### Notes

1. Mark, *Aerial Interdiction in Three Wars*, 23.
2. Syrett, *Northwest Africa*, 223.
3. *Ibid.*, 223–24.
4. *Ibid.*, 224.
5. *Ibid.*, 225.
6. History of the Twelfth Air Force, vol. 1, 2; Wesley Craven and James Cate, *The Army Air Forces in World War II*, vol. 2, 52; and Davis, *Tempering the Blade*, 7.
7. Air Corps Field Manual (FM) 1-5; Syrett, *Northwest Africa*, 225; and Mortensen, *A Pattern for Joint Operations*, 11–13.
8. Air Corps FM 1-10; and Mortensen, *A Pattern for Joint Operations*, 225.
9. War Department Basic FM 31-35; and Mortensen, *A Pattern for Joint Operations*, 20–24.
10. War Department Basic FM 31-35, 6–13.
11. *Ibid.*, and Mortensen, *A Pattern for Joint Operations*, 20–24.
12. War Department Basic FM 31-35.
13. Mortensen, *A Pattern for Joint Operations*, 22.
14. *Ibid.*, 23.
15. Syrett, *Northwest Africa*, 223.
16. Mortensen, *A Pattern for Joint Operations*, 52.
17. *Ibid.*, 55–56. Maj Gen George S. Patton Jr. commanded the Western Task Force and landed near Casablanca, French Morocco. Maj Gen Charles W. Ryder commanded the Eastern Task Force and landed near Algiers, Algeria. Maj Gen Lloyd Fredendall commanded the Central Task Force and landed near Oran, Algeria.
18. History of the Twelfth Air Force, vol. 1, chap. 1, 10–20.
19. *Ibid.*
20. *Ibid.*
21. *Ibid.*
22. *Ibid.*, chap. 11, 9.
23. Mark, *Aerial Interdiction in Three Wars*, 28–29. The three airfields capable of supporting fighters were respectively 120, 150, and 70 miles from the front. It wasn't until the end of December that medium bombers could operate from Constantine, Algeria, and reach the Straights of Sicily in order to attack German shipping. B-17s were used to bomb the

ports of Tunis, Bizerte, Sousse, and Gabe in Tunisia. The Allies also suffered from a lack of all-weather airfields, and most became inoperable during the heavy rains of the African winter.

24. Ibid.
25. History of the Twelfth Air Force, chap. 11, 7.
26. Syrett, *Northwest Africa*, 236.
27. History of the Twelfth Air Force, chap. 10, 5.
28. Syrett, *Northwest Africa*, 236. The British also recommended Doolittle to assume responsibility of all long-range bomber aircraft, Welsh assumed all aircraft in support of ground operations, and another RAF officer to assume responsibility for maritime missions and port protection.
29. History of the Twelfth Air Force, chap. 10, 1. Brig Gen Laurence Kuter's command consisted of the XII ASC, British Royal Air Force (RAF) 242 Group, and a photographic reconnaissance unit.
30. Ibid., chap. 9, 2.
31. Ibid.
32. Ibid., Headquarters, Allied Air Forces, memorandum to Brig Gen H. A. Craig, subject, "Reorganization of the Allied Air Force Consequent upon Decision to Establish the Mediterranean Air Command," 3 February 1943; and Allied Force Headquarters, General Order No. 20, 17 February 1943.
33. Mark, *Aerial Interdiction in Three Wars*, 32.
34. General Mitchell's lecture.
35. Syrett, *Northwest Africa*, fig. 5-2.
36. HRA Call no. 612.193, IRIA no. A6001; also HRA Call no. 612.193, IRIA no. A6001.
37. Mortensen, *A Pattern for Joint Operations*, chart no. 2.
38. History of the Twelfth Air Force, chap. 9, 7.
39. HRA Call no. 655.193, IRIS no. A6352.
40. Headquarters, NAAF, letter, Spaatz to Arnold, 7 March 1943 found in History of the Twelfth Air Force, chap. 10, 7.
41. Ibid., chap. 11, 1-22.
42. War Department FM 100-20.
43. Ibid.
44. History of the Twelfth Air Force, chap. 12, 13.



## Chapter 3

### **Operation Husky and the Invasion of Sicily**

*Valuable though the contribution of the Navy had been in silencing individual batteries and strong points, it was saturation bombing of the Air Force which wrought general havoc among the defenses and broke what little will to fight the enemy possessed.*

—Gen Dwight D. Eisenhower

On 10 July 1943 Allied forces carried out an amphibious assault on the Italian island of Sicily. Operation Husky would serve as a stepping-stone for the invasion of mainland Italy and its elimination from the war. The operation provided the Allies with secure sea lanes of communication in the Mediterranean Sea for future operations in Italy and Southern France, relieved Axis pressure on the Soviet Union by causing the Germans to reassign units on the eastern front to Italy, and increased pressure on the Italian government to surrender.<sup>1</sup> The US Seventh and British Eighth Armies landed along the southeastern coast of Sicily, meeting minimal resistance. They advanced west and north, respectively, converging on the northern city of Messina, and the island was secured by 17 August 1943.<sup>2</sup>

Operation Husky was the first operation where air commanders exercised centralized control of air assets under the Northwest African Air Force (NAAF), employing air assets in a coordinated effort that supported all aspects of the invasion. Air assets were used to provide cover for the naval armada, interdiction to isolate the battlefield, and CAS for the ground forces.<sup>3</sup> Gaining and maintaining air superiority was the top priority, achieved by the relentless bombardment of the enemy airdromes on Pantelleria Island and Sicily. The relentless pressure applied by the Allied air forces destroyed hundreds of enemy aircraft, compelling the Germans and Italians to evacuate their Sicilian airfields to airfields on mainland Italy, leaving behind approximately 1,100 aircraft.<sup>4</sup> Many ground commanders felt CAS was sacrificed and air superiority over-emphasized. The C2 procedures for requesting air support were cumbersome at best and reaction time was often slow. Naval and army commanders complained about the lack of coordination from the Allied air force in the initial planning stages, stating that they were unaware of the NAAF's intentions for air support throughout the operation.<sup>5</sup> Despite these issues, Operation Husky succeeded and contributed, at least, to the refinement of cooperation between air and ground commanders and demonstrated the importance of centralized control of air assets.

## **Allied Strategy in the Mediterranean**

As Allied forces continued to exploit their successes in North Africa, Allied planners could not agree upon the direction of subsequent operations after the Tunisian campaign. The British chiefs of staff wanted to initiate operations in the Mediterranean against Sardinia, Sicily, Italy, and the Balkans while continuing to build up combat power in the United Kingdom for a cross-channel invasion. The British also wanted to reduce the current effort against the Japanese.<sup>6</sup> American planners saw the strategic picture through a different lens and wanted to begin preparing for a 1943 cross-channel invasion. If this was not feasible, then all efforts should be shifted toward the Pacific theater and the defeat of Japan. The Americans did not believe an invasion of Italy was worth the price in equipment and manpower, they did not want to divert forces required for the cross-channel invasion.<sup>7</sup>

The Allied invasion of Sicily was conceived at the Casablanca Conference, in January 1943.<sup>8</sup> Roosevelt and Churchill agreed that by attacking Sicily, the Allies would be able to continue the momentum achieved in North Africa and indirectly approach the Axis center of power and its “soft underbelly” through Italy.<sup>9</sup> The US Joint Chiefs of Staff maintained that the most direct way to defeat Germany was through a cross-channel invasion into France. The British did not support the execution of a cross-channel invasion in 1943, arguing that it would not be feasible until 1944. British planners agreed that a new offensive was imperative but believed that it would be most effective in the Mediterranean, specifically to defeat Italy, as the personnel, equipment, and shipping would already be in place after the conclusion of the Tunisian campaign.<sup>10</sup> The British originally proposed invading the island of Sardinia, but American planners believed that “a Sardinian campaign would be equivalent to picking the soft spot first with the danger of making the hard spot harder in the long run.”<sup>11</sup>

The Americans convinced the British that an invasion of Sicily could be conducted in the summer of 1943 and would cause the Germans to divert a significant portion of their combat power from the Russian front during “the critical campaign season.”<sup>12</sup> Although the Allies were concerned with reducing German pressure on the Soviet Union, they were more concerned with forcing Italy out of the war and compelling Germany to fight the war alone. The overall Allied strategy for the Mediterranean was expelling the Italo-German forces from North Africa, securing Sicily as a stepping-stone to the Italian mainland, invading mainland Italy, eliminating them from the war, and wearing down German forces as a prelude to the cross-channel invasion into France.<sup>13</sup> On 23 January 1943 the Allied combined chiefs of staff (CCS) directed General Eisenhower to begin planning for the invasion of Sicily.<sup>14</sup>

## **Planning for Operation Husky**

After receiving orders to begin planning for Operation Husky, General Eisenhower established a separate headquarters, known as Force 141, to develop the assault plan. By 15 March, Force 141 produced a summary of the basic assault and air plans. The plans contained specific guidance on the employment of fighter and bomber aircraft, and air coordination with naval and ground forces.<sup>15</sup> Since Allied air forces would operate from North African and Maltese airfields, the amphibious assaults were directed towards the southeastern and southwestern coastlines of Sicily in order to stay within supporting range of fighter and fighter-bomber aircraft.<sup>16</sup> The most strategic objective in Sicily was Messina, but because this was located in northern Sicily, beyond the range of fighter and fighter-bomber aircraft, it could not be secured until ground forces were able to capture airfields in southern Sicily.<sup>17</sup> The original assault plan included four simultaneous assaults on D-day, conducted by an Eastern Task Force seizing critical airfields and ports in southeastern Sicily to be used in support of the main assault on Catania on D+3 (D-day plus three days). On D+2, a Western Task Force would assault Sciacca-Marinelli to secure the airfields at Sciacca and Castelvetro. Later, on D+5, assault forces with the mission of cutting off Palermo from the west, would land near Castellamare, Trappeto, and Carini Bay.<sup>18</sup>

Air Marshal Tedder and Admiral Cunningham rejected this plan, believing instead that it was essential to capture the southeastern airfields at Comiso, Ponte Olivo, and Biscari to provide better protection for Allied ships supporting the assaults. However, General Montgomery, commander of the Eastern Task Force, did not believe he had enough forces to secure all the airfields, and he did not want to divide his combat power to secure objectives that were not located in close proximity to each other.<sup>19</sup> General Eisenhower and his planners recognized the importance of capturing the southeastern airfields, while at the same time concentrating available combat power at one decisive point: "On 3 May we stopped tinkering and completely recast our plan on the sound strategic principle of concentration in the crucial area. I abandoned not only the southwestern assault scheduled for D plus 2, but the assaults west of Palermo on D plus 5 as well, and diverted the entire Western Task Force to the southeastern assault. I deliberately assumed the maintenance and supply risk involved in the sacrifice of Palermo as an immediate objective, because all of us were at last convinced that it was the lesser of two evils."<sup>20</sup> General Eisenhower submitted the revised Husky plan to the CCS, and they approved the plan on 13 May 1943 during the Trident Conference in Washington, DC. The new plan called for eight simultaneous amphibious assaults to be conducted over 100 miles from Cap Murro di Porco south of Syracuse, around the southeastern tip of Sicily, and west to Licata (fig. 3).<sup>21</sup> General Montgomery and the Eighth Army (Eastern Task Force) would land on both sides of the southeastern cape of Sicily, while Lt Gen George Patton would land with

OPERATION HUSKY AND THE INVASION OF SICILY

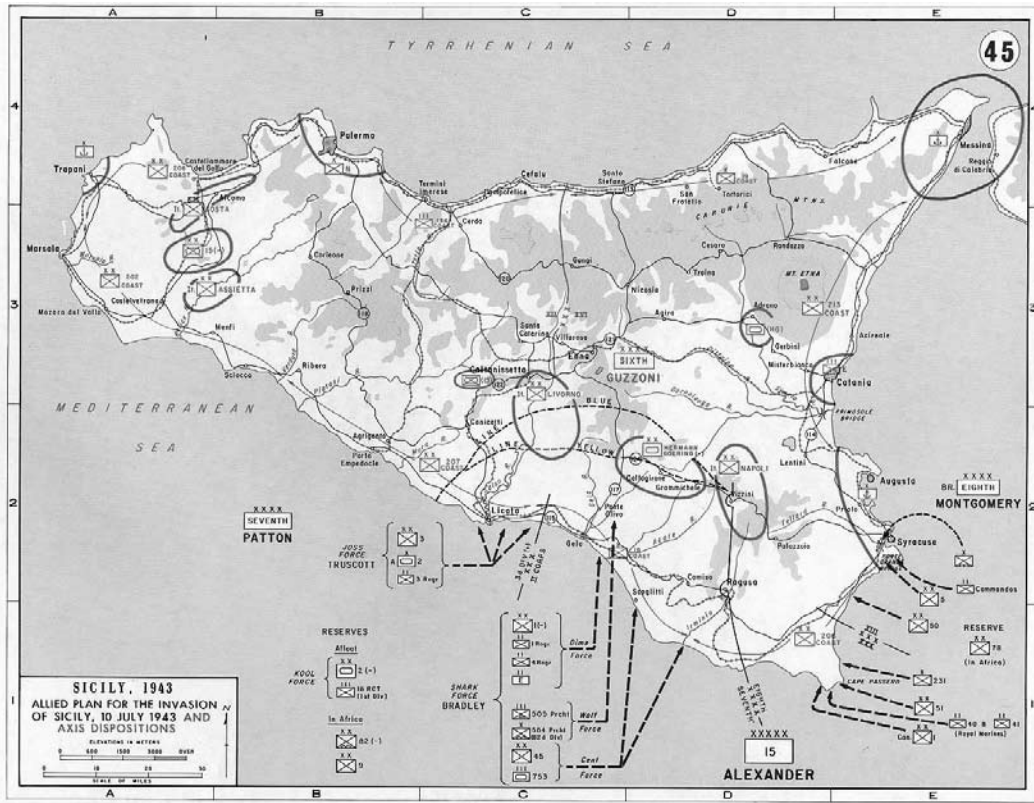


Figure 3. Allied invasion of Sicily (Reprinted from US Army Center of Military History, Carlisle Barracks, PA)

the Seventh Army (Western Task Force) on the south central coast of Sicily. The confirmation of a final assault plan now made it possible for the development of a coordinated air plan.

**Air Plan for Operation Husky**

Air intelligence played a significant role in NAAF air planning and General Spaatz ensured that his staff had access to all available intelligence functions required for detailed planning.<sup>22</sup> Information gathered through ULTRA intercepts, prisoner of war (POW) interrogations, combat intelligence, target intelligence, counterintelligence, and British Y-service painted a fairly clear picture of the Axis air force in the Mediterranean theater of operations (MTO).<sup>23</sup> To ensure dissemination of intelligence, the NAAF A-2 section produced the Daily Intelligence Summary and the Weekly Intelligence Report to provide summaries of Axis ground and air activities.<sup>24</sup> These reports contained valuable information concerning the technical capabilities of Axis aircraft and their tactical employment, which greatly assisted pilots of the NAAF.

ULTRA intercepts proved invaluable, and according to Group Capt R. H. Humphreys, senior ULTRA officer of the NAAF, “we had advanced timing of every intention and move of the German air force in Africa and Italy, and as many moves and intentions of Italian forces as fell into joint Italo-German programmes.”<sup>25</sup> The ULTRA intercepts, combined with the Y-service reports, allowed Allied access to damage reports of enemy airfields that enabled them to determine the effectiveness of their attacks and whether specific airfields needed to be reattacked.<sup>26</sup> The NAAF A-2 section identified the principle supply centers of the Luftwaffe in the MTO as Naples, Italy, Crete, Rhodes, and Athens, Greece, allowing General Doolittle to focus the strategic bombing effort of the NASAF.<sup>27</sup> Intelligence analysts were also able to monitor the arrival of Luftwaffe aircraft in the MTO from the other fronts, and the disposition of aircraft within the theater. NAAF intelligence experts were able to depict, with considerable accuracy, the strength, disposition, units, basing, and operational routes of the German and Italian air forces in-theater, providing a substantial advantage to the NAAF planners.

Embracing lessons learned in Tunisia, the Allied air plan for Operation Husky was designed around four primary missions: (1) neutralize enemy air forces, (2) disrupt enemy lines of communications, (3) isolate the battlefield, and (4) provide CAS. Other tasks, of no lesser importance, included protection to the Allied naval armada, coordination of naval and air operations, reinforcement to convoys, airborne assaults, protection of rear areas from enemy air attacks, and air-sea rescue.<sup>28</sup> The air plan consisted of four phases that covered: (1) preparatory operations, (2) assault phase, (3) assault on Catania, and (4) reduction of the remainder of Sicily.<sup>29</sup> Preparatory operations included: Operation Corkscrew; capturing the island of Pantelleria and its critical airfield; interdiction of enemy reinforcements; supplying Sicily and Sardinia troops; neutralizing Axis airfields; gaining air supremacy; building up air facilities on Malta to make it an “aircraft carrier” for invasion support; and training troop carrier and glider pilots to transport airborne forces.<sup>30</sup>

Northwest African Tactical Air Force (NATAF) assumed planning responsibility for employing tactical air forces, while Doolittle planned strategic operations. Planners decided early on that to optimize the flexibility of the NAAF, the air plan would allow units of American or British air forces to be placed under the operational control of the other, as the situation dictated.<sup>31</sup> Air Marshal Coningham was concerned about treating the two separate assault task forces as separate entities. He convinced Spaatz that to optimize available tactical air assets, NATAF should exercise control over their operations.<sup>32</sup> The XII ASC would maintain two headquarters: an advanced headquarters with Patton’s Seventh Army and a rear headquarters on the Cape Bon Peninsula near Korba, Tunisia. The rear headquarters would control Tunisian units designated to provide bomber escort until they dispersed to airfields in Sicily.<sup>33</sup> The two headquarters were over 800 miles apart, creating con-



siderable confusion during the planning stages of Husky.<sup>34</sup> The Desert Air Force supporting Montgomery, maintained its headquarters near Tripoli, while the tactical bomber force was located in the vicinity of the bomber fields of Nabeul on the Cape Bon Peninsula.<sup>35</sup>

As the ground task forces advanced, aircraft flying from airfields in North Africa and Malta would displace to airfields in Sicily. All fighters flying from island airfields would be the first to move to Sicily, and fighter-bombers from Tunisia would occupy the island airfields. As more airfields were captured on Sicily, the fighter-bombers would move to Sicily, and light bombers would then occupy the island airfields.<sup>36</sup> Operation Husky air planners had over 4,000 operational aircraft at their disposal. The aircraft were divided among 146 American squadrons and 113.5 British squadrons and would be flying against 1,500–1,600 Axis aircraft.<sup>37</sup> In order for Allied aircraft to operate freely over the Sicilian Straits and the Eastern Tunisian plains, airmen would have to eliminate German radar direction-finding stations on Pantelleria Island and destroy the enemy air assets on the island.

### **Air Operations against Pantelleria**

Seizing Pantelleria would neutralize German long-range radar stations and allow Allied fighters to use the island's airfield to augment fighters from Malta in their efforts to protect the invasion convoys and the beaches during the assault phase of Husky. It would also eliminate the German ship-watching stations that reported Allied shipping movements.<sup>38</sup> Pantelleria was 8½ by 5½ miles, covering an area of approximately 42½ square miles. The Axis defense of the island consisted of 15 batteries ranging from 90 millimeter (mm) to 120 mm guns dispersed along the coast, with the largest concentration in the north where any amphibious assault would occur. A contingent of approximately 100 aircraft, predominately Italian fighters, was stationed at the airfield.<sup>39</sup> Due to the concentrated gun positions, covering the only feasible assault approach, planners decided that the NAAF would execute an intense bombing effort to break the strong defensive belt and possibly compel the Axis to surrender the island.

The NAAF objectives for Corkscrew were to destroy the possibility of air interference from the island, blockade the island against reinforcement by sea, reduce the coastal defenses of the island to permit landing operations, reduce morale of the garrison by continuous bombing, and provide air cover for naval vessels and landing craft.<sup>40</sup> The Twelfth Air Force, along with British bombers and fighters assigned to Doolittle's NASAF, would carry the burden of bombing missions. Doolittle had four groups of B-17s, two groups each of B-26s and B-25s, three groups of P-38s, one P-40 group, and two groups of British Wellingtons.<sup>41</sup> The XII ASC assigned to NATAF consisted of two B-25 groups; three groups and one squadron of P-40s; one group of Spitfires, A-36s, and A-20s; and one observation squadron of F-4s, P-39s, and P-51s. The RAF units in the NATAF consisted

of four Boston squadrons, three Baltimore squadrons, one Hurribomber, and one Tactical Reconnaissance squadron.<sup>42</sup>

The strategic bombing operations against Pantelleria began on 15 May and by 30 May over 1,267 tons of bombs had been dropped over the island, neutralizing most of the airdrome. The last ships to leave the port carried the small German garrison, as air sorties flown by medium and fighter-bombers averaging 50–60 per day, rendered the port unusable. Heavy bombers began bombing on 1 June and focused on the coastal gun positions. Due to the thick concrete of the gun emplacements, 1,000-pound bombs had to be dropped within 200 yards of the target to neutralize them. On 6 June around-the-clock air operations began in preparation for an amphibious assault scheduled for 11 June. A British cruiser and two destroyers provided naval fire support from 31 May to 5 June.<sup>43</sup> From 30 May to 11 June over 4,770 sorties were flown, saturating the sky with so many aircraft that planes had to circle the target area, awaiting a turn to attack. Bomber runs were followed up immediately by antipersonnel and strafing attacks.<sup>44</sup>

On 8 June aircraft began dropping leaflets over the island that demanded the remaining Italians surrender. The Italians failed to take advantage of this offer, and bombing continued. Leaflets were again dropped over the island on 10 June, demanding unconditional surrender and immediate cessation of hostilities, but after six hours without a reply, the air assault resumed.<sup>45</sup> The British First Infantry Division embarked on amphibious shipping on 10 June, sailing towards Pantelleria for an assault scheduled for 1100 on 11 June. Tactical and strategic aircraft continued bombing the island in support of the ground forces. At approximately 1130 a white flag was seen flying from the island, but several of the shore batteries were still firing on the assault craft, so the aerial bombardment continued.<sup>46</sup> As the first assault craft reached the shore, enemy resistance (except for sporadic, small arms fire on one landing beach) ceased. On 13 June Pantelleria was declared secure, making it the first strategic position captured by the Allies through the use of airpower.<sup>47</sup>

### **Lessons Learned from Corkscrew**

Corkscrew provided valuable lessons for employing airpower against coastal defense positions. Airmen observed that although thousands of bombs were directed against the coastal batteries, only two batteries received direct hits, and only those bombs falling within 10 yards of the target were effective in neutralizing the guns.<sup>48</sup> Bombs landing beyond 10 yards produced minimal damage. However, what airmen failed to observe was the fact that 500-pound bombs dropped on concrete gun emplacements were extremely ineffective. They would later find that 1,000-pound bombs were required to penetrate the reinforced concrete gun emplacements. Another important lesson *not* learned was the importance of rapidly passing this information to other theaters. Five months later the USMC

stormed the beaches of Tarawa in the Pacific, using 500-pound bombs during the preinvasion bombardment, and found the bombing of the Japanese gun emplacements was largely ineffective. During the bombing of Pantelleria Island the standard bomb fuse employed had a .025-second time delay that produced a crater effect, thus minimizing the blast effect. Due to the small percentage of direct hits, airmen suggested that a blast effect would produce better results against targets that were unprotected "and therefore proportional instantaneous fuzing is considered preferable."<sup>49</sup> The AAF was elated that Pantelleria fell to airpower and reluctant to admit failures in the bombing campaign. Their elation appears to have prevented a careful analysis of what had gone wrong and dissemination of the vital data to other theaters.

Low-level strafing attacks by fighters yielded inconclusive results against enemy gun crews, having little more than a temporary effect during the immediate attack. Since gun emplacements were relatively small targets, precision engagement was preferred, and as long as air supremacy was maintained, the 75 mm gun or rockets on the B-25 could produce the desired effect.<sup>50</sup> At the time of the Pantelleria bombing, the Italian army was standing on the edge of defeat, and the soldiers garrisoned on the island were not a robust force. The Italian army spent little time preparing the defense of the island, many of the batteries and pillboxes were poorly camouflaged, and communication lines were laid above ground.<sup>51</sup> Had the island been defended by a German army unit, it would have required considerably more than saturation bombing to secure the island. Now that Pantelleria, as well as the remaining islands in the Sicilian Straits, was under Allied control, planners shifted their focus towards Sicily.

### **Operation Husky**

Immediately following operations in Tunisia, the strategic air force began modest operations against enemy airdromes in Sicily, Sardinia, southern Italy, and the eastern Mediterranean, as well as submarine bases, and communication and industrial targets until seven days before D-day (D-7). Winning and maintaining air superiority was the objective of the bombing effort. Beginning at D-7 and continuing until D-day (10 July), the focus of strategic bombing was to eliminate the enemy air force, with priority given to German airdromes over Italy.<sup>52</sup> These operations were conducted day and night, keeping unrelenting pressure on the German air force. Airfields closest to the assault beaches were given priority. A special tactic, aimed at enemy aircraft approaching their home airdromes at night, was introduced and referred to as *Intruder* operations. During these night operations a single Allied fighter or "lone wolf" would locate a formation of enemy aircraft and follow behind it en route to its home base. As the formation circled over the airfield, preparing to land, the lone wolf attacked from the rear, destroying as many aircraft as possible, then disengaging.<sup>53</sup> The ports of Messina, Palermo, and Catania were vital enemy lines of communica-

tion and were bombed continuously. Other targets during this period were rail marshalling yards and industrial and communication areas.<sup>54</sup> The preinvasion bombardment undertaken by the strategic air force caused the enemy air force to withdraw from Sicilian airfields and seek shelter in Italy. This significantly reduced the enemy's ability to provide air support to ground forces defending the island.

While the strategic air force neutralized enemy airfields, fighters assigned to the Coastal Air Force and fighters based on Malta provided convoy protection to the massive Allied naval armada approaching Sicily from North Africa. The naval armada consisted of 2,590 vessels, 945 ships and landing craft of the US Navy, and 1,645 ships and landing craft of the British Royal Navy.<sup>55</sup> On D-2 and D-1, over 570 cover sorties were flown over the western convoys, along with 540 sorties providing local defense.<sup>56</sup> The convoy protection provided by the air force prevented the enemy from attempting any significant attacks. In fact, only one attack, consisting of six enemy aircraft, was attempted on the convoys on D-1, and easily defeated.<sup>57</sup> NATAF aircraft were used extensively for interdiction missions prior to the main assault. XII ASC and British P-51s participated in newly implemented daylight-intrusion raids, known as *Rhubarbs*.<sup>58</sup> Rhubarb missions were carried out under low overcast conditions (500–1,000 feet), against enemy aircraft on the ground, motor transport assets, locomotives, and shipping. Two aircraft executed the mission, one providing cover, while the other attacked the target at speeds in excess of 270 miles per hour (mph). The elements of surprise, observation, and coordination were essential to the success of these missions, and an intense training program was developed, making them highly successful.

NATAF's A-36 dive-bombers proved highly effective in interdiction efforts. Pilots observed that 90-degree dive-bombing proved to be more accurate than glide bombing in open terrain. Glide bombing was only used when the ceiling was low, preventing a pilot from obtaining an altitude of 8,000–10,000 feet; to conduct a vertical dive; or when the target area was protected by mountains or high ground, preventing the pilot from pulling out of a dive.<sup>59</sup> NATAF adopted a fighter-defense formation of 12 aircraft, line-abreast, in flights of four, with 35 yards between aircraft and 100 yards between flights. Although the A-36 proved extremely effective as a fighter-bomber, it was ineffective as a bomber escort because its performance drastically decreased above 8,000 feet. P-40s were effective as bombers; but from lower altitudes while attacking with the sun behind them. In addition to being responsible for all tactical air operations in-theater, NATAF was also assigned the Troop Carrier command for Husky airborne operations.

### **Airborne Operations**

The first major Allied airborne operation of the war was executed during Husky. The operation, to be carried out by the Northwest African Air Force Troop Carrier Command, consisted of more than 350 aircraft, 130 gliders,

and 4,000 troops. The 51st Wing provided lift for the British 1st Airborne Division, while the 52d Wing carried the US 82d Airborne Division.<sup>60</sup> On the evening of D-1, British forces flying in gliders were to land in the vicinity of Syracuse and secure the valuable bridges over the canal. The 82d would parachute near Gela and secure the high ground and road junctions in support of the landing of the US 1st Infantry Division.<sup>61</sup> Inexperienced crews, lack of combined training, complicated flight plans, radio silence, poor navigation, moon period, and strong winds contributed to the disastrous results during the insertion of the paratroopers.

Only 12 of the 133 gliders assigned to the British assault force landed in the correct zone; 47 landed in the sea, and the remaining were scattered over southeastern Sicily. The 82d Airborne experience mirrored that of the glider operation, and most of the 2,781 paratroopers were widely dispersed over the intended Gela drop zones.<sup>62</sup> B-17s specially equipped with *obstructive devices* flew over Sicily during the airborne operations to negate the effects of enemy direction finders. Diversionary bombardment was carried out with incendiaries, but the smoke from the bombardment obstructed the pilot's vision.<sup>63</sup> On the evening of 11 July a subsequent airborne operation was conducted to reinforce the paratroopers already on the ground from the 82d. This operation, named Husky No. 2, consisted of 2,000 paratroopers and 144 C-47s of the 52d Troop Carrier Wing.<sup>64</sup> The designated drop zone was the Gela-Farello airport, and unbeknown to the Allied planners, it had recently been occupied by enemy forces. Enemy shore batteries provided lethal fire against the approaching aircraft, causing them to take evasive action that scattered the paratroopers throughout the area. Additionally, the assault force received friendly fire from the invasion and merchant fleets that were recently attacked by enemy aircraft as they approached Sicily. The friendly fire brought down 25 C-47s.<sup>65</sup> The failure of Husky No. 2 was due in large part to the last-minute decision to execute the operation and utilizing a flight path taking the aircraft directly over Allied shipping.

The decision to launch was not made until the day of execution, leaving inadequate time to fine-tune the plan and coordinate with the naval vessels along the flight path.<sup>66</sup> Recognition signals used by the pilots were not recognized by the sailors, ensuring intense anti-aircraft fire from the sailors. According to one pilot, "but no amount of recognition signals had the least effect on their fire. . . . As rapidly as they passed over one vessel, the next took up the fire, and so it continued some 20 miles out to sea."<sup>67</sup> On 23 July Eisenhower ordered a review of the Sicilian airborne operations. The training memorandum produced from this review stipulated, among other issues, that any decision to execute airborne operations "must be made in time to permit notification to all air, ground, and naval forces, including naval craft and merchant ships. Although, of course, the minimum time of advance notice would vary according to the size and nature of the operation contemplated, in large scale airborne operations over friendly ground and naval forces, a minimum of 12 hours was considered a good rule."<sup>68</sup>

The Husky airborne operations revealed to the commanders that specific training and C2 procedures must be established if future operations were to achieve success.

### **The D-day Assault**

Allied assault forces encountered minimal enemy resistance on D-day. By 0600 on 10 July all landings were complete and the infantry began advancing inland. Air planners could not provide enough fighter aircraft for continuous coverage over the assault beaches because of operational conditions on the Pantelleria and Malta airfields; the short operational time over the beaches due to the flying time from Maltese and Pantelleria airfields to Sicily; and the large number of fighters assigned to bomber escort.<sup>69</sup> Air and ground commanders agreed that fighters would provide continuous cover over two of the landing beaches during daylight; all landing areas would have continuous coverage from 0600–0800, 1030–1230, 1600–1730, and for the last hour and a half of daylight; and a reserve wing would be ready to provide support as required.<sup>70</sup> Enemy air attacks on D-day were limited to approximately 100 sorties, compared to the 1,092 Allied sorties flown. The enemy sorties met with limited success, sinking 12 Allied ships by the evening of the 10th at a cost of 15 aircraft destroyed and 11 damaged (fig. 4).<sup>71</sup> A torpedo from an Italian airplane damaged the British carrier *Indomitable* on D+6.<sup>72</sup>

Although the presence of enemy aircraft over the beaches and shipping was minimal, the Navy argued that tactical air support for the amphibious assault was inadequate, citing that only 10 aircraft, on average, were over the beaches and often there were none. They also complained about the limited number of aircraft available which prevented the air force from providing patrols at more than one altitude.<sup>73</sup> Airmen of the NAAF pointed out to the Navy that because many aircraft had been fired upon by naval and merchant vessels, combat air patrols were moved from 5,500–8,000 feet to 10,000–14,000 feet. It was difficult for the air force to cover the beaches, landing craft, and ships simultaneously because many ships were anchored as far as six miles from the beaches.<sup>74</sup>

To control the large number of sorties flown by the strategic and tactical air forces, Fighter Control Centers were established aboard ships, and Air Support Parties ashore were used for the first time in Husky.<sup>75</sup> The XII ASC (advance) with its fighter control was aboard the USS *Monrovia*. All requests for P-40 and A-36 aircraft had to go through the *Monrovia* to the XII ASC (rear) at Cape Bon Peninsula. Requests for light and medium bombers from XII ASC had to be passed to NATAF.<sup>76</sup> This cumbersome system for requesting tactical air (TAC), combined with the distance from the Malta and Pantelleria airfields, caused a delay of planes on station by several hours.

The fighter control operators were inexperienced and were handicapped by inadequate communications equipment. Once ashore, the Air Support



**Figure 4. Air attack on Allied ammunition ship, USS *Rowan*, off Gela Beach** (Reprinted from US Army Center of Military History, Carlisle Barracks, PA)

Parties proved ineffective, as their communication gear was substandard, and the mountainous terrain masked their radars. The SCR 299, the standard radar used by the Air Support Parties, was easily damaged and unreliable. This radar was replaced with the more reliable SCR 195 mounted in a jeep or half-track.<sup>77</sup> The SCR 522 was also found to be “unsuitable for use in controlling aircraft due to its difficulty of maintenance, lack of power, and unreliability of performance.”<sup>78</sup> A modified version of the SCR 522, mounted on a jeep, employed a rectifier and proved reliable.<sup>79</sup> Air Support Parties quickly realized that proper waterproofing was essential for all communications gear, as the corrosive action of salt water rendered many radios and radars inoperable.

Due to bad communication and the fact that all fighter and fighter-bomber assets were directed towards convoy patrols and protection of the beaches, no CAS sorties were executed on D-day or D+1. Ground Control Intercepts mounted on landing ships tank (LST) to aid in the control of night fighters proved most effective. On D-day the enemy attempted 89 raids on the assault area; 26 were intercepted and diverted prior to reaching the beaches and the remainder engaged by fighters covering the beaches.<sup>80</sup> The strategic and tactical air forces delivered a punishing blow to the defending forces on D-day, but the mission of CAS suffered and was severely criticized by the ground commanders. However, according to Eisenhower, “it was agreed among the planners of all services that the primary role of our forces in all phases of the attack was to neutralize the enemy air force and to provide maximum security for the shipping and assault beaches against enemy air attack, and that until that mission had been definitely accomplished, the scale of air effort available for the direct support of naval and military operations was certain to be strictly limited.”<sup>81</sup>

Air superiority was obtained through the unrelenting punishment of the enemy airfields, causing the enemy to abandon most of the Sicilian airfields and withdraw to Italy, leaving behind 125 fighters to operate from Sicily. Although enemy aircraft from Italy participated in the defense of the island, their time on station was significantly reduced due to the distance from the southern Italian airfields to Sicily. This minimized the enemy threat to the invasion force and strengthened the airman’s argument for making the destruction of the enemy air force a first priority. The conduct of airborne operations was a fiasco during the insertion phase, revealing the need for extensive training, coordination with all units, and less complex flight plans to ensure future successes and avoid fratricide. Coordination between ground and air commanders improved, but tension still existed. Ground commanders still desired partial control of tactical aviation supporting their units, although few could deny the success of the Husky air plan. A more efficient tactical-air-request system was needed to process requests for CAS faster, resulting in planes over the target in minutes vice hours. Husky was a strategic success, contributing to the resignation of Italian dictator Benito Mussolini on 25 July 1943, and the



signing of the armistice by the Italians on 3 September 1943.<sup>82</sup> The path for the invasion of Italy was now open.

#### Notes

1. Garland and Smyth, *Sicily and the Surrender of Italy*, 1 and 10.
2. Wilt, *Allied Cooperation in Sicily*, 199. The US Seventh Army was commanded by Lt Gen George S. Patton, and the British Eighth Army was commanded by Gen Bernard Montgomery.
3. *Ibid.*
4. Sunderman, *World War II in the Air*, 141; and Wilt, *Allied Cooperation in Sicily*, 199. The Luftwaffe had aircraft strategically positioned at 31 different airfields on Sicily.
5. Wilt, *Allied Cooperation in Sicily*, 200.
6. Garland and Smyth, *Sicily and the Surrender of Italy*, 6.
7. *Ibid.*, 6–7.
8. Coles, *Participation of the Ninth and Twelfth Air Forces*, 1.
9. Garland and Smyth, *Sicily and the Surrender of Italy*, 1.
10. Coles, *Participation of the Ninth and Twelfth Air Forces*, 1.
11. *Ibid.*, 2.
12. *Ibid.*
13. Garland and Smyth, *Sicily and the Surrender of Italy*, 1.
14. *Ibid.*, 54. Eisenhower's deputy commander in chief (CIC) and CIC of ground forces was General Alexander, CIC of naval forces was Admiral Cunningham, and CIC of air forces was Air Chief Marshal Tedder.
15. Coles, *Participation of the Ninth and Twelfth Air Forces*, 3. The document produced by Force 141 was referred to as the "Tactical Appreciation."
16. *Ibid.*, 4.
17. *Ibid.*, 4–5.
18. *Ibid.*, 6.
19. *Ibid.*, 10.
20. Coles, *Participation of the Ninth and Twelfth Air Forces*, 11.
21. *Ibid.*, 12.
22. Ehrhart, Fabyanic, and Futrell, *Building an Air Intelligence Organization*, 161.
23. *Ibid.*
24. *Ibid.*, 162.
25. *Ibid.*, 164.
26. *Ibid.*
27. HRA Call no. 555.6314-1, German Air Force Organization 1942–1943.
28. HRA Call no. 650.01-2, v. 6, Twelfth Air Force in the Sicilian Campaign, 1.
29. HRA Call no. 626.430-10, 9.
30. HRA Call no. 650.01-2 v. 6, Twelfth Air Force in the Sicilian Campaign, 1.
31. Craven and Cate, *Torch to Pointblank, August 1942 to December 1943*, 444.
32. Coles, *Participation of the Ninth and Twelfth Air Forces*, 17.
33. HRA Call no. 650.01-2 v. 6, 23.
34. HRA Call no. 168.6007-1, 58.
35. HRA Call no. 650.01-2 v. 6, 23.
36. *Ibid.*, 25.
37. Craven and Cate, *Torch to Pointblank, August 1942 to December 1943*, 445.
38. HRA Call no. 650.01-2 v. 6, 3.
39. *Ibid.*
40. *Ibid.*, 6.
41. *Ibid.*, 7.
42. *Ibid.*

43. Craven and Cate, *Torch to Pointblank, August 1942 to December 1943*, 426.
44. HRA Call no. 650.01-2 v. 6, 8.
45. Craven and Cate, *Torch to Pointblank, August 1942 to December 1943*, 427.
46. *Ibid.*, 428.
47. *Ibid.*, 430.
48. HRA Call no. 650.01-2 v. 6, 13.
49. *Ibid.*
50. *Ibid.*
51. Craven and Cate, *Torch to Pointblank, August 1942 to December 1943*, 431.
52. HRA Call no. 626.430-10, 10.
53. Molony, *History of the Second World War*, vol. 5, 34.
54. HRA Call no. 626.430-10, 11.
55. <http://www.naval-history.net/WW2CampaignsSicilySalerno.htm>., Sicily, Salerno, and Anzio Landings 1943–1944.
56. Coles, *Participation of the Ninth and Twelfth Air Forces*, 99.
57. *Ibid.*, 100.
58. HRA Call no. 650.01-2 v. 6, Operations Bulletin no. 5, Headquarters Northwest African Air Forces, A-3 sec., 16.
59. *Ibid.*, 12.
60. *Ibid.*, 79.
61. *Ibid.*, 80. The British operation was named Operation Ladbroke, and the US operation was named Operation Husky, 1.
62. *Ibid.*, 87.
63. *Ibid.*
64. *Ibid.*, 88.
65. *Ibid.*, 89; and Coles, *Participation of the Ninth and Twelfth Air Forces*, 95.
66. Coles, *Participation of the Ninth and Twelfth Air Forces*, 88.
67. *Ibid.*, 89.
68. *Ibid.*, 97.
69. *Ibid.*, 102.
70. HRA Call no. 650.01-2 v. 6, 34.
71. *Ibid.* The Navy had planned to lose up to 300 ships.
72. <http://www.naval-history.net/WW2CampaignsSicilySalerno.htm>., Sicily, Salerno, and Anzio Landings 1943–1944.
73. Craven and Cate, *Torch to Pointblank August 1942 to December 1943*, 451.
74. *Ibid.*
75. Wilt, *Allied Cooperation in Sicily*, 199.
76. Coles, *Participation of the Ninth and Twelfth Air Forces*, 103.
77. HRA Call no. 612.430D-2, 60.
78. *Ibid.*, 61.
79. *Ibid.*
80. *Ibid.*, 106.
81. Coles, *Participation of the Ninth and Twelfth Air Forces*, Eisenhower Report, 177.
82. Craven and Cate, *Torch to Pointblank August 1942 to December 1943*, 486.



## Chapter 4

### **Operation Avalanche and the Invasion of Italy**

*I have just returned from an extensive tour of the Fifth Army front during which I talked with the Army and many subordinate commanders, their staffs and other ranks. General Clark has asked me to convey to you and to the officers and men of the North West African Air Force whom you command, the sincere thanks and appreciation of Fifth Army for the magnificent air support which has been given them. It has greatly heartened the ground forces and has contributed much to the success of their operations. All were enthusiastic in their acclaim of the close and continuous support which has been given them by the Air Force.*

—Gen Sir H. R. Alexander

The success of Husky opened the door for the Allies to invade Italy and caused Germany to shift forces from Western Europe and Russia to defend against the Allied offensive in the Mediterranean. With the collapse of the Vichy French in North Africa and the surrender of Italy, Germany was compelled to fight the war alone on multiple fronts with decreasing resources. On 9 September 1943 a combined British and American Task Force, commanded by Lt Gen Mark Clark, conducted an amphibious assault, landing south of Naples, Italy, on the beaches of Salerno Bay. Operation Avalanche allowed the Allies to maintain the momentum gained in Sicily by securing valuable airfields that would be used to support future operations in southern France, Austria, and the Balkans. The operation forced Germany to move forces from the eastern front to Italy and provided a shorter sea-supply route to the Soviet Union.<sup>1</sup> The soft underbelly of Germany was exposed.

The Airmen of the Twelfth Air Force played a critical role in the pre-assault bombardment, convoy protection, interdiction, and coverage of the assault beaches on D-day. Airmen continued to maintain centralized control of air assets, and destruction of the enemy air force was the first priority of the air forces. Maj Gen Edwin House, commander of the XII ASC, was responsible for the overall air cover of the assault area on D-day and served as the “on the spot air coordinator.”<sup>2</sup> He alone directed the employment of the tactical air force. House was not subordinated to a ground commander and as an independent commander, maintained equality with Clark. Air support to ground and naval forces remained a problem during Avalanche on D-day primarily due to the distance (over 150 miles) from the Sicilian airfields to Salerno.<sup>3</sup> Air and ground coordination, still problematic, con-

tinued to improve throughout *Avalanche*, embracing lessons learned from *Torch* and *Husky*. Refining tactical procedures and improving C2 led to more effective and timely air support.

### **Allied Strategy in the Mediterranean**

Germany was facing a dilemma as to how it should adjust its forces in face of the Allied threat to Italy, while British and American strategic planners had difficulty seeing eye to eye as to the future of Allied strategy in the Mediterranean. During the Casablanca Conference in January 1943, there was no mention of Allied plans for subsequent operations after Operation *Husky* against the Italian mainland. Allied planners believed that the success of *Husky* and continued heavy bombardment of mainland Italy might cause Italy to collapse. Many advocated planning one operation at a time based on the fluid political and military situation. Until a date could be agreed upon for a cross-channel invasion, further operations in Italy could not be planned.<sup>4</sup> Thus, Allied planners were unable to reach a consensus for a strategy in the Mediterranean at the Casablanca Conference. The only decision agreed upon, beyond *Husky*, was to execute air operations against the Italian mainland beginning in March 1943.<sup>5</sup>

General Eisenhower directed his planners to develop courses of action based on the assumption that *Husky* would not cause the collapse of Italy. They presented three options to him on 7 May and included operations in southern France, the Balkans, and a campaign on the Italian mainland.<sup>6</sup> These options were presented to Roosevelt and Churchill at the Trident Conference in Washington, DC, on 12 May 1943, where post-*Husky* operations were discussed. Churchill was adamantly in favor of attacking Italy in order to force an Italian surrender and compel Turkey to grant Allied access to Turkish airfields for raids against Ploesti, Romania (oil refineries), and the Aegean Sea area. In addition, an Italian invasion would cause Germany to either move forces from the eastern front to Italy or give up their control of the Balkans. It would also neutralize the formidable Italian navy and strike a blow against German morale.<sup>7</sup> Churchill insisted that the defeat of Italy would contribute directly to the defeat of Germany. Roosevelt, on the other hand, believed that any further operations in the Mediterranean would severely deplete assets that would be needed for the cross-channel invasion and distract from the air offensive against Germany.<sup>8</sup> Unable to agree on terms for a future strategy in the Mediterranean, the two leaders placed the burden of planning on the combined chiefs of staff.

On 14 May General Eisenhower and Adm Sir Andrew Cunningham presented the CCS two courses of action for operations after *Husky*: first, a direct assault upon the Italian mainland to secure Naples and second, the capture of Sardinia and Corsica.<sup>9</sup> Eisenhower and Cunningham recommended that until an accurate assessment of Italian morale could be made, it would be better to capture Sardinia and Corsica rather than at-

tempt an assault on Italy. Air Marshal Tedder disagreed with their assessment and argued that the value of the airfields on Italy would enhance the MAC's ability to conduct long-range bombing raids and that the airfields on Sardinia would be defensive in nature.<sup>10</sup> Roosevelt and Churchill met six times during the Trident Conference, but could not agree upon a final strategy for the Mediterranean theater. However, they decided "that General Eisenhower was to be instructed to mount such post-Husky operations as he felt would be best calculated to knock Italy out of the war and at the same time pin down the largest number of German forces and that a final decision as to the exact operation or operations to be undertaken would be made by the CCS."<sup>11</sup>

On 29 May Prime Minister Churchill, General Marshall, General Eisenhower, Sir Alan Brooke, General Alexander, and Air Marshal Tedder met in North Africa for the Algiers Conference. Again, little was accomplished during this conference, as both sides failed to yield on their beliefs about the strategy in the Mediterranean theater after Husky. The frustrations of coalition warfare were impeding the planning process. On 28 June Eisenhower informed the CCS that should Husky not cause the collapse of Italy, he would assault either the Italian mainland at the heel or toe of Italy or assault Sardinia.<sup>12</sup> This was a breakthrough in the development of Allied strategy after Husky, as the CCS accepted Eisenhower's proposals but directed him to focus all planning efforts towards Italy and discontinue planning for operations against Sardinia.

While Eisenhower's staff developed plans for the invasion of Italy, the NAAF planners, along with army and navy representatives, began developing air plans for no less than five separate amphibious operations against Italy.<sup>13</sup> On 24 July Eisenhower's staff presented a plan directing an amphibious assault along the Salerno plain south of Naples. An assault on Salerno put the Allies in close proximity to Rome—the primary objective; threatened the rear area of German forces in Calabria; and cut German communications on the west coast. Among other advantages it gave the Allies access to airfields that would support the conduct of future operations in Italy, central Europe, and Ploesti.<sup>14</sup> On 26 July the CCS directed Eisenhower to continue further development of the assault on Salerno "with the object of expediting the elimination of Italy from the war."<sup>15</sup> After six months of continual debate, the Allies finally reached an agreement for post-Husky operations and the detailed planning for the invasion of Italy, Operation Avalanche, began in earnest.

### **Planning for Operation Avalanche**

On 19 August 1943 General Eisenhower made his final decision for the invasion of Italy and presented his plan to Roosevelt, Churchill, and the CCS at the Quadrant Conference in Quebec. Operation Baytown would precede Avalanche. Operation Baytown would be launched across the Strait of Messina to the toe of Italy, in an effort to tie down as many German

troops as possible and divert their attention from the main assault force landing at Salerno Bay.<sup>16</sup> The Baytown assault force consisted of a British and Canadian infantry division. The assault force was commanded by General Montgomery and received air support from the Desert Air Force. On D-day, 3 September, the British division would land at Gallico and Catona, while the Canadians landed at Reggio. The objective of the assault force was to capture the airfields at the tip of the Italian mainland, then advance to the north for an eventual linkup with the Avalanche assault force.<sup>17</sup>

Lt Gen Mark Clark, commander of the US Fifth Army, led the Avalanche assault force, consisting of two corps: the US VI Corps, commanded by Maj Gen Ernest Dawley, and the British 10th Corps, commanded by Lt Gen Sir Richard McCreery. D-day was set for 9 September, and the immediate objectives of the assault force were to seize Salerno, and the Monte Corvino airfield; capture the port city of Naples and surrounding airfields; and linkup with the Baytown assault forces (fig. 5).<sup>18</sup> A floating reserve was established, consisting of the US 45th Division (known as Force I) and a regimental combat team of the 82d Airborne Division, referred to as Force II. This reserve force was prepared to reinforce the Fifth Army on D-day, as required.<sup>19</sup> The assault force, to include follow-on forces, exceeded 125,000

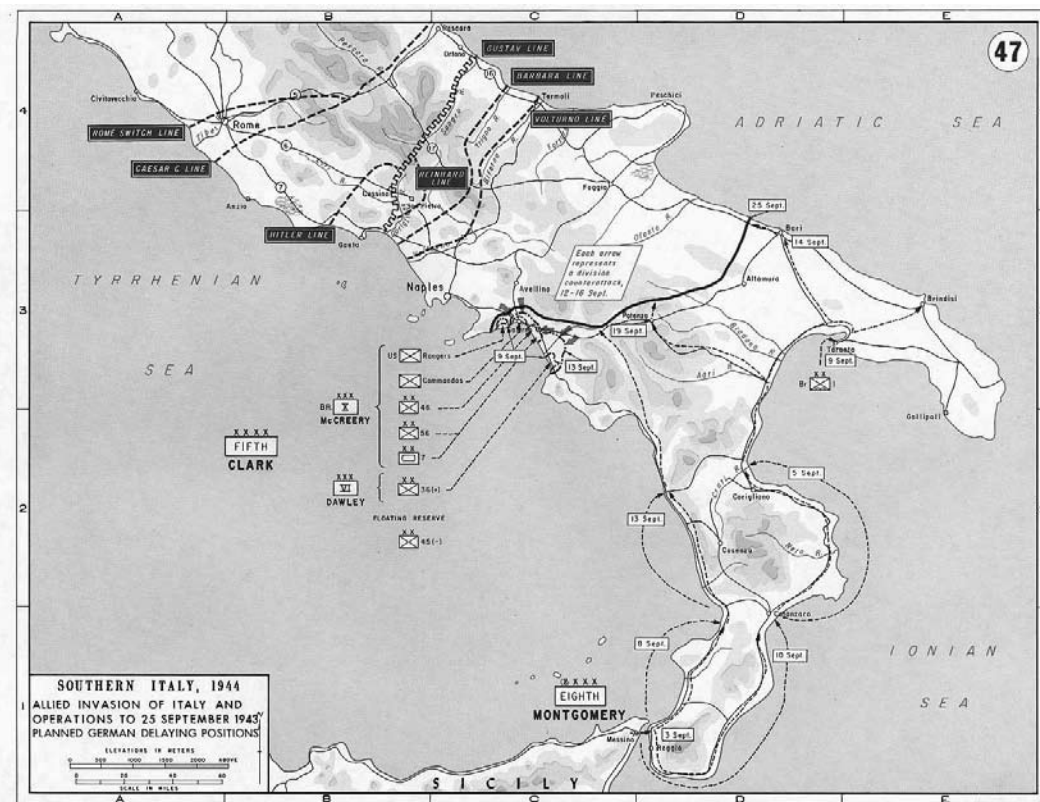


Figure 5. Allied invasion of Salerno (Reprinted from US Army Center of Military History Carlisle Barracks, PA)

troops opposing approximately 39,000 enemy troops. Due to the proximity of the toe of Italy to Sicily, the Baytown assault force enjoyed substantial air support from Sicilian airfields. However, the distance from Salerno to Sicily severely limited aircraft time on station over the Avalanche landing beaches and convoys. Carrier-based aircraft provided a partial solution to this problem. The Support Carrier Force, consisting of four British escort carriers, one light carrier, and 110 Seafire aircraft, provided air support until 12 September. Two British fleet carriers assigned to the Covering Force provided combat air patrols for the Support Carrier Force.<sup>20</sup>

### **Air Plan for Operation Avalanche**

The air plan for Avalanche consisted of pre-invasion operations, D-day operations, and operations subsequent to D-day. Air Marshal Tedder assigned General Spaatz and NAAF the responsibility of developing the air plan. The principal tasks of the air forces were to neutralize the enemy air forces; provide air protection over the landing beaches, assault convoys, and subsequent operations ashore; prevent or interdict movement of enemy forces into the assault area; provide close or direct air support; and provide air protection to the Baytown assault force.<sup>21</sup> NAAF planners estimated that the Luftwaffe had approximately 380 fighters and fighter-bombers and 270 bombers in the immediate vicinity to defend against the invasion, with an additional 60 fighters and 120 bombers coming from Sardinia.<sup>22</sup> The Italian air force consisted of approximately 365 dayfighters and 275 bombers. The NAAF had over 1,700 aircraft, composed of 346 heavy bombers, 388 medium day bombers, 122 medium night bombers, 140 light bombers, 528 fighters, 160 fighter-bombers, and 32 night-fighters. Aircraft supporting Avalanche came from British units based at Malta, the Middle East, and the XII ASC.<sup>23</sup> An additional 12 British Barracudas, 12 Albacores, and 56 Martlets, operating from the two British fleet carriers, were available to support the invasion. Those units assigned to NATAF, besides the XII ASC, supported the Baytown operation.

General House was designated as the commander for all tactical aviation from NATAF for Avalanche and was not tasked with supporting operations until D-day. Air coverage for the convoys up to D-day was provided by the NACAF, but House was directed to make available on D-1 72 two-hour P-38 sorties and six one-hour sorties for convoy protection, if needed. On D-day House assumed responsibility for all convoys from the shore to 40 miles out to sea. The mission of the XII ACS was to destroy enemy air strength in aerial combat, bomb Axis airfields, and disrupt enemy communications throughout Italy to prevent enemy reinforcements from reaching the assault area. Increased night attacks were ordered to destroy enemy equipment and defense installations, provide fighter cover over the assault convoy and assault areas, and provide direct support to the ground forces.<sup>24</sup> Night operations by Allied airmen proved vital throughout Avalanche. General House would exercise control over a coalition air force of three groups



of US P-38s, two groups of A-36s, seven squadrons of P-51s, one group of US Spitfires, four squadrons of British Beaufighters for night operations, and 18 squadrons of RAF Spitfires.<sup>25</sup>

During May bombers from NASAF intensified their efforts against targets in Italy, striking enemy airfields, marshalling yards, harbors, supply lines, shipping, and other facilities and reducing the Axis ability to reinforce troops in Sicily. During the last 20 days of June, NASAF's B-17s flew over 300 sorties, and medium bombers flew 566 sorties.<sup>26</sup> In July bombers from the Twelfth and Ninth air forces flew an excess of 3,000 sorties in 45 major attacks directed against airfields and marshalling yards.<sup>27</sup> The final phase of the preassault bombing campaign began on 18 August and continued until 2 September. During this period B-17s flew over 1,000 sorties and medium bombers flew close to 2,000.<sup>28</sup> The largest attack was directed against Foggia on 19 August. Doolittle assigned 162 B-17s and 71 B-24s to the mission, dropping over 600 tons of bombs and devastating lines of communication, factory buildings, and electrical substations.<sup>29</sup> The second largest attack was conducted on 31 August against Pisa. One hundred fifty two B-17s dropped 452 tons of bombs, causing widespread destruction to marshalling yards and industrial targets.<sup>30</sup> Doolittle's bombers maintained a concentrated effort until D-day of Avalanche. NASAF airmen flew over 7,000 sorties and dropped in excess of 10,000 tons of bombs during the preparatory period.<sup>31</sup> The NAAF preparatory air campaign contributed significantly to reducing enemy air strength and breaking the morale of the Italians aiding in the surrender of Italy on 8 September 1943 (fig. 6).<sup>32</sup>

### **Operation Avalanche and the Invasion of Italy**

D-day for Operation Avalanche was 9 September 1943. The enemy air effort was ineffectual, thanks to the effectiveness of the pre-invasion missions conducted by the NAAF. With the loss of Italian aircraft, German air planners only executed five raids, consisting of eight fighter-bombers over the assault beaches on the morning of D-day and a similar number in the afternoon and early evening.<sup>33</sup> The Luftwaffe used a new weapon, radio-controlled glide bombs, against Allied targets. The Fritz X (PC 1400 FX) was a 3,000-pound, armor-piercing radio-controlled bomb used for hitting warships. The Henschel 293 (Hs 293) was a rocket propelled, radio-controlled glide bomb with a 660-pound explosive warhead for use against merchant ships and transports.<sup>34</sup> Glide bombs were guided visually by radio from an observer flying at a high altitude of 20,000–23,000 feet.<sup>35</sup> Allied commanders had little information on glide bombs and had not yet developed tactics to defend against their employment.<sup>36</sup> One problem defending against the glide bomb was that jamming of the bomb's radio frequency was difficult due to the short time the bomb was controlled, and the frequency could not be detected until the enemy observer exercised control over the bomb.<sup>37</sup>



**Figure 6. B-25s over Italy** (Reprinted from US Army Center of Military History, Carlisle Barracks, PA)

General House's primary mission on D-day was to maintain continuous air cover over the assault beaches. Due to the long distance between Salerno and the Sicilian airfields, this proved to be a difficult but not impossible task. House had all the Spitfires carry their 90-gallon external fuel tanks to give them approximately 30 minutes' time-on-station over the assault beaches. The bulk of the air coverage came from the P-38 squadrons, and House assigned these squadrons two sorties per day, per aircraft, providing one hour of coverage each over the assault area.<sup>38</sup> The British carrier-based Seafires operating from the HMS *Unicorn*, *Battler*, *Attacker*, *Hunter*, and *Stalker* were used to augment the aircraft operating from Sicilian airfields and conducted 713 sorties during the first four days of *Avalanche*.<sup>39</sup> The Seafires were able to remain on station for longer periods, due to their close proximity to the beachhead. Their turn-around time for refueling was also reduced, as they didn't have to cover the flight distance of land-based aircraft. The Seafire pilots flew aggressively in the face of enemy ground fire, and only 26 of 110 Seafires were operational when the British carriers moved off station. These 26 aircraft flew to an airfield on the US beachhead and continued flying air patrols.<sup>40</sup> British aircraft from the HMS *Illustrious* and *Formidable* augmented combat air patrols flown by the Coastal Air Force over the invasion fleet.<sup>41</sup>

To prevent enemy air penetration of the assault beaches and convoys, the XII ASC provided three different layers of coverage. General House ordered high cover to be provided by Spitfires from 16,000 to 20,000 feet, medium cover by P-38s and Seafires from 10,000 to 14,000 feet, and low cover by P-51s from 5,000 to 7,000 feet.<sup>42</sup> Using this plan, House was able to ensure continuous air coverage over the assault area using an average of 36 land-based aircraft. The additional 110 carrier-based Seafires increased the total aircraft over the beaches to 58 during daylight hours on D-day. House used a specially trained group of P-38 pilots to ensure the first hour prior to dawn and last hour after dusk would be covered.<sup>43</sup> The pilots were trained to fly during periods of limited visibility and were able to take off prior to sunrise and land after sunset. Beginning at dusk on 8 September to dusk on 9 September Allied airmen flew over 2,000 sorties in support of Operation Avalanche.

Convoy protection was essential to the success of Avalanche. The Allies had over 600 vessels, organized into 16 convoys, sailing from six ports at different times from D-6 to D-1.<sup>44</sup> The Luftwaffe conducted its first raid on D-2 at approximately 2230, using several torpedo bombers. The attacking aircraft made four passes without damaging a vessel.<sup>45</sup> The next attack on D-1 was conducted by 22 aircraft, using both conventional and guided rocket bombs. The Luftwaffe first used guided rocket bombs on 3 September 1943. The Allies, although familiar with German precision-guided munitions, had yet to develop countermeasures.

One landing craft infantry (LCI) was severely damaged, and one British LCT was sunk at a cost of one German airplane.<sup>46</sup> Repeated attacks from 2000 until 2400 on D-1 yielded limited German success. The Northern Attack Force was attacked several times by torpedo bombers, scoring one direct hit to an LST, but the bomb failed to explode.<sup>47</sup> Naval antiaircraft fire destroyed five of six Ju-88s. One LST in the southern convoy was sunk, at a cost of five enemy aircraft.<sup>48</sup> On D-day, NATAF airmen flew over 900 sorties, providing protection to the convoys and the beaches. The effectiveness of the fighter protection on D-day is evident; only one ship sunk and one LST damaged.<sup>49</sup> The Luftwaffe continued raiding the convoys throughout the campaign and on D+2 the USS *Savannah* was severely damaged by a direct hit from a radio-controlled guide bomb that killed over 200 of her crew.<sup>50</sup> A guided bomb also hit the British cruiser *Uganda*. The British battleship *Warspite* was hit on D+7 by several guided bombs and received extensive damage.<sup>51</sup>

General House established a fighter-direction center aboard the USS *Ancon*, allowing him to maintain continuous liaison with the naval air planners in coordinating efforts of both land-based and carrier-based aviation. To improve coordination between the XII ACS and the navy, three naval officers were assigned to General House. One of these officers trained P-51 pilots in naval gunfire-observation techniques, while the other two processed requests for carrier aviation and spotting planes. Once aircraft from Sicily were able to use captured airfields in Italy, House moved his head-

quarters ashore and collocated it with Clark and the Fifth Army, permitting the ground and air commander to maintain continuous coordination.<sup>52</sup> General House and Clark ensured that air officers were provided down to the corps and division level, increasing cooperation and significantly improving the responsiveness of air requests from over two hours to an hour from time of request, a significant improvement from Husky. The success achieved by positioning Ground Control Intercepts aboard an LST for control of night-fighters in Husky was repeated in Avalanche. However, the control of aircraft ashore still remained a problem primarily due to the mountainous terrain and technical difficulties in maintaining plots. To alleviate this problem, the fighter-control unit aboard the *Ancon* was on standby to assist as necessary.<sup>53</sup>

Communication difficulties continued to plague the processing of air requests from the ground forces. Requests for CAS from Air Support Parties with the VI Corps or forward British brigades of the 10th Corps were to go through the XII ACS headquarters, either afloat or ashore, and then were passed for action to the XII ACS Headquarters (rear) in Sicily. The mountainous terrain hampered the communication of the Air Support Parties ashore and prevented the transmission of numerous air requests. XII ACS requests to Sicily were also difficult to transmit.<sup>54</sup> Communicators fought a constant battle, repairing landlines cut by enemy artillery and mortar rounds. To minimize the problems posed by the communication systems, the British 10th Corps sent their CAS requests directly to the 64th Fighter Wing of the XII ACS, who then briefed fighter-bombers—already airborne—on the targets to be engaged. Due to the continuous presence of aircraft over the assault areas, this procedure allowed for air support to reach the target in 10 to 30 minutes.<sup>55</sup> This led to the development of an easily understood procedure for briefing pilots in the air, similar to the modern Nine Line Brief.<sup>56</sup> Fighter-bombers immediately began flying defensive combat air patrols after attacking their designated targets.

The use of forward air controllers (FAC) was another innovative technique employed during Operation Avalanche. FACs were first employed in the Mediterranean by the British Desert Air Force in North Africa but not by the AAF until operations in Salerno. This type of C2 was referred to as “Rover Joe” by the United States and “Rover David” or “Rover Paddy” by the British.<sup>57</sup> The FAC team, usually consisting of a combat-experienced pilot and one army officer, positioned itself overlooking the frontline positions. Infantrymen encountering resistance requiring air support radioed the “rover” unit, who in turn passed the request to the fighter control center. If the request was approved, the rover unit contacted designated aircraft on station and directed them to the target.<sup>58</sup> This approach proved very effective but did not become standard until late 1943.

The use of prearranged tactical reconnaissance missions flown by British Spitfires and US P-51s became standard during Avalanche. General House assigned the British 225th Squadron to conduct reconnaissance operations over the southern sector in support of the 10th Corps, while the US

111th Squadron supported the VI Corps in the northern sector.<sup>59</sup> The decision to conduct prearranged missions was due to the requests for reconnaissance from the ground commanders. Requests for reconnaissance were overwhelming the system, making it nearly impossible to assign an aircraft for each request, as each squadron provided approximately six missions a day, using two aircraft per mission. The information collected was disseminated to the ground units through a tactical-reconnaissance broadcast system from the airfield used by each squadron.<sup>60</sup> The 111th Squadron also utilized P-51 artillery spotters, at the request of the US Navy, and augmented missions flown by the Fifth Army's own Taylor Cub aircraft.<sup>61</sup> The technique developed—using two aircraft, one as a spotter, and one as a “weaver” providing cover—proved to be highly effective.<sup>62</sup>

Another significant improvement over Husky operations was the coordination with the navy for self-defense measures taken by the fleet. The fratricide experienced from naval antiaircraft fire continued to haunt airmen providing convoy protection. To reduce the chances of this during *Avalanche*, the army and navy planned against it in detail. They agreed that no friendly aircraft would fly below 6,000 feet over the convoys except when pursuing enemy aircraft. Naval antiaircraft fire was cleared to engage all hostile aircraft, regardless of altitude, within their assigned kill box. Aircraft not positively identified as hostile were not engaged above 3,000 feet unless a hostile act was observed.<sup>63</sup>

D-day operations during *Avalanche* were successful and the ground forces, encountering heavier-than-expected German resistance, established a beachhead and began advancing inland to assigned objectives. NAAF airmen flew 1,649 sorties on D-day and dropped over 450 tons of bombs, while carrier aviation flew over 200 sorties.<sup>64</sup> The Luftwaffe, flying only 60–70 sorties, harassed the invasion force throughout the day but did not have a significant impact on Allied operations.<sup>65</sup> Reported losses for the Luftwaffe were 14 planes destroyed, three damaged in the air, and four aircraft destroyed on the ground.<sup>66</sup> The Germans counterattacked on 12 September with four Panzer divisions in an effort to cut the Allied line in half and push it back to the sea. On 13 September NAAF aircraft began a massive carpet-bombing effort, delivering over 1,300 tons of bombs on German forces.<sup>67</sup>

On 14 September, the Germans penetrated the Allied front and advanced to within 1,000 yards of the beach.<sup>68</sup> Tedder, recognizing the severity of the situation, directed all NAAF efforts to the Salerno fight.<sup>69</sup> During the counter-attack, the tactical air force concentrated its efforts on enemy troop concentrations, supply depots, motor-transport assets, and the areas surrounding the beachhead.<sup>70</sup> Roads, bridges, and railroads to the north were priority targets, vital to the German supply efforts. Destruction of the supply lines created traffic jams for German motor-transport columns, allowing the air force to inflict severe damage and lower German morale.<sup>71</sup> Col Rudolf Boehmler, commanding officer of the Fourth German Paratroop Regiment, commented on the effectiveness of the Allied air effort. “The de-

structive power of Allied air force carpet bombing was demonstrated. . . . The most decisive factor in holding the German counterattack was the destructive effect of the Allied air attacks."<sup>72</sup> The most intense fighting took place on the 14th and 15th, with NAAF airmen flying hundreds of missions, severely damaging the Panzer units and virtually destroying the 1st Battalion and the Third German Paratroop Regiment.<sup>73</sup> The 82d Airborne Division made three separate drops between 13 and 15 September to reinforce positions near Agropoli, Oglianto, Capaccio, and Albanella, Italy.<sup>74</sup> The German losses were so heavy that they were forced to pull back by 16 September, allowing Clark to go on the offensive.<sup>75</sup>

General House controlled air operations and directed air efforts to destroy enemy air forces and protect the assault areas and convoys. As in Sicily, the focus on gaining and maintaining air superiority, combined with convoy protection, meant aircraft for CAS of the infantry were not always available. Indeed, it was not until D+4 that daytime CAS bombing was feasible.<sup>76</sup> Fighters and fighter-bombers provided the most responsive CAS and could usually be over the target within 30 to 45 minutes of requests.<sup>77</sup> This was a significant improvement over Husky, where it often took one to two hours to process air requests. The ground forces anticipated that the bombers of the Tactical Bomber Force could be over the target in one and one-half hours; however, it usually took four to five hours upon request.<sup>78</sup>

Communication problems between the field commanders and the XII ACS headquarters continued to be a problem, especially when the headquarters moved to a new location. All communication gear was taken down to move, preventing communications with the infantry until the headquarters was reestablished. House developed a system of *leapfrogging* communications to maintain a rear detachment for processing air requests until the main headquarters settled into its new forward position.<sup>79</sup> Once the main headquarters established effective communication with the ground commanders, the rear headquarters moved forward.

Cooperation between ground, air, and naval commanders improved, but the navy still complained about inadequate air cover and the army complained about the lack of timeliness in processing air requests. At the tactical and operational levels, techniques were introduced that enhanced the effectiveness of air support and increased the level of confidence ground commanders had in airmen. The use of FACs made a significant improvement in the ability of ground commanders to direct aircraft onto enemy targets. However, control of aircraft ashore by Air Support Parties needed improvement. Problems with communication gear and radars continued to cause delays in processing air requests. Airfields close to the invasion area were critical to increasing aircraft time on station and improving the support for ground troops.<sup>80</sup> Target selection remained a controversial issue between ground and air leaders; each having an opinion on what constituted a priority target. A means to resolve target selection was needed to optimize mission planning.

The Allies established significant combat forces on the Italian mainland with Avalanche and continued to weaken the German war machine. The initial success of Avalanche soon turned into a stalemate, with the German defenders challenging the ability of air and ground commanders to coordinate operations to optimize the combined effects of available combat power.

#### Notes

1. Blumenson, *Salerno to Cassino*, 6.
2. *Ibid.*, 36.
3. Wilt, *Allied Cooperation in Sicily*, 202.
4. HRA Call no. 101-115, 7.
5. *Ibid.*, 10.
6. *Ibid.*, 16.
7. *Ibid.*, 17a.
8. *Ibid.*, 18.
9. *Ibid.*, 20.
10. *Ibid.*, 21.
11. *Ibid.*, 24.
12. *Ibid.*, 28. The assault on the Italian heel was referred to as Operation Musket, and the assaults on the toe were referred to as Operations Buttress and Goblet. The assault on Sardinia was referred to as Operation Brimstone.
13. *Ibid.*, 29.
14. *Ibid.*, 30.
15. *Ibid.*, 31.
16. Blumenson, *Salerno to Cassino*, 23–30.
17. *Ibid.*; and HRA Call no. 101-115, 49–53.
18. Blumenson, *Salerno to Cassino*; and HRA Call no. 612-430D-2, 1. The Sixth Corps was designated the Southern Task Force, and the 10th Corps was the Southern Task Force.
19. HRA Call no. 101-115.
20. Morison, *History of United States Naval Operations*, 393.
21. HRA Call no. 680.01, vol. 1, 53.
22. *Ibid.*, 2.
23. *Ibid.*
24. HRA Call no. 650.057-3, vol. 2, 1 and 3.
25. *Ibid.*, 4.
26. HRA Call no. 101-115, 62.
27. *Ibid.*, 62a.
28. *Ibid.*, 78.
29. *Ibid.*
30. *Ibid.*, 79.
31. *Ibid.*, 81.
32. Smith, *Bombing to Surrender*. Major Smith analyzes the Allied bombing campaign of Italy and the significant effect it had on Italian morale, contributing to the country's surrender.
33. Fifth Army History, 53.
34. Morison, *History of United States Naval Operations*, 283; and HRA Call no. 170.2278B, RAF technical note.
35. *Ibid.*
36. *Ibid.*
37. HRA Call no. 519.607A-1, 7.
38. HRA Call no. 101-115, 66.

39. Wilt, *Allied Cooperation in Sicily*, 202–3; and Morison, *History of United States Naval Operations*, 393.
40. Wilt, *Allied Cooperation in Sicily*, 203.
41. Morison, *History of United States Naval Operations*, 251.
42. Molony, *History of the Second World War*, 283.
43. *Ibid.*, and Molony, *History of the Second World War*, 271–72.
44. HRA Call no. 101-115, 107.
45. *Ibid.*, 108.
46. *Ibid.*
47. *Ibid.*, 109.
48. *Ibid.*
49. *Ibid.*, 115.
50. Molony, *History of the Second World War*, 283.
51. Campaign Summaries of World War II.
52. HRA Call no. 101-115, 68–69; and HRA Call no. 680.01, vol. 1, 53.
53. HRA Call no. 612.430D-2, 6–19.
54. *Ibid.*, 23.
55. *Ibid.*
56. *Ibid.*, 4. The Nine Line Brief is used by forward air controllers to direct pilots on to targets. It provides information on target location, target description, friendly forces location, and information pertaining to attack heading and egress direction.
57. Wilt, *Allied Cooperation in Sicily*, 208.
58. *Ibid.*, 209.
59. HRA Call no. 612.430D-2, 25.
60. *Ibid.*
61. *Ibid.*
62. *Ibid.*, 30.
63. HRA Call no. 650.057, v. 2.
64. HRA Call no. 101-115, 114 and 118.
65. *Ibid.*, 114.
66. *Ibid.*, 118.
67. Doc. K113.310.8, 1943–1945, Col Rudolf Boehmler, commanding officer, 4th German Paratroop Regiment, 21.
68. Russell and Johnson, *Africa to the Alps*, 13.
69. Doc. K113.310.8, 1943–1945, 22–23.
70. HRA Call no. 680.01, vol. 1, 53.
71. *Ibid.*; and Doc. K113.310.8, 1943–1945, 18–35.
72. Doc. K113.310.8, 1943–1945, 17.
73. *Ibid.*, 23–24.
74. Russell and Johnson, *Africa to the Alps*, 13; and HRA Call no. 612.430-D-2, para. 33.
75. *Ibid.*
76. *Ibid.*, 116.
77. HRA Call no. 612.430-D-2, 4.
78. *Ibid.*
79. *Ibid.*
80. Wilt, *Allied Cooperation in Sicily*, 202.





## Chapter 5

### **Operation Shingle and the Assault of Anzio**

*The Commanding General, VI Corps, was particularly pleased with the excellent cooperation given him in successful support of difficult operations in the ANZIO-NETUNNO beachhead area. The air forces put forth their maximum effort despite rather unfavorable weather, enthusiastically attacking their assigned targets at low altitudes nor withstanding exceptionally heavy enemy antiaircraft fire. We realize the extremely difficult nature of the precise dive-bombing which was accomplished in missions where targets were close to our own troops in a moving situation. I am informed that the fighter-bombers made three sorties in a day. Prisoners of war have confirmed that the continuous heavy bombardment from the air had a shattering effect upon enemy personnel and caused serious shortages of food and ammunition.*

—Gen Mark Clark

With the successful completion of *Avalanche*, Allied forces advanced on the capital city of Rome. The capture of Rome, seen as an important psychological blow to the Germans, would be the first Axis capital to fall into Allied hands.<sup>1</sup> Field Marshal Alfred Kesselring, commander of German forces in Italy, recognized the intentions of the Allied forces, and in an effort to prevent the capture of Rome, ordered the construction of a heavily fortified defensive line south of Rome. The Gustav Line, designated by Kesselring, consisted of concrete bunkers built into the mountainous terrain, with hundreds of mutually supporting machine-gun positions, wire obstacles, and thousands of land mines.<sup>2</sup> To reach Rome, the Gustav Line must be breached by an Allied frontal assault; consequently, casualties would be high.

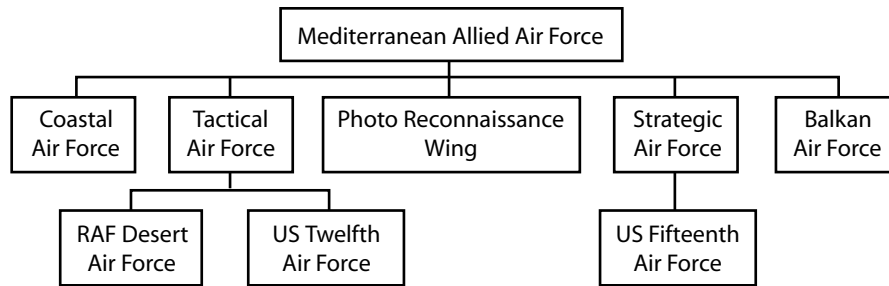
As the winter of 1943 settled over Italy, the increasingly bad weather prevented the NAAF from flying many missions, causing the Fifth and Eighth Armies to face the tenacious German defense with little CAS. General Clark, despite the severe winter weather, continued his advance along the western coast, and by October crossed the Volturno River, directly into the jaws of the Gustav Line.<sup>3</sup> Allied leaders, recognizing the tremendous casualties that would result in breaking through the Gustav Line, favored an amphibious assault behind the German lines. The assault would compel the Germans to remove forces from the Gustav Line to meet the new threat on Rome.<sup>4</sup> By weakening the Gustav Line, the remaining Allied forces would be able to penetrate the weakened defensive belt and advance on Rome. Allied planners identified Anzio as the optimal location for such

an assault, and on 22 January 1944 a combined British-American assault force, supported by the newly reorganized Allied air forces of the Mediterranean, initiated Operation Shingle.

### **Creation of the Mediterranean Allied Air Force**

On 10 December 1943 the MAC was disbanded, and the Mediterranean Allied Air Forces (MAAF) was established.<sup>5</sup> Tedder was appointed as the air commander-in-chief, Mediterranean, with Lt Gen Carl Spaatz as his deputy. Tedder controlled all British and American air forces in the Mediterranean theater, as well as all friendly Italian and French air forces in-theater.<sup>6</sup> On 12 January 1944 Lt Gen Ira Eaker assumed command of the MAAF. Tedder and Spaatz followed Eisenhower to the European theater to prepare for the cross-channel invasion. The MAAF consisted of the Mediterranean Allied Strategic Air Force (MASAF), Mediterranean Allied Tactical Air Force (MATAF), and the Mediterranean Allied Coastal Air Force (MACAF).<sup>7</sup> Maj Gen Nathan Twining commanded MASAF, Maj Gen John Cannon commanded MATAF, and Air Vice Marshal Sir Hugh Lloyd commanded MACAF.<sup>8</sup> The Twelfth Air Force and Desert Air Force were assigned to the MATAF. The primary missions of the MAAF were to support the Combined Bomber Offensive, support ongoing ground operations in the Italian campaign, keep the sea-lanes of communication open, and protect supply points.<sup>9</sup> The Twelfth Air Force also reorganized during this period.

General Cannon assumed command of the Twelfth Air Force on 21 December 1943.<sup>10</sup> On 1 November 1943 the Fifteenth Air Force was formed from six heavy bombardment groups and two long-range fighter groups previously assigned to the Twelfth Air Force. The Fifteenth Air Force would primarily be part of the Combined Bomber Offensive.<sup>11</sup> The transfer of aircraft from the Twelfth Air Force began the process of changing it from an all-purpose Air Force to a strictly tactical one.<sup>12</sup> On 1 January 1944 the 90th Photo Reconnaissance Wing, Twelfth Engineer Command, and Twelfth Air Force Service Command headquarters personnel, all previously part of the Twelfth Air Force, were reassigned.<sup>13</sup> Also, on 1 January the 42d Bombardment Wing, consisting of B-26s from the 17th, 319th, and 320th Bombardment Groups, was transferred from the Fifteenth back to the Twelfth Air Force and into the Twelfth Bomber Command.<sup>14</sup> The 57th Bombardment Wing, comprised of B-25s from the 12th, 321st, and 340th Bombardment Groups, was transferred from the XII ASC to the Twelfth Bomber Command.<sup>15</sup> The Twelfth Bomber Command was essentially an administrative headquarters and operational control belonged to the Tactical Bomber Force of the MATAF. The Twelfth Air Force no longer had heavy bombers, and the XII Fighter Command was operationally assigned to the MACAF (fig. 7).<sup>16</sup> The Twelfth Air Force and the MAAF now shifted their focus to supporting the winter breakout of the ground forces facing the Gustav Line.



**Figure 7. Mediterranean Allied Air Force command and control, January 1944** (Reprinted from History of the Twelfth Air Force, vol. 5)

### Planning for Shingle

An Allied amphibious assault on Anzio would threaten the German's rear, turn the right flank of the German defense, secure routes leading to Rome, threaten lines of communication, and vital supply facilities.<sup>17</sup> The assault would also force the Germans to move forces from the Gustav Line to reinforce Anzio.<sup>18</sup> Pres. Franklin D. Roosevelt and Prime Minister Sir Winston Churchill were frustrated with the winter stalemate of the Italian campaign and anxious to capture Rome prior to the cross-channel invasion of France. In December 1943 Roosevelt and Churchill met in Tunis, to discuss future operations in Italy, specifically Shingle.<sup>19</sup> Allied planners decided that two infantry divisions were required for Shingle, but there were only enough landing craft in the theater to support one. On 15 January 1944 56 LSTs were scheduled for transfer to the European theater of operations.<sup>20</sup> American planners did not want to dedicate additional landing craft and shipping which could delay Operation Overlord and Anvil's timelines (Anvil was the code name given for the proposed invasion of southern France) to Shingle. Churchill requested that Roosevelt allow the 56 LSTs to remain in the Mediterranean theater until 5 February to support Shingle. Roosevelt agreed; stipulating that Shingle could not interfere with the Overlord and Anvil timetables, nor delay the building up of forces required to support Overlord and Anvil.<sup>21</sup> He directed that the invasion must be sustained without *over the beach maintenance*, and should be carried out without subsequent reinforcement of the initial assault force.<sup>22</sup> On 8 January Shingle was given final approval and Roosevelt provided 25 more LSTs to support the assault.

The US VI Corps, Fifth Army, consisting of the 3d Infantry Division and British 1st Infantry Division, with a combined strength of over 110,000 soldiers, made up the main body of the assault force. Allied intelligence showed that the Germans had two divisions held in reserve in the vicinity of Rome that could quickly advance upon Anzio. General Clark was responsible for the detailed plan, and Gen John Lucas commanded the invasion force.<sup>23</sup> Clark anticipated heavy German resistance and believed that

OPERATION SHINGLE AND THE ASSAULT OF ANZIO

an assault upon Anzio would be “an emergency to be met by all the resources and strength available to the German High Command.”<sup>24</sup> Upon landing on the beaches and securing the Anzio beachhead, the assault force would advance towards Colli Laziali and secure the high ground dominating the southern approach to Rome.

In an effort to achieve tactical surprise, 11 days prior to the invasion, British and French forces launched an attack against the right side of the Gustav Line. Five days prior to Shingle the Fifth Army attempted to cross the Rapido River (fig. 8).<sup>25</sup> The Allied planners believed that these attacks would divert the Germans’ attention away from the Anzio approaches to allow the assault force to land with minimal opposition and tactical surprise. Once the assault force was ashore the Allies believed the Germans would remove forces from the Gustav Line, thus allowing the Fifth and Eighth Armies to break through the Gustav Line and advance to Rome. As in previous amphibious assaults, Shingle depended upon the control of the skies and the destruction of the enemy air force.

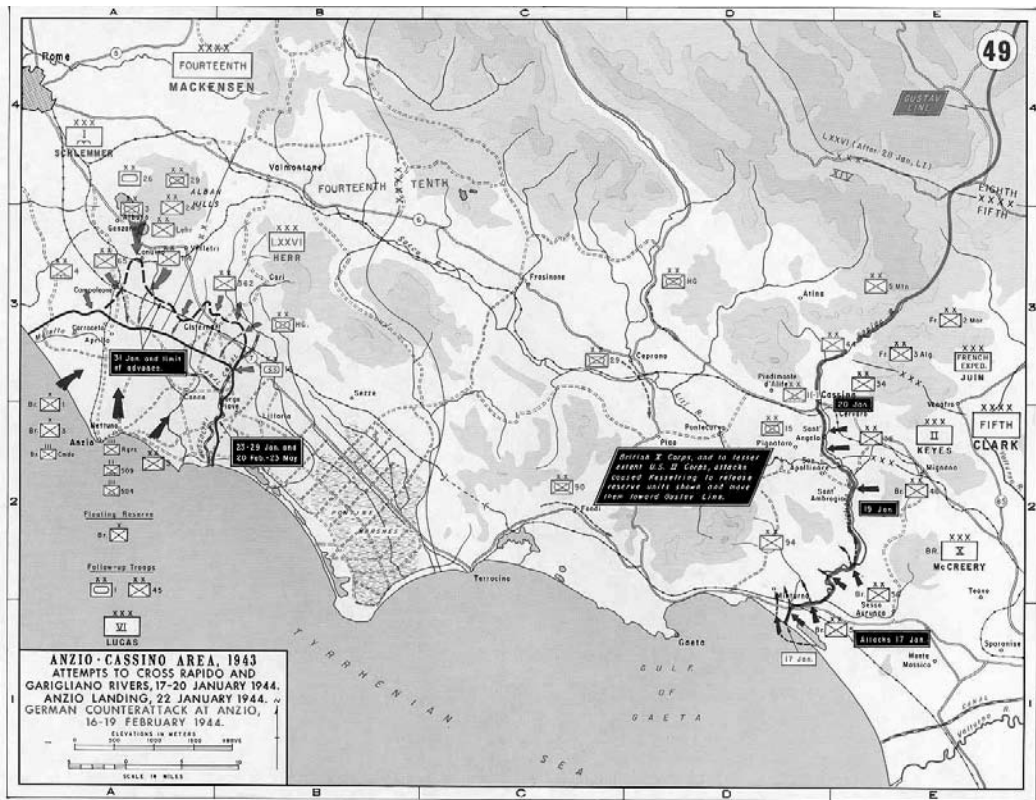


Figure 8. Allied invasion of Anzio (Reprinted from US Army Center of Military History, Carlisle Barracks, PA)

## **Intelligence Preparation for Operation Shingle**

Intelligence gathering and analysis efforts played a critical role in developing the air plan for Shingle. The MAAF intelligence section focused on collecting information and disseminating it to subordinate commands as digests, appreciations, and special reports.<sup>26</sup> The intelligence sections of the subordinate commands conducted the detailed analysis used to support operational and tactical decisions.<sup>27</sup> Planners emphasized targeting in support of the interdiction campaign. They saw photoreconnaissance as one of the most valuable sources of information and gave it top priority at all levels within the MAAF.<sup>28</sup> Commanders appreciated photoreconnaissance, as it revealed the effectiveness of air strikes, indicating targets to be reattacked, areas needing attacking, and identifying new targets.<sup>29</sup> ULTRA was used to support photoreconnaissance efforts and provided intelligence to pinpoint the areas to photograph.<sup>30</sup>

Air planners remained concerned about the German air defense; specifically radar and flak units. Because of these concerns the planners requested the use of Ferrets, which were first used in the Mediterranean theater in 1943 with great success, to determine the capabilities of German radar.<sup>31</sup> Ferrets were B-17s specially equipped with directional antennas and a series of receivers that provided the capability to monitor the frequencies of German radars.<sup>32</sup> Ferrets allowed the air planners to plot enemy radar locations and then recommend routes to and from potential targets, avoiding German defenses.<sup>33</sup> Jamming was employed to reduce the effectiveness of German radar, while the Y-Service intercepts monitored its success.<sup>34</sup> Intercepts also provided detailed intelligence on the movement of German aircraft to new airfields, arrival of reinforcements, unit status reports, and airfield serviceability.<sup>35</sup> Monitoring German fighter frequencies provided intelligence on attacking aircraft that included numbers, altitude, and direction of attack.<sup>36</sup> When informed, MAAF airmen could often intercept the enemy aircraft before they reached their targets.

Photoreconnaissance was an essential tool for the air campaign. It was the primary source for building target folders, selecting targets, and identifying targets for reattack. Human intelligence revealed German rail and road movement, and identified congested areas for targeting.<sup>37</sup> Air planners used signals intelligence and ULTRA intercepts to locate and monitor the movement and status of the Luftwaffe, which provided an accurate picture of enemy strengths and weaknesses. The aggressive Allied intelligence campaign was essential to win air superiority in the Mediterranean and force the *Wehrmacht* to fight with minimal air support.

## **Air Plan for Operation Shingle**

MAAF planners had to design an air plan that not only supported the Shingle landing, but also assisted the main Fifth and Eighth Armies attacking the Gustav Line. The plan for Shingle had three phases. Phase I

lasted from 2 to 13 January 1944, focused on attacking enemy communication targets in northern Italy to conceal the Allied intention to land at Anzio, and made the Germans believe an assault against Civitavecchia was imminent.<sup>38</sup> Phase II began on 13 January and ended on D-day, 22 January. During Phase II the mission was to destroy enemy airfields, aircraft, communications, and isolate the beachhead.<sup>39</sup> Phase III extended beyond 22 January to the end of the operation, maintaining air cover over the beachhead, supply convoys, and naval vessels, and provided CAS to the assault forces.<sup>40</sup> Air planners estimated that the Germans had approximately 270 combat aircraft in Italy, 95 located in southern France, 190 in Greece, and the remaining in the Aegean area.<sup>41</sup> Of these aircraft, 280 were single-engine fighters, and 110 were long-range bombers.<sup>42</sup> Most of the German bombers had been withdrawn from the Mediterranean in late 1943. Air support for Shingle would be provided primarily by MATAF, and it continued to enjoy an overwhelming numerical superiority in aircraft over the Luftwaffe.

MAAF airpower overwhelmed the Germans, employing over 2,600 aircraft. The XII ASC had 500 fighters and fighter-bombers, plus 369 medium bombers in the tactical bomber force.<sup>43</sup> During Phase I, interdiction of German bridges, rail lines, and marshalling yards was the primary mission of the bomber force. Aircraft of MASAF and MATAF flew 12,974 sorties, dropped 5,777 tons of bombs, and destroyed over 90 enemy aircraft during this period.<sup>44</sup> To increase the probability of destroying bridges, the B-26 was used instead of the B-25 because it was equipped with the more accurate Norden bombsight. The B-25s were used primarily against choke points and marshalling yards. By D-3, the combined efforts of the B-26 and B-25 missions cut much of the German movement from northern Italy to Rome.<sup>45</sup>

During Phase II, Allied bombardment of German airfields intensified, with 9,876 sorties flown by MAAF aircraft, dropping 6,461 tons of bombs and destroying over 50 enemy aircraft. The XII ASC, reinforced with seven Desert Air Force squadrons, flew 3,340 sorties during the week prior to D-day and more than 5,500 during Phase II.<sup>46</sup> Enemy airfields were made unserviceable by cratering the runways with 500-pound demolition bombs, and aircraft were destroyed on the ground, using 20-pound fragmentation bombs.<sup>47</sup> Heavy bombers attacked the airfields first with the demolition bombs, followed one hour later by medium bombers dropping fragmentation bombs. This technique caused major damage to the airfields, aircraft landing and parked on the ramps, and stopped enemy aircraft from taking off.<sup>48</sup> The shrapnel from the fragmentation bombs was very effective at setting fire to aircraft on the ground.

Another tactical innovation in the bombing of German airfields used three different aircraft for raids. First B-17s and B-24s (escorted by P-38s) would take off and fly at normal altitudes to allow them to be picked up by German radar. P-47s would then take off behind them, flying below enemy radar, and eventually overtaking the bombers, while climbing to a higher

altitude when approaching the target area. The idea was for the P-47s to arrive over the airfield approximately 15 minutes prior to the bombers, catching the enemy fighters scrambling to intercept the inbound bombers. After the P-47s destroyed the enemy fighters, the B-17s and B-24s arrived over the target and dropped their bombs unimpeded.<sup>49</sup> This effective technique was continued throughout the remainder of the campaign. Attacks against the German long-range reconnaissance units on D-3 were so successful that the Germans could not fly reconnaissance sorties for the next four days. This was a major contribution to the successful Allied landing.<sup>50</sup> The Germans, restricted to only a few intermittent sorties, failed completely to pick up any sign of the Allied invasion fleet massing at Naples or en route to Anzio. The landing was a complete surprise to the Germans.

### **D-day Operation Shingle**

On 22 January the assault forces landed at Anzio and Nettuno, encountering minimal German resistance, thanks to the complete surprise of the attack. A naval armada of 154 American vessels and 215 British and Allied ships supported the invasion force.<sup>51</sup> Allied airmen flew over 1,200 sorties, while the Luftwaffe managed only 140 sorties (fig. 9).<sup>52</sup> General Cannon delegated control of all tactical aircraft in the MATAF to the XII ASC, assigning it responsibility for support to the assault force and the Fifth Army. The Desert Air Force provided support to the British Eighth Army. Generals House and Clark kept the method for requesting air support as simple as possible, having seen its importance in *Avalanche*. Ground requests for air came directly from the Fifth Army commanding general, who had two air liaison officers acting in advisory roles.<sup>53</sup> As in *Avalanche*, the headquarters of the XII ASC was collocated with the Fifth Army. Target information was passed from the frontline units to the Fifth Army, where priority for attack was assigned and passed to the XII ASC. General House or his rep-



Figure 9. B-25 of the 489th Bombardment Squadron (Reprinted from <http://sbl.salk.edu>)



representative determined which request to fulfill based on assets available and the overall tactical picture.<sup>54</sup>

To enhance cooperation between the ground and air commanders, Fifth Army and XII ASC personnel met nightly to discuss the results of the day and plan for the next day. During these meetings they built a plan identifying *pre-arranged* targets for destruction and established a priority for the order of attack.<sup>55</sup> Once the plan was agreed on, House's staff sent a directive for the next day's operations to the supporting air wings and groups. This significantly improved coordination between the air and ground teams by fostering better understanding of objectives, issues of air support, and potential problems. Another new method to enhance air support was the *call targets* system. This system consisted of a telephone call from the Fifth Army to the XII ASC when emergency air support was needed. The XII ASC called a unit standing by for call targets and assigned it the attack.<sup>56</sup>

As in previous assaults, day fighters were controlled from shipboard until established ashore. Afterwards, seaborne Ground Control Intercepts for control of night fighters continued. The HMS *Ulster Queen* served as the primary control vessel, and the HMS *Palamaris* and *Bulolo* served as alternates. However, even these control measures failed to ensure truly effective C2 of supporting air units. According to the Navy, few movements of friendly aircraft were passed to the HMS *Ulster Queen*, and the MAAF did not provide naval commanders with the code for friendly aircraft operations and movements.<sup>57</sup> The lack of coordination resulted in seamen spending valuable time investigating radar plots of approaching aircraft, unnecessary air-raid warnings, and exposed MAAF aircraft to ships' anti-aircraft fire.<sup>58</sup>

The XII ASC was responsible for continuous air cover over the assault area and accomplished it by providing three layers of fighter protection. Four fighters were maintained at an altitude of 20,000–25,000 feet, 12 fighters at 16,000–18,000 feet, and 16 fighters at 6,000–8,000 feet.<sup>59</sup> The XII ASC flew over 500 sorties over the assault beaches on D-day. To provide cover at dusk and dawn, the same pilots trained to take off and land in the dark used in Operation Avalanche were employed in Shingle. Additionally, MACAF maintained eight Beaufighters, using two of the aircraft to conduct freelance operations, while another pair remained under Ground Control Intercept control.<sup>60</sup> This proved valuable, as the Luftwaffe normally raided the assault areas and convoys just prior to dawn or just after dusk with anything from 25 to 50 FW-190s and ME-109s carrying rockets or equipped as fighter-bombers.<sup>61</sup> He-111 and Ju-88 bombers were also used to bomb Allied shipping. The Beaufighters operated beyond the range of German ground-jamming stations and intercepted the approaching aircraft before they dropped window (chaff) to blind Allied ground radar.<sup>62</sup> Air patrols "carried bombs which it released on targets before taking over from the preceding patrol; at the close of its watch and after being relieved it spent its ammunition in strafing, then departed for the base."<sup>63</sup>

Air patrols over Allied shipping were conducted by the MAAF. The XII ASC was directed to provide fighter cover over a convoy lane between the Ponziane Islands and the assault beaches. House ensured that, at a minimum, two fighters were held at 20,000–25,000 feet, four fighters at 16,000–18,000 feet, and eight fighters at 6,000–8,000 feet.<sup>64</sup> He also provided a minimum of two aircraft for continuous coverage over the convoy lane at night. Falling back on lessons learned during *Avalanche*, the XII ASC carried out detailed planning and coordination with naval and shore anti-aircraft defenses to minimize fratricide. Over 135 patrols were flown over convoy formations on D-day. Airmen and seamen agreed that anti-aircraft guns were free to fire on aircraft not identified as friendly, below an altitude of 3,000 feet, and within 12,000 yards of the beaches. Aircraft above 3,000 feet and within 12,000 yards of the beaches could be engaged if identified as an enemy or if they displayed hostile intentions.<sup>65</sup> Merchant ships were subject to the same rules of engagement; however, they were restricted to within 1,500 yards of the beaches, but the altitude remained the same.

Although the protection provided to the naval armada was continuous, several German raids penetrated the defensive umbrella with considerable success. The Germans continued to use guided munitions against Allied shipping, as they had done during the invasion of Salerno. The Allies recovered the wreckage of a glide bomb in late 1943, and after detailed analysis by scientists and engineers, failed to develop effective measures to counter it. However, the Navy did develop a means to counter the lethal precision bombs used by the Germans. Army fighter-director teams monitored Luftwaffe frequencies while embarked on the US destroyer escorts *Frederick C. Davis* and *Herbert C. Jones*, and the HMS *Ulster Queen*.<sup>66</sup> The fighter-director teams were then able to determine when the bombers were preparing to leave Rome and from what direction they were approaching.<sup>67</sup> Jamming efforts eventually produced positive results, at times disrupting the control of the glide bombs and deflecting them into the water.<sup>68</sup> Unfortunately, the Allies did not become proficient in jamming until after the Anzio landings.

The PC 1400 Fritz-X (FX) type glide bombs were dropped from Do-217Ks, and the Hs-293 glide bombs were dropped from Do-217E5s.<sup>69</sup> The wingspan of the Do-217K was increased from 62 and one-half feet to 80 and one-half feet to enable the aircraft to fly at the higher altitudes needed to release and control the glide bombs.<sup>70</sup> The nose of the aircraft was also modified to provide the crew with exceptional forward and downward vision needed for controlling the FX bomb.<sup>71</sup> No major modifications were made to the Do-217E5 for carrying the Hs-293, although the pilot and observer could both control the aircraft engine exhaust piped into the bombs to keep the propellants from freezing.<sup>72</sup> The preferred tactic for gliding the bombs into a ship was to hit the ship with the bomb at or slightly below the waterline, but direct hits were also effective.<sup>73</sup> Luckily, only a handful

of German aircraft had been modified to carry the radio-controlled bombs, and few crews had been fully trained to employ the weapons.

Control of the FX bomb's trajectory was limited. A flare located on the tail was used to provide illumination to assist the observer in guiding the bomb on target.<sup>74</sup> The FX bomb fell 23,000 feet in 42 seconds. In order to guide the bomb onto the target, the aircraft slowed to 125 mph, allowing the observer to watch the bomb all the way to the target.<sup>75</sup> German prisoners indicated that the pilot could not change the direction of the aircraft more than 5° during the attack or the observer would experience difficulty in controlling the flight of the bomb.<sup>76</sup> The FX bomb was released at an altitude of 20,000–23,000 feet. If dropped at a lower altitude, the bomb would hit the water before the observer had time to guide it onto a target.<sup>77</sup> The Hs-293 was dropped from an altitude of 6,500–11,580 feet and the aircraft carrying the bomb only had to slow down to 185 mph.<sup>78</sup> These bombs fell 260 feet until the rocket motor built-up enough thrust to give the bomb a speed of 370 mph, allowing the bomb to rise in front of the control plane. The control plane basically followed the bomb to the target, although it could fly at an offset angle of up to 30°, providing better visibility for the observer.<sup>79</sup>

The most concentrated German raids were conducted on 23, 24, 26, and 29 January 1944, sinking the British cruiser HMS *Spartan*, the destroyer HMS *Janus*, several Liberty ships, LSTs, one hospital ship, and damaging a second.<sup>80</sup> The British destroyer HMS *Inglefield* was sunk by an Hs-293 glide bomb on 25 February.<sup>81</sup> SGT Melvin Schlien, a communicator in the XII ASC, experienced firsthand the glide bomb attack on the HMS *Spartan* and commented that "when the target was located it came down like a comet in a wide sweeping arc."<sup>82</sup>

Glide bombing was not the only effective measure the Germans used. Luftwaffe pilots attacked Allied aircraft at dusk, taking advantage of Allied aircraft returning to bases over 100 miles away and requiring daylight to land.<sup>83</sup> To counter this threat, MATAF employed more Beaufighters for night patrols and increased the number of Spitfire pilots trained in night flying. More importantly, engineers repaired an airstrip located at an abandoned Italian artillery school at Nettuno, near the assault area which allowed P-40s to use the airfield and maintain *on-the-spot* cover of Allied shipping.<sup>84</sup> Several LSTs were hit on D-day by German long-range artillery fire.<sup>85</sup> The Germans sank five Allied merchant ships in January, totaling 31,000 tons, and eight in February, totaling 36,000 tons.<sup>86</sup>

The Germans easily jammed Allied anti-aircraft artillery radars, using window. The British actually developed window and first employed it in August 1943 during the great raid against Hamburg, Germany. The Germans soon figured out how window worked and began employing it against the Allies. The Germans used window to disrupt the frequencies of the radars controlling anti-aircraft artillery to prevent accurate, effective fire. This jamming forced Allied anti-aircraft crews to use barrage fire techniques that were largely ineffective. The German use of window during the first

days of the Anzio invasion allowed the Luftwaffe to conduct several night raids with minimal loss. Once the MAAF established airfields in Anzio, the pilots trained to fly Spitfires at night could cover the fleet during the vulnerable dusk/dawn periods and minimize the effects of window. By the end of the first week of fighting, the German air threat to Allied shipping was significantly reduced, although small, sporadic raids continued throughout the campaign.

Using lessons learned from *Avalanche* and recognizing the difference in spotting procedures practiced by the Allied navy and army, US P-51s were used to spot for the ground forces, while British Spitfires spotted for the navy.<sup>87</sup> This proved to be effective, but airmen recommended that a universal spotting procedure be developed. The Rover units used at Salerno were again employed in *Shingle* and became standing operating procedure. The Rover units developed *Cabrank* procedures to enhance their proficiency.<sup>88</sup> Fighters assigned to *Cabrank* missions were assigned to attack specific alternate targets prior to take off. *Cabrank* aircraft arrived over the battlespace at 30-minute intervals. Once on station, they waited 20 minutes for Rover tasking. If not tasked, they attacked previously assigned alternate targets.<sup>89</sup> Rover Frank was another technique developed to overcome the effects of enemy artillery on ground troops.<sup>90</sup> Each evening the Allied army and air force held meetings and passed the current list of enemy artillery batteries and their locations to the tactical air force. The next day pilots briefed on the target locations and checked in with Rover Frank units on their way to the targets. If the batteries were still in position, they attacked them.<sup>91</sup> If the batteries had moved during the night, the Rover Frank units directed the pilots to new targets.

Rover units often had difficulty locating a good observation position to direct aircraft onto targets threatening the infantry. They solved this problem with the *horsefly* technique.<sup>92</sup> *Horsefly* was first employed during the Allied advance on Rome, 23 May–4 June 1944, consisting of an L-5 aircraft flying at 6,000 feet over or five miles behind the front lines, with an army observer aboard.<sup>93</sup> The *horsefly* enjoyed a significantly better view than the Rover. Although the *horsefly* maintained contact with the Rover unit, it could direct aircraft onto designated targets. Aircraft of MATAF also flew *pineapple* missions against vital moving targets.<sup>94</sup> Reconnaissance aircraft identifying moving targets reported to the army air-control center and then passed it to *pineapple*-designated aircraft on alert. This proved to be an extremely efficient technique, often having aircraft over the target area within 15 minutes (fig. 10).<sup>95</sup>

### **The German Counterattack**

Despite light German resistance on D-day the invasion force failed to make substantial gains as it dug in and awaited reinforcements.<sup>96</sup> The delay gave Marshal Kesselring time to move troops from Rome, while Hitler sent reinforcements from Yugoslavia, France, and Germany.<sup>97</sup> Kesselring



**Figure 10. Twelfth Air Force B-26 targets a bridge at Ceprano, 30 miles from Anzio**  
(Reprinted from US Army Center of Military History, Carlisle Barracks, PA)

launched a vigorous counterattack on 4 February lasting until early March. The most intensive fighting took place between 16 and 22 February. German forces fought with tenacity and at one point penetrated the American lines; advancing to within a few miles of the Allied beachhead.<sup>98</sup> MAAF airmen played a critical role in helping to defeat the counterattack.

On 16 February, due to the desperate situation caused by the German counterattack, the XII ASC augmented by the strategic and tactical air force, committed 813 bombers and fighter-bombers that dropped over 970 tons of bombs to repulse the counterattack.<sup>99</sup> This was the largest tonnage of bombs dropped by Allied airmen in close support of ground troops to date.<sup>100</sup> Using bombers in close support of infantry required detailed coordination and knowing the location of the *bomb safety line* that was typically 1,000 feet in front of the forward line of the troops.<sup>101</sup> The use of bombers for CAS was risky as evidenced by the attack on a German position in the town of Cassino: 30 Twelfth Air Force bombers dropped bombs short of the target, killing 57 soldiers and civilians and wounding 179.<sup>102</sup>

The CAS continued through 22 February, helping to pin down enemy forces and disrupt the flow of supplies and reinforcements to the battlefield. Enemy troop-assembly areas, supply depots, communication centers, and motor transport parks were attacked with great success.<sup>103</sup> The Fifth Army G-2 estimated that heavy German personnel casualties, damaged equipment, and loss of supplies resulted in a significant decline in

the enemy's offensive effort.<sup>104</sup> German prisoners indicated that the bombing was very effective, and Allied soldiers believed it gave confidence to the defenders and contributed to the success of stopping the Germans.<sup>105</sup> On 29 February the Germans attacked with three divisions, penetrating 1,000 yards into the line of the 3d Infantry Division. The attack was stopped as the Germans prepared for another thrust. On 2 March the MAAF airmen flew 796 sorties, dropping over 600 tons of bombs to help Allied ground forces stop the German offensive.<sup>106</sup> Although Kesselring failed to break the Allied lines, the Allies were still unable to penetrate the Gustav Line. Nearly three months would pass before the Allies would finally break through and advance on Rome.

The XII ASC and airmen of the MAAF dominated the skies over Anzio and Italy. Although the Luftwaffe made sporadic harassing raids over Allied shipping and the battle area, MAAF won air superiority and did not relinquish it. The limited Luftwaffe attacks on Allied shipping failed to disrupt the flow of supplies from ship to shore. By the end of D-day, 90 percent of the assault load was ashore including 36,034 troops and 3,069 vehicles.<sup>107</sup> Allied supply lines were never in danger of being cut and by the end of January over 100 LSTs were unloaded in the port of Anzio.<sup>108</sup> From D-day until 15 February 1944 MAAF airmen flew 27,204 sorties, dropped 13,035 tons of bombs, and destroyed 326 enemy airplanes at a cost of 96 Allied bombers and 133 fighters that were lost mostly to German anti-aircraft artillery.<sup>109</sup> Twelfth Air Force support contributed greatly to the initial success of Shingle and the defense of the beachhead. Cooperation between the Allied army and air force improved doctrine and new techniques were refined, enhancing the combat effectiveness of the forces in the Mediterranean theater. General House and the XII ASC orchestrated tactical support for the Anzio landings and received accolades from General Clark, who expressed: "deep appreciation of the splendid assistance given by the Twelfth Air Support Command during the operations which resulted in the Fifth Army's successful landings in the vicinity of Anzio, Italy. The air forces have made a notable contribution to the success of this undertaking and the bravery and initiative displayed by the pilots and associated personnel is representative of the finest traditions of our superb air services."<sup>110</sup>

#### Notes

1. Russell and Johnson, *Africa to the Alps*, 18.
2. *Ibid.*, 19.
3. *Ibid.*
4. *Ibid.*
5. HRA Call no. 622.01-2 v. 2.
6. *Ibid.*
7. *Ibid.*; and Craven and Cate, *Army Air Forces in World War II*, 326.
8. Craven and Cate, *Army Air Forces in World War II*, 326.
9. *Ibid.*

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10. Biography of Gen John K. Cannon. General Cannon commanded the XII ASC in support of the Western Task Force during the Allied invasion of French Morocco in 1942. He was subsequently assigned as the commanding general of the Twelfth Bomber Command of the NASAF. In March of 1943 he organized an air training command for the NAAF and commanded the unit until May. General Cannon became the deputy commanding general of the NATAF in May 1943, remaining in the billet during the Sicilian campaign and the invasion of Italy. He commanded the MATAF until March of 1944 when he became the commanding general of the MAAF. In May 1944 he was assigned as the commanding general of US Air Forces in Europe. He returned to the United States in April of 1946 to command the Air Training Command until October 1948 when he was assigned as the commander-in-chief, US Air Forces in Europe. In October 1950 he was appointed as the commanding general of the Tactical Air Command, remaining until his retirement in 1954.

11. HRA Call no. 622.01-2 v. 2.
12. HRA Call no. 650.01-2 v. 6, 1.
13. *Ibid.*, 1-2.
14. *Ibid.*, 3.
15. *Ibid.*
16. *Ibid.*, 4.
17. Blumenson, *Salerno to Cassino*, 294.
18. *Ibid.*
19. *Ibid.*, 300.
20. *Ibid.*, 298.
21. *Ibid.*, 300.
22. *Ibid.*
23. HRA Call no. 626.430-14, 1.
24. Blumenson, *Salerno to Cassino*, 354.
25. Russell and Johnson, *Africa to the Alps*, 20.
26. Ehrhart, "The European Theater of Operations, 1943-1945," 180.
27. *Ibid.*
28. *Ibid.*
29. *Ibid.*
30. *Ibid.*
31. *Ibid.*, 175.
32. *Ibid.*
33. *Ibid.*
34. *Ibid.*
35. *Ibid.*, 176.
36. *Ibid.*
37. *Ibid.*, 189.
38. HRA Call no. 622.430-1, 6.
39. *Ibid.*
40. *Ibid.*
41. History Twelfth Air Force, Central Italian Campaign, 15.
42. *Ibid.*
43. *Ibid.*, 14.
44. HRA Call no. 622.430-1, 7; and HRA Call no. 650.01-2, 23.
45. HRA Call no. 650.01-2, 10.
46. *Ibid.*, 10.
47. *Ibid.*, 8.
48. *Ibid.*
49. Craven and Cate, *Army Air Forces in World War II*, 351.
50. *Ibid.*
51. Campaign Summaries of World War II: Sicily, Salerno, and Anzio Landings 1943-1944.

52. Anzio Beachhead, 22 January–25 May 1944, 9.
53. HRA Call no. 650.01-22, 12.
54. Ibid.
55. Ibid., 13.
56. Ibid.
57. Morison, *History of United States Naval Operations in World War II*, 351.
58. Ibid.
59. HRA Call no. 622.430-1, 13.
60. Ibid., 14.
61. Ibid., 31.
62. HRA Call no. 632.549-1, 6.
63. HRA Call no. 622.430-1, 13.
64. HRA Call no. 655.430-2, 1.
65. Ibid.
66. Morison, *History of United States Naval Operations in World War II*, 355.
67. Ibid.
68. Ibid.
69. HRA Call no. 519.607A-1, 6.
70. Ibid.
71. Ibid.
72. Ibid.
73. Ibid., 7.
74. Ibid.
75. Ibid.
76. Ibid.
77. Ibid.
78. Ibid.
79. Ibid.
80. HRA Call no. 655.430-2, 1.
81. Royal Navy and World War II, Anzio landings.
82. HRA Call no. SQ-A-Sup-Cont-3-HI, 3.
83. HRA Call no. 632.549.1, 22 January–25 May 1944, 26.
84. Ibid.
85. Morison, *History of United States Naval Operations in World War*, 340.
86. Royal Navy and World War II, Anzio landings.
87. HRA Call no. 650.01-2 12, 14.
88. Wilt, "Allied Cooperation in Sicily and Italy 1943–1945," 209.
89. Ibid.
90. Ibid., 217.
91. Ibid.
92. Ibid.
93. Ibid., 218.
94. Ibid.
95. Ibid., 219.
96. Russell and Johnson, *Africa to the Alps*, 21.
97. Ibid.
98. Ibid.
99. HRA Call no. 680-619-2.
100. Ibid.
101. Wilt, "Allied Cooperation in Sicily and Italy 1943–1945," 215.
102. Ibid.
103. Ibid.
104. Ibid.
105. Ibid.



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106. Ibid.
107. Morison, *History of United States Naval Operations in World War*, 343.
108. Ibid., 347.
109. HRA Call no. 650.01-2, 17.
110. HRA Call no. 168.6007-1.

## Chapter 6

### **Conclusion**

*A knowledge of the powers and limitations of military aviation is a prerequisite to sound employment. Air operations almost invariably precede the contact of surface forces. The orderly mobilization and strategic concentration of the field forces and their ability to advance from their concentration areas in accordance with the strategic plan of operations depend in large measure on the success of these early air operations.*

—War Department Field Manual (FM) 100-20  
July 1943

The Mediterranean theater of operation proved to be a testing ground for American Airmen in the development of tactics, techniques, and procedures for the employment of airpower in a combat environment. The air-ground operations conducted in the Mediterranean theater yielded some of the same lessons experienced earlier by Allied forces fighting on New Guinea in July 1942. Additional lessons learned over the skies of the Mediterranean (in coordination with the ground commanders) yielded positive results that benefited Allied airmen and soldiers landing in Normandy and southern France.

The Twelfth Air Force (activated for only three months) deployed to North Africa in October of 1942 to participate in Operation Torch. The Airmen of the Twelfth Air Force arrived without experience in combat, or joint, coalition, or amphibious operations. Their learning curve was steep. Their dogged determination, innovative thinking, and sound leadership helped them overcome the friction and fog of war. The German air force fought cleverly and tenaciously, introducing new weapons and techniques, such as radio controlled glide bombs and the use of window. The Twelfth Air Force adapted quickly, becoming an efficient and effective combat force that made a significant contribution to the collapse of Italy and the defeat of *Wermacht* forces in the Mediterranean theater.

### **Effectiveness of the Air Campaign in the Mediterranean Theater**

The coordinated air campaigns that supported the amphibious landings in Sicily, Salerno, and Anzio allowed the soldiers of the Fifth and Eighth Armies to secure beachheads and advance inland with minimal interference from enemy aircraft. Allied airmen quickly established air superiority, denying the enemy the ability to effectively use its rapidly declining air

## CONCLUSION

assets. As in the Pacific theater, the skies over Italy and the Mediterranean were by no means void of enemy aircraft. However, the sorties they were able to fly inflicted only moderate damage and failed to keep the Allies from achieving their strategic objectives.

The intensity of the Allied air campaign compelled the Germans to withdraw most of their aircraft, first from Sicily, then from southern Italy. The long distance from the airfields to the beaches reduced the Germans' ability to mass their air effort to oppose the Allied landings. The concerted Allied air and ground effort in the Mediterranean drained away German combat power needed on the eastern front and to reinforce the front in France. The Germans were forced to fight a three-front war with inadequate resources. The aerial interdiction campaign in the Mediterranean disrupted the flow of supplies to the German army and made a significant contribution to the fall of Mussolini and the surrender of Italy.

The Italian capitulation forced the Germans to defend Italy alone with overstretched forces. The Twelfth Air Force and their British counterparts helped secure the Mediterranean lines of communication, and with most of Italy under Allied control, allowed US and Free French Forces to invade southern France in August 1944. The invasion secured the huge port of Marseilles that would play a major role in relieving the Allies logistics crisis in late 1944. Reopening the Mediterranean reduced the shipping losses from submarines and reduced the time and expense of shipping around Africa. Allied airmen in the Mediterranean helped achieve the strategic goals. The lessons learned in Italy helped refine AAF doctrine and enhance the effectiveness of the air-ground team.

### **Refinement of Doctrine**

The pilots of the Twelfth Air Force flew alongside their British counterparts, each having their own theory and doctrine about employing airpower. During the interwar years, neither air force developed doctrine for conducting joint, coalition, or amphibious operations. Existing doctrine for both emphasized the role of the strategic bomber for attacking enemy industrial centers and reducing their will to continue the fight. Although doctrine existed for tactical missions, the focus on air superiority restricted efforts to refine CAS procedures.<sup>1</sup>

The success of the British air-ground team at El Alamein, Egypt, and the humiliation of US forces at Kasserine, North Africa, reinforced the need for US ground commanders to reevaluate their views on the employment of airpower.<sup>2</sup> General Eisenhower recognized the need to appoint one airman to control all air assets and plan a coordinated air campaign. British and American airmen had advocated this doctrine since the end of World War I. Without coordinating all air assets, airmen were not able to optimize their combat power, and air support was less than adequate. Prior to the invasion of Sicily, the Twelfth Air Force and the British 242 Group were reorganized to support the strategic, tactical, and coastal air forces of the

NAAF, commanded by General Spaatz. This was a significant step forward in supporting joint and coalition operations.

The reorganization of the air forces into tactical and strategic components provided “greater understanding of aircraft limitations and capabilities by ground leaders, centralization of air support resources, and prioritization of missions allowed the air commander to exercise the accepted principles of air warfare better.”<sup>3</sup> This system of C2 required the air and ground commanders to conduct continuous, integrated planning to maintain situational awareness and optimize employment of all available combat power.

A unified air command provided a better way to coordinate the overall air campaign of strategic objectives, while simultaneously supporting the operational and tactical objectives. Airpower was finally used in accordance with the principles of mass and unity of command, significantly increasing the lethality of its effects. In short, airmen employed air assets as a ground commander would employ his or her forces.

Although this reorganization did not resolve all C2 issues, it provided the foundation for subsequent Allied operations in Italy and influenced the promulgation of the US Army Air Force FM 100-20 *Command and Employment of Air Power*, July 1943. Air superiority became the first priority of the tactical air force, and the coordination of the air campaign under one airman, on equal footing with the ground commander, became policy. FM 100-20 provided the basic doctrine for the air campaigns in Sicily, Italy, northwest and southern France, and the Pacific.<sup>4</sup>

Airmen, soldiers, and seamen had to work together to develop a doctrine for conducting amphibious operations. Procedures were required for covering ship-to-shore movement, defensive air patrols, phasing control of aircraft ashore, and spotting for naval gunfire. Coordination with the naval component was essential to minimize fratricide from naval anti-aircraft gunners. Air and naval planners in the Mediterranean did not start the war on harmonious terms. However, after the disastrous airborne operations of Husky, cooperation and coordination improved dramatically. The establishment of specific rules of engagement for naval anti-aircraft gunners, after Sicily, allowed the Allied navy to defend itself from air attack while allowing Allied airmen to fly safely over the fleet. Coordination and cooperation improved, with each landing in the Mediterranean enhancing the effectiveness of Allied operations.

The bombardment of Pantelleria Island demonstrated the effectiveness of an intense and sustained bombing effort on the morale of enemy forces. However, airmen failed to inform Allied forces fighting in the Pacific that 500-pound bombs dropped on concrete gun emplacements produced minimal damage. This was valuable information and could have been used by the US Marines landing on Tarawa Atoll in November 1943. There was clearly a need to establish procedures for passing information from one theater to another. This certainly happened informally through individual

correspondence, but a formal process was required to ensure essential information was passed to the right people.

### **Tactics and Procedures**

CAS continued to evolve as the Allies marched toward Rome. Air support procedures practiced in North Africa and Sicily were unresponsive, and requests for support could take as long as two hours to fulfill. Coordination with ground units improved with each invasion as tactics, techniques, and procedures were refined and adjusted based on previous operations. The establishment of *call* and *prearranged* missions in Italy enhanced the responsiveness of air support, allowing air to be on station as early as 30 minutes from the time of request.

The failure of C2 procedures used in Sicily identified the need for procedures to optimize the inherent responsiveness of aircraft and facilitate better control of airpower by ground forces. The use of Rovers, equivalent to the twenty-first-century forward air controller (FAC), improved the accuracy of air strikes. The airborne forward air control in use today can trace its roots back to the development of the horsefly spotter plane first used over the skies of Italy. Having a FAC in the air provided observation of the battle area and made it easier to direct aircraft onto targets. Aircraft were also employed to control and spot for artillery and naval gunfire. Ground Control Intercepts embarked aboard LSTs enhanced Allied capability to control aircraft at night.

Air liaison officers were sent down to the division level to enhance control procedures. General Clark ensured that the XII ASC headquarters was collocated with his own. Target information was then passed from front-line units to the Fifth Army, where priority for attack was assigned and then passed to the XII ASC. The XII ASC headquarters would determine which request, based on assets available and the overall tactical picture, to process. This enhanced the timeliness for processing air requests and allowed for better coordination of the overall air campaign.

To increase the number of aircraft available to support ground operations, bombers were assigned to the Tactical Air Force and used for CAS, not their normal mission. This allowed airmen to generate more sorties dedicated to CAS carrying more lethal payloads. The development of a bomb safety line assisted in the control of CAS missions by minimizing the risk of but not eliminating fratricide. Bombing techniques improved with each mission and contributed to the overall success of the interdiction campaign, significantly degrading the enemy's resupply efforts.

To prevent enemy air penetration of the assault beaches and convoys, defensive air patrols were used to provide three different layers of coverage. The defensive air cover over the Allied navy allowed for a continuous flow of supplies ashore, an essential element in sustaining amphibious landings. The Luftwaffe preferred to attack just prior to sunrise and sun-

set. To defend against this tactic, Allied pilots were trained to fly during periods of limited visibility and were able to take off prior to sunrise, and land after sunset.

### **Influence of Technology**

As in most conflicts, technology plays an important role and can render advantages to each side. One of the most innovative technological developments in the Mediterranean theater was the German employment of radio-controlled glide bombs. The Luftwaffe was able to successfully employ this weapon against Allied shipping at Salerno and Anzio. Although the damage sustained from these attacks was moderate, it had a significant psychological effect on seamen. Allied air planners were challenged to develop effective countermeasures. Seaborne army fighter-director teams developed the capability to determine when the bombers were preparing to leave airfields and their direction of approach. Allied jamming efforts eventually produced positive results by disrupting the control of some bombs and deflecting them into the water.

The Germans also used new technology to jam Allied antiaircraft artillery gun radars through the use of window. Although the British had developed and used window, Allied planners were first stymied in their efforts to counter its effects when used against them. However, since the Germans preferred to attack at night, the Allies were able to take advantage of their night-fighter technology. British Beaufighters could operate well beyond the range of German ground-jamming stations and intercept approaching aircraft before window was employed. The development of window, radio-controlled glide bombs, and night-fighter capabilities demonstrates the importance of the evolution of technology and its effect on warfare.

The Allies maintained a significant technological advantage in intelligence collection with ULTRA and signals intelligence capabilities. The use of specially equipped B-17s with directional antennas and receivers provided a unique capability to monitor German radar frequencies. This was of significant value to airmen as it assisted them in planning their air routes to avoid enemy radars associated with air-defense systems. Intelligence collection in the Mediterranean was a combat multiplier and made a major contribution to Allied success.

Air support parties ashore were plagued by poor equipment that degraded their effectiveness to control air support. The standard SCR 299 radars used in Sicily were unreliable and performed poorly in the mountainous terrain. Once provided with more reliable radars and communication equipment after Husky, the Air Support Parties became a valuable resource, although they never reached their full potential.

## **The Mediterranean Theater of Operations and Its Importance in the Twenty-First Century**

Coalition operations involve cultural issues, interoperability challenges, conflicting national command and control procedures, intelligence gathering and sharing, and a host of supporting issues.<sup>5</sup> Commanders at all levels in coalition warfare must be prepared to accommodate differences in operational and tactical capabilities between nations of the coalition.<sup>6</sup> Doctrine and tactical procedures used in combat, proven ineffective, must be modified. The airmen of the Twelfth Air Force and British Royal Air Force continuously shared experiences, exchanged ideas, and adopted or modified procedures and techniques to enhance their ability to provide adequate air support.

The positions held by Air Chief Marshal Sir Arthur Tedder and General Eaker in the Mediterranean theater were precursors to the modern-day joint force air component commander (JFACC). The issues of command, control, and doctrine that they faced in the Mediterranean and other theaters are issues encountered by the twenty-first-century JFACCs. Each service has its own doctrine for the employment of airpower and often compromises must be made to achieve the overall effects desired by the joint force commander (JFC). In the joint environment coordination between air, ground, and naval commanders is essential in the execution of any operation.

The forces in the Mediterranean theater wrote one of the initial foundation chapters for cooperation between air and ground forces, and their overall results were impressive. Doctrine was modified and refined throughout the campaign. Cooperation did not come easily at first, but with the reorganization of the air forces, ground commanders realized the potential that airpower offered. Commanders quickly turned their attention towards achieving decisive results, using a new application of air assets. The Mediterranean theater offers an excellent case study in the development of an effective air campaign that encompassed three of the primary missions of an air force: air superiority, interdiction, and CAS. The Twelfth Air Force, RAF, and ground commanders established an effective system of cooperation that achieved the desired results of the Allied coalition and continues to serve today as an example of combined operations done right.

### **Notes**

1. Mortensen, *A Pattern for Joint Operations*, 23.
2. Mets, "A Glider in the Propwash of the Royal Air Force," 46.
3. Mortensen, *A Pattern for Joint Operations*, 87.
4. Syrett, "Northwest Africa, 1942-1943," 263.
5. Marine Corps Doctrinal Publication 1-0, 1-12.
6. Ibid.

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