1993

Close air support in Normandy: The case of First U.S. Army and IX Tactical Air Command. A question of doctrine, training and experience

B. Michael Bechthold
Wilfrid Laurier University

CLOSE AIR SUPPORT IN NORMANDY

THE CASE OF FIRST U.S. ARMY AND IX TACTICAL AIR COMMAND
A QUESTION OF DOCTRINE, TRAINING AND EXPERIENCE

BY

Michael Bechthold
B.A., Wilfrid Laurier University, 1991

Thesis
Submitted to the Department of History
in partial fulfilment of the requirements
for the Master of Arts degree
Wilfrid Laurier University
1993

ISBN 0-315-84401-9

TABLE OF CONTENTS

List of Figures

List of Maps

Acknowledgements

It seems like an eternity ago that this project was no more than a couple of vague ideas, some background knowledge and a lot of determination. Slowly, out of the darkness, it all came together. This could not have happened without much help and encouragement from many sources.

Two people have been instrumental in helping me complete this thesis. On the academic side, I must thank my advisor, Professor Terry Copp. In the time that I have known him he has given me nothing but encouragement. With a firm but gentle hand he has endowed me with his wisdom and provided the direction needed for this project to succeed. On the personal side, mere words cannot express the debt I owe to my confidant and friend, Lisa Shannon. Her encouragement, support, sacrifice, and above all, patience have helped me immensely. I think I have yet to realize the full scope of her contribution. More tangibly, Lisa contributed materially through the laborious task of drawing and labelling the maps.

In the many professional contacts I made during my research, a few people must be singled out. Ms. Yvonne Kinkaid, the Chief Librarian at the Historical Research Branch, Centre for Air Force History at Bolling AFB was very generous and patient in helping me find the materials I needed during my trip to Washington D.C. As well, Dr. Daniel Mortensen, an historian at the Centre for Air Force

History, took time out of his busy schedule to listen to some of my ideas and provide me with a number of ideas from his current research. He was also able to direct me to some very important sources that I would otherwise have missed. At the Director General History, Department of National Defence, Ottawa, Dr. William Rawling tracked down some papers I needed and helped to conceptualize some of my ideas. Dr. David Lenarcic, a professor at WLU, offered to read an early draft of my thesis and gave me crucial feedback that I needed during the early writing stage.

Anyone familiar with the History department at Wilfrid Laurier knows that the mastermind who keeps everything running smoothly is Evelyn Jones. Evelyn is always willing to help you out and find that obscure phone number, interpretation of university policy or other useful, otherwise unobtainable, piece of information.

Marcella Martin, responsible for Inter-Library Loan at WLU, helped me to find many books and articles I needed during my research. She was always friendly and did everything in her power to track down my requests.

Finally, I must thank my parents. They have been behind me 100 per cent from the start and have given me all the love and support a son could ever want.

INTRODUCTION

American tactical aviation in the Second World War remains poorly understood nearly 50 years after the conclusion of hostilities. In discussions of aviation topics, strategic bombing and fighter operations have received the greatest amount of attention in both personal memoirs and historical accounts. The story of the ground war has also been told many times in the period since the war. Unfortunately, the marriage of the two topics, air war and ground war, has not received the attention that it warrants. A good example of this tendency is contained in J. Lawton Collins' autobiography, Lightning Joe. Though VII Corps, commanded by General Collins, formed a close relationship with General Elwood R. Quesada's IX Tactical Air Command, Collins has very little to say on the subject of tactical air power. When he does mention close air support, it is in sweeping generalities that shed little light on the nature of the relationship. For example, in his discussion of armoured column cover, he reflects, "This system . . . had been instituted in First Army . . . and we employed it in the VII Corps whenever possible, with wonderful results."[1] At no point does Collins give details on the employment or effectiveness of close air support, and he does not deal with the relationship between the U.S. Army's Air and Ground Forces.[2]

At the root of this problem was the rivalry between the Army Air Forces and the Army Ground Forces. The Ground Forces wanted more control over the resource in order to get the kind of support they believed was essential. On the other side of the coin, the Air Force generals worried that if they worked too closely with the Ground Forces, they risked becoming a mere adjunct service in the same sense as the artillery or armoured branches. For this reason, the United States Army Air Force devoted substantial time and resources to establishing an independent role. Strategic bombing, seen as a possible war-winning endeavour, was given priority by the pre-war Army Air Force at least partly because it could be carried out independently of the Ground Forces.

To a large degree, this interservice rivalry has continued in the post-war literature. Most authors show an obvious service bias through their tendency to write accounts which focus on either the ground war or the air war. Though there is usually some discussion of the other service, no serious attempt is made to integrate the two streams. This situation has changed in the last 15 years with the work of a new generation of historians. William A. Jacobs, Daniel Mortensen and David Syrett,[3] among others, have taken it upon themselves to delve deeper into the question of air-ground support in the Second World War. Their works have utilized an integrated approach, and attempt, as far as the sources will allow, to examine the issue using Army Ground and Air Force points of view.

This study will also attempt to provide a balanced appraisal of American close air support operations in France during the summer of 1944. Specifically, this thesis will argue that despite years of preparation, experimentation, theorizing and combat experience, the U.S. Army Air Forces and U.S. Army Ground Forces began operations in Normandy without fully grasping the basic tenet of close air support — cooperation. However, as the campaign progressed, the First Army and IX Tactical Air Command were able to shed the encumbrances of theory and doctrine, and through experience develop an empirical response that considered the actual level of training of the personnel involved and the tactical conditions encountered. Though previous American theory and experience indicated that a centralized close air support system was the ideal, operations in Normandy proved the opposite and led to the improvisation of a decentralized system.

American tactical air doctrine is examined from the pre-war period, through operations in North Africa, Sicily and Italy, so that the evolution of thought and practice that preceded the invasion of France in June 1944 may be analyzed. The significance of the level of training achieved by both the air and ground forces on the conduct of operations is discussed. With this in mind, the question of training for joint air-ground operations by the Ground and Air Forces prior to Overlord is to be examined. The paper concludes with a detailed examination of operations in Normandy that focuses on the systems of support that existed between the First United States Army and the IX Tactical Air Command to determine the level of cooperation that existed, its effectiveness, and how the system and doctrine evolved, both from the start of the war, and from the start of the campaign.

NOTES

1. J. Lawton Collins, Lightning Joe: An Autobiography (Baton Rouge, 1979), p.248.

2. In this study an attempt is made to distinguish between the U.S. Army Ground Forces and the U.S. Army Air Forces, both of which fell under the jurisdiction of the U.S. Army. In this context, references to the "army" refer not to the Ground Forces in general, but to a specific formation in the field. An exception to this occurs in the discussion of the military forces of other nations. For instance, the British made a clear distinction between the Army and the Royal Air Force, two separate and independent organizations.

3. A representative selection of their work includes W.A. Jacobs, "The Battle for France, 1944." in Case Studies in the Development of Close Air Support, edited by B.F. Cooling (Washington D.C., 1990), Daniel Mortensen, A Pattern for Joint Operations: World War II Close Air Support, North Africa (Washington D.C., 1987), and David Syrett, "The Tunisian Campaign, 1942-1943." in Case Studies in the Development of Close Air Support, edited by B.F. Cooling (Washington D.C., 1990)

Chapter 1

THE DEVELOPMENT OF TACTICAL AIR POWER DOCTRINE

The evolution of tactical air doctrine in the U.S. Army Air Forces in the Second World War was a long, troubled affair marked by debate, argument, innovation, and an adoption of outside ideas. At the end of the process emerged a sophisticated doctrine that would provide the framework for future operations in Northwest Europe. By no means had a perfect doctrine been created, but what evolved was a basic mode of operation that allowed the ground forces and air forces to focus on winning the campaign without an inordinate amount of time spent wrangling over chain of command, type and priority of missions and allocation of resources that plagued the Tunisian campaign. A basic understanding of the events surrounding the early development of American tactical air doctrine will help to explain the system of close air support that existed in Normandy in the summer of 1944.

In the 1930s, the theories of tactical air power did not reach a widespread audience. The new ideas of strategic bombing, as espoused by Giulio Douhet and William Mitchell, touched the imaginations of many people. This interest in strategic bombing affected the development of tactical aviation in a number of ways. As Thomas Greer stated in his work on U.S. air doctrine prior to 1941:

> By 1933, with the high-speed heavy bomber almost a reality, and with the emerging concept of a long-range, precision attack becoming dominant at ACTS [Air Corps Tactical School], ground support aviation fell into neglect. In a word, the development of the heavy bomber and its doctrine of employment, although the most important American airpower accomplishment of the 1930's, had a retarding effect upon attack, pursuit and all other aviation activities.[1]

As the strategic bombing concept grew in strength, it alienated many ground force commanders who believed that the Air Corps favoured strategic over tactical bombing because it would lead to an independent air force. Close air support, though still considered a mission of primary importance, did not garner much respect in the Air Corps. The Air Corps Tactical School (ACTS),[2] located at Maxwell Field, Alabama, was one of the few bastions of tactical aviation. As such, it fostered the development of many new ideas. These "progressive" ideas, however, did not receive wide circulation. As a result, the ground force officers remained largely ignorant (through no fault of their own) of the new concepts being developed for close air support. Even within the Air Corps itself the new concepts remained largely untested.[3]

Existing ground support doctrine in the Army Air Corps prior to the war placed emphasis on observation and attack aircraft that were slow, maneuverable and able to hit pinpoint targets and avoid enemy anti-aircraft fire while operating at low altitudes. The Northrop A-17, which began replacing the Curtiss A-12 Shrike in 1936, was the last pre-war example of this type. With a top speed of 220 mph, ceiling of 20,000 feet, range of 730 miles and armed with 650 pounds of bombs and five 30-calibre machine guns, the A-17 became the Air Corps' standard attack aircraft.[4] However, the evolution of the modern battlefield made changes necessary in the application of aerial support. Increasingly accurate and deadly anti-aircraft fire as witnessed during the Spanish Civil War and the early German campaigns in Europe meant that slow aircraft would not have a long life expectancy over the battlefield. To counter this, a switch was made to bigger and faster aircraft able to carry more munitions and defensive armament. This was typified by the decision made in 1939 by General Henry H. 'Hap' Arnold, Chief of the Air Staff, to procure the Douglas A 20, a twin-engined light bomber, as the new attack aircraft for the Air Corps.[5]

The first statement on close air support doctrine made in the United States following the start of the European war was Air Corps Field Manual 1-5, "Employment of the Aviation of the Army," released on 15 April 1940. FM 1-5 was viewed primarily as a "compromise document." It encompassed the views of both the Air Corps and the Ground Forces. For instance, major Air Corps principles such as a need for air superiority and centralized command were included but it was still made possible for air units to be detached and assigned to ground force units for specific missions. As well, FM 1-5 did not emphasize the offensive nature of tactical air power nor did it outline in detail the chain of command necessary for air ground operations.[6] The manual did include some advanced ideas. To explain the dual role played by the air commander, a "two-hatted" concept was adopted. The manual stated that, "As a commander, he commands all Air Corps troops. . . . As a staff officer, he is the immediate assistant to the [ground] commander and adviser of his staff on all aviation matters."[7] A second innovative notion was the requirement that the "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."[8] Though the Air Commander was considered subordinate to the Ground Commander, his input was seen as crucial in the process of designating close air support. These principles would have served the Americans well in North Africa if they had been followed.

On the surface, the Ground and Air Forces talked of close cooperation but in reality they remained far apart in their visions of tactical air support. In September 1940, a memorandum signed by General George C. Marshall, Army Chief of Staff, was published which listed five kinds of aviation support for the ground troops:

1. Close, direct-support fire missions on the immediate front of ground troops.
2. Air defence of friendly ground forces and installations in the combat zone.
3. Air attack against targets in hostile rear areas.
4. Support of airborne forces.
5. Reconnaissance, observation and liaison.[9]

Though no priorities were listed, Major General Frank M. Andrews, author of the memorandum, recommended that the first two missions, which would require the greatest coordination, be tested through joint air-ground exercises. This eventually occurred when Marshall ordered Lieutenant General Lesley J. McNair, chief of staff of GHQ, to conduct the trials.[10] A series of 18 air support tests were held between 11 February and 17 June 1941. They investigated various methods and techniques to improve air-ground support. Matters such as type of target, methods of communications and control, and tactics were examined. The results of these tests were used as the basis for the creation of Basic Field Manual 31-35.[11]

The War Department staged a series of large-scale exercises later in the year. The Louisiana and Carolina maneuvers, which pitted army-sized formations against each other, did little to foster a spirit of cooperation between the air and the ground. In fact, the opposite happened. A major gulf was exposed between theory and practice. Much thought had been given to the goals sought from the employment of tactical air power without considering how those aims could be achieved. Both sides showed a lack of understanding of the other's needs and capabilities. In addition, this problem was compounded by other failings. The Air Force was unable to supply a sufficient number of trained crews and aircraft for the maneuvers because it was committed to basic aircrew training. The Army Ground Forces also failed by not realistically employing the few available aircraft in their manuevers.[12] This lack of joint training between the Air and Ground Forces was a problem that would crop up again in North Africa and Northwest Europe with serious implications each time. The outcome of these training exercises served to confirm in the minds of the Ground Forces that the Air Force was committed to its own missions and priorities, irrespective of the wants and needs of the ground forces. This served to keep the relationship between the two branches on an adversarial rather than cooperative basis.[13]

While tactical aviation was going through its birth pains in the U.S., the war in Europe was not passing unnoticed. The Americans sent a large number of observers from all branches of the armed forces to report on the employment of new weapons and doctrine. The German blitzkrieg, in particular, received a great deal of attention due to its use of closely coordinated attacks by tanks, artillery, infantry and aircraft. It has been suggested that the success of the blitzkrieg "rekindled" interest in tactical aviation in the U.S.[14] Though it is uncertain whether the German experience with close air support early in the war had a direct influence on American doctrine, it was definitely a factor in its development. Proponents of both the Ground and Air Force positions were able to find evidence to back their views from the German model. Marshall, a strong advocate of the concept of a unified command under the Ground Forces,[15] stated in 1941 that the German victories early in the war were based on the "creation of a single high military command for all forces, whether of the land, sea or the air. . . In fact the key to the military success of Germany in the present war has not been the operation of the air forces on an independent basis but rather the subordination of air power to the supreme command of the armed forces..."[16] At one point, in late 1941, it was even proposed that the Americans adopt the German system "which had proven repeatedly successful and which gave control over aviation to subordinate field commanders within an army or theater."[17] This suggestion was made following reports from the Middle East evincing that cooperation between the British Army and RAF had failed primarily due to the separation of the two forces.

The Air Force also payed close attention to events in Europe. Lieutenant Colonel Donald Wilson, an instructor at the Air Corps Tactical School, wrote in

September 1939, "He [Hitler] is our greatest booster - without even so much as a request from us he has voluntarily undertaken the job of demonstrating our theories. So far the coordination between our theories and his practice is so marked that someone is going to be accused of collusion."[18] Wilson went on to explain that in the attack on Poland, the Luftwaffe had started by claiming air superiority through the destruction of the Polish air force on the ground, and in the air. It then moved to isolate the battlefield and finally, attention was turned towards the close support of the ground forces in their lightning assault.[19] This account is interesting due to its similarity to FM 100-20, the "declaration of independence" of the Army Air Force that would be written in the summer of 1943. This "three phase" concept was to become a central tenet of FM 100-20. It is also interesting to note the long period between the development of these new ideas at the ACTS and their acceptance and implementation in the doctrine of the USAAF. Another instructor at the ACTS, Major M.S. Fairchild, expressed a similar sentiment:

> We have observed with pardonable satisfaction that the German air force has actually been employed exactly in accordance with the School's concept of proper employment to accomplish such a mission. That this employment has been eminently successful is attested by the startling rapidity of the German penetration into the interior of a desperately defending nation.[20]

The impressions taken away from the German experience by both the Ground and Air Forces were accurate in their appraisal of the relationship between the Wehrmacht and the Luftwaffe but the analogies were not a perfect fit to the American experience, especially that of Marshall. It was true that in the German system the Luftwaffe came under the control of the Army, but the two services worked on a cooperative basis rather than on the adversarial relationship that existed between the U.S. Army Ground Forces and Air Force. As well, the German system was very well adapted to the breakthrough of prepared defensive positions, but did not contain much flexibility and was thus less successful in support of mobile operations. It is likely the Germans made their greatest impact on the Americans by showing how important tactical air power could be in winning battles. The integrated air-land battle team demonstrated by the Germans was not perfect but it marked a significant departure from the British, French and American doctrine between the wars. As such, a definite impetus was added to American effort to develop a workable system of their own.[21]

The first serious American attempt at producing a modern, workable tactical air doctrine came in April 1942 with the publication of War Department Basic Field Manual 31-35, "Aviation in Support of Ground Forces." This new manual went far beyond FM 1-5 in that it provided a detailed organizational framework to guide future ground-air operations. Unfortunately, FM 31-35 was to prove unsuccessful when it was given its baptism of fire in North Africa in late 1942.

FM 31-35 arose out of the experiences gained in the Louisiana and Carolina manuevers of 1941. The project began under the direction of Colonel William E. Lynd, head of the Air Support Section of the Air Force Combat Command. With the reorganization of the Army Air Forces in March 1942, the Air Support Section was eliminated and in its place the Directorate of Ground Support was created. Colonel David M. Schlatter, head of the new directorate, inherited from his predecessor a nearly complete manual on air-ground coordination. After a few finishing touches, FM 31-35 was published on 9 April 1942. Neither Lynd nor Schlatter considered FM 31-35 to be the final word on the subject. In fact, they considered the new manual "highly tentative and subject to change."[22]

The main fault with FM 31-35 was that it was too equivocal. It tried to walk the thin line between the ground and air force views on close air support. At the heart of the debate was the question of centralization versus decentralization. Centralization, advocated by the Air Force, would place the air support resources at the disposal of the highest level of the local army hierarchy, usually the Theater Commander. This allowed the strengths of the air weapon, (ie. fluidity, mobility and massed striking power), to be maintained and could be applied to targets of the highest priority. The cost of this, however, was a slow response to calls for immediate support since requests had to meander up and down the entire chain of command for approval and execution. Decentralization, favoured by the ground forces, solved this problem by splitting up the air support command and parcelling individual units out to lower commands. Though this allowed for a quicker response to local demands for support, it could tie up air resources in missions of secondary importance and generally dissipate the effectiveness of air support.[23] The final version of FM 31-35 tried to combine the best features of centralization and decentralization. However, rather than settle the issue it allowed both opposing camps to support their arguments based on FM 31-35 and, in the end, settled nothing.

A close look at FM 31-35 itself will reveal its duality. The tone of the entire manual is set out right at the start. "Aviation in support of ground forces is normally constituted into air support commands which are ordinarily component parts of air forces. . . . An air support command is habitually attached to or supports an army in the theater."[24] The terminology makes it clear that it was the Ground Forces, rather than the Air Force, which would provide the air support command with its operational directives when in the field.

In terms of a balance between centralization and decentralization, FM 31-35 was weighted towards the latter. The major concession to centralization embodied in the manual provided that the Air Force Commander had sole control of the Air Forces and that all missions assigned must go through him. Aside from that small provision, the Ground Force commander exercised almost total control over the employment of the air resources. To the Ground Commander, the use of air was not significantly different from the employment of artillery, armour or one of the other specialized combat branches. This relationship was explicitly stated in FM 31-35. The commander of the Air Support Command was given two hats to wear, in similar fashion to FM 1-5: "In addition to his duties as commander of support aviation, the air support commander acts as adviser to the ground commander. He normally functions under the army, theater, or task force commander."[25] Further on, the manual states that, "The ground force commander, in collaboration with the air support commander, decides the air support required."[26] It can thus be seen that the real power in the allocation of air support rested with the ground commander while the air commander functioned primarily in an advisory and administrative function. Lip service was paid to the notion that teamwork was necessary for effective air support of the ground forces to take place, but FM 31-35 formed the basis of an adversarial rather than cooperative relationship between the Air and Ground Forces. One must wonder if the word "collaboration," with its connotations of "working with the enemy," was used purposefully in defining the relationship between the air and ground commanders.

The pattern outlined in FM 31-35 for the transmission of air support requests was a good attempt at creating a workable system. Air Support Parties (ASP), composed of an air support officer and affiliated personnel, were usually located with divisional headquarters. The ASP would receive requests for air support from the division or lower formations and would advise the division commander of the practicality of the requested mission. If approved by the ground commander, the request was forwarded to the Air Support Control (ASC), usually associated with a Corps. The process of evaluation was again repeated. If the Corps commander approved the mission, the ASC transmitted an operational order to the airdrome and the mission was carried out.[27] [This process is shown in Figure 1.]

This was by no means the quickest or most efficient design for a request system. It was very slow in forwarding front-line requests for immediate support for two reasons. First, the request had to be approved at every level. There was no shortcut to a central body charged with the authority to dispatch aircraft. Secondly, all requests had to be sent through regular army channels. There was no dedicated

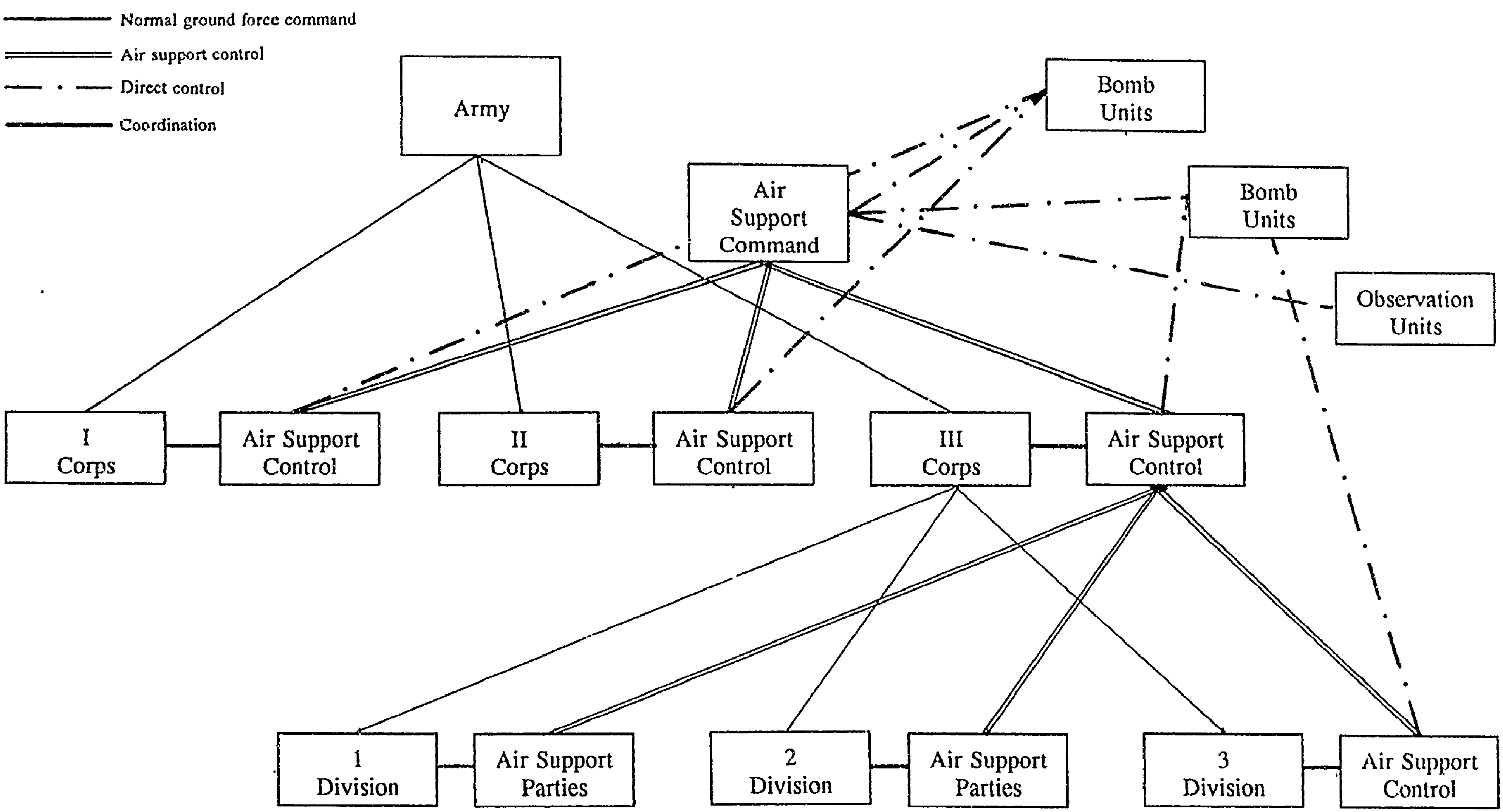


Figure 1

FM 31-35 - Channels of Command of a Typical Air Support Command

Source: War Department Basic Field Manual 31-35. "Aviation in Support of Ground Forces." 9 April 1942. p.5.

channel for air support requests. This meant that air support requests had to compete for air time with the many other communications needed by an army in battle. The system was also burdened by the fact that the air force personnel at each level maintained only advisory power. In spite of its failings, the system provided a good basis from which further refinements could be made. The system used in Normandy was very similar with the exception that lines of communications were shortened and streamlined and the relationship between the air and ground officers was put on a more even footing.

In spite of the problems, FM 31-35 contained a number of thoroughly modern concepts on close air support. These ideas, though modified by experience, would outlive the manual itself. It was recognized that local air superiority was very important for the conduct of ground-air cooperation and must be maintained to prevent excessive losses from enemy fighters. However, no priorities were assigned to the importance of the various missions performed by the air support command. Aircraft were viewed as a scarce resource that was expensive and difficult to replace. As such, care should be taken to ensure that aircraft (and of course, aircrew) were not wasted on targets of secondary importance. As well, FM 31-35 specified that the headquarters of the air support command should be collocated with the headquarters of the unit it was supporting. The combined headquarters were not fully integrated but an air liaison officer would always be present at the army headquarters while a ground representative remained at the air force headquarters.[28] Commanders were warned that the employment of combat aviation was a very subjective matter. It was highly dependent on the hostile air and ground situation and other uncontrollable factors such as the serviceability of aircraft and existing weather conditions. This meant that air support was not "a weapon which can be applied with equal value in all circumstances."[29] As well, targets within the range of the artillery were not to be selected and small targets were considered unsuitable targets due to dispersion and camouflage.[30] Though these considerations would be overcome during the course of operations in Northwest Europe, in 1942 these were valid limits on the use of air support due to the scarcity of the resource and state of technology. It must be remembered that the Air Support Command of 1942 was very different from its 1944 counterpart and it would not be fair to evaluate FM 31-35 based on technology and tactics not known at the time of its creation.

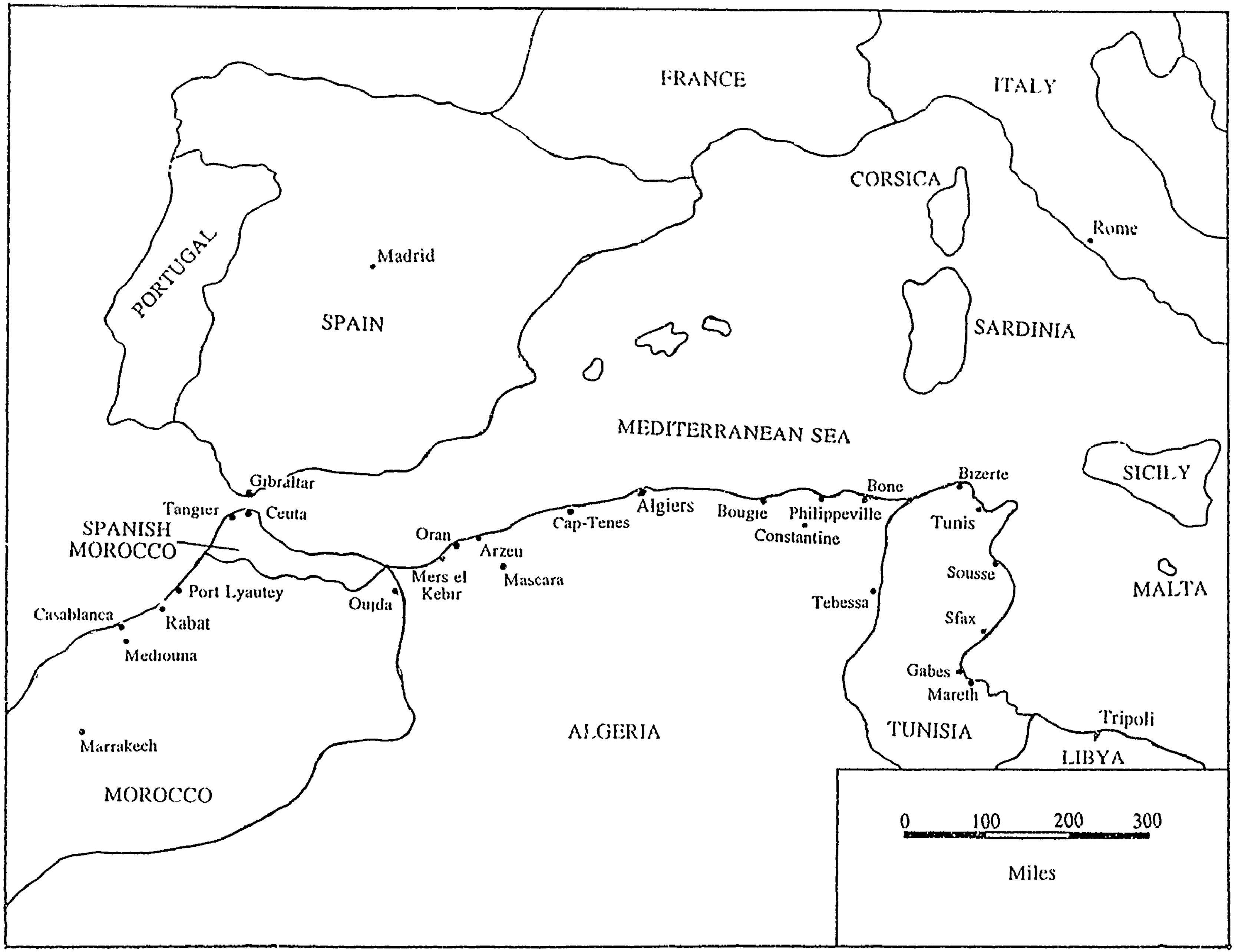
In the summer of 1942, FM 31-35 seemed to provide the operational framework for close support operations needed by a military that would soon be used in battle. However, it would take an actual trial-by-fire to prove (or disprove) the efficacy of the new doctrine. Operation Torch, the invasion of North Africa in late 1942, was to provide the first opportunity to test these new concepts.

On 8 November 1942, the Americans and British launched their first major combined operation of the war. Torch, the result of the failure to launch a Second Front in Europe in 1942, was designed to catch the Axis between a rock and a hard place and squeeze them out of North Africa. Morocco and Algeria, the landing sites, were viewed as important objectives by both the Allies for defensive reasons as a

German occupation of these Vichy areas would threaten the shipping and air routes to the Middle East.[31] [See Map 1]

Overall command of the operation was given to Lieutenant General Dwight D. Eisenhower. It was fitting that an American assumed overall command since most of the assault force was provided by that nation. Another factor in the appointment of Eisenhower was the hope that less resistance would be encountered from the Vichy defenders because the operation was not under British command.[32]

The Torch plan encompassed three landings. The Western Task Force, under Major General George S. Patton, was assigned the Casablanca area. Major General Lloyd Fredendall's Central Task force was given Oran as an objective. These two groups made up the American contingent. The British, under Lieutenant General K.A.N. Anderson, made up the remaining Eastern Task Force with Algiers as its target.[33] The Allied Air Command for Operation Torch was also split along national lines. In support of the British was the Eastern Air Command under Air Marshal Sir William Welch. The Western Air Command, composed of the U.S. 12th Air Force, was commanded by Major General James H. Doolittle. Both these commanders were directly responsible to Eisenhower who, in addition, had two air advisors on his staff, Air Vice Marshal A.P.M. Sanders and Brigadier General Howard Craig. The constituent parts of the 12th Air Force were further divided and allocated to the support of the American task forces. Patton was assigned direct control of XII Air Support Command while Fredendall had authority over portions of XII Bomber Command and XII Fighter Command. Doolittle was left with only advisory or



Map 1 — Operation Torch

indirect control of these forces. To complicate matters further, there was little coordination or contact between the American and British air forces. The system of control established for the air components was far from streamlined. In the words of the official British history, the setup of the Allied Air Command was "an awkwa·d arrangement."[34] [This command structure is illustrated in Figure 2.]

Just prior to the Torch landings, Brigadier General Walter Bedell Smith, Eisenhower's Chief of Staff, issued an operational memorandum entitled, "Combat Aviation in Direct Support of Ground Units." The objective of this memo was the elucidation of the system of air-ground cooperation that would exist following the invasion, especially the channels of command and control. The memo drew attention to the fact that there were close parallels between British and American doctrine on the topic (British Army Training Instruction No.6 and FM 31-35), and communications systems were also similar.[35] The memo referred only to written doctrine and did not take into account the lack of American experience or the evolution of British doctrine that had taken place under conditions of battle.

This directive firmly placed the control of the air resources in the hands of the ground commanders. It stated that, "Effective air support of ground troops is dependent on a proper estimate of the situation by the supported commander." As well, it was made possible for air units to be placed under the direct control of ground units as low as brigade or division.[36] This memo, while addressing some concerns of the air advocates, made it clear that it was the ground commander who had the final say on air operations. Though this was not completely out of character

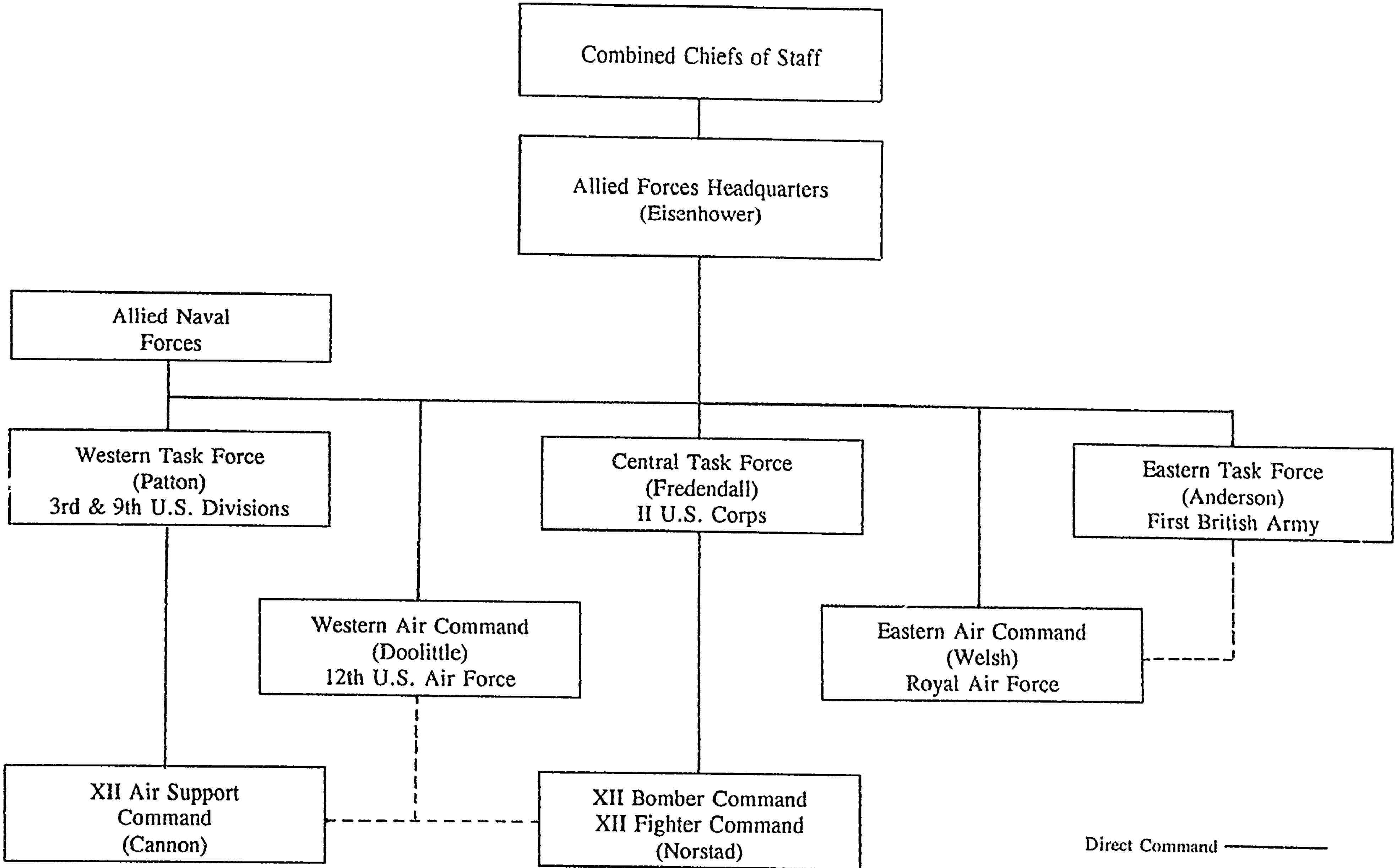


Figure 2

Command Structure for Operation Torch

with FM 31-35, it chose to highlight only one particular aspect, and in doing so, throw off the fine balance the manual had tried to maintain between the air and ground positions.

The first phase of air operations in North Africa, in November and December, was characterized by inexperience as well as unforeseen problems and obstacles. After the initial landings in which the land-based air forces played only a small role, the Allied forces collected themselves and began to move towards Tunisia. Unfortunately, the advance was not quick enough and the Germans were able to send reinforcements that greatly bolstered the Axis defence in North Africa.

Problems were apparent from the outset of the campaign. Although it may seem surprising, Allied knowledge of the physical conditions in Algeria and Tunisia was poor. The mountainous terrain and poor road and rail systems played havoc with British and American logistics. As well, the country was found to be very wet. This proved a problem for the Allied air forces as they occupied very few all-weather airfields. The lack of prior planning also made itself felt in other ways. The Allies in general, and the air forces in particular, found themselves to be chronically short of the resources necessary to conduct successful operations. Airfields, fuel, aircraft, spare parts and other essentials were never in plentiful supply during the early months of the campaign.[37]

The callowness of the Ground and Air Forces in their first introduction to war was quite apparent and considerably affected the cooperation between the two branches. Many of the notions, tactics and equipment the Americans had brought to

North Africa were found to be either outclassed or obsolete. Indeed, the commanders and men themselves were quite unfamiliar with the new situation. Light bombers, for instance, were expected to perform the majority of close support work. However, they were found to be terribly vulnerable to German air and ground defences. An attempt to fill this unexpected gap with the use of fighters met with the difficulty that many of the fighter pilots were not trained in ground strafing and their aircraft were not outfitted with bomb racks.[38] Problems with the Ground Forces presented a larger problem. As mentioned, they were given the ultimate authority in the use of air support. In many cases though, they were not sufficiently knowledgeable about the capabilities, limitations and other factors that would allow the resource to be used most efficiently. In one incident, a ranking ground commander ordered a daylight strike on a Stuka base by a squadron of Bristol Bisleys. The Bisley, also known as the Blenheim V, was characterised as "a failure; underpowered and undergunned...and not fit to stand in the line of battle, certainly in daylight." The ground commander, however, ignored the protests of an RAF Wing Commander and ordered the attack. Predictably, the entire squadron was massacred.[39] Another case of the mismanagement of the air resource was the ground's insistence on the use of the air umbrella to protect its forward lines from enemy air attack. The air force considered the air umbrella to be a major waste of resources. The short endurance of their fighters combined with the long distance from their airbases to the area of operations meant that the planes could maintain the combat air patrol for only a limited time. The rest of the time the German aircraft were able to act at will. In addition, the devotion of aircraft to defensive tasks meant they could no longer be employed in direct attacks against the enemy. Though the morale of inexperienced troops was buoyed by the sight of friendly aircraft, this hardly offset the great cost of this measure.[40]

Another problem not sufficiently considered in the planning of Operation Torch was resistance from the Luftwaffe. Because of this, the ground forces were not adequately supplied with the light anti-aircraft weapons needed for their defence. As a result, ground commanders came to depend on the air forces for the protection they needed. The exact toll in men and materials taken by German air attacks is not known, but if nothing else, the psychological impact was very great. General Eisenhower reported at the beginning of December that enemy air action had greatly influenced recent Allied advances. In spite of the fact that the Allied air forces had been working hard, they were unable to "keep down the hostile strafing and dive-bombing that is largely responsible for breaking up all attempted advances by ground forces."[41] General Anderson believed the impact of the German air attacks to be so great that he threatened to withdraw his forces to a position where an air umbrella could offer a greater degree of protection.[42]

The reason the ground forces were so insistent that the air force maintain an air umbrella over the front lines was the fact that the Luftwaffe possessed "*de facto*" air superiority over the battlefield. This advantage accrued to the Germans because their airfields were of all-weather construction and were located much closer to the battlefield.[43] The air umbrella was deemed necessary because it appeared the

Luftwaffe was taking a terrible toll on the army at the front. Many of the senior Allied ground commanders were very impressed with the cooperation afforded the German Army by the Luftwaffe. In a letter to General Marshall on 8 December, Brigadier General Paul Robinett, commander of Combat Command B, First U.S. Armoured Division, recounted an example of the "perfect" air-ground coordination executed by the Germans. He questioned why this type of support was not present on the Allied side and why the air support that was available was being wasted on targets far distant from the battlefield. The point of Robinett's report, and a view shared by most other Allied ground commanders in Tunisia, was that the air force could only become effective if it was placed completely under the control of the ground commanders.[44] There is no doubt that the German air attacks were effective. Ground commanders reported that attacks by Stukas were the greatest problem. Though the Stuka was outclassed during the Battle of Britain, in Tunisia they were able to operate almost at will over the battlefield. This was possible in spite of the air umbrella because of the problem mentioned earlier. The Stukas would simply wait for the Allied fighters to leave so they could return to the battle area from their nearby airfields.[45] In the span of 17 days, from 25 November to 12 December 1942, Luftwaffe dive-bombers, fighter-bombers and fighters flew nearly 800 close support missions against Allied troops, armour, vehicles, guns and airfields.[46]

Operations during November and December served to show the large gap that existed between Allied air doctrine and its practical employment. FM 31-35 had been put forth as the pattern air-ground cooperation should follow to be successful.

However, it seems to have been virtually discarded once actual operations began. The Ground Forces moved quickly to assert its dominance over the air force and received very little opposition. However, by the end of 1942, the ad hoc system that developed was shown to be ineffective. This left the American command bankrupt of ideas. However, there was hope on the horizon. The British system of close air support that evolved in the Middle East between General Bernard L. Montgomery and Air Vice Marshal Sir Arthur Coningham had proven enormously successful. With no other alternatives, the Americans turned to the British for help.[47]

In late December, Eisenhower brought an end to the first stage of operations in North Africa. He blamed the halt on poor organization and logistics, greater than expected German resistance and the onset of bad weather. Air Chief Marshal Sir Arthur Tedder, General Doolittle and others suggested that the Allied air forces needed some sort of centralized command. This reorganization was deemed necessary due to the inefficiencies of the current system, not the least of which concerned the lack of communication between the American and British air forces and the poor use of the air resources made by ground commanders.[48] As a result of these suggestions, Eisenhower announced a number of changes effective 5 January 1943. The most significant of these was the appointment of Major General Carl A. Spaatz to command the Allied Air Force. Later in January, additional steps were taken to streamline the organization of the air forces. Spaatz was instructed to collocate his army support headquarters with that of Anderson who had just been appointed the Deputy Commander of all Allied ground forces. Brigadier General Laurence S. Kuter was given command of the new Allied Air Support Command. Kuter, who was directly responsible to Anderson, became responsible for all air support missions flown by XII Air Support Command and No.242 Group RAF.[49] He attempted to introduce some of the methods of air support practised by the British in the Western Desert but was unsuccessful. As Kuter stated in an unpublished biography, "Our tactical units would have been delighted to go after the Luftwaffe on its airdromes. However, their whole energies were required to keep enough airplanes in flying conditionsto maintain the umbrella that II Corps demanded."[50] Higher levels in the American chain of command were most resistant to change. In a letter to General George E. Stratemayer, the US Chief of the Air Staff, Spaatz wrote that the RAF did not consider itself assigned to any army command and would certainly not allow the ground forces to dictate its employment. The concept of coequality, however, was very difficult for the Americans to accept.[51] Though these command changes brought the Allied air support system more into sync with the air force view of the most effective system, most of the problems would not be rectified until a final command rearrangement was made at the Casablanca conference in January 1943.

At Casablanca, Churchill and Roosevelt, along with the Combined Chiefs of Staff and their advisors, hammered out a new system of command for the North African theater that survived until the end of the hostilities on that continent. General Sir Harold Alexander was given the dual role of Deputy Commander-in-Chief to Eisenhower as well as command of 15th Army Group. Most importantly, the structure of the Allied Air Forces was rearranged and centralized. Air Chief Marshal

Tedder was placed in charge of all Allied Air Forces in the Mediterranean. Under Tedder were three commands: the Middle East Air Command, the Malta Air Command and the Northwest African Air Forces (NAAF).[52] This last organization, commanded by Spaatz, was responsible for all air operations in the primary theater of operations, Tunisia. It was decided that three sub-commands were necessary, "one to control heavy and medium bombers with their fighter escorts, another for general reconnaissance and fighter aircraft for the defence of shipping and ports, and the third to specialise in air support for the ground forces."[53] As a result, three air forces were created: the Northwest African Strategic Air Force (Doolittle), the Northwest African Coastal Air Force (Air Vice Marshal Hugh P. Lloyd) and the Northwest African Tactical Air Force (NATAF). The NATAF, under Air Vice Marshal Coningham, was designed to provide support to each of the three armies operating in Africa. No.242 Group RAF was paired with First Army, the XII Air Support Command worked with the II US and XIX French Corps while the partnership between Montgomery's Eighth Army and the Western Desert Air Force continued.[54] [See Figure 3.]

Coningham was the obvious choice to command the tactical air forces in Tunisia. The revised air support structure owed much to the system of cooperation developed by Coningham and Montgomery in the Western Desert following the battles of Alam el Halfa and the second El Alamein.[55] Coningham was to have a great impact on the development of American tactical air doctrine.

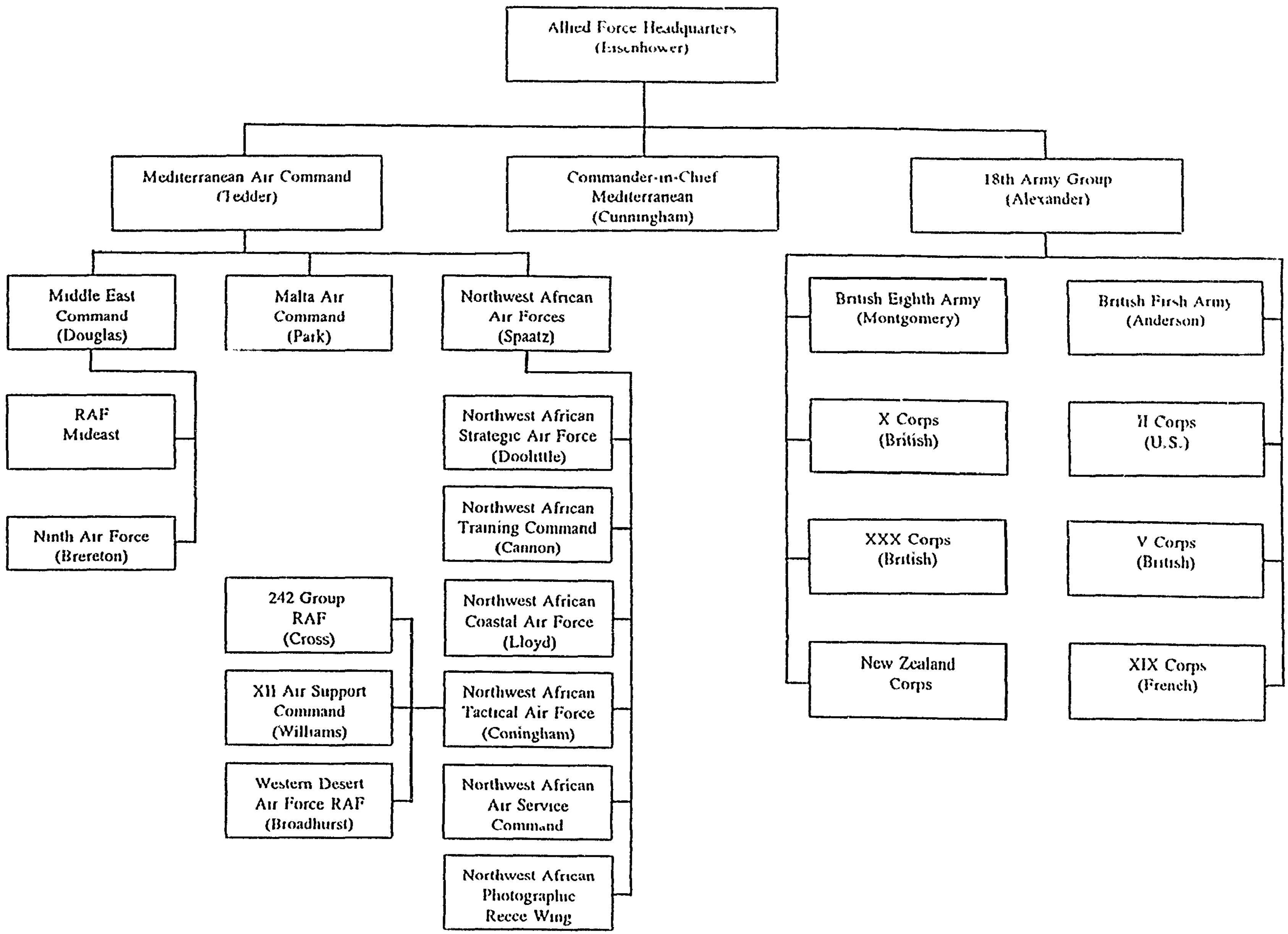


Figure 3

Allied Command Structure, February 1943

Just prior to activation of the new air organizations, a meeting was held on 16 February 1943 in Tripoli to discuss the various lessons learned during the Libyan campaign. The focus of the meeting, attended by General Alexander, General Sir Bernard Paget, Commander-in-Chief, Home Forces, General Bedell Smith and other senior American and British officers, was a presentation by General Montgomery. His speech was based primarily on a pamphlet he had recently issued entitled "Some Notes on High Command in War." This "gospel according to Montgomery," as it was referred to by Tedder, set out very clearly Monty's beliefs on how air power should be used to support the army.[56] Among the tenets Montgomery set out was his conviction of the importance of air power: "Any officer who aspires to hold high command in war must understand clearly certain principles regarding the use of air power." Montgomery also believed that flexibility was the greatest asset of air power. This allowed it to be applied as a "battle-winning factor of the first importance." As well, he fully endorsed the air force view of centralized control: "Nothing could be more fatal to successful results than to dissipate the air resource into small packets placed under the control of army formation commanders, with each packet working on its own plan. The soldier must not expect, or wish, to exercise direct command over air striking forces." Montgomery concluded his discussion by stating that it was of prime importance for the army and air force to "work together at the same H.Q. in complete harmony, and with complete mutual understanding and confidence."[57]

Following Montgomery, Coningham made a presentation to the assembled group of generals and other senior officers. In his opening remarks, Coningham observed that, "the Army Commander [Montgomery] has stated more perfectly than I can hope to do the present position of Army-Air development in this operational area."[58] This was a rather ironic and humble statement. Tedder revealed after the war that Monty's pamphlet "Some Notes on High Command in War" had originally been prepared by 'Mary' Coningham himself.[59] That point aside, Coningham made some very important statements in his speech. It is worth quoting at length from that document as his ideas were to become the cornerstone of American tactical air doctrine for the rest of the war, and indeed, into the post-war period.[60]

> 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 operations [sic] being directed by the Army Commander.
>
> There are certain fundamental differences between the Army and the Air forces which should be recognized:
>
> The Army fights on a front that may be divided into sectors, such as Brigade, Division, Corps or an Army front. The Air front is indivisible.
>
> An Army has one battle to fight, the land battle. The Air has two. It has first of all to beat the enemy air, so that it may go into the land battle against the enemy land forces with the maximum possible hitting power. . . .
>
> The fighter governs the front, and this fact forces the centralization of air control in the hands of one air commander operating on that front. I think it is generally accepted that with adequate fighter superiority and bomber forces the air has a governing influence on what happens within reach on the ground or on the sea.
>
> And finally, there is no doubt that in this technical age it needs a life of study and specialising for a sailor, a soldier or an airman to learn his profession. He is never free from the problems of development, particularly in war, and I

> therefore cannot accept the possibility that any man, however competent, can do the work of the other services without proportionately neglecting his own In plain language, no soldier is competent to operate the Air, just as no Airman is competent to operate the Army.[61]

The remainder of Coningham's speech was devoted to examples which supported his general comments. Of interest is his description of air support in battle. He gave the case of a unit which requests an attack on a 200 vehicle enemy formation located near the front lines. The request was denied. All available air support is committed to attacking an enemy divisional-sized armoured unit containing over 2,000 vehicles located 15-20 miles behind the front line. This was the reason the comparatively smaller formation at the front was being ignored. Coningham states, "The smaller formations of the Army must understand that penny packets of air are a luxury which can only be afforded at certain times, and that judgement on the question of targets is the result of agreement between the Army and Air commanders, and in accordance with the Army Commander's broad directive of priority."[62] In essence, Coningham was reinforcing the argument that tactical air resources need centralized control to be most effective.

Coningham sent copies of his speech to every ranking officer in Tunisia to ensure that his views on tactical air doctrine were well known. According to Vincent Orange, Coningham's biographer, the Tripoli speech made a "remarkable impact," especially judging by the large number of copies that survive today.[63]

In the space of a few hours, Montgomery and Coningham had succinctly and accurately summed up the position held by the U.S. Army Air Forces for years, but which they had been unable to enunciate clearly or put into effect. Now that a new doctrine had been introduced into the vacuum left by the breakdown of the American close air support system following the start of Torch, it remained to be seen whether the British influence would have any effect.

On assuming command of the NATAF on 18 February, Coningham wasted no time in making his presence felt. In short order he changed the entire orientation of the tactical air forces in Tunisia. No longer were his units to be used in defensive missions. The air umbrella was discontinued and control of the aircraft was removed from First Army and II Corps. Henceforth, all requests for air support had to be made through Coningham. Fighters and fighter-bombers began flying offensive missions aimed at destroying the Luftwaffe and gaining air superiority. As well, the emphasis on ground targets was shifted to enemy troop concentrations and motor transport, objects which were well within the capabilities of the airmen. Tanks were declared to be unprofitable targets due to the difficulty, and expense, of attempts to destroy them.[64] Though Coningham's reorganization went against current American practice in Tunisia, acceptance of these changes was made easier by the notion that aircraft were a scarce resource. This "economy of force" principle became more palatable to the Ground Forces after a number of military set-backs in Tunisia, including Kasserine.[65]

The air forces in Tunisia, British and American, were now organized on a principle of coequality that previously had not existed. Coningham and Alexander formed a close relationship. Each day they met to discuss the current situation and they worked together to form a joint plan for the day's ground and air operations.

According to Kuter, "They worked in complete harmony."[66] Tedder reported in early March following an extensive tour of the forward area that, "Everything I saw and heard convinced me that the establishment of a joint headquarters by Alexander and 'Mary' Coningham had changed the whole atmosphere and outlook of the British and American land and air forces."[67] Coningham's changes were beginning to take effect. It was noted in the official history of the U.S. Army Air Forces that "hopeful signs of a new cooperation" were beginning to appear.[68]

However, the problems that had plagued the Allied Forces since the invasion of North Africa did not disappear overnight. Between 14 and 22 February, in the middle of the reorganizations, the Germans launched a counteroffensive and routed American forces in the Kasserine Pass. Allied air power was very active in trying to stop the Axis advance, but in the end it played only a small role in the operation. Poor weather and the loss of forward air bases interfered with the provision of air support. At least one success was recorded, however, when aircraft from the XII Air Support Command caught a force of German armour and infantry outside Thala. Results of the engagement are sketchy, but it appears the air attacks caused a noticeable decline in enemy fire. But this was an exception. Operations during this period were characterized by a breakdown in coordination between the air and the ground. This was clearly indicated by a number of friendly fire incidents on 21 and 22 February. On the first day, American anti-aircraft fire prevented two air support missions from being carried out and destroyed five aircraft. Steps were taken that night to prevent a reoccurrence the next day. Gunners were told that Allied aircraft would fly low over their positions, but that they would rock their wings rather than make diving attacks. As well, it was stressed that American aircraft had dark noses, while German aircraft were decorated with white or yellow noses. In spite of these efforts, American aircraft were again shot at on 22 February resulting in the loss of five aircraft. The lack of coordination becomes even more blatant due to the fact that the aircraft shot down were the very distinctive P-38 Lightning, of which the Germans had nothing similar. General Robinett, commander of the forces in question, finally had to order his troops not to fire at aircraft unless specifically attacked.[69]

A major stumbling block in the creation of a more effective tactical air force was the acceptance of the changes. Tedder wrote to Charles Portal, British Chief of the Air Staff, on 26 March regarding American Army reaction to the reorganized air support system:

> They are instinctively antagonistic to it and find it difficult to understand that every General has not a divine right to command his own private air forces, and incidentally a divine inspiration by which he knows better than anyone else how those air forces should be employed. I think most of the Americans who have now seen our organization working admit that it is sound, and produces better results than their own, but at the back of their minds there is always the bitter feeling which exists amongst them regarding separate air forces.[70]

The animosity between the Ground and Air Forces reached a climax on 1 April when II Corps headquarters was attacked by a flight of Stukas. General Patton, though not harmed, was furious about the air attack which killed a number of men including his favourite aide. The incident was recorded in the II Corps situation report for the day:

> Forward troops have been continuously bombed all morning. Total lack of air cover for our units has allowed German air force to operate almost at will.

> Enemy aircraft have bombed all division CP's and concentrated on units supporting the main effort.[71]

Coningham could not believe this report when he first received it. He actually thought it was an April Fools' Day joke. He soon realized it was genuine and issued a harsh rebuttal of the Patton's dispatch contesting its accuracy:[72]

> It is to be assumed that intention was not to stampede local American air command into purely defensive action. It is also assumed that there was no intention to adopt discredited practice of using air force as an alibi for lack of success on ground. If sitrep is in earnest and balanced against. . . facts, it can only be assumed that II Corps personnel concerned are not battle-worthy in terms of present operations.
>
> In view of outstandingly efficient and successful work of American Air Command concerned, it is requested that such inaccurate and exaggerated reports should cease. 12 Air Support Command have been instructed not to allow their brilliant and conscientious support of II Corps to be affected by this false cry of wolf.[73]

This confrontation was very serious in nature. At one point Eisenhower nearly resigned his command due to his perceived inability to control his subordinates.[74] The episode was eventually defused with apologies from both Patton and Coningham. The incident showed, however, that it would take more than a reorganization to change attitudes towards tactical air support and create a harmonious air ground team.

In spite of the differences between the Ground and Air Forces, a more effective system of air support had emerged. The reorganization imposed at Casablanca spurred the improvement, but significant credit must also be given to the pilots, aircrew and soldiers on the ground who had learned through their mistakes and were now experienced veterans. The battles of the Mareth line at the end of March represent the ultimate development of tactical air doctrine and employment in the Tunisian campaign. The versatility of the tactical air forces was used to overcome

German resistance as Montgomery's Eighth Army closed in from the East. XII Air Support Command and No.242 Group RAF worked together to hold back the Luftwaffe while the Western Desert Air Force acted in close cooperation with the British Army (becoming, in effect, part of the barrage) to overcome the German defences at El Hamma. For two nights prior to the ground attack, Allied bombers attacked German positions by the light of parachute flares. The primary intention was to wear down the enemy through the interruption of sleep. On the day of the ground assault, the attack was opened by light bombers followed by Kittyhawk fighter-bombers and Hurricane tank-busters. Enemy positions were marked by smoke as was the British bombline. When the ground attack commenced, fighter-bombers continued to attack German gun positions, and troop and tank concentrations in an effort to keep the enemy from resisting the assault. A report on the battle, endorsed by Coningham, summed up the air effort at El Hamma on 26 March:

> There is no doubt that this attack achieved surprise both in the air and on the ground, and that continuous low bombing and straffing [sic] completely disorganized the enemy defences for sufficiently long to allow the leading elements of the Eighth Army to take them . . . [75]

This operation would become a pattern for future Allied operations in Normandy such as Cherbourg and Cobra.

David Syrett ably summed up the effect of tactical air operations in North Africa:

> In later campaigns, in the Mediterranean and northwest Europe, the techniques of close air support of ground forces would be further developed. But this would not have been possible without the doctrinal foundations laid down by the NATAF in 1943.[76]

Essentially, the American experience in North Africa had shown that the tactical air doctrine in use was totally inadequate. Conveniently, a new doctrine emerged just as the old one was collapsing. Without any alternatives, the Americans adopted the methods and techniques that had been hammered out by Coningham and Montgomery in the Western Desert. This British doctrine became the template for American close air support operations for the remainder of the war.

Recent American scholarship has attempted to dispel some of the "myths" that have surrounded American tactical air doctrine in North Africa. David Mets and Daniel Mortensen both argue that the U.S. Army Air Forces were as innovative and professional as the RAF of the period. They offer considerable evidence to show that a doctrine for the employment of tactical aviation had been developed in the United States and that American Air Force officers were well versed in those ideas.[77] Mets attributes the lack of American success in tactical air operations to a lack of combat experience in the North African theatre rather than the absence of a sound tactical air doctrine. He asserts that the British instructed the Americans only in such matters as efficient staff work, air research and development, intelligence and radar. Mets' paper contains some good ideas, but it misses two major points. First, Mets states that, "The first waves of airmen in Torch could not have any theater indoctrination at all."[78] If this was the case, it was due to the failings of the Air Force high command, rather than a lack of experience to draw on. Setting aside the fact that Britain had been fighting in the desert since 1940, the Americans had sent General Lewis Brereton and the nucleus of the Ninth Air Force to the Middle East in June

1942. The intention was to work with the Royal Air Force and share their accumulated experiences. As early as 7 July 1942, Brereton dispatched a report to the War Department which commented on the "wonderful opportunity for training and observation of operational methods of fighters and light bombardment in direct support of ground army operating against highly trained tank and motorized units."[79] Following the successful employment of tactical air power by Montgomery and Coningham at El Alamein, Brereton submitted a detailed paper entitled, "Direct Air Support in the Libyan Desert." In this 22 page report Brereton examined all aspects of air-ground operations. He dealt with topics such as headquarters organization, air support control, fighter and bomber operations and tactics. Brereton concluded by stating that air-ground operations had proven an "unqualified success" despite deficiencies in training and equipment. This success was largely due to the "maintenance of a spirit of complete cooperation and mutual understanding between the air and ground echelons."[80] It can thus be seen that Washington was well informed of current practice in the Western Desert and experienced American personnel were available as instructors well before Operation Torch.

The second point that Mets does not account for was the reason why the American tactical air doctrine that had been developed was not put into effect. It was certainly true that American airmen had developed a sound doctrine of their own, but they were unable to convince the Ground Forces of the applicability of their ideas. As a result, the Air Force found itself being utilized by Ground Force commanders in a manner that did not take full advantage of the air weapon. This was where the

British came in. Coningham and Montgomery were anointed as the creators of a revolutionary system of air-ground cooperation. This was a slight distortion of the truth. Their ideas were not new, but they had been the first on the Allied side to successfully implement the concepts. The American airmen became disciples of the British doctrine not because of its originality, but because they could use its success to convince the Ground Forces of its utility, something they had hitherto been unable to achieve.

Brigadier General Kuter was one of the first to take full advantage of this. Upon his return from North Africa in May 1943, he wrote a report entitled, "Organization of American Air Forces." Kuter offered an acrimonious indictment of American operations in Tunisia and made very specific recommendations for the future. The report covers the American experience in North Africa. Kuter attributes the lack of American success to the utilization of an unsound air-ground organization and the lack of understanding of air matters demonstrated by Ground commanders. The recommendations for the future included in the report were largely derived from the experiences of Air Vice Marshal Coningham and the Royal Air Force.[81] Historian Daniel Mortensen puts Kuter's paper in its proper perspective. "Kuter was in the right place to become the disciple who took the British message to the United States Army."[82] Kuter's paper received wide circulation and had a significant effect of the authors of FM 100-20. To a large extent, the impact of Kuter's report was predicated on the respect accorded to Coningham and Montgomery in the American military.

The effects of these lessons quickly became apparent. The British Air Ministry issued a pamphlet in June 1943 entitled "Air Power in the Land Battle." It consisted entirely of excerpts from the Montgomery's booklet, "Notes on High Command in War," and the speech made by Coningham in Tripoli in February 1943. The Foreword and Introduction to this pamphlet are most interesting as they were written by General Arnold and Air Chief Marshal Portal. Arnold declared that, "Embodied in these pages are battle-tested fundamentals in the exercise of command and employment of Air Power, adherence to which has contributed to the success of two of this War's outstanding commanders." He believed that these inspirational principles should be recommended reading for every officer in the Army Air Forces. Portal echoed the words of Arnold and commended the pamphlet to all RAF officers who, "aspire to the command of air forces taking part in warfare on land."[83] The high profile given to the ideas of Coningham and Montgomery showed the revolution that had occurred in American thinking on tactical air doctrine. As recently as April 1939, General Arnold had persisting doubts about the role of attack aviation.[84] Only four years later he was fully endorsing a centralized concept of tactical air power.

In June 1943 the War Department, responding to Air Force pressure, appointed a board to develop an official position on tactical air doctrine. The board was composed of Colonel Morton H. McKinnon, Commandant of the Air Support Department of the School of Applied Tactics, Colonel Ralph F. Stearley, commander of I Air Support Command, and Lieutenant Colonel Orin H. Moore, Armoured Force liaison officer at AAF Headquarters. Within three weeks, a draft manual had been produced. It was formally released on 21 July 1943 as War Department Field Manual 100-20, "Command and Employment of Air Power."[85]

The main ideas contained in FM 100-20 are stated very forcefully, in capital letters, at the beginning of the manual:

> LAND POWER AND AIR POWER ARE CO-EQUAL AND INTERDEPENDENT FORCES; NEITHER IS AN AUXILIARY OF THE OTHER. . . .
>
> THE INHERENT FLEXIBILITY OF AIR POWER IS ITS GREATEST ASSET. THIS FLEXIBILITY MAKES IT POSSIBLE TO EMPLOY THE WHOLE WEIGHT OF THE AVAILABLE AIR POWER AGAINST SELECTED AREAS IN TURN; SUCH CONCENTRATED USE OF THE AIR 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 KNOCKOUT 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 COMMANDERS CHARGED WITH THE ACTUAL CONDUCT OF OPERATIONS IN THE THEATER, WHO WILL EXERCISE COMMAND OF AIR FORCES THROUGH THE AIR FORCE COMMAND 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 FORCES ARE OPERATING INDEPENDENTLY OR ARE ISOLATED BY DISTANCE OR LACK OF COMMUNICATIONS.[86]

The statements contained in FM 100-20 can be seen as a deliberate attempt to avoid the pitfalls experienced in North Africa. The equal status of the Ground and Air Forces, the principle of centralized control and the flexibility of tactical air power are dominant themes in this manual. Another aspect of FM 100-20 was the prioritization of the missions of the tactical air force. The first phase of operations was to gain air superiority. Without this pre-condition, the operational advantage passed to the enemy. The second priority was interdiction or the prevention of hostile troops and supplies from moving within, or to, the battle area. Once these first two missions had been accomplished, attention could focus on third phase operations: the support of ground forces in the immediate battle area. The manual stated, "in the zone of contact, missions against hostile units are most difficult to control, are most expensive and are, in general, least effective. Targets are small, well-dispersed, and difficult to locate. . . . Only at critical times are contact zone missions profitable."[87] The arrangement of the three main missions of the tactical air force makes sense but only in a conceptual manner. The attainment of air superiority was an essential prerequisite for other close air support operations. However, the strict ranking of missions seemed to preclude the various operations from taking part along side each other. This, combined with the fact that close support of the Ground Forces was relegated to third priority, left many army commanders wondering how committed the air force was to its support. This question could not be answered until the Allies turned their attention to continental Europe.

FM 100-20 was directly based on the ideas espoused by Coningham. Lieutenant General Elwood R. Quesada, the man who would lead the IX Tactical Air Command in Northwest Europe was full of praise for the tall New Zealander.

> 'Maori' Coningham was the first senior air force guy who established tactical air doctrine as supportable doctrine which almost everybody accepted. The doctrine that Spike [General William Momyer] has referred to [FM 100-20]: Coningham is the architect of it. He made everybody accept it, and almost everybody thereafter was forced to adopt it, and I think it should be recorded that he established it over tremendous opposition. He overcame the concept of using the air force as artillery, and he established the doctrine that if an airman

is left to use his own weapon and use his experience he would further the cause of the army or the ground battle.[88]

Quesada fully supported the new ideas on the application of tactical air power, and it was through his association with Coningham that many of these notions made their way from North Africa to Western Europe.[89]

Most people eventually came to accept FM 100-20, although this did not happen immediately. The new manual caused quite a stir when it was published because there was no consultation or approval sought from General McNair and the Army Ground Forces. This preemptive move, considered by some to be a "Declaration of Independence," tended to support the view that the Air Force had only its best interests in mind and FM 100-20 was merely an attempt to gain freedom of action from the Army Ground Forces. In spite of this opposition, the new doctrine quickly became part of the curriculum at Army ground schools.[90]

Until FM 100-20 was published, American tactical air doctrine lacked focus. In their competition for dominance over the resource, the Ground and Air Forces failed to create a workable system. FM 31-35 contained a number of good ideas but these were lost in the attempt to satisfy the proponents of both a centralized and decentralized system of close air support. Operations in North Africa proved this. FM 100-20 was not perfect, and there were many who opposed the ideas it contained. However, control of the air resources was placed firmly in the hands of the Air Force. If nothing else, this eliminated most of the bickering over command arrangements and allowed attention to be focused on the provision of support, as outlined in FM 100-20 rather than on the form the support should take.

NOTES

1. Thomas H. Greer, The Development of Air Doctrine in the Army Air Arm, 1917-1941, USAF Historical Study No.89 (Maxwell AFB, 1955), pp.66-67.

2. The Air Corps Tactical School operated at Maxwell Field, Alabama from 1931 to 1940. It offered courses to senior officers (over age 32) in command and staff problems, air tactics and strategy, an ground tactics. The school often questioned the official Army doctrine. Captain Laurence S. Kuter (who would later be appointed commander of the Allied Air Support Command, stated in a Tactical School lecture in 1938, "Battles have been won too often by the judicious violation of doctrine. . . . Disagree with the doctrine in the conference room—be familiar enough with it to violate it in the conference room—but know it well enough to know what it is and why you are violating it." (Futrell, p.47 and Wesley F. Craven and James L. Cate, eds., The Army Air Forces in World War II. Volume 6, Men and Planes (Washington D.C., 1983 (1955)), p.684.)

3. Daniel R. Mortensen, A Pattern for Joint Operations: World War II Close Air Support, North Africa (Washington, 1987), pp.6-7 and David Syrett, "The Tunisian Campaign, 1942-1943." in Case Studies in the Development of Close Air Support, edited by B.F. Cooling (Washington, 1990), p.155.

4. Greer, p.88.

5. Mortensen, pp.8-9 and 25 and Greer, p.88.

6. Mortensen, pp.11-13 and William A. Jacobs, "Tactical Air Doctrine and AAF Close Air Support in the European Theater, 1944-1945." in Aerospace Historian, March 1980, p.38.

7. Air Corps Field Manual 1-5, Employment of the Aviation of the Army." 15 April 1940 as quoted in Mortensen, p.12.

8. Air Corps Field Manual 1-5, "Employment of the Aviation of the Army." 15 April 1940 as quoted in Mortensen, p.13.

9. James A. Huston. "Tactical Use of Air Power in World War II: The Army Experience." Military Review. July 1952. pp.32.

10. Mortensen, p.13.

11. Kent Roberts Greenfield, Robert R. Palmer and Bell I. Wiley, The Organization of Ground Combat Troops, United States Army in World War II: The Army Ground Forces (Washington D.C., 1947), pp.106-107 & 104.

12. Kent Roberts Greenfield, Army Ground Forces and the Air-Ground Battle Team including Organic Light Aviation, Study No.35, Historical Section, Army Ground Forces, (Washington, D.C., 1948), p.7 and Mortensen, p.17.

13. Syrett, p.157.

14. David N. Spires, Air Power for Patton's Army: The XIX Tactical Air Command in the Second World War (Washington, 1992), Draft Manuscript, p.10.

15. Mortensen, p.14.

16. Mark Skinner Watson, Chief of Staff: Prewar Plans and Preparations, United States Army in World War II (Washington, 1950), p.294.

17. Kent Roberts Greenfield, *et al.*, The Organization of Ground Combat Troops, p.112.

18. Memo, Lt. Col. Donald Wilson to Lt. Col. L.F. Stone, Command and General Staff School, 23 September 1939. Quoted in Greer, p.109.

19. Robert Frank Futrell, Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964 (Alabama, 1980 (1971)), p.52.

20. Greer, p.109

21. For more information on Luftwaffe close air support practices, see Williamson Murray, "The Luftwaffe Experience, 1939-1941," in Case Studies in the Development of Close Air Support, edited by B.F. Cooling (Washington, 1990), pp.71-113,and James S. Corum, "The Luftwaffe's Army Support Doctrine, 1934-1941," A paper presented to the 59th Annual Meeting of the Society for Military History, Fredricksburg, Virginia, 10-12 April 1992.

22. Futrell, p.66. and Mortensen, p.14.

23. Kent Roberts Greenfield *et al*, The Organization of Ground Combat Troops, p.113.

24. War Department Basic Field Manual 31-35. "Aviation in Support of Ground Forces." Washington D.C., 9 April 1942. (Bolling AFB, K170.13-31-35.) p.1.

25. FM 31-35, p.3.

26. FM 31-35, p.6.

27. FM 31-35, pp.12-14.

28. FM 31-35, pp.5-6.

29. FM 31-35, pp.6 and 10.

30. FM 31-35, p.10.

31. I.S.O. Playfair, C.J.C. Molony, F.C. Flynn and T.P. Gleave, The Mediterranean and Middle East, Volume IV, The Destruction of Axis Forces in Africa (London, 1966), pp.109-110.

32. Playfair *et al.* p.112.

33. Fredendall had under his command II US Corps; Patton, 3rd and 9th US Divisions and Anderson, First Army.

34. Playfair *et al.* p.113 and Syrett, p.162.

35. Mortensen, p.50.

36. Operation Memo No.17, "Combat Aviation in Direct Support of Ground Units." Allied Force Headquarters, Quoted in Mortensen, p.51.

37. Syrett, p.161.

38. Mortensen, p.62.

39. John Terraine, The Right of the Line: The Royal Air Force in the European War, 1939-1945 (London, 1985), p.393, Syrett, p.164 and Wesley Frank Craven and James Lea Cate, eds., The Army Air Forces in World War II, Volume 2: Europe: Torch to Pointblank, August 1942 to December 1943 (Chicago, 1983 (1949)), p.108.

40. Playfair *et al*, pp.182-183 and Mortensen, p.61.

41. Playfair *et al*, p.182.

42. Playfair *et al*, p.182.

43. Syrett, p.161 and Playfair *et al*, pp.177-178.

44. Syrett, pp.165-166.

45. Mortensen, pp.60-61.

46. Playfair *et al*, pp.182-183.

47. It should be pointed out that the British air-ground team in Tunisia fared no better than the American system. The RAF was forced to fly the same umbrella patrols, and the British Army commanders, especially General Anderson, did not view air power in the same terms as General Montgomery.

48. Syrett, p.164.

49. Mortensen, p.67 and Syrett, pp.165 and 168.

50. Vincent Orange, Coningham: A Biography of Air Marshal Sir Arthur Coningham, (London, 1990), p.132.

51. Orange, pp.131-132.

52. Syrett, pp. 170-172.

53. Lord Tedder, With Prejudice: The War Memoirs of Marshal of the Royal Air Force, Lord Tedder (London, 1966), p.393.

54. Mortensen, p.74.

55. Tedder, p.394.

56. Tedder, p.396.

57. B.L. Montgomery, "Some Notes on High Command in War." Second Edition, Italy, September 1943, (DHist Air 8/984). This is a reprint of the original which was first issued in January 1943. The only change is the addition of a new introduction by Montgomery.

58. "Talk by Air Vice Marshal Sir A. Coningham to assembled British and American General and Senior Officers". Tripoli, 16 February 1943. (DHist Air 8/984).

59. Tedder, p.397. Coningham, a New Zealander, derived his nickname from a corruption of the word "Maori," a tribe native to his country.

60. Kohn, Richard H. and Joseph P. Harahan, eds., Air Superiority in World War II and Korea, An interview with Gen. James Ferguson, Gen. Robert M. Lee, Gen. William Momyer, and Lt. Gen. Elwood R. Quesada. (Washington, 1983), pp.30-35.

61. "Talk by Air Vice Marshal Sir A. Coningham." 16 February 1943.

62. "Talk by Air Vice Marshal Sir A. Coningham." 16 February 1943.

63. Syrett, p.173 and Orange, p.133.

64. George F. Howe, Northwest Africa: Seizing the Initiative in the West, The United States Army in World War II, The Mediterranean Theater of Operations (Washington D.C., 1957), p.493 and Craven and Cate, II:157.

65. Mortensen, p.72.

66. quoted in Mortensen, p.83.

67. Tedder, p.404.

68. Craven and Cate, II, p.160.

69. Craven and Cate, II, pp.153-161, Playfair *et al*, pp.287-303 and Howe, Northwest Africa, pp.467-468.

70. Tedder, p.404.

71. Omar N. Bradley, A Soldier's Story (New York, 1951), p.62. Patton assumed command of II Corps following the dismissal of Fredendall after Kasserine.

72. Laurence S. Kuter, "Goddammit, Georgie: North Africa, 1943: The Birth of Tac Air Doctrine." Air Force Magazine, February 1973, p.53.

73. Bradley, pp.62-63.

74. Tedder, p.411.

75. "The Eighth Army Break-Through at El Hamma on 26th March, 1943." Northwest African Tactical Air Forces. n.d. (LCMSDS roll A6011 [This refers to microfilm obtained from the United States Air Force Historical Research Centre held in the collection of the Laurier Centre for Military Strategic and Disarmament Studies]), Terraine, pp.396-398 and Syrett, pp.177-178.

76. Syrett, p.184.

77. David M. Mets, "A Glider in the Propwash of the Royal Air Force? General Carl A. Spaatz, the RAF, and the Foundations of American Tactical Doctrine." Paper delivered at the annual conference of the Society for Military History, Kingston, Ontario, 22 May 1993, and Daniel R. Mortensen, "Laurence Kuter, Disciple of American Tactical Doctrine." Paper delivered at the annual conference of the Society for Military History, Kingston, Ontario, 22 May 1993, [papers in possession of author]

78. Mets, pp.36.

79. quoted in Harry L. Coles, Ninth Air Force Participation in the Desert Campaign to 23 January 1943, Army Air Forces Historical Study No.30 (Washington, February 1945), p.23.

80. Lewis H. Brereton, "Direct Air Support in the Libyan Desert." 22 August 1942, (LCMSDS roll B5593)

81. Laurence S. Kuter, "Organization of American Air Forces." Northwest African Air Force Headquarters, 12 May 1943, (LCMSDS roll A6011) [Note: Though the dateline for this report is North Africa, Kuter had already been in the U.S. for several weeks. (Mortensen, "Laurence Kuter," p.34n.")]

82. Mortensen, "Laurence Kuter," p.9.

83. "Air Power in the Land Battle: A Note by the Chief of the Air Staff." Air Ministry, June 1943. (LCMSDS Roll A1927 frames 1737-43).

84. Greer, p.87.

85. Futrell, p.69.

86. War Department Field Service Regulations FM 100-20, Command and Employment of Air Power (Washington, 21 July 1943), (LCMSDS Roll A1927, frames 1720-1736).

87. FM 100-20.

88. Kohn and Harahan, eds., p.34.

89. John Schlight, "Elwood R. Quesada: Tac Air Comes of Age." in John L. Frisbee, ed., Makers of the United States Air Force (Washington D.C., 1987), p.186.

90. Mortensen, p.79, Futrell, p.69 and Huston, p.34.

Chapter 2

ON TO BATTLE: NINTH AIR FORCE AND THE POST-FM 100-20 REORGANIZATION OF TACTICAL AIR POWER DOCTRINE

In the aftermath of the Tunisian campaign the Americans worked hard to solve their tactical air problems. The reorganizations of January and February 1943 had made a big difference but there was still much to be worked out. Two different routes were being followed in the hunt for a workable tactical air doctrine. The first involved continued refinements to the existing air support system during operations in Sicily and Italy. The second involved a theoretical examination of the problem back home in the United States. This further development of American tactical air power along the parallel streams of practice and theory was to have far-reaching effects on its employment in the Normandy campaign.

The Evolution of Tactical Air Doctrine in Battle: Sicily and Italy

Air operations in Sicily and Italy relied largely on doctrine as it stood during the Tunisian campaign. FM 100-20 was published shortly after the invasion of Sicily. Though operations in Sicily and FM 100-20 drew on the same experiences, the further development of tactical air doctrine on the battlefield remained relatively independent of outside influences.

In Sicily, cooperation between the ground and the air had advanced since operations in Africa but significant problems remained. In the early stages of the landings there was almost no close air support. This stemmed partially from the need for aircraft in beach and shipping patrols. However, there was almost no capability at that point to direct aircraft to phase three targets. Air support parties had been landed on the first day, but they remained ineffective for a variety of reasons. The naval air parties were supposed to provide interim direction, but this did not work. At the root of the problem was an ineffective system of communications.[1] This was the first campaign in which the air commanders were in a position to exercise central control over the utilization of the air resources.[2] It resulted in a period of acclimatization in which commanders adjusted to the new order. Problems were apparent not only in the communication system but also in the application of close support. Ground commanders, in particular, showed a lack of knowledge in positioning the bomb line. It was quite common that the bomb line was not kept up-to-date. This resulted in numerous cases of friendly casualties when troops overstepped the bomb line and in German troops being protected by a bomb line positioned too far ahead of Allied lines.[3] The capture of Sicily has been pointed to as a "model campaign" since it required the cooperation of ground, naval and air units to overcome a determined and tenacious enemy in terrain that favoured the defender. However, there were many areas that could be improved. Operations in Sicily showed above all that coordination had to be improved between the air and ground forces. Experience was a great teacher in this respect, but the process could be greatly facilitated by instructing the army in the capabilities and limitations of tactical air support and reinforcing this through a comprehensive joint training program.[4]

The move to Italy in the fall of 1943 saw the continuation of the existing system of close air support. By this time, the impact of FM 100-20 had made itself felt, but it did little more than alter the terminology. The problems of coordination that were experienced in Sicily continued to be felt in Italy. The number of assault landings during the Italian campaign reinforced the fact that closer cooperation was needed between the Navy and the Air Force. This was imperative as ground-based air support parties would not begin to function effectively for a number of days following the invasion. Until then, communications facilities on the ships would have to provide the necessary liaison from the Army to the Air Force.[5]

As the campaign progressed, cooperation between the air and ground drew closer and became more effective. One reason for this was the success of new tactics. The improving communications systems allowed a technique known as Rover to become effective. Rover was first developed in North Africa, but its very nature required both a high level of skill and extremely close relations between observers on the ground and the pilots overhead. Because of this, the technique did not succeed immediately. Rover involved sending a team of forward controllers, including a combat pilot and a Ground Forces officer, to a position which overlooked the battlefield. This team received requests for air support from the ground forces. If the mission was approved, the Rover controller would contact a flight of aircraft holding in Cabrank, assign them the target and talk the aircraft right down onto the target (Cabrank involved successive flights of aircraft arriving over the battlefield at 30 minute intervals. If they did not receive a Rover target in the period, they would attack alternate targets before returning to base).[6] This procedure achieved great successes in Italy, but not in North Africa due an inadequate communications network as well as a lack of understanding of the abilities of tactical air power by the ground forces.

A second reason for the greater effectiveness of tactical air operations in Italy was the closer relationship between the air and the ground. A joint conference was held daily between representatives of the Fifth U.S. Army and XII Air Support Command. This meeting allowed the two forces to work in unison to decide the next day's air support missions based on both the ground and air situation.[7] It is apparent from operations in Sicily and Italy that the air and ground needed a significant period of time working together, in combat, before the system of providing air support became really effective.

The Theoretical Evolution of Tactical Air Doctrine: The AAF School of Applied Tactics

Away from the battlefield, the Army Air Forces School of Applied Tactics (AAFSAT), located in Orlando, Florida, was the primary site for the elaboration and formulation of new doctrine. The AAFSAT was created in November 1942 because a centre was needed for "the conduct of tactical development and testing . . . at which tactical instruction could be given to flyers about to be dispatched to the theatres of operations."[8]

The AAFSAT fully adopted the new doctrine of FM 100-20 into its teachings. All courses dealing with tactical air power were based on the principles contained in FM 100-20 and were backed up with lessons from German, British and American practice in the early years of the war, especially the campaigns in France and North Africa.

A lecture delivered in November 1943, entitled, "Air-Ground Coordination and Planning" outlined the basics of the new doctrine. However, it did little more than flesh out some of the theoretical concepts presented in FM 100-20. Particular emphasis was given to three main areas: bomb line safety, target selection and the definition of a profitable target. The lecture specified that it was the responsibility of the ground commander to set the bomb line, monitor its position relative to his forces and either move it forward or restrain his troops as required. Five different methods for designating a bomb line were offered including smoke, radio contact between forces and the use of photographs. On the question of target selection, a list of suitable targets was given for each of the three phases of operations. To help in the identification of profitable targets, five criteria were recommended to help with the decision: 1. Can a pilot see the target? 2. Can he find it? 3. Can he hit it? 4. Can he destroy it if he hits it? and finally, 5. Is the probable gain achieved in destroying the target worth the probable losses that would be incurred in attacking it? If the target passed this test, the final decision to fly the mission always rested with the air commander. In choosing Phase 1 targets, the decision was made solely by the Tactical Air Force Commander. In Phase 2, the TAF Commander made the decision after carefully weighing the needs of the air, ground and naval forces. In Phase 3, missions were assigned by the TAF Commander after consultations with the Army Group Commander or by the Tactical Air Division Commander (the equivalent of the Air Support Command or Tactical Air Command) in consultation with the Army Commander. In all cases, the decision on the suitability of a target was made at the army or theatre level, not the battalion or division level.[9]

This lecture provided a good introduction to the new ideas being espoused by the AAF, but it did not yet provide the detail that would be needed by an air force at war. By early 1944, this leap had been made. A new series of lectures at the AAFSAT showed a significant evolution of thinking. Benefitting from the recent American experience in Sicily and Italy, the AAFSAT had taken the theoretical ideas contained in FM 100-20 and translated them into a workable system that could be implemented in battle.

The most significant feature of the new lessons being taught at the AAFSAT was its definition of the role of the tactical air force. A great amount of detail was given concerning types of missions and how they would be accomplished. One lecture delivered by Captain Wasson J. Wilson, simply titled "The Tactical Air Force," contained detailed discussions on such varied topics as the function of a tactical air force, the equipment and organizational needs of a TAF, and a break down of the various components of a TAF. The lecture concluded with a comparison between the theoretical employment of tactical air power and its actual usage in Italy and Sicily.[10]

One of the biggest differences between the FM 100-20-pattern and the FM 31-35-pattern tactical air forces was the system used to control tactical air operations. The Tactical Control Group (or Tactical Control Center) was a significant improvement over the Air Support Control used in Tunisia because of its flexibility. Covering such diversified functions as enemy aircraft warning, the control of aircraft in flight and liaison with ground forces, the Tactical Control Group provided an invaluable service as the central information, control and coordination agency within the tactical air force. The greatest strength of the Tactical Control Group was its ability to function as a bridge between the Tactical Air Force and the Army Ground Forces. In addition to the work of the Air-Ground Liaison Squadron which supplied air parties to the corps and divisions of the ground forces, the Tactical Control Group provided a central location for the interaction of those forces. Liaison officers were sent by both the ground and anti-aircraft forces to the centre to maximize the cooperation between the various forces. By keeping in close contact, misunderstandings were less likely to occur and the air and the ground would be better able to communicate their needs and abilities to each other. Wilson summarized by stating: "This is a three dimensional war we are engaged in, and the Tactical Control Center is a modern innovation. It is a place where, in a given area, both the air and ground situation can be determined at the same time."[11]

In Italy, the Tactical Control Group, known as the Air Support Control Section, worked in much the same way. Aside from minor variations in set-up and procedure, the major difference between Air Force theory and practice in Italy was that the Air Support Control Section was run by the Fifth Army rather than the XII Air Support Command. The reason given for this development was that the Fifth Army had the most to gain from its successful operation.[12]

The importance of the air-ground relationship was summarized in an AAFSAT lecture as follows:

> Theirs is a joint enterprise, depending for success upon a common understanding and combined plans cooperatively carried out. The tactical control center is intended to be the nucleus of this cooperative effort. It is the one place where both the air and ground situation can be determined at the same time.[13]

While the operation of the tactical control centre in Italy differed from that devised at the AAFSAT, it can be seen that this definition easily applies to both systems.

Concurrently, a second lecture on the Tactical Air Force delivered at the AAFSAT provided a list of "self-evident truths" about the battlefield:

> 1. It is practically impossible for any surface force, either land or sea, to operate successfully unless the enemy air force has been neutralized or destroyed.
> 2. Nothing will contribute more to the demoralization of ground troops than for them to realize that air attacks can be conducted at will by an enemy who has complete control of the air.
> 3. The short duration of a single airplane attack requires large masses of aircraft to make fire power effective
> 4. Aviation is a powerful striking force which can be diverted to many widely separated targets within a few hours.
> 5. We just don't have all the combat aviation we want, and need in the theatres.

> 6. As General Montgomery has said: "Nothing could be more fatal to successful results than to dissipate the air resources into small packets placed under the command of Army formation commanders with each packet working on its own plan. The soldier must not expect or wish to exercise direct command over air striking forces."[14]

The author of this lecture, Lieutenant W.L. Cobb, stated that these "truths" arose because of the changing nature of warfare. The old-style air support command was sufficient when war was largely confined to the ground. But with the advances in technology and tactics, the air support command became outdated, hence the need for the reorganized tactical air force.

This emphasis on detail had a couple of effects. First, it gave the Army Air Forces a pattern, or blueprint, to follow in the reorganization of their tactical air forces. FM 100-20 provided a good start in the new direction, but it offered only guidelines, not detailed directions. More importantly, however, the AAFSAT showed the Ground Forces that this new doctrine was practical and would offer them benefits in the accomplishment of their mission.

The Ninth Air Force in Britain, October 1943-April 1944

The establishment of a tactical air force in Britain, designed to support future operations on the continent, was decided on following a number of studies and proposals. The organization that resulted was to prove very successful during the campaign in Northwest Europe. Before that could happen, a number of difficulties had to be worked out. Foremost, and central to this study, was the question of training. The state of training had a major impact on the operational readiness of the tactical air force at a number of levels. First was the level of individual training. Before anything else could happen, the pilots had to be very proficient at their jobs. Not only did this include the basics, such as flying and navigating, but also the skills essential to close air support such as bombing techniques (dive, glide and low level) and the strafing of ground targets. Once these basics were mastered, training turned to joint exercises with the Ground Forces. Included in this phase of training were command post exercises staged by the various headquarters as well as actual joint maneuvers involving all personnel in mock operations. These exercises were essential to ensure that everyone involved, both air and ground forces, understood their tasks and worked as a fully integrated team. The preparedness of the troops would have a major impact on the success, or failure, that occurred during the invasion of the continent and subsequent operations. Before a discussion of training can begin, it is first necessary to examine the evolution of Ninth Air Force in England as well as the structure of this organization.

There was little doubt following the eventual success of British and American tactical air operations in North Africa that a tactical air force would be created to support the eventual invasion of Western Europe. The major decision that remained was the form that air force would assume. The first step towards the establishment of a tactical air force in Britain came in the Combined Bomber Offensive plan. This report was the result of discussions held at Casablanca in January 1943.[15] The report described in depth the Anglo-American agenda for "the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened."[16] Though the focus was on strategic bombing, a recommendation was made for the creation of a distinct force to complement the long-range bombers:

> In order to supplement this [strategic bomber] force in providing the close support required for the surface operations, steps must be taken early to create and train a tactical force in this theatre. This force must include light bombers, reconnaissance, fighter and troop carrier elements.[17]

Strategic bombing was given priority in late-1943 and early-1944, but the tactical air force was not being left out of the discussions.

In April 1943 Major General Ira C. Eaker, Commanding General, Eighth Air Force, submitted a plan to the Combined Chiefs of Staff in Washington concerning the creation of a tactical air force in England. He proposed that the VIII Air Support Command be greatly enlarged, essentially to form a "super" Eighth Air Force - half strategic, half tactical. As a whole, the Eighth Air Force would be responsible for all American air operations in Western Europe. The tactical and strategic halves of the Eighth would each be responsible for missions in its own sphere of operations, but when needed, the two could combine their efforts.[18]

In response to this proposal, the Air Force dispatched a team under Major General Follett Bradley to investigate the needs of a tactical air force in Britain. After examining conditions in England and North Africa, the committee submitted a report known as the "Bradley Plan." This report, with some modifications, served as the basis for the organization of the Ninth Air Force in Britain. The plan called for the creation of a tactical air force under the command of the Eighth Air Force, as envisioned by General Eaker. This arrangement was modified at the Quadrant Conference in August 1943. The decision made at Quebec was to form an Anglo American tactical air force, distinct from the strategic air forces. This effectively put an end to the idea of a "super" Eighth Air Force. Shortly after the conference, the decision was made to transfer the skeleton of the surplus Ninth Air Force, complete with its commander, General Brereton, to England to become the basis for the creation of a new tactical air force. This was possible due to the consolidation of the combat units of the Ninth and Twelfth Air Forces in the Middle East.[19]

Ongoing studies in England contributed to the final structure of the Ninth Air Force. Brigadier General Robert C. Candee, commander of the VIII Air Support Command, conceived a plan for a tactical air force that included a bomber command, a fighter command containing two air support divisions, a tactical air service command, an air defence command and an engineer command. This proposal was important for two reasons. The suggested incorporation of two air support commands under the umbrella of fighter command, as Ninth Air Force was eventually set up, was the first time this was mentioned. Second was the inclusion of air defence and engineer commands in the organization of the tactical air force. These units would be crucial in providing Ninth Air Force with the mobility to advance across Europe and maintain continuous support for the Ground Forces without becoming a burden on the Ground Forces's resources.[20]

The reconstituted Ninth Air Force was officially activated on 15 October 1943. It shared little more than a name with its predecessor in the Middle East. All of the combat units and most of the service units which had served with the Ninth were transferred to the Twelfth Air Force. That left only the main headquarters of Ninth Air Force along with three command headquarters (Fighter, Bomber and Service) to form the cadre of what was essentially a new organization.[21]

The final form that Ninth Air Force assumed was based largely on the successful Northwest African Air Forces. The chief innovation in this structure was the decision to group aircraft by function rather than by type. The principal advantage of the old-style air force was economy of force or the ability to mass aircraft against a single target. Ninth Air Force, however, accrued significant advantages by concentrating its aircraft by function. Though it was somewhat more difficult to mass aircraft, this structure was more than compensated by the greater versatility, flexibility and efficiency of the tactical air force in operations.[22]

At the heart of the Ninth Air Force were its bomber and fighter commands. These units were the *raison d'être* of the tactical air force. The IX Bomber Command was formed around light and medium bomber units. Its heavy punch was primarily directed at first and second phase targets, ranging from airfields and towns, to railyards, bridges and other large-scale infrastructure. The IX Fighter Command was the parent organization for the air support commands and their inventory of fighter-bombers. The IX Fighter Command was originally envisioned as a training headquarters intended to oversee the air support commands until they became operational. At that point it would be disbanded and absorbed by the air support commands. The decision was ultimately made to retain the fighter command since its

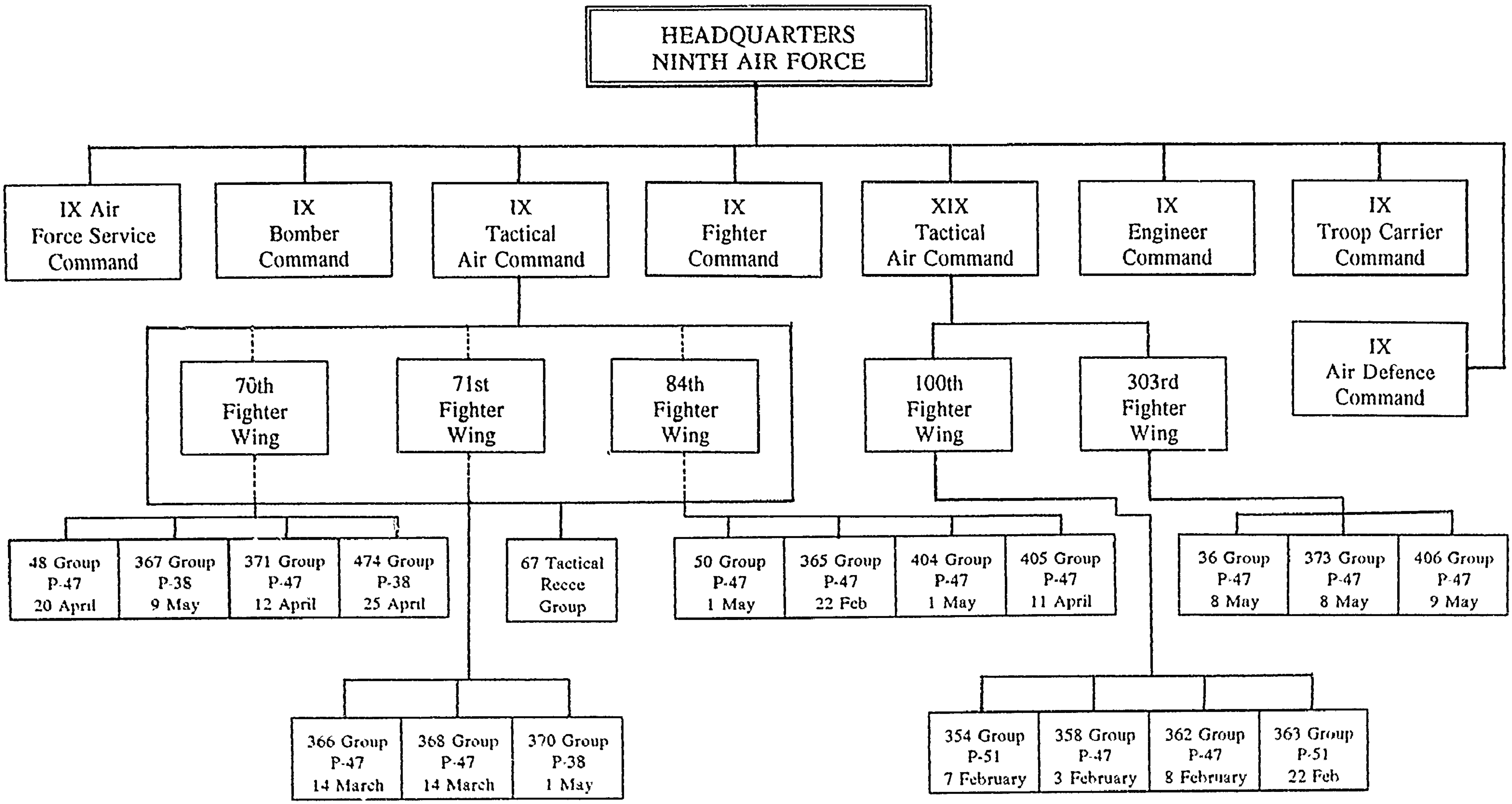


Figure 4

Ninth Air Force, June 1944

existence allowed the Ninth Air Force representative at Uxbridge (Allied Expeditionary Air Force Headquarters) to maintain parity with his opposite number from the Second Tactical Air Force.[23] [See Figure 4 for the organization chart of Ninth Air Force.]

Underneath the IX Fighter Command were two air support command. Each of these air support commands was paired with an army. The IX Air Support Command worked with the First U.S. Army, while the XIX Air Support Command was scheduled to work with the Third U.S. Army upon its activation. In April 1944, the name "air support command" was replaced by "tactical air command." This modification was made in order to "discard" terms which were "misleading with respect to the status and role of the Tactical Air Forces in relation to ground forces."[24] The change occurred primarily to expunge the notion that the Air Force "supported" the Ground Forces, and to emphasize the team concept which revolved around "cooperation."

The IX Fighter Command and IX Air Support Command were both commanded by Brigadier General Elwood R. Quesada. An outstanding fighter pilot, Quesada had amassed a good deal of combat experience. Rising through the ranks, Quesada participated in the Tunisian, Sicilian, Corsican and Italian campaigns, commanding the XII A r Support Command for much of that period.[25] Quesada was described as a "rarity" among senior AAF and RAF commanders due to his strong commitment to tactical air operations.[26] This attitude won Quesada praise from both above and below. General Omar Bradley, with whom Quesada worked closely through much of the Normandy campaign, was full of praise for the commander of the IX Tactical Air Command:

> This 40-year-old airman helped more than anyone else to develop the air-ground support that was to speed us so successfully across France on the heels of the breakout. He succeeded brilliantly in a task where so many airmen before him had failed, partly because he was wiliing to dare anything once. Unlike most airmen who viewed ground support as a bothersome diversion to war in the sky, Quesada approached it as a vast new frontier waiting to be explored.[27]

Quesada was also popular with his pilots. He was aware of the stigma that was attached to training, but he also was aware of its importance. In an effort to make the process less painful, Quesada substituted the name "combat drill" for "training" and sought to make the process as realistic as possible. This innovation was very successful, and some units even requested that the scope of their combat drills be expanded.[28] "Pete" Quesada played a major role in shaping the evolution of the IX Tactical Air Command and remained with the unit until April 1945.

The tactical air commands employed three principal types of aircraft. Each filled its own niche and contributed to the overall success of the tactical air command. The Republic P-47 Thunderbolt was the most widely used. Originally designed as a high-altitude interceptor, the P-47 proved to be exceptionally adept at tactical air operations. Its combination of ruggedness, fire power (8 x .50 calibre machine guns), bomb load (up to 2 x 1000 lbs of bombs), range, and ease of maintenance combined to give the Thunderbolt the reputation as one of the best fighter bombers of the war. The main disadvantage of the P-47 was its large size and heavy weight which made it difficult to pull out of dives and somewhat sluggish at low altitudes. This had an effect on ground strafing since the target had to be engaged at a greater distance to prevent the aircraft from "pancaking" into the ground. This drawback was somewhat offset by the P-47's heavy volume of fire. The Lockheed P-38 Lightning also garnered a fine reputation as a fighter-bomber. Though not as rugged as the P-47, the Lightning was able to carry a larger bomb load over a greater distance. The P-38 packed a potent punch for strafing operations due to the concentration of four .50 calibre machine guns and one 20-mm cannon in the nose of the aircraft. Another advantage was its ability to make exceptionally quiet, high speed, low level approaches to the target area. This allowed the aircraft to surprise the defenders and avoid anti-aircraft fire. The engines of the P-38 were particularly susceptible to damage from ground fire. Fortunately, the twin engines of the Lightning imparted a redundancy which helped to bring many crippled aircraft home. The North American P-51 Mustang made its reputation as a long-range bomber escort. It was employed in the Ninth Air Force as a fighter-bomber, though it was used sparingly in the ground attack role. The P-51 proved to be exceptionally vulnerable to ground fire due to its liquid-cooled engine. Because of this, its use was largely limited to escort and air superiority missions. The P-51 and P-38 were both used successfully as reconnaissance aircraft due to their high speed and long range.[29] [Figures 5, 6 & 7 contain diagrams of these aircraft.]

The aircraft in the IX Tactical Air Command were organized into groups, squadrons and flights. The flight was the basic formation made up of two two-plane

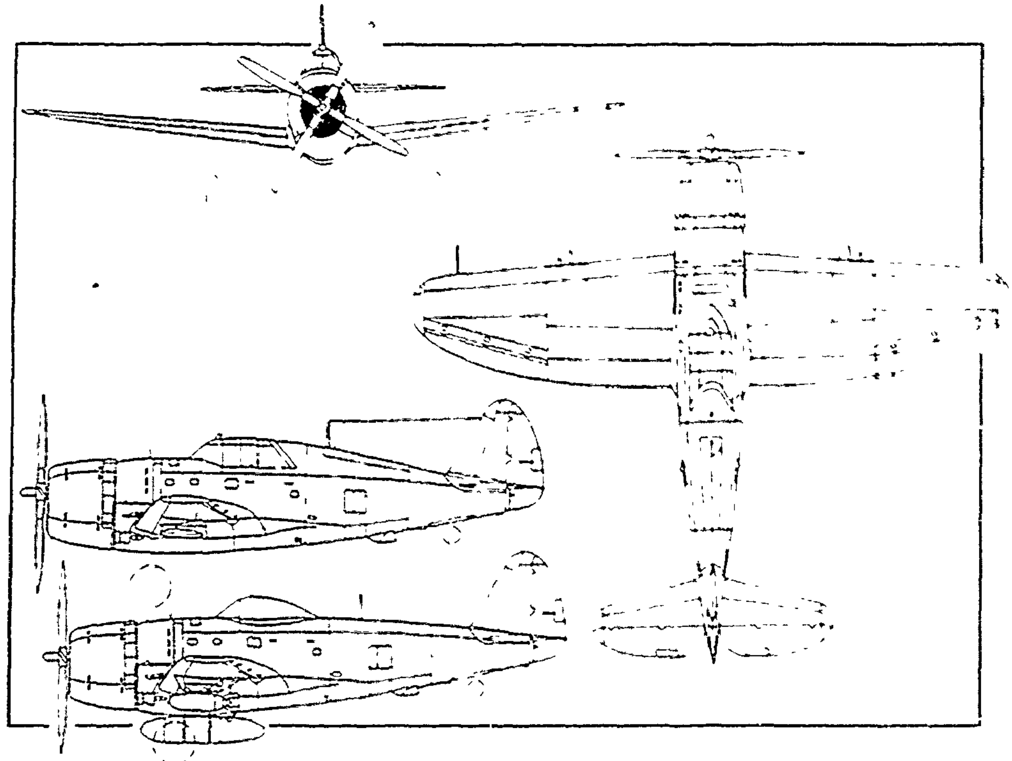


Figure 5

P-47 Thunderbolt

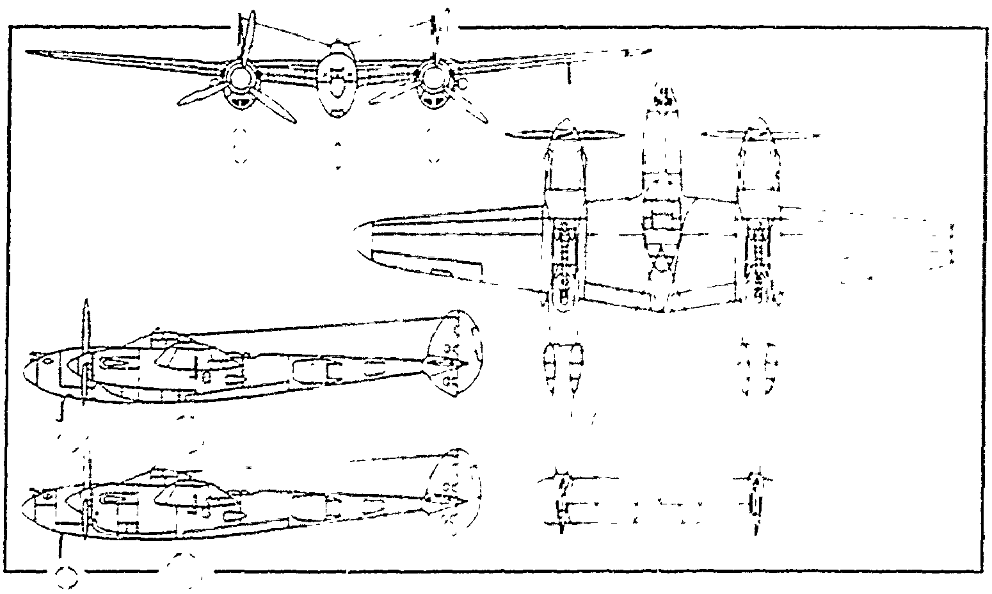


Figure 6

P-38 Lightning

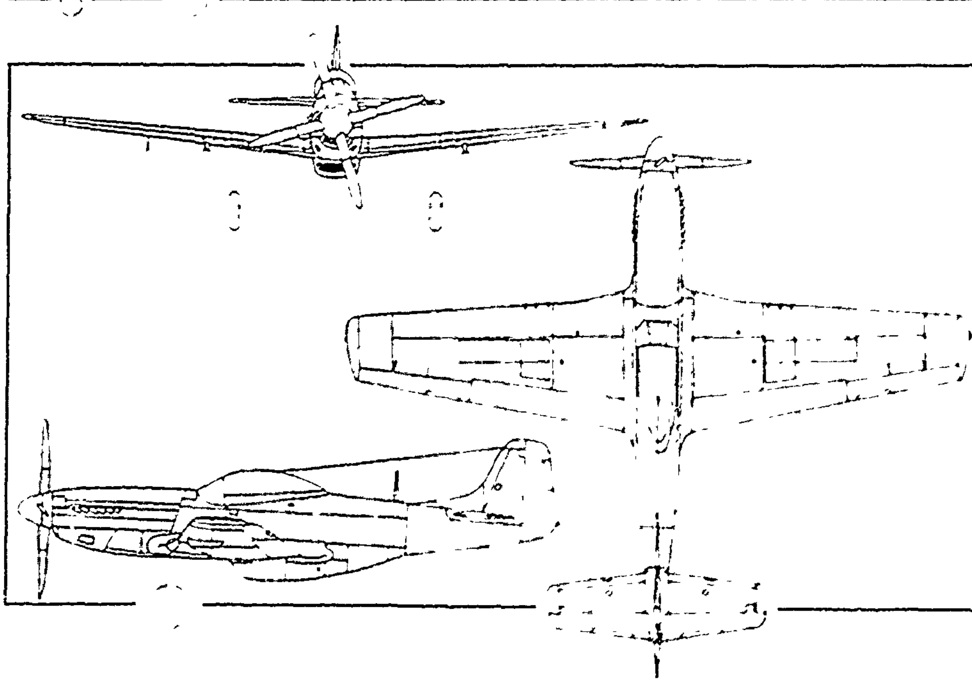


Figure 7

P-51 Mustang

Source: Enzo Angelucci and Paolo Matricardi. World War II Airplanes. Volume 2. pp.54, 85 & 96.

elements. The squadron consisted of either 12 or 16 planes, while three squadrons formed a group.[30]

The provision of close air support required that pilots be proficient in four basic mission profiles. Ground strafing was considered to be the most vital type of attack. The heavy armament of the Ninth Air Force fighter-bombers proved devastating in strafing attacks. The technique required that a pilot approach a target at a low altitude with a dive angle of 15 degrees. A steeper angle would cause the pilot to open fire at too great a distance while a more shallow glide path would require the pilot to devote too much attention to flying around ground obstacles. Ideally, an aircraft would approach the target area at an altitude of 300 feet and climb to 500 feet just prior to commencing an attack. If flak is too severe to allow this, a steeper dive beginning at 4,000 to 5,000 feet can be utilized. Dive bombing was the most frequently used bombing attack. Aircraft approached the target area from a right angle at an altitude of 6,000 to 10,000 feet. The attack was made at a 40 to 60 degree angle with bombs being released between 2,000 and 3,000 feet. This allowed the pilot to recover at a minimum altitude of 1,000 feet and thus escape the effects of his bomb blast. It was important that the pilot throttle back during his descent to prevent the aircraft from gaining excessive speed that would impede recovery at the bottom of the dive. Anti-aircraft fire in the target area determined the exit profile. If opposition was light, the pilot would execute a climbing turn in order to regain altitude as quickly as possible. If flak was concentrated, the pilot would exit the target area at high speed on the deck, and climb for altitude once a flak-free area was reached. Dive bomb missions were always provided with a fighter escort since the fighter-bombers were highly vulnerable during their attacks. Glide bombing attacks were similar to dive bombing except that a 30 degree dive was made commencing at 3,000 to 5,000 feet. This type of attack was made with the throttle wide open. Glide bombing was generally used when cloud cover prevented dive bombing attacks, when ground opposition was expected to be light, or when a target required small deflection errors and range errors were not as important. The final mission profile was minimum-altitude bombing. This high speed, low altitude attack was most effective against targets which had a vertical surface sufficient to stop a bomb (ie. building, embankment, ship, certain types of bridges).[31] Each of this mission profiles required a high degree of pilot skill. In the case of the bombing attacks, the aircraft contained no specialized bomb sight. The pilot had to rely on his own skills and experience to determine the proper angle of attack, keep the wings level and the plane free of skid, and most importantly, to know when to release the bomb.

Aside from the fighter and bomber commands, Ninth Air Force was composed of troop carrier, service, engineer and air defence commands. These units allowed the Ninth to carry out the full range of tactical air operations and to operate as an independent unit in terms of its ability to meet the requirements of a mobile unit in the field.

The organizational structure to which Ninth Air Force belonged was quite confused. In terms of operations, the Ninth Air Force looked to Air Marshal Sir Trafford Leigh-Mallory's Allied Expeditionary Air Force (AEAF). The role of the

AEAF was to provide tactical air support to all the Allied armies during the invasion of France. For this purpose, the AEAF had control over both the American Ninth Air Force and the British Second Tactical Air Force. However, administrative responsibility for Ninth Air Force was retained by the American command in Britain. On the formation of Ninth Air Force in October 1943, this duty was held by an organization known as the United States Army Air Forces in the United Kingdom (USAAFUK). At the start of the new year, USAAFUK gave way to the United States Strategic Air Forces in Europe (USSTAF) which oversaw the operations of both the Eighth Air Force in England and the Italian-based Fifteenth Air Force in addition to administering the non-operational requirements of all three American air forces in the European theatre. From the point of view of administration and economy of effort, this arrangement made good sense. However, it left the Ninth Air Force in a difficult position. The official Air Force historian accurately described the situation of the Ninth Air Force as that of "a vassal owing homage to two suzerains who had conflicting conceptions of their authority . . ."[32] Training was a particularly contentious issue. Leigh-Mallory sought to control this area, but General Carl Spaatz, commander of USSTAF would not allow it. In a memo to Brereton in February, Spaatz categorically stated: "The Commanding General, USSTAF, will exercise control of all administrative and training matters pertaining to Ninth Air Force, and will assume direct responsibility to higher headquarters for the proper performance of those functions."[33] This cleared up all questions of jurisdiction, but limited Leigh-Mallory's control of his organization and limited the amount of cooperation and training that would take place between Ninth Air Force and Second Tactical Air Force leading up to the invasion.

Preparation for Combat: The Training Programme of Ninth Air Force

Training was widely recognized as an essential prerequisite to successful operations. This point had been driven home by the Allied experience during the Sicilian campaign. The evidence shows that both the Ninth Air Force and the First U.S. Army were aware of this need, but were unable to fully carry it out. Post-war studies of the Ninth Air Force disagree on the success of the pre-invasion training program. The official Air Force history states: "The contributions of the Ninth Air Force to the landings in Normandy and the subsequent defeat of the German armies could not have been so impressively successful but for the intensive training in which it engaged during the seven months preceding June 1944."[14] At the other extreme is historian W.A. Jacobs. He believes that the training program failed to prepare the pilots of Ninth Air Force for the invasion of the continent.[15] These divergent views would seem to indicate that some aspects of the training program worked while others did not. Regardless of view, most studies devote very little space to the consideration of training, preferring to concentrate on operations. If the role of Ninth Air Force during the Normandy campaign is to be fully understood, it is essential to examine in detail the pre-invasion training program to discover its strengths and weaknesses. Once completed, the effect of training on continental operations can be determined.

The rapid build-up of Ninth Air Force prior to the invasion, compounded by the disparate nature of the units in the organization, placed a major strain on training resources.[36] In the span of less than eight months, the Ninth Air Force grew from a small cadre of headquarters units to a full-fledged air force comprised of 45 tactical groups, 1,000 bombers, 3,000 transport aircraft and gliders, and well over 200,000 personnel.[37] As mentioned at the start of this chapter, training was conducted on many levels. Individual pilot training in the United States came first. These courses provided pilots with basic and advanced lessons in flying, navigating, tactics, and other essential skills. Upon graduation, pilots were proficient in the operation of their aircraft but lacked practical experience. Stateside training did not prepare pilots for combat. One reason for the failure of training was the great need for aircraft in the theatres of operations. This resulted in the use of obsolete aircraft for training.[38] Compounding this problem was the speed of change at the cutting edge. New tactics were constantly being developed at a rate much faster than could be disseminated in the U.S. Because of this, pilots had to be retrained upon reaching their combat units.[39]

The same was true for the training of support personnel. Tactical Air Communications squadrons, which would form the core of the Ninth Air Force Air Support Parties (ASPs), received extensive training in the United States. Unfortunately, their training was based on prewar theory and practice using outdated High Frequency (HF) radios (HF radios did not allow direct communication with aircraft). These U.S.-trained ASPs did not get a chance to work with Very High

Frequency (VHF) radios which allowed them to talk directly to the aircraft overhead until two months prior to the invasion.[40] The failure to train the ASPs with the most modern equipment as soon as possible meant that operations would be less efficient than if the crews had been afforded a chance to become completely familiar with the use and application of their equipment. The slow pace of training also affected the pilots since they would be unfamiliar with the practice of communicating directly with the ASPs. This was apparent during the pre-invasion training maneuvers, in particular, Exercise "Tiger."[41] The ultimate result would be a slower learning curve, with personnel having less experience going into battle and having to learn their trades under less than ideal circumstances - while being shot at.

Attempts were made in the United States to go beyond the regular training and provide pilots with actual experience in air-ground operations. For this purpose, the I and II Air Support Commands were directed to prepare an appropriate training program. In most respects this program was a failure. New units were in high demand and were often dispatched overseas as soon as unit training was complete.[42]

Because it new pilots were inadequately trained, Ninth Air Force could not concentrate on advanced training of the type needed to make a unit operational. It first had to perform basic training to bring the pilots up to standard. As one post war evaluation stated, "The groups arrived overseas with personnel eager for combat but lacking experience. In general, they were deficient in ground-strafing and dive bombing training."[43] As might be expected, these skills were central to the operation of a tactical air force.

The Air Force recognized that pilots would require further training upon reaching their operational station. A lecture given at the AAFSAT in February 1944 detailed the training requirements for combat crews in the combat area. Provisional Training Units were to be established in the theatres of operations to provide "intensive combat training" for new arrivals. Theatre-specific instructions would be given covering everything from living conditions to aeronautical information such as local flying rules, navigational aids, flight corridors and radio procedure. Experienced instructors would provide orientation in the latest tactics and equipment, both Allied and enemy. Also, flying practice would be given to bring pilots up to standard in such areas as formation flying, gunnery, bombing and other fighter tactics.[44] It is unknown whether Provisional Training Units were actually set up in the United Kingdom since no subsequent reference can be found which mentions the centres. However, the methods and stages of training described in the lecture were very evident in the practice of Ninth Air Force.

Ninth Air Force began to train its fighter pilots in early November 1943. As mentioned previously, the initial stages of training focused on the basics. A memo issued by IX Fighter Command headquarters specified that training should concentrate on "map reading, R/T procedure and homing practice, formation flying, instrument flying, individual stern attacks, navigation, air-to-ground firing, aerobatics, air fighting, search formations, cloud flying, air-to-air firing, bombing practice, night flying and rendezvous missions."[45] This program was very similar to that proposed at the AAFSAT.

As would be expected, this type of training consumed a significant amount of time. In February 1944, IX Air Support Command advised that it was of "paramount importance" that the 11 fighter groups arriving in the theatre prior to March become proficient in bombing techniques. It was recommended that each fighter group be put through an intensive two week course that would allow each pilot to fly a minimum of five glide or dive bombing missions and three low-level bombing missions. In addition, each squadron was to fly three glide or dive bombing missions as a unit. In total, this program required each group to fly nearly 1,000 sorties with an average daily rate of 72 sorties. This was a very heavy schedule to follow. During each two week period, an average of three fighter groups would need to be removed from operations so they could engage in training. In a perfect world, the fighter groups of Ninth Air Force would have had no trouble working themselves up to a high state of operational readiness in anticipation of the Normandy landings in the time allowed.[16] Unfortunately, for both the pilots and the ground forces who were to be supported, this goal was not reached. The entire training program was slowed down due to the operational commitments of Ninth Air Force.[17]

Preparations for the invasion were very important, but there were at least two higher priorities. The "Pointblank" directive, promulgated at the Casablanca conference, gave Eighth Air Force the first claim on air resources in the European theatre. As such, Ninth Air Force fighters were constantly used to escort the heavy bombers in the raids over France and Germany. A significant amount of effort was also devoted to the destruction of German V-1 and V-2 rockets and sites. Known as

Operation "Crossbow," the destruction of the German "revenge" weapons was accorded a very high priority due to the potential damage they could inflict on Britain.[48]

The need for Ninth Air Force fighters to act as escorts for the heavy bombers created a dilemma for the tactical air force. The missions allowed the Ninth Air Force to contribute to ending the war through the destruction of the enemy air force and the gaining of air superiority. This task was of great importance to the tactical air force itself and was accorded the number one priority in FM 100-20. In addition the pilots gained operational experience on the missions and learned the habits of the Luftwaffe. However, these advantages came at a substantial cost. Bomber escort was not the main function of the tactical air force. The dichotomy was clearly stated in the history of the IX Air Support Command: "We will be used in the support of the ground troops and we are badly in need of training in fighter-bomber and strafing tactics."[49] Training cannot occur in both air support techniques and bomber escort tactics without the quality of both suffering. The high rate of operations in support of the bombers also meant that down time had to be spent in resting the pilots and maintaining the aircraft. As a result, training time was significantly diminished. One additional factor that had to be considered was the attrition of pilots and aircraft. The high demand for bomber escort was quickly using up the operational life of the pilots who had to be rotated home after a certain number of missions and the planes which were becoming worn out. There was a danger that Ninth Air Force would lose a significant amount of its prime resources before the invasion was launched.[50]

The net result of these "distractions" was to delay the training of Ninth Air Force. The problems in training were already apparent 10 weeks before the invasion. On 15 March, seven P-47s from the 366th Fighter Group made an attack on an airdrome near St. Valéry, France. This marked the start of continental fighter-bomber operations by Ninth Air Force. The scale of these missions gradually increased.[51] In March, fighters dropped approximately 102 tons of bombs, in April this increased to 1,050 tons while in May nearly 3,100 tons of explosives were expended.[52] At a Commander's meeting on 29 March 1944, General Quesada stated the pilots in his command had not been properly prepared for the targets they were engaging. Some pilots were not taking the time necessary to make accurate bomb runs and were merely throwing their bombs into the general target area. This resulted in poor bombing performance. Quesada believed the problem stemmed from mental mistakes, and ultimately, a lack of training.[53] Brigadier General Ned L. Schramm, commander of the 71st Fighter Wing, agreed with Quesada. He attributed the loss of training time to the fact that his aircraft were being held on "alert" status most of the day, and when they were finally scrubbed it was too late to conduct any training. In an attempt at compromise, Schramm suggested that training be limited to one or two day periods. This would make training easier to schedule around operations and it would also help to keep the pilots focused. In response, Quesada authorized Schramm to take the 366th Fighter Group off operations for the next two days (30-31 March) to conduct dive-bombing training. To add to the problems of training, it was specified at this meeting that no more than two Fighter Groups were to be released for training at one time due to operational requirements. It will be remembered that an earlier memo on fighter-bomber training had stated an average of three Fighter Groups at a time would need to undergo training to ensure that preparations were complete prior to the invasion.[54]

It was reported at the end of May that the training of the Fighter Groups in IX Tactical Air Command was almost complete. All fighter-bomber groups in the Command were considered to be operational. The 365th, 366th, 368th and 405th Fighter-Bomber Groups were declared completely operational, while the remaining seven Fighter-Bomber Groups (the 48th, 50th, 367th, 370th, 371st, 404th and 474th) were fully trained only in terms of bomber support. They had not yet finished training in their most important role - close air support.[55] In the XIX Tactical Air Command, four of the fighter-bomber groups were fully operational at the end of May while the remaining three were in the same category as the partially-trained groups in IX Tactical Air Command. This state of training left the Ninth Air Force able to conduct operations in support of the Ground Forces, but with neither the flexibility or proficiency that was possible from the tactical air force.

With training time at a premium, the Ninth Air Force utilized every resource at its disposal. As a new organization, the Ninth had limited expertise and experience of its own to call on. To make up for this, arrangements were made to make use of the expertise and training facilities of the Eighth and Twelfth U.S. Air Forces as well as those of the RAF. The IX Fighter Command sought the aid of training officers from the Eighth Air Force in the instruction of its fighter pilots. As early as mid-

November 1943, a fighter pilot training program had been instituted which was based on the Eighth Air Force model.[56] The Twelfth Air Force provided a great deal of operational experience. During the entire period Ninth Air Force was training in England, the Twelfth was engaged in close support operations in Italy. In January 1944, General Schramm and 10 officers went to Italy to observe the Twelfth Air Force in action. This group was the first of several to travel to Italy. Many of the officers sent on the visits did more than simply watch - they actually flew operational missions to gain first-hand experience in dive-bombing and strafing. This practice was not without its hazards. Major Albert De Fehr, Chief Controller of the 100th Fighter Wing, was killed on 15 March 1944 after his plane was hit by flak and crashed. In spite of the dangers, the experience gained proved instrumental in preparing the Ninth Air Force for combat.[57]

Another important aspect in the training of Ninth Air Force was the use of the Millfield School. This centre was run by the AEAF to develop tactics for use in close air support and to instruct pilots on the finer aspects of ground attack. The school made use of experienced British and American pilots as instructors. The highly qualified commanding officer of the 57th Fighter Group, Colonel Arthur Salisbury, was brought from Italy especially to instruct American pilots. The course of study included the theory behind fighter-bomber tactics, such as dive bombing and strafing, and the practical application of theory through training missions against various targets including bridges, locomotives, trucks and tanks. After each attack, a thorough debriefing was held to discuss the particulars of the mission, emphasising the mistakes that were made and offering corrections. The three week course was offered to senior Group Operations Officers, Squadron Commanders and Flight Leaders. These officers then took the experience they gained at the school and shared it with the pilots in their commands.[58]

There is one final aspect of training in Ninth Air Force that has not yet been discussed. In many respects, it was the most crucial factor in respect to the ultimate success of operations. The primary task of a tactical air force was to work with the army to defeat the enemy. In many cases the two forces work separately towards the same goal. For instance, air attacks against the enemy's airdromes and lines of communications, while indirectly supporting the Ground Forces, are conducted independently by the Air Force. However, in third phase operations the Ground and Air Forces must work very closely to ensure goals are reached. This cooperation starts with the choice of targets, establishment of the bomb line, and prevention of friendly casualties (due to short bombings or misdirected anti-aircraft fire), right through to post-mission intelligence debriefings to determine the effectiveness of an attack and whether a follow-up attack will be necessary. These factors were recognized by the Air Force. FM 100-20 stated, "In modern battle operations, the fighting of land elements and the general air effort in the theatre must be closely coordinated."[59] From this, it can be seen that it was essential for the Ground and Air Forces to train extensively together to weld a closely-knit team that will function effectively on the battlefield.

The Ninth Air Force and U.S. Army got off to a propitious start. Beginning in December 1943, a series of air support indoctrination courses were held by the A-3 section of Ninth Air Force Headquarters. The purpose of the lectures was to explain and demonstrate the workings of a tactical air force. Army Ground Force officers were particularly targeted in these courses. An important aspect of these lectures was their use as a forum where the ideas, concerns and comments of the participants could be heard. In the span of three months, half a dozen courses were run. Each course was tailored to suit the audience.[60] The first, in mid-December, was for Ninth Air Force officers. The second was held on 6 January 1944. In attendance were General Brereton, Lieutenant General Omar Bradley, commander of First Army, Major General Leonard T. Gerow, commander of V Corps, Major General Leven Allen, Bradley's Chief of Staff and numerous other high ranking officers. The two day lecture did much to clarify ground force understanding of the operations of a tact al air force. In addition to getting across their message, the organizers of the conference received important feedback from those in attendance. General Bradley remarked that the orientation lectures were very useful and should be continued.[61]

The third course was held on 24-25 January for officers of the RAF, U.S. Navy as well as American divisional commanders and corps staff officers. The series of presentations provided a general overview of all aspects involved in the operation of a tactical air force. The stature of those involved added credence to the lectures. The following topics were addressed on the first day:

Origins and role of the Ninth Air Force
Lieutenant General Lewis H. Brereton

The principles of air support
Lieutenant Colonel Larocque

The organization and operation of the Air Support Command
Brigadier General E.R. Quesada

Functioning of radar in air support
Lieutenant Colonel Garland

Fighter and fighter-bomber operations
Colonel Stecker

The organization and operation of medium bombardment
Brigadier General Samuel E. Anderson

The organization and operation of the Airborne Division
Major General William C. Lee

The organization and operation of the Troop Carrier Command
Brigadier General Benjamin F. Giles"[62]

On the second day the group moved to the Headquarters of the IX Fighter Command at Middle Wallop. The morning was spent looking at the aircraft, equipment and organization at the airdrome and field headquarters. In the afternoon a command post exercise was staged. It allowed the participants to witness a demonstration of the organization and channels of command of an Air Support Command working with a Field Army. This exhibition received warm accolades from many of the Ground Forces officers present.[63]

The remaining courses were delivered to groups of ground force officers at an increasingly lower rank. The influence of the campaigns in Tunisia, Sicily and Italy can be seen in these early attempts to establish close relations with the Ground Forces. Some success was achieved, but unfortunately the intervention of the uncontrollable events described above interrupted the process, and some of the gains achieved were lost.

In February 1944, joint training began for the personnel who would control the tactical air operations. Ground (also known as Air) Liaison Officers (GLOs) were supplied by the Army Ground Forces. As their title suggests, they provided one of the links between the Ground and Air Forces. The GLOs worked in close association with the Air Force S-2s and S-3s.[64] Their main role was to interpret the ground situation for the Air Force. Prior to a mission, the GLOs would brief air crews on their targets as well as provide information on the location of the bomb line, disposition of friendly troops and other pertinent matters. Upon the return of the aircraft, the GLOs would take part in the debriefing and relay the intelligence gained to the ground forces. GLOs were located at the headquarters, wing and group level of IX and XIX Tactical Air Commands; the headquarters and wing level of IX Bomber Command; and with the tactical and photographic reconnaissance groups. As part of the training for GLOs, Ninth Air Force organized a number of courses which provided an introduction to the workings of the air-ground communications system. The first day of the course was spent at the Headquarters of Ninth Air Force for a general introduction and overview. On the second day, proceedings moved to Headquarters IX Air Support Command where the participants witnessed a Command Post Exercise. To complete their training, the Ground Liaison Officers were sent on a two-week course at the RAF School of Army Cooperation at Old Sarum.[65]

The final aspect in the training of Ninth Air Force which must be considered is the degree to which joint exercises were conducted prior to the invasion and the success that was achieved in those combined manuevers. The first major joint exercise to be staged was Exercise "Duck," during the first week of January 1944. Its stated purpose was, "to give training in combined operations to the V Corps, the U.S. Navy, the U.S. Army Air Force and the Services of Supply under actual assault conditions."[66] The amphibious assault landing took place in England at Slapton Sands on the coast of Devon southwest of Dartmouth. The Ninth Air Force was to provide air cover for the naval units, attack coastal defences in advance of the landing and support the actual landing operations. In a post-exercise critique, General Gerow, commander of V Corps, criticized many aspects of the assault. In addition to many problems concerning the performance of the ground forces, Gerow commented on the lack of proper planning and regretted the inability of the Navy and Air Force to participate more extensively in the exercise.[67] In part, the minimal Air Force participation was due to operational commitments.[68]

The next major operation to be staged with the support of Ninth Air Force was Exercise "Beaver" from 27 to 31 March 1944. This exercise featured an amphibious assault landing by the 4th U.S. Division. Colonel J.F. Taylor, the IX Air Support Command representative aboard the U.S.S. *Bayfield*, recorded a detailed resumé of the activities aboard the command ship during the exercise. The weather during the exercise was poor. A 10/10ths cloud base was reported with a ceiling ranging from 600 to 2500 feet. Visibility was only 3-5 miles. Aside from the affects of weather on air operations, the exercise was marked by significant communications problems. Major General J. Lawton Collins, commander of VII Corps, ordered a fighter bomber attack on a column of trucks and tanks at 1352 hours on the first day of the exercise. The mission was eventually cancelled, but notification was not received aboard the *Bayfield* until 1629 hours. It had taken two hours and 13 minutes to make a decision whether to undertake the mission and a further 24 minutes to transmit the decision to *Bayfield*. This delay was deemed unacceptable. A similar delay was experienced in a request for a reconnaissance mission.[69]

There were additional miscommunications between the Navy and the Air representatives who requested information on the location of a landing craft bearing important air support equipment. A reply was never received from the Navy. Taylor also reported on the lack of coordination in preparing for the exercise. He reported that the Ground Forces had used methods to mark the front lines which were unknown to the Air Force. It appears that the orders specifying these methods appeared in an annex to the Army field orders, but were absent from the Air Force orders. In addition, there were problems with incoming aircraft which either mixed up communication procedures or were unaware of the correct codewords in use for the exercise.[70]

Observations made after the exercise remark on lack of detailed preparations. Though the weather interfered with most participation by the aircraft, significant problems were still in evidence. Of particular note was the lack of cooperation between the various services. The report stated that the Navy had shown a large degree of ignorance on Air Force operations. According to the author of the report, this generalization probably did not apply to the senior naval staff, but was most certainty true for the lower ranking officers. The same sentiments were expressed in regards to the Ground Forces. The report stated, "as far as could be ascertained during the exercise, liaison by the Army with the IX Air Support Command was conspicuous by its absence."[71] In general, "Beaver" demonstrated an overall lack of cooperation and coordination between the various branches involved in the exercise. It is understandable that there were problems with the early attempts at joint operations. However, Exercise "Beaver" demonstrated that each service was following its own agenda with little consideration of the needs and abilities of the other.

On 28 April 1944, the final dress rehearsal was held for units designated to assault "Utah" beach on 6 June. Exercise "Tiger" involved VII Corps, Ninth Air Force, Naval forces, as well as elements of Second Tactical Air Force. "Tiger" became infamous for the German E-boat attack on troop-carrying LSTs which resulted in the loss of over 700 lives, more than VII Corps would suffer on D-Day.[72] The exercise, however, was successfully completed before this tragic incident.

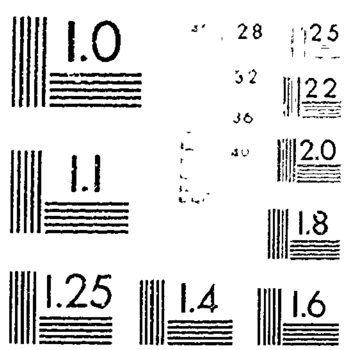
The exercise was planned to include large-scale air participation. The total air contribution was scheduled to be two groups of B-26 medium bombers from IX Bomber Command, three and one third groups of P-47s, one group of P-38s, and one tactical reconnaissance flight from IX Fighter Command, and seven squadrons of Typhoons and Spitfires from Second Tactical Air Force. The air cooperation involved both pre-planned and on-call missions. One group of P-47s was scheduled to attack a simulated gun position at H+15 minutes on D-day. A single squadron of P-47s was given the task of maintaining a standing patrol over the naval flotilla. Upon completion of its patrol, this squadron was available for request missions. Additional squadrons of Typhoons and Thunderbolts were held on alert at base in case they were needed for immediate support missions during the course of the three day operation.[73]

As became the norm in the execution of the joint exercises, air participation was less than expected. A major problem occurred in the initial stages of the exercise when there was an inexplicable delay in landing the first wave of troops. This delay upset the carefully scheduled timetable of the exercise and created a large degree of confusion.[74] The P-47 squadron assigned to fly patrol over the headquarters ship was already airborne when this delay developed and was unable to complete its mission. The fighter-bomber group assigned to bomb a gun position at H+15 was able to hold position during the delay and successfully complete its mission. However, the delay placed the group in an exposed position for the duration of the hold. This could have severe consequences during an actual operation.[75]

More significant problems were encountered in the area of communications. The air support parties attached to the 4th Division and 101st Airborne Division did not get into position until 1300 hours on D+1. During this delay, communications failed between the ground units on shore and the air support parties on board ship. As a result, no air support requests could be made until the ASPs were set up ashore.

2 of/de 2

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT



Consequently, the Thunderbolts and Typhoons held in readiness for support missions were not employed. Five dive-bombing missions were executed by P-47s on D+1 and D+2. Umpires judged the results of these attacks to be satisfactory. The report does not state whether these were preplanned or immediate missions, but the prevailing state of communications would seem to indicate the latter.[76]

In conclusion, the report stated that amphibious operations must stick rigidly to the planned timetable due to the inherent inflexibility of the forces involved. The results of unexpected changes were very evident in "Tiger" and could be the difference between the success and failure of an operation. The unreliability of communications was seen as a major problem in the provision of close support. It was advised that pilots should be fully briefed on their mission before they take off due to the poor communications link between air support parties and airborne aircraft. This situation put additional responsibility on the ASPs since they had to be sure to include all pertinent details in their requests so pilots could be duly informed at the pre-flight briefing. As a corollary to the communication problem, the report stated that air power should not be used interchangeably with artillery. Air support should be requested only when greater fire power was needed, or if targets were beyond the range of artillery.[77]

Exercise "Tiger" showed some improvement in the area of air ground support. However, it still appears that the Ground and Air Forces were working independently. A significant degree of improvement can be attributed to the increased proficiency of the Ground and Air Forces at their own roles, not to better cooperation between them.

The program of combined Army-Air training discussed above was to have been complemented with a number of other major joint exercises. Exercises "Prank" and "Fox," amphibious assaults conducted by the 3rd Canadian Infantry Division and the U.S. V Corps respectively, took place on 10 March. Unfortunately, the planned air cooperation by Ninth Air Force did not occur due to poor weather.[78] Air support for Exercise "Fabius" succumbed to the same fate. Scheduled for the first week of May, "Fabius" was to complement "Tiger" as the big finale to the amphibious training program. Four of the five Overlord assault groups, "Omaha," "Juno," "Gold" and "Sword," took part in simultaneous landings for the exercise.[79] The "Fabius" plan included a detailed schedule of air participation. The entire range of air missions was included: convoy and beach cover, reconnaissance, air support, submarine patrols and night defence. The planning went for naught. British weather again interfered forcing the Air Force to scrub its missions.[80]

Cooperation between the Ground and Air Forces had started well with the series of conferences and lectures discussed above. However, the practical application of support between the two services proved to be sparse. General Bradley recognized this. He understood that a close partnership between ground and air was important for success in battle. However, he felt that General Brereton did not recognize the importance of joint training and in fact, had given the army "the brush-off." Bradley expressed these feelings after the war in his autobiography:

> If our preinvasion confidence in air support were to be measured by the indifference shown us in England by the Ninth Tactical Air Force, we would have sailed on the invasion with misgivings. . . . As a result of our inability to get together with the air in England, we went into France almost totally untrained in air-ground cooperation.[81]

Bradley recognized the operational commitments of the Ninth Air Force had to be fulfilled, but believed it was up to the Air Force to make the time for joint training. He may have a point, but conversely, the Ground Forces were most concerned with preparing its own troops for the invasion and did not push very hard to obtain joint training with the air. It was almost as an afterthought that the need for a more comprehensive program of joint training was recognized.

The program of training exercises which took place prior to the invasion was not a complete failure. British weather, notoriously unpredictable in the spring, had intervened on a number of occasions to curtail training. Operational commitments also took their toll. However, the mistakes made in training helped to prepare the Ninth Air Force for actual battle. One observer of the landing exercises, depressed by the performance he had witnessed, remained optimistic. He stated that, "frequently the poorest kind of exercise presages the best actual operation because the failures are noticed and corrected."[82] In many ways he was right.

It can be seen that pilots in the Ninth Air Force had a good deal of experience to draw on prior to the invasion. A serious attempt was made to bring the organization up to a high level of readiness prior to the invasion. There is little doubt that individual pilots were well trained. The lessons of the AAFSAT and from Tunisia, Sicily and Italy had a significant effect on the readiness of the Ninth Air

Force. Some important lessons, however, were missed. Not enough attention was payed to developing a close relationship between the Air Force and the Navy. These problems had first appeared during the numerous amphibious operations in the Mediterranean but they again appeared during the exercises carried out in England. As well, the example of close cooperation and excellent communications between the Fifth Army and XII Air Support Command was not followed. At the same time as Rover techniques were being successfully employed in Italy, Ninth Air Force was reporting that communications between the ground and aircraft in flight was possible but impractical. Above all, the missing ingredient missing in close air-ground relation was time - time to train pilots and become proficient at the squadron and group level; time to fly missions over the continent to gain operational experience in fighter-bomber tactics and, most importantly, time to train with the ground forces to become a fully-integrated, air-land battle team. There were many flaws in the Ninth Air Force training program, some avoidable, many not. In the final analysis, there is only one test upon which the success, or failure, of the preparations can be judged - the crucible of war.

NOTES

1. J.B. McAfee, "The Tactical Air Force in the Sicilian Campaign." AAF School of Applied Tactics, AAF Tactical School (Orlando, Florida, February 1944), p.4. (LCMSDS roll A2801 frames 1219-1224 [This refers to microfilm obtained from the United States Air Force Historical Research Centre held in the collection of the Laurier Centre for Military Strategic and Disarmament Studies])

2. Alan F. Wilt, "Allied Cooperation in Sicily and Italy, 1943-1945." in Case Studies in the Development of Close Air Support, edited by B.F. Cooling (Washington D.C., 1990), p.200.

3. McAfee, "The Tactical Air Force in the Sicilian Campaign." p.3.

4. Wesley Frank Craven and James Lea Cate, editors, The Army Air Forces in World War II, Volume II, Europe: Torch to Pointblank, August 1942 to December 1943 (Washington,D.C., 1983 (1949)), p.486.

5. Wilt, p.202.

6. Wilt, pp.208-209.

7. Wasson J. Wilson, "The Tactical Air Force." AAF School of Applied Tactics, AAF Tactical School (Orlando, Florida, 15 February 1944), p.24. (LCMSDS roll A2801 frames 1107-1143)

8. Thomas D. White, "The Development of Tactical Doctrines at AAFSAT and AAFTAC." Army Air Forces Historical Study No.13, July 1944, p.22. (LCMSDS roll K1004).

   The ACTS, discussed in Chapter 1, was dissolved in June 1940 for a number of reasons including such factors as the need for instructors elsewhere, a majority of Air Corps officers had already been through the school, and those who had not could not be spared from their current duties. By early 1942 it was realized that the closing, though necessary at the time, was a mistake. As such it was decided to recreate an expanded tactical school to be known as the AAFSAT which opened in late October or early November 1942 [sources vary on this detail]. (Robert Frank Futrell, Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964, (Alabama, 1980 (1971)), pp.58 & 67; Wesley Frank Craven and James Lea Cate, general editors, The Army Air Forces in World War II, Volume 6, Men and Planes (Washington D.C., 1983 (1955)), p.684; and White, pp.1, 22 & 25).

9. M.J. Dauer, "Air-Ground Coordination and Planning," AAF School of Applied Tactics, AAF Tactical Center (Orlando, Florida, 18 November 1943) (LCMSDS roll A2801, frames 403-411).

10. Wilson. "The Tactical Air Force."

11. Wilson, "The Tactical Air Force," pp.11-14.

12. T.P. Talley, "Air-Ground Coordination" AAF School of Applied Tactics, AAF Tactical Center (Orlando, Florida, February 1944), p.6. (LCMSDS roll A2801)

13. W.L. Cobb, "Organization of a Tactical Air Force," AAF School of Applied Tactics, AAF Tactical Center (Orlando, Florida, February 1944), p.14. (LCMSDS roll A2801 frames 1439-1454)

14. Cobb, p.3.

15. John Ramsey, Ninth Air Force in the ETO: 16 October to 16 April 1944, Army Air Forces Historical Study No.32 (Washington D.C., 1945), pp.9-10. (LCMSDS roll K1004)

16. "The Combined Bomber Offensive from the United Kingdom (*Pointblank*) as approved by the Combined Chiefs of Staff, 14th May 1943." in Charles Webster and Noble Frankland, The Strategic Air Offensive Against Germany 1939-1945, Volume IV, Annexes and Appendices (London, 1961), p.273.

17. "The Combined Bomber Offensive," p.282.

18. Richard H. Kohn and Joseph P. Harahan, general editors, Condensed Analysis of the Ninth Air Force in the European Theatre of Operations (Washington D.C., 1984 (1946)), p.49.

19. Ramsey, pp.13-15.

20. Ramsey, p.20 and Condensed Analysis of the Ninth Air Force., p.50.

21. Wesley Frank Craven and James Lea Cate, general editors, The Army Air Forces in World War II, Volume 3, Europe: Argument to V-E Day, January 1944 to May 1945 (Chicago, 1951), pp.107-108.

22. Wilson, "The Tactical Air Force," pp.2-3.

23. Craven and Cate, III, pp.112-113.

24. "Report on Tactical Air Cooperation, Organization, Methods, and Procedures with Special Emphasis on Phase III Operations," AAF Evaluation Board (ETO), 31 July 1945, p.4. (LCMSDS roll A1174)

25. "Biographical Notes on Brigadier General E.R. Quesada." Headquarters IX Fighter Command. 14 November 1943. (LCMSDS roll B5838) and Craven and Cate, III, p.112.

26. Russell F. Weigley, Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945 (Bloomington, 1981), pp.103-104.

27. Omar N. Bradley, A Soldier's Story (New York, 1951), p.250.

28. "Historical Record of IX Fighter Command Covering Period 18 October 1943 to 31 December 1943." 15 January 1944. p.4. (LCMSDS roll B5838)

29. "Report on Tactical Air Cooperation, Organization, Methods, and Procedures with Special Emphasis on Phase III Operations." pp.268-271, and "The Effectiveness of Third Phase Tactical Air Operations in the European Theatre, 5 May 1944 to 8 May 1945." AAF Evaluation Board (ETO). August 1945. p.32.

30. "Tactics and Technique Developed by the United States Tactical Air Commands in the European Theater of Operations." AAF Evaluation Board in ETO. 1 March 1945. p.6. (LCMSDS roll A1174)

31. "Tactics and Technique Developed by the United States Tactical Air Commands in the European Theater of Operations." pp.7-8.

32. Craven and Cate, III, p.108.

33. Craven and Cate, III, p.109.

34. Craven and Cate, III, p.134.

35. W.A. Jacobs, "The Battle for France, 1944," in Case Studies in the Development of Close Air Support, edited by B.F. Cooling (Washington D.C., 1990), pp.263-264.

36. Ramsey, p.91.

37. Condensed Analysis of the Ninth Air Force, p.12.

38. Wesley Frank Craven and James Lea Cate, general editors, The Army Air Forces in World War II, Volume Six, Men and Planes (Washington D.C., 1983 (1955)), pp.612-615.

39. J.W. Strader, "Training of Combat Crews in the Combat Area," AAF School of Applied Tactics, AAF Tactical Center (Orlando, Florida, February 1944), p.1. (LCMSDS roll A2801, frames 124[illegible]-1244), and Craven and Cate, III, p.134.

40. Jacobs, "The Battle for France, 1944," p.263.

41. See discussion of Exercise "Tiger" later in this chapter.

42. Craven and Cate, VI, p.609.

43. "The Effectiveness of Third Phase Tactical Air Operations," p.303.

44. Strader, pp.1, 3-4.

45. Memo 50-2, "Training," HQ IX Fighter Command. 1 November 1943, as quoted in Ramsey, p.102.

46. Henry L. Taylor, "Proposed Schedule of Fighter Bomber Training." Headquarters IX Air Support Command, 13 February 1944. (LCMSDS roll B5838).

47. Unit History IX Fighter Command and IX Tactical Air Command Covering Period 1 April 1944 to 30 April 1944. n.d. p.6. (LCMSDS roll B5849)

48. Craven and Cate, III, p.121, and Lewis H. Brereton, The Brereton Diaries: The War in the Air in the Pacific, Middle East and Europe, 3 October 1941 - 8 May 1945 (New York, 1976 (1946)), p.230.

49. Unit History IX Fighter Command and IX Air Support Command Covering Period 1 February 1944 to 29 February 1944. n.d. p.5. (LCMSDS roll B5838)

50. Unit History IX Fighter Command and IX Air Support Command Covering Period 1 February 1944 to 29 February 1944. n.d. p.5.

51. Craven and Cate, III, p.125.

52. 26th Statistical Control Unit. "Statistical Summary of Ninth Air Force Operations, 16 October 1943 - 8 May 1945." n.d. pp.17-18. (LCMSDS roll A1716 frames 713-762)

53. "Commander's Meeting - 29 March 1944." IX Air Support Command. 1 April 1944. p.1. (LCMSDS roll B5838)

54. "Commander's Meeting - 29 March 1944," p.2.

55. Unit History IX Fighter Command and IX Tactical Air Command Covering Period 1 May 1944 to 31 May 1944. n.d. p.8. (LCMSDS roll B5849)
Fighter groups were officially renamed fighter-bomber groups in May 1944 to more accurately reflect their role. The two terms soon became interchangeable. (Craven and Cate, III, p.125n.)

56. Ramsey, p.102.

57. Unit History IX Fighter Command and IX Air Support Command Covering Period 1 March 1944 to 31 March 1944. n.d. p.11.

58. Unit History IX Fighter Command and IX Air Support Command Covering Period 1 March 1944 to 31 March 1944. n.d. p.12.

59. War Department Field Service Regulation FM 100-20, Command and Employment of Air Power (Washington, 21 July 1943), p.10.

60. Robert C. Angell, "Memorandum on Air Support Indoctrination Courses." Headquarters Ninth Air Force, 25 February 1944, (LCMSDS roll B5725)

61. Brereton, p.232.

62. V.H. Strahm, "Indoctrination Course," Headquarters Ninth Air Force, 17 January 1944. (LCMSDS roll B5725)
The distribution list for this memo included the commanding generals of V, VII, VIII and XV Corps; 1st. 2nd, 5th, 9th, 28th and 29th Infantry Divisions; 2nd and 3rd Armoured Divisions; and 82nd Airborne Division. From this list it can be surmised that representatives from these units, among others, were in attendance at the conference on 24-25 January.

63. Strahm, "Indoctrination Course," and "Unit History, IX Fighter Command for the Period 1 to 31 January 1944," HQ IX Fighter Command, 1 March 1944, p.3. (LCMSDS roll B5838)

64. The designations S-2 and S-3 refer to air force officers at the squadron level responsible for intelligence and operations respectively. Above squadron level, the terms A-2 and A-3 were used, while in the Army Ground Forces G-2 and G-3 had the same meaning.

65. Robert H. George, Ninth Air Force, April to November, Army Air Forces Historical Study No.36, October 1945, p.53. (LCMSDS roll K1005) and Angell, "Memorandum on Air Support Indoctrination Courses."

66. Exercise "Duck," Headquarters V Corps, 14 November 1943, p.1. (USAFHRC roll B5739 frames 1062-1063)

67. Edward H. Shea, "Memorandum: Exercise "Duck."" Headquarters IX Air Service Command, 13 January 1944, (USAFHRC roll B5739 frames 1108-1109)

68. Ramsey, p.113.

69. I.F. Taylor, "Memorandum to General Quesada on Exercise 'Beaver'," IX Air Support Command, 31 March 1944, (USAFHRC roll B5895 frames 936-937)

70. Taylor, "Memorandum to General Quesada on Exercise 'Beaver'"

71. "Memorandum on Exercise 'Beaver' - 27-31 March 1944," HQ IX Air Support Command. 3 April 1944. (USAFHRC roll B5895 frames 928-929)

72. J. Lawton Collins, Lightning Joe: An Autobiography (Baton Rouge, 1979), p.188.

73. Lewis H. Brereton, "Directive for Exercise 'Tiger,'" Advance Headquarters Ninth Air Force, 15 April 1944, p.2. (USAFHRC roll B5739 frames 1102-1106)

74. Harry C. Butcher, My Three Years with Eisenhower: The Personal Diary of

Captain Harry C. Butcher, USNR, Naval Aide to General Eisenhower, 1942-1945 (New York, 1946), p.528.

75. Brigadier General D.M. Schlatter, Assistant Chief of Staff, A-3, "Cover Report - Exercise "Tiger."" Advanced Headquarters Ninth Air Force, 27 May 1944, p.2. (USAFHRC roll B5739 frames 1178-1182)

76. Schlatter, "Exercise 'Tiger.'" pp.2-3.

77. Schlatter, "Exercise 'Tiger,'" pp.3-4.

78. Brereton, The Brereton Diaries, pp.248-249 and Ramsey, p.113.

79. "Minutes of a Meeting held at Headquarters 21 Army Group on Monday 20 March 1944 to examine the preliminary problems connected with the final assault exercises and the build-up exercise to follow during the period 3-8 May 1944." HQ Ninth Air Force. 24 March 1944. (USAFHRC roll B5739 frames 1025-1026)

80. "Air Plan for Exercise 'Fabius,'" 11 Group and IX Fighter Command, 28 April 1944, (USAFHRC roll B5739) and Brereton, The Brereton Diaries, p.262.

81. Bradley, A Soldier's Story, p.249.

82. Butcher, p.529.

Chapter 3

NORMANDY AND THE BATTLEFIELD EVOLUTION OF CLOSE AIR SUPPORT

In the early morning of 6 June 1944 the Allies launched the largest amphibious landing in history. After months of detailed planning, a force of five American, British and Canadian divisions, carried and protected by 6,000 naval vessels ranging from powerful battleships to fragile landing craft, steamed towards the Norman coast. In the air overhead, the combined strength of the Strategic and Tactical Air Forces added to the awesome strength that had been assembled. In total, over 12,000 aircraft lent their support to the invasion by providing cover and reconnaissance, or by using bombs, rockets, machine guns and cannon to kill, demoralize and incapacitate the defenders of Hitler's Atlantic Wall.[1] By the end of the day, a foothold on the continent had been achieved. However, it would take nearly two months of intense combat to break out of the beachhead and a further six weeks to send the Germans into a headlong retreat towards Germany. During this period, the IX Tactical Air Command (IX TAC) in cooperation with the First United States Army (FUSA) evolved an effective system of close air support that greatly facilitated the winning of the war. As the campaign progressed, adjustments were made to the system based largely on experience. This resulted in the more efficient use of tactical air power as both the Ground and Air Forces came to learn what it could and could not do, and to take advantage of its strengths to greatest effect.

As the previous chapter has shown, the Air Forces and Ground Forces were both well trained in their respective tasks, but they had not adjusted fully to working with each other. The evolution of cooperation can be divided into three distinct phases: 1) The amphibious assault and consolidation of the beachhead, 6 June to 17 June; 2) The transfer of close air support mission control to IX TAC advanced headquarters in France and the continuation of positional warfare, 18 June to 25 July; and 3) The Breakout and support of mobile operations, 26 July to 29 August. The experience gained in North Africa and the conclusions drawn in FM 100-20 both pointed towards a centralized system for close air support under the control of the Air Force. It was argued that this centralization would allow for maximum flexibility and control to be exercised over the air weapon. Both the British and Americans warned that aircraft should not be split into "penny packets" and that standing air patrols were a waste of resources. However, this is exactly what happened in Normandy. Each of the stages above marked the further **decentralization** of the system of tactical air support. In spite of this, the application of close air support became more effective as the campaign progressed. How was this possible? To understand this evolution it is necessary to look at each of the stages to discover the changes that were made, and more importantly, to put them into context.

Assault and Consolidation: 6 June to 17 June 1944

In planning for Operation "Neptune," special arrangements were made for the control of aircraft on tactical air missions. Hillingdon House in Uxbridge became the focal point for these operations. All of the headquarters involved in the provision and request of close air support were located there. This included the Advanced Headquarters of the Allied Expeditionary Air Force (AEAF), Ninth Air Force and Second Tactical Air Force. As well, there were two combined control centres. The Combined Control Centre (Fighter) included the advanced headquarters of IX Fighter Command and 11 Group RAF. This organization was responsible for the operational control of aircraft from the IX and XIX Tactical Air Commands as well as the those of the British 11 Group.[2] The 21st Army Group Combined Control Centre, under the command of Brigadier General C.C. Oxborrow, was also located at Hillingdon House. It was created to allow the Ground Force representatives to work alongside their Air counterparts. Staffed by officers from 21 Army Group and First U.S. Army, it was divided into three functional groups or cells. The Reconnaissance Cell dealt with all requests for reconnaissance and passed on the information gathered from various sources. The Information Cell received all intelligence on the ground situation and was responsible for keeping an up-to-date map which displayed the location of friendly and enemy forces and any other relevant material. The Operations Cell was responsible for the coordination of close air support. It received requests from U.S. Air Support Parties and British Visual Control Posts or from ground commanders directly. These requests were evaluated and either refused or passed on to the appropriate air operations room. The Operations Cell also had the authority to develop air support missions on its own initiative and was responsible for setting and adjusting the bombline based on information provided by the other two cells. The facilities at Hillingdon House comprised the U.K.-based half of the air support system.[3]

For the invasion itself, the Americans placed their forward air support control network on a number of headquarters ships located off the French coastline. The two most important ships were the USS *Ancon*, the headquarters ship for the V U.S. Corps and 1st Infantry Division of the Omaha assault force, and the USS *Bayfield*, the headquarters ship for the VII U.S. Corps and 4th Infantry Division of the Utah assault force. The USS *Augusta* had Ninth Air Force personnel aboard in its capacity as the flagship of the Western Naval Taskforce and FUSA, but its role in the invasion, from the standpoint of close air support was minimal, as was the role of the USS *Henrico*, a back-up for *Ancon* and *Bayfield* should they be put out of commission.[4] The principal role of the air representatives aboard the headquarters ships was to direct offensive air operations in support of the Ground Forces on the beaches. In many respects, the duties of the Combined Control Centre at Uxbridge were duplicated on board the ships. The Senior Air Representative on each ship acted as air advisor to the commanding generals of the army, corps and divisions engaged in operations. All air cooperation requests that were sent direct to Uxbridge by Air Support Parties attached to the troops ashore were to be monitored and those that were deemed unnecessary, wasteful or too dangerous, were vetoed. As well, the air representatives could originate air support requests and convey information on weather and the bombline to the Air Force.[5] The Senior Air Representative also had a direct role to play in battle. Upon arrival in the invasion area, American fighter-bombers were required to check in with the *Ancon* or *Bayfield* prior to executing their attack. This served two functions. First, it allowed the pilot to be briefed on the latest target conditions and to be given a final vector or visual landmark to the target. The second function was to provide the air representative with the opportunity to divert aircraft to targets of greater importance. These usually consisted of fleeting targets of opportunity reported by air support parties or by tactical reconnaissance flights.[6] One final component in the communications network needs to be mentioned. There were three Fighter Direction Tenders with the invasion fleet, one each in the American and British sectors and a third in the shipping channel. Their function was limited to the guidance of tactical aircraft engaged in defensive operations over the Channel and landing beaches. [See Figure 8 for a diagrammatic representation of the Allied air support system in use during the invasion; Map 2 shows Normandy and the invasion beaches.][7]

The air support system created for the invasion was highly centralized. Primary control over the aircraft rested with the air commanders at Hillingdon House. The air representatives located on the headquarters ships exercised some mission control but were generally limited to providing pilots with a final briefing. The air

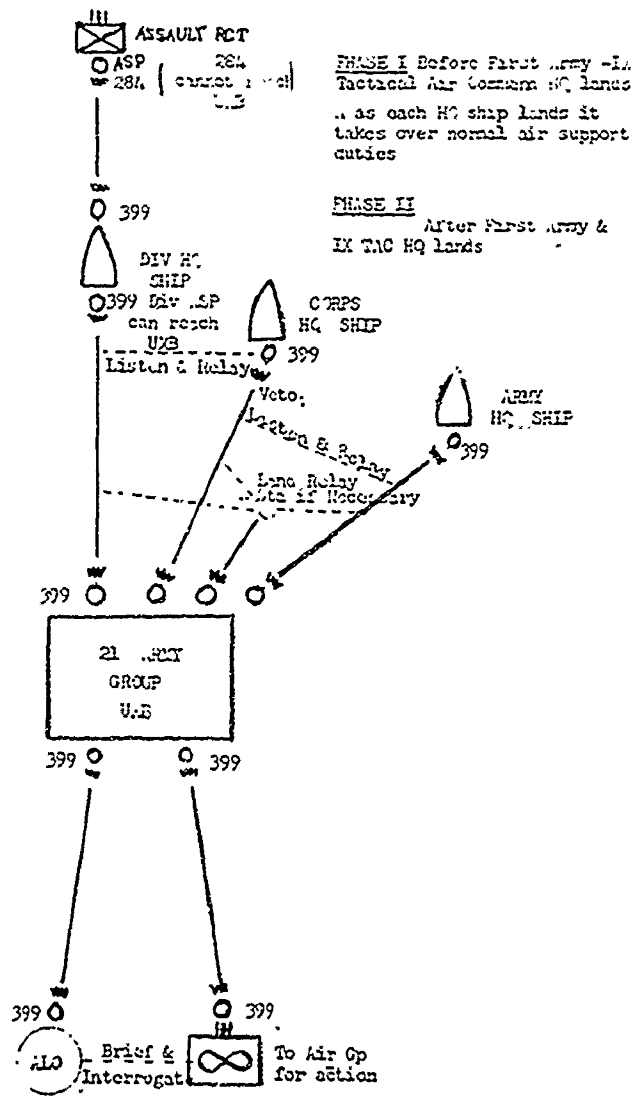
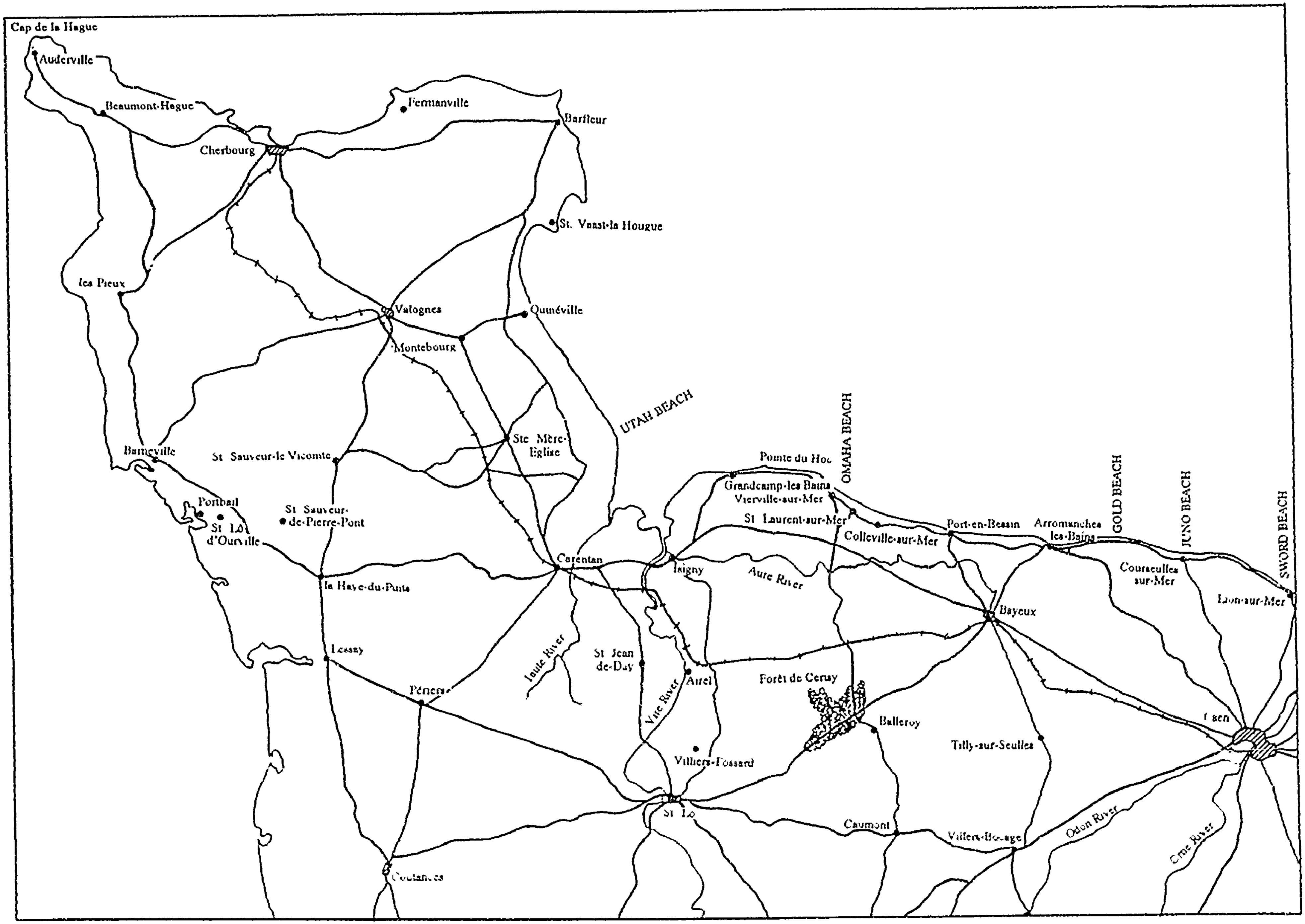


Figure 8

Allied Air Support System During Operation Overlord

Source: E.L. Johnson. "Information Regarding Air-Ground Joint Operations." HQ FUSA, G-3 Air Section. 16 July 1944. Contained in <u>Air-Ground Joint Operations</u>. HQ FUSA G-3 Air Section and HQ IX TAC. n.d. p.42.



Map 2 — Normandy

support rendered during the landings would consist primarily of pre-arranged missions. Though the British did not employ their Visual Control Posts during the actual assault, the Americans sent their equivalent Air Support Parties (ASPs) ashore with each of the Regimental Combat Teams. However, the role of these parties was to be extremely limited. The ASPs had the ability, through their VHF radios, to contact aircraft overhead. But this action was prohibited unless they received prior authorization. The restrictions on communications were so severe that the ASPs were not even permitted to signal aircraft that were attacking friendly troops or attacking the wrong target. The rationalization behind these orders is not immediately understandable, but historian W.A. Jacobs postulates that the Air Force did not want their forward attack control to develop into target control, and thus erode the centralized system of air support.[8] It is now necessary to turn to the invasion itself to see how effective the system was in action.

The "11 Group and IX Fighter Command Joint Air Plan and Executive Order" of 25 May 1944 called for all 18 groups of Ninth Air Force fighter-bombers to participate in the invasion. Shipping cover was to be provided by two groups of P-38s from the IX TAC. They were assigned that duty in the hope that the distinctive shape of the P-38 would prevent friendly fire casualties due to nervous and trigger-happy anti-aircraft gunners aboard the invasion fleet. An additional five groups of P-47s were detailed to provide high cover over the invasion beaches. Pre-arranged air support on D-day was furnished by five groups of P-47s and one group of P-38s. Among the targets attacked by these groups were bridges, gun positions, buildings, and rail embankments as well as any rail and motor transport targets that appeared. An additional five groups of fighter-bombers (two groups of P-51s and three groups of P-47s) were kept in reserve to meet any contingencies that arose during the day.[9]

The first targets hit by the fighter-bombers of Ninth Air Force on the morning of 6 June were a series of nine targets consisting of two coastal gun batteries, six bridges and a rail embankment. The gun batteries, located behind Omaha beach at Maisy and Gefosse-Fontenay, were capable of disrupting the American landings. The result of the air strikes, by 18 and 15 aircraft respectively, were reported as "good" and "excellent." The bridge-busting attacks in the Cherbourg Peninsula destroyed three of the targets and registered hits on the remaining spans.[10] The attacks on these targets raise a question that is central to this study - "What constitutes close air support?" FM 100-20 considered close air support to be attacks on targets in the "zone of contact." Third phase operations were designed to "gain objectives on the immediate front of the ground troops."[11] This included troop concentrations, armoured formations, artillery positions, and other similar targets.[12] Implicit in this definition was the idea that tactical air operations must have an immediate effect on the battle. The definition of second phase, or interdiction, targets was "to prevent the movement of hostile troops and supplies into the theater of operations or within the theater."[13] This included shipping, rail and supply installations, troop and truck convoys, as well as highway and terrain features such as bridges, crossroads and other points suitable for blocking traffic.[14] Interdiction targets were generally considered to have an indirect or delayed effect on battlefield operations.

Unfortunately, the reality of the situation was not so clear cut. An attack on a headquarters well behind the lines, (ie. not in the zone of contact), could have an immediate effect on the battle by wrecking command and control functions and thus leaving the enemy forces without higher direction. The same was true for attacks on troop and tank columns behind the lines, the destruction of which could directly affect the fighting ability of the enemy. For this reason, the attacks on the bridges in the Cherbourg Peninsula by Ninth Air Force on D-day were considered close air support targets since their destruction helped to slow the movement of German troops to the beachhead. This was a direct benefit to the landing forces. If the same targets had been hit the day before they would have constituted interdiction targets. However, this distinction changed when the tactical situation changed. For the purposes of this study the black and white delineations of FM 100-20 will be slightly blurred. Targets will be considered to belong to the realm of close air support if they provide direct benefits to the Ground Forces with which the Air Force was cooperating.

Following the completion of the pre-arranged support on D-day, the fighter-bombers of the Ninth Air Force were made available to meet any immediate needs of the Ground Forces. The plan called for at least one squadron to patrol each beach throughout the day. They were under the control of the headquarters ships which could direct them to targets impeding the advance of the troops. If no requests had been received by the end of the patrol, the squadrons had orders to attack pre-arranged targets before heading home.[15] During the afternoon and early evening of 6 June, 13 requests were made. Five were refused for various reasons including weather, impending darkness, the unavailability of aircraft and coverage by other missions. The remaining eight requests were accepted and a total of 11 missions resulted. The majority of the missions were flown against gun batteries near Carentan, Maisy, Isigny and Bayeux. The importance of these targets prompted Major General Leonard T. Gerow, Commanding General V Corps, to personally contact the headquarters of Ninth Air Force and request, "continuous fighter bomber support to search out and attack enemy artillery firing on the beaches."[16] This entreaty was fully endorsed by General Quesada. A series of attacks on the coastal batteries resulted in numerous direct hits being reported and the missions were considered to be generally successful. Other request missions carried out included armed reconnaissance of the three main roads leading from Coutances, and attacks on a number of convoys, trains and other targets of opportunity. Two P-51 Mustangs from the 67th Tactical Reconnaissance Group flew an artillery adjustment mission late in the evening following a request by the *Ancon*.[17]

The request missions flown on the first day of the invasion were quite successful. However, even at this early stage a number of problems were apparent. As the official Air Force history stated, "The first day's experience disclosed that the control mechanism centred at Uxbridge, however logically it may have been planned, was too involved in operation for the speedy provision of air support."[18] Though the Overlord plan called for a continuous rotation of alert squadrons, these proved insufficient to meet the needs of the situation. It was determined that a greater number of squadrons had to be put at the disposal of the air representatives on the headquarters ships. This problem was compounded by a number of communications difficulties. It was found that the VHF radios sent ashore with the ASPs, (SCR-284s with a maximum range of 25 miles), could not reach the Combined Control Center at Uxbridge. As a result, their requests had to be passed on by the headquarters ships. As well, the *Bayfield* experienced intermittent communications failures and had to rely on the *Ancon* to relay messages to aircraft overhead.[19]

These problems resulted in an expeditious reorganization of the air support system shortly after the invasion. To streamline the system of target selection, the Senior Air Representative aboard the *Ancon* was provided with a greater number of alert squadrons to which he could assign targets based on requests from Air Support Parties, tactical reconnaissance reports and other sources. The Senior Air Representative could also direct the squadrons to undertake armed reconnaissance behind the German lines to seek targets of opportunity.[20]

Even with the early improvements in the system of tactical air support, there were still shortcomings. Early in the invasion, the bombline was fixed on the Aure River which parallelled the coast behind Omaha beach at a depth of 2-5 miles. The official Air Force history records that pinpoint targets on the front could not be found due to the "fluid nature" of the operation. While it is admitted that the U.S. V Corps was making progress inland, their movements were in no way comparable to the advances made following the breakthrough in Operation "Cobra." It was reported at a Ninth Air Force Commanders meeting on the evening of the sixth that the location of the bombline prevented the attack of the enemy close to the beachhead. The misplacement of this "false bombline" can be attributed primarily to inexperience. First, the Ground Forces were not sufficiently knowledgeable of the capabilities of the Air Force. This led to the initial misplacement of the bombline. The placement so far in advance of the troops could also be due to a fear of short bombings, caused by pilots inexperienced in close air support. Another factor was the lack of any kind of effective target control from the air support parties on the ground. Without this, pilots could not be guided to precise targets close to friendly positions. Finally, the relationship between the Air Forces and Ground Forces had not yet developed to the point where problems such as this could be quickly discussed and rectified.[21] A similar situation was reported by the 1st Air Combat Control Squadron Amphibious located on the *Ancon.* It stated that the fighter-bombers often had difficulty finding targets that had been located by tactical reconnaissance flights. Even though the pilots were given the precise location of the targets, including a six figure military grid reference number and the range and bearing to the objective from prominent landmarks, they were often unable to locate their targets. It was unknown whether the problem originated with imprecise directions from the reconnaissance flights, errors by the fighter-bomber pilots or if the target itself relocated or improved its camouflage.[22] Whatever the cause, these difficulties can ultimately be traced back to the inexperience of the personnel in matters of close air support. Practically everybody involved, from the reconnaissance and fighter bomber pilots, to the men of the air support parties and the controllers aboard the headquarters ships, had little operational experience. Troubles such as occurred were to be expected but would become less obvious as the campaign progressed.

One final point must be mentioned concerning the air effort on D-day. The Luftwaffe failed to show up in force. Ninth Air Force fighters reported only one encounter with three German Focke-Wulf 190s, and no aerial claims were made for the entire day's operations.[23] The Allies had made generous allowances to screen the invasion fleet, troop transports and ground forces from interference by German aircraft. Though there were a few scattered attacks, for the most part the Luftwaffe had been defeated by the Allied Air Forces prior to D-day. The effect of this victory would become more apparent as the campaign progressed since it allowed a greater proportion of the tactical air effort to be applied to third phase operations.

Following the initial landings, and the first minor alterations to the IX TAC air support system, operations continued in an effort to secure the beachhead. On Omaha beach, where the V Corps faced a determined and experienced enemy, the Ninth Air Force was given credit for helping to get the troops inland. General Montgomery, commander of 21 Army Group, told General Brereton that the "rehabilitation" of Omaha was due almost entirely to the close support provided by the IX TAC.[24] General Brereton was equally lavish in praising his unit. He stated, "It is possible, if not probable that their efforts were in large part responsible for the attack on Omaha continuing, History may show that they saved the day."[25]

It is interesting to note that despite these accolades from Montgomery and Brereton, the official U.S. Army histories make only brief mention of the role of air power in helping the troops off Omaha beach. The request of General Gerow for "continuous support" to knock out enemy gun batteries was referred to, but the results and impact of the air attacks was not recorded. The accounts mention only that the German positions were difficult to locate from the air. The problems presented by the German artillery was a major focus of the studies but according to the Ground Force accounts its destruction was most often brought about by infantry action or naval gun fire.[26] The Air Force itself records that three of the more experienced fighter-bomber groups in Ninth Air Force, the 365th, 366th and 368th, flew 35 squadron strength missions over Omaha on 7 June. Numerous targets were engaged but only five gun positions, the priority target, were attacked, the results of which were unknown.[27] The discrepancy evident here can be attributed to two main causes. First, the focus of the Army histories was the actions of the ground forces. Good records exist concerning the actions of the men on the ground during the invasion. As well, the fire support of the Navy figures prominently in the accounts due to the fact that the ships had to fire over the beaches to engage their targets. This meant their contributions were witnessed by many soldiers on the ground. The same cannot be said for Air Force operations which often occurred out of sight of the men on the ground. It was usually the more senior commanders who were best able to judge the effect of the air attacks as they were able to receive their intelligence from a myriad of sources. The second factor that must be considered is that early in the campaign an attempt was being made to achieve the closest possible interservice cooperation. This at times could result in the elaboration or embellishment of the truth in an attempt to foster harmonious relations. There is no doubt that the IX TAC played a role in helping V Corps to get off Omaha beach. Their true contribution lies somewhere in between the sparse mention in the Ground Force accounts and the lavish praise given by Montgomery and Brereton.

In the initial period following the invasion, tactical air operations continued in the pattern set on D-day. The number of air support requests increased gradually, but mission acceptance was conditional on the suitability of the weather. Air operations were severely limited by weather on 8 June and totally scrubbed the following day. It must be remembered that all Ninth Air Force fighter-bombers were based in England during the early days of the invasion. This meant that good weather was needed on both sides of the Channel for operations to be carried out. Weather became less of a problem once a significant number of fighter-bomber groups were moved to France. However, weather always remained a factor.[28]

On 10 June the first major step towards a more decentralized air support system was taken. On that day, Ninth Air Force issued General Order No.158 which authorized IX TAC to assume operational control of all fighter-bombers arriving on the continent. This did not mean much at that point since no groups were yet based in France. There were, however, a number of operational airfields. These were used by aircraft on roulement, a technique which allowed aircraft to take-off in England, carry out a mission and then land at one of the French airstrips to refuel and rearm and then fly another mission. The fighter-bombers would continue to stage out of France until the end of the day when they would return to England for the night.

Roulement allowed for a much shorter turnaround time between missions than if they had to return to England following the expenditure of their bombs, fuel and ammunition.[29] The activation of Advanced Headquarters, IX TAC, along with the 70th Fighter Wing at Au Gay marked the transition period from the assault air support organization to a close partnership between the IX Tactical Air Command and First United States Army. The headquarters of FUSA was located only a hedgerow away from that of IX TAC. On 13 June, IX TAC began to exercise operational control through the 70th Fighter Wing but it was five days later that organization gained its relative independence. Until that time all air support requests continued to go to Uxbridge. A short message on the night of 17/18 June changed that situation. It read,

> Effective midnight 17-18 June this Headquarters [IX TAC advanced] in conjunction with 1st Army will assume responsibility for designating bomblines. Will also assume responsibility for operating Air Support Net. Submitting those requests that cannot be met by local resources to Ninth AF.[30]

This marked a major change in the manner in the provision of close air support. First Army would now have to go no further than a couple hundred yards to the control centre where air support was arranged. The Advanced Headquarters of IX TAC assumed control for filtering and acting upon air support requests. Ninth Air Force would only be involved in the process if IX TAC could not meet the requests with the aircraft at its disposal. Generally, this meant the use of medium bombers. For those additional resources, requests would continue to go to Hillingdon House.[31]

Transfer of Control to the Continent: 18 June to 23 July 1944

The activation of the combined IX TAC-FUSA headquarters on 17 June marked the start of the decentralization of the assault air support system. By the time of the operation to capture the Cherbourg Peninsula, the joint headquarters was in operation processing air support requests. However, it did not reach full stride until early July. This system, which would continue in operation through the end of the Battle of France, had at its heart the combined operations room. It acted as a collection point, filter, and action centre for all air support requests. To accomplish this, the staff of the combined operations room consisted of representatives from the army and the air force. Operations were controlled by the IX TAC A-3, Chief of Combat Operations and his FUSA counterpart, the G-3 Air. Along with their staffs, these two men were responsible for evaluating requests for air support, determining priorities and assigning aircraft to missions. Intelligence matters were handled by the IX TAC A-2 and the Army G-2 Air. They were also responsible for all information on the battle situation. This included the receipt and dissemination of information obtained from photo and tactical reconnaissance flights, pilot reports, intelligence from ground sources such as Prisoners of War, captured documents and battle reports. As well, an artillery representative was included in the combined operations room to coordinate the actions of his branch with air operations.[32] In order to fully understand the workings of the combined operations room, it is necessary to distinguish the different types of requests it processed. There were three types: planned missions, request missions and immediate request missions.

Planned missions were defined as sorties to be flown the next day or on succeeding days. They originated with the ground forces at either the divisional or corps level. Each request included information on the type and location of the target, the required time over target, the position of the forward troops as well as any special instructions such as the type of target designation to expect (ie. coloured smoke). Divisional requests were first given to the Air Support Party Officer (ASPO) assigned to the division. He sent the request through ASP communications channels to the G-3 Air at Corps who passed it to the Corps ASPO. The request was then sent through ASP communications to the G-3 Air at the combined operations room. If the request was approved, it was passed to the IX TAC A-3 Officer located in the same tent. Requests were gathered each day until 1930 hours when the Daily Air-Ground Conference was held to determine the air support programme for the following day.[33] [Figure 9 outlines the channels of air support communications.]

The daily conference marked the "highest point" of cooperation between FUSA and IX TAC. The daily agenda began with a forecast by the IX TAC Weather Officer detailing areas where operations could be carried out and where they would be restricted. Next in line was the IX TAC Target Section Chief with an outline of the targets under consideration for attack by the Air Force. This was followed by a discussion of the current air situation as it related to joint operations given by the IX TAC A-2. Representatives from the Army then took over headed by the G-2 Air.

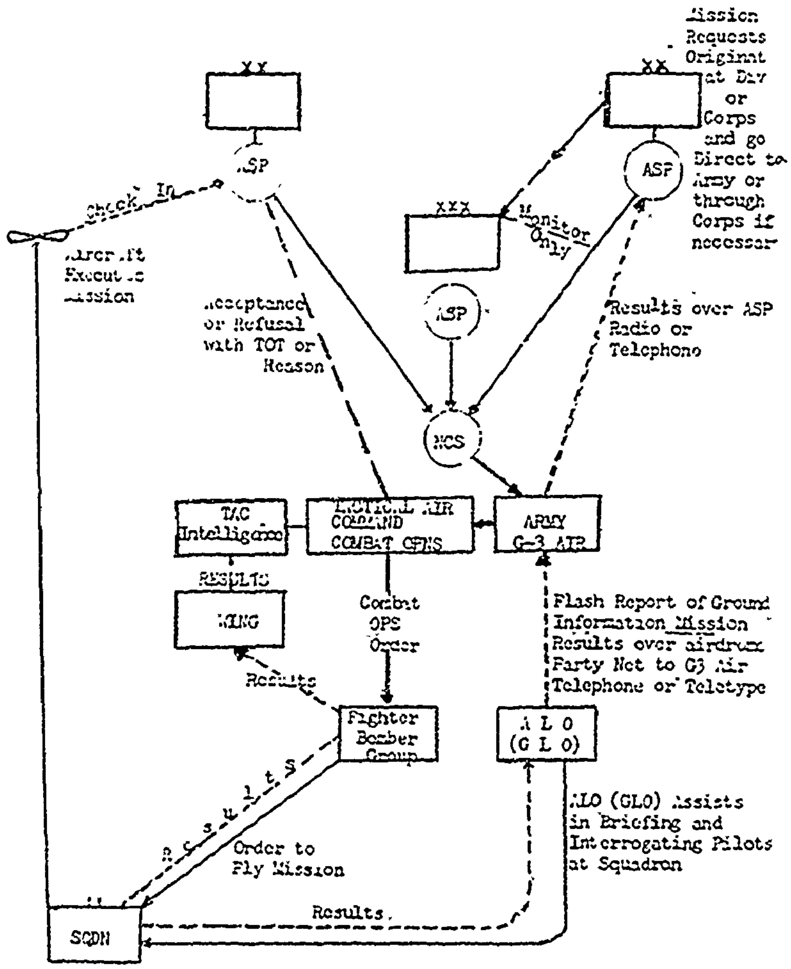


Figure 9

Channels of Air Support Communications

Source: E.L. Johnson. "Information Regarding Air-Ground Joint Operations." HQ FUSA, G-3 Air Section. 16 July 1944. Contained in Air-Ground Joint Operations. HQ FUSA G-3 Air Section and HQ IX TAC. n.d. p.43.

He provided a report on enemy movements over the past 24 hours, highlighting anticipated action by the enemy. A parallel report was given by the G-3 Operations Officer concerning the ground operations of the previous day. He followed his review by outlining Corps plans for the upcoming day with emphasis on which units should be given priority in the allocation of air support. The final Army representative to be heard from was the G-3 Air. He announced Army air support needs for the next day including planned missions submitted by Corps and missions developed by FUSA. The G-3 Air could also seek to have aircraft allocated for anticipated request missions the next day. The final participant in the daily conference was the IX TAC A-3, Chief of Combat Operations. He was responsible for matching the requirements of Ninth Air Force (ie. for bomber escort or special missions), and requests submitted by FUSA to the available IX TAC fighter-bomber groups. He based his decision on the status of continental airfields (which affected radius of action and aircraft turnaround time) as well as groups unavailable for operations due to maintenance requirements. If the number of requested missions exceeded the number of available groups the A-3 could turn to Ninth Air Force for additional air power or cancel low priority requests based on the recommendations of the G-3 Air. At the conclusion of the meeting, the Combat Operations Officer on duty drafted an operations order which was sent to the Wings and Groups to inform them of their upcoming missions. Concurrently, a representative from the G-3 Air Section, the Records Officer, utilized the ASP communications network to inform corps and divisions of the acceptance or denial of their mission requests and to give the anticipated time on target (TOT) of the aircraft.[34]

The procedure for request missions was similar to that for planned missions. Request missions were required on the same day, but the exact timing was not crucial. These requests followed the same channels from the division or corps to the combined operations room. Once there, the request was approved or refused by the G-3 Air. If approved, it was passed to the IX TAC A-3 for dissemination to the airfields. The decision on the request was sent back along the communications network to keep the originating unit informed.[35]

An immediate request mission was required as "soon as possible" (SAP) and action on the request took priority over other activities. The request was sent direct from the ASPO at division or corps to the FUSA G-3 Air. General Quesada reported that in most cases, missions requested SAP required 60-80 minutes from the time of the request until the arrival of aircraft over the target. This process could be expedited by the diversion of airborne aircraft from less important targets or by keeping aircraft and crews on a high state of readiness at their airfields.[36] An examination of the air support requests records for the first week in July reveals that the response times were much longer. On average it took 88 minutes from the time a request was submitted until the ground unit received notification on the status of the request. Aircraft did not actually reach the target until an average of nearly four hours after the request was made. There were instances when a response was made almost immediately and support arrived within 75 minutes. At the other extreme, there were also cases when it took over six hours for a SAP mission to be carried out.[37] These figures, however, must be treated with caution. As the month of July progressed, the number of SAP missions recorded in the daily operational summaries declined significantly while the response times improved. The decline in SAP missions was not due to a reduced need for air support but rather was caused by a shift in policy. As the campaign progressed, the improved communications facilities combined with more experienced personnel to allow low priority planned missions and armed reconnaissance flights to be diverted and briefed in the air to meet SAP target requests. Following Cobra, SAP missions disappeared completely from the mission records as they were replaced by armoured column cover and armed reconnaissance flights. As a result it is difficult to evaluate the figure quoted by Quesada based on the records that are available today. In considering the aircraft response time, it is worth mentioning that for a majority of the planned and request missions, the aircraft of IX TAC arrived in the target area within minutes of the time requested by the ground forces.[38]

Air Support Parties, discussed above, were an integral component of the air support system. The principle role of the ASP was to act as the conduit for all ground force air support requests. The ASPO worked closely with both the G-3 Air and the commander of the unit he was assigned to. As a qualified flying officer, the ASPO brought with him an intimate knowledge of the capabilities and limitations of close support aircraft. In this capacity the ASPO acted as the Air Commander's representative on the division or corps staff. He advised the Ground Force commander on all matters pertaining to air support, in particular, the suitability of targets selected for attack.[39] The ASP was equipped with a complete communications system to relay requests to the combined control centre. This generally consisted of a SCR 399 VHF radio and, at the corps level, a teleprinter. This set-up was unique to the Ninth Air Force. The British air support communications system was manned entirely by army personnel. The same was true for the American 5th Army-XII Tactical Air Command communications system in the Mediterranean. The G-3 Air of FUSA remarked in mid-July that the air support system had been functioning very satisfactorily, but that it could be improved by transferring the responsibility for maintaining the communications system to the Army Ground Forces. It appears that Ninth Air Force would rather have had such a system in place for Overlord but was held back by a shortage of equipment and suitably trained personnel. It was believed that such a system would have streamlined the communications network in the theatre.[40]

Starting in mid-July fighter-bomber pilots whose tour of duty had expired were assigned to act as ASPOs. The idea behind this move was to bring the most experienced personnel to the frontlines where they could make a difference. By most accounts this was very successful. The IX TAC Unit History for August remarked that the fighter pilots, in their capacity as ASPOs, collected numerous souvenirs and had many exciting experiences. On a more serious note, the History recorded that the presence of experienced pilots helped to improve cooperation between the air and the ground:

> At times a pilot would work with his own Group. For example, a familiar voice would say, 'Boys, this is Lanny. We need your help. Knock out that 88 mm. gun that is giving us hell.' The request from a fellow pilot made the situation much more personal to those flying the support missions.[41]

A report from the G-3 Air Section, 12th Army Group stated that the system of rotating pilots through the Air Support Parties was highly recommended by all concerned.[42]

The system of rotation was not without its problems, however. Pilots from IX TAC were not thrilled with the assignment. They felt they were being treated unfairly since other pilots in the theatre, upon completion of their tour were sent home to serve in the United States. As a result of these complaints, the tour of duty for a pilot ASPO was limited to 90 days.[43] Unfortunately, this caused problems as well. Infantry officers resented having to repeatedly break-in new ASPOs as a result of the end of their tours. They rightly believed that this continual rotation impacted on the efficiency of the air support provided. As well, friction was caused between the infantry officers who were committed until the end of the war and the pilots who could look forward to a brief stay in the combat zone.[44]

It should be emphasized that the employment of ASPOs varied significantly depending on the corps or division. At the corps level the differences were extreme. A number of corps ASPOs maintained an extremely close watch over all aircraft in the corps area. At times, this involvement approximated a miniature forward fighter control. Another corps, equipped to the same standards, seldom used its VHF radio except for special operations. The same variety was true at the divisional level. A number of ASPOs worked from the division command post or artillery fire direction centre and made use of maps and aerial photographs to guide aircraft to their targets. Some located themselves in a position where they could actually see the target, such as a forward command post or combat command. At least one divisional ASPO located his vehicle in a clearing with panels placed around it and used it as a prominent landmark to aid pilots in finding their targets. It was common practice among all division ASPOs to maintain close communications with the artillery. This was done so that smoke could be ordered quickly and easily to mark targets.[45]

The ability and personality of the ASPOs was seen as a critical factor in the quality of the air support provided. In most cases the calibre of the ASPO was very high. The penalty for poor performance was to be cut out of the loop. Instead of consulting his Air Force officer on matters pertaining to air support, the ground commander would rely on his own ideas as well as those of his G-3 Air.[46]

This issue of the provision of Air Support Party Officers touches on the heart of the question of decentralization. Captain R.L. Leary, the Operations Officer of the 368th Fighter Group, was sent on detached service to the 3rd Armoured Division. He was sent to learn the difficulties which faced the ground forces in identifying targets for air attack. This came about because many pilots believed they were being asked to attack targets ill-suited for air support. The intent of his mission was to develop closer air-ground relations.[47] However, in a sense this was a back-handed slap to the ground forces. The visit sent the implied message that the ground forces were incapable of selecting proper targets, and this role had to be performed by qualified air force personnel. This message was picked up by the army. The report from the 12 Army Group G-3 stated:

> Air personnel consistently believe strongly that only qualified pilots should be used to direct planes via the VHF radio. Some G-3s' Air, while realizing the inherent value in this procedure, are confident (and have proved) that ground personnel if well selected can be trained to do this work efficiently.[48]

A comment, recorded in a post-war report, by the 1st Infantry Division echoed the same sentiments:

> At the present time, there seems to be a lack of confidence on the part of the Tactical Air Force in the ability of a ground staff officer to choose appropriate targets for fighter-bombers. Until that confidence is gained and the ground staff officers' decision is taken automatically by the Air Force, there will always be a delay at each headquarters that the request goes through, while AGCO's [Air-Ground Coordination Officers - previously known as ASPOs] and G-3 Airs and G-2 Airs re-evaluate the target.[49]

It was not a question of trust or confidence that prevented the Air Force from allowing the Ground Forces to control target allocation. Rather, it was a result of the Air Force effort to gain complete independence from the Ground Forces. Decentralization would occur to the point where the efficiency of operations was maximized but would not proceed so far as to threaten the autonomy of the Air Force. In spite of the problems with the air support system, the friction between the Ground and Air Forces did not seriously interfere with the conduct of operations. Though it was acknowledged that there was some duplication of effort between the G-3 Air and ASPO, it was considered by most that the existing system should continue in operation.[50]

As can be seen, at every level of the air support system a balance was maintained between army and air force representatives. This was no different at the airfields. Besides the regular complement of Air Force S-3s and S-2s, the army had representatives at each fighter-bomber wing and group headquarters, and at the Tac/R group and squadron level. These men, known as Army or Ground Liaison Officers (ALOs or GLOs),[51] acted as agents for the FUSA G-2 Air and G-3 Air. In most cases the ALOs were assigned from combat units and had battle experience. As such, they brought to the Air Force an intimate knowledge of Ground Force field operations. Their primary duty was to "promote understanding of mutual problems, cooperative spirit and good feeling between the ground and air forces."[52] The ALOs were responsible for maintaining the link between the airfields and the combined operations room at IX TAC-FUSA headquarters. Regular duties for the ALO included caring for an operations map which showed Allied and German positions as well as a prominently marked bombline. This display was always kept up-to-date. Upon receipt of an air support request, the ALO played a major role in briefing the pilots for the mission. Following the completion of the mission the ALO was responsible for debriefing the pilot and immediately forwarding any intelligence gained to the combined operations room. Both the Ground and Air Forces recognized the importance of the ALOs. Colonel Edwin L. Johnson, the FUSA G-3 Air stated that:

> ALOs have rendered a valuable service to both the air and ground units in this theater and have added materially to the success of many missions. They have also been a factor in securing information of value to ground commanders during the interrogation of pilots returning from missions and have expedited the transmission of results to supported ground units. In at least two cases they have prevented bombing of friendly troops.[53]

The IX Fighter Command/IX Tactical Air Command Unit History had similar praise for the ALO:

> . . . where the officer's [sic] concerned were well qualified, the results have been excellent. The value of the GLO lies in his familiarity with the Ground Forces and his ability to arrange detail such as display of panels, local bombline, use of smoke, etc. These, it was felt, could best be done by personal contact.[54]

As with the ASPOs, much of the success of the ALO was derived from his personal ability and character. In the first six weeks of the invasion, three out of the 30 ALOs assigned by FUSA to IX TAC were relieved of duty because of their inadequate performance. This problem extended beyond the ALOs. FUSA had a significant problem finding qualified officers with a strong knowledge of air ground operations. During the same period, three of the four corps G-3 Air officers were also relieved of duty. It is interesting to note that these officers were each replaced by the promotion of ALOs who had performed well in their relations with the Air Force.[55]

The performance of the Ground Force officers responsible for air matters closely parallelled the Air Force experience. Their officers had received broad training prior to the invasion. What was lacking, however, was close contact with the Air Force officers with whom they would be working during the course of operations. Until actually subjected to the conditions of battle, it was unknown how the officers, and the system in general, would perform. It appears, from the evidence available, that the men and system performed reasonably well from the start but it took a while to fully test the system to discover the most efficient means of operation and to weed out the individuals who did not perform as expected.

With the beachheads secure, General Bradley turned his attention to the capture of the Cotentin Peninsula. By 18 June, General Collins had advanced across the neck of the peninsula and on the 19th began to attack northward. The VII Corps made steady progress and by the evening of 21 June was poised to commence attacks on Cherbourg itself. The capture of Cherbourg had figured prominently in the planning for Operation Overlord. However, a severe and unexpected storm lasting from 19 to 22 June smashed the artificial Mulberry Harbour at Omaha Beach and severely damaged a second one in the British sector. This lent an even greater urgency to capturing the port of Cherbourg due to the Allied belief that they could not sustain their armies without either the Mulberries or comparable port facilities.[56]

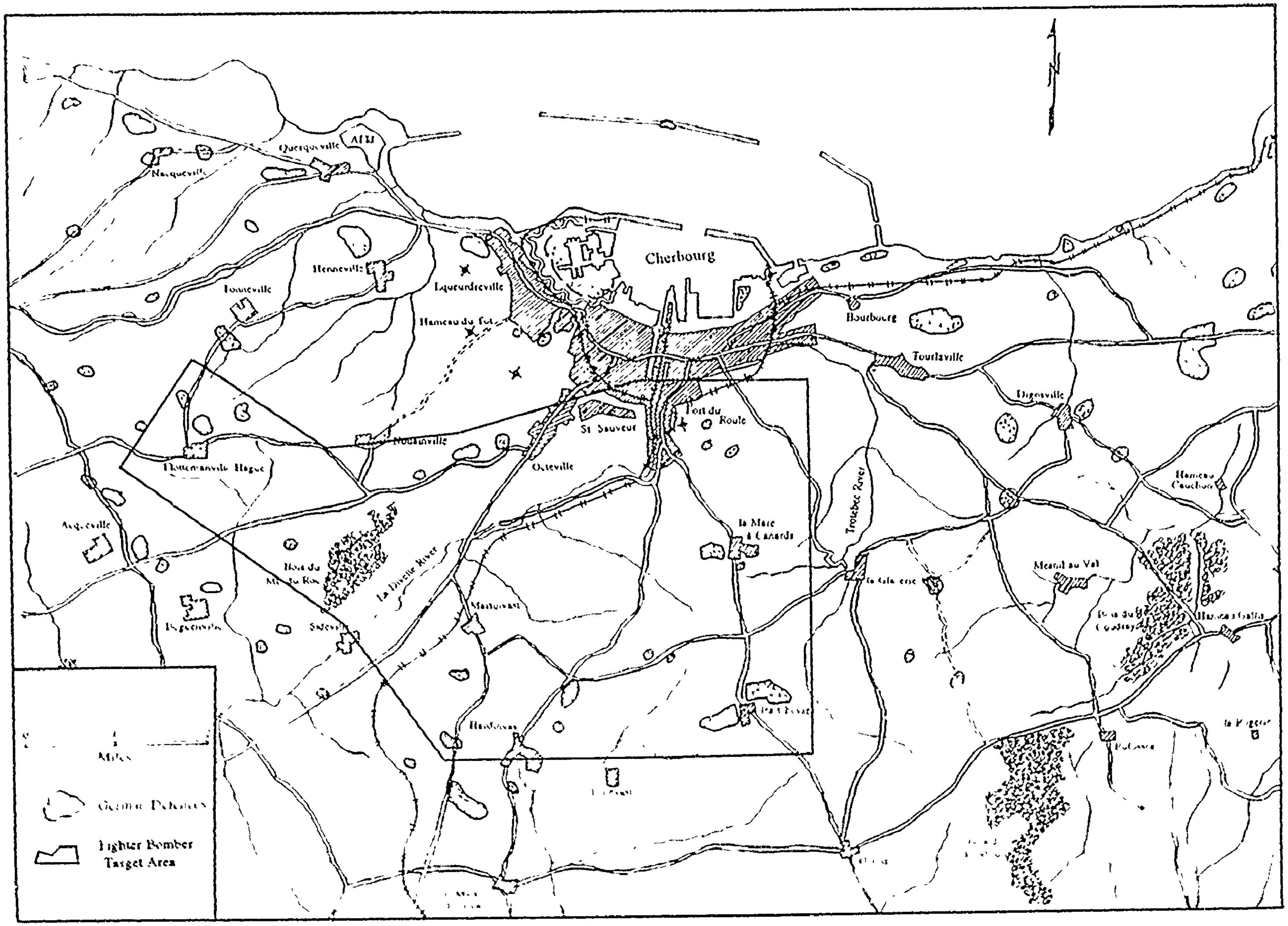
The Ninth Air Force first received word on 17 June that FUSA wanted to mount a large scale air operation in support of the attack on Cherbourg. General Brereton and his chief intelligence officer, Colonel Melon Hall met with General Bradley at his headquarters at Au Gay on the afternoon of 17 June. General Bradley stated that he wanted to make "special use of air power" to support the Cherbourg operation. He believed that it would serve the dual function of speeding up the completion of the operation as well as prevent unnecessary casualties.[57]

On the morning of 21 June, Generals Brereton and Quesada met with General Collins at the VII Corps headquarters. Collins announced that the attack on Cherbourg would commence the next day led by the 9th and 79th Divisions. The ground plan called for the two divisions to capture the high ground overlooking the city by the end of the first day. A third division, the 4th, was also involved in the attack. Its role was to seal off the city from the east. Intelligence had reported that the Germans were disorganized and it was hoped that a heavy air attack prior to the ground assault would facilitate the capture of the city.[58]

The planning for the air assault was a model of grace under pressure. The entire process was carried out at Hillingdon House by Brigadier General Schlatter, Assistant Chief of Staff, Operations, A-3, and Brigadier General Stearley, Director of Operations, with cooperation from Air Vice Marshal Froom, the RAF representative. In the span of only six hours, a complete plan was worked out for the participation of 12 groups of fighter-bombers from IX and XIX Tactical Air Commands, eight groups of Medium bombers and three groups of light bombers from IX Bomber Command, and 10 squadrons of Typhoons and Mustangs from Second Tactical Air Force. The planning was completed in time to send operations orders to all the units involved. However, late completion required General Schlatter to personally fly to France in the early hours of 22 June to deliver and explain the air plan to the officers of VII Corps. It is important to note that the entire air plan was developed at Hillingdon House by the staff of Ninth Air Force without the participation of any Ground Force representatives.[59]

The ground assault on Cherbourg was scheduled to begin at 1400 hours on 22 June. Prior to the air attack, the artillery of VII Corps was to conduct a counterbattery bombardment on German antiaircraft positions to clear the way for the aircraft. The target area for the attack was originally planned to be two "L" shaped areas in front of each attacking division. This was changed late in the planning process to be one large area located to the south and southwest of Cherbourg. Priority targets in that area were to be marked by white smoke fired by the artillery. White smoke was also used to mark the bombline. No attacks were to be carried out south of the bombline.[60] [See Map 3.]

Air operations in support of the Cherbourg assault commenced on schedule at 1240 hours with an attack by four rocket-firing Typhoon squadrons of Second Tactical Air Force. These aircraft concentrated on suppressing flak positions that remained after the artillery barrage. Following the completion of the rocket attacks, six squadrons of British Mustangs conducted strafing attacks in the target area. It is interesting to note that British orders categorically stated, "Mustangs are to use cannon only. Bombs are NOT to be carried by British Typhoons or Mustangs for these attacks."[61] The rationale behind this order is not immediately clear but might be attributable to the quickness of the planning process which did not leave sufficient time for the aircraft to be fitted with the proper bombs for the mission. The fighter-bombers of Ninth Air Force were the next to enter the target area. They began their strafing and bombing attacks at H-60 minutes and continued for the next hour. The 12 groups involved staggered their attacks at five minute intervals. The attacks were made from west to east on a variety of targets including military installations, troop positions and transportation targets. Special attention was given to six pinpoint targets consisting of Flottemanville-Hague, Martinvast, les Chevres, la Mare à Canards, Fort



Map 3 — Cherbourg

du Roule, and a defended locality just west of Octeville. At 1400 hours VII Corps launched its attack. This was accompanied by attacks on pinpoint locations by the aircraft of IX Bomber Command. These attacks lasted for the first hour of the ground attack. In total, 562 fighter-bomber and 387 light and medium bomber sorties were flown during the operation.[62]

In spite of the large area targeted by the air attack, it was not designed to be a "carpet bombing" similar to that which preceded Operations "Goodwood" and "Cobra." Instead, it was hoped that the bombing could cause a break in the morale of the troops garrisoning Cherbourg. Their morale had been reported as low and attempts were made to secure the surrender of the city prior to the attack. Morale was not low enough amongst the defenders of Cherbourg to cause a capitulation, and the air attacks did not have that effect either. The three attacking divisions made slow progress on the afternoon of the first day as they encountered a stubborn and determined enemy. Over the next few days the American forces made slow but steady gains. Organized resistance in Cherbourg came to a halt on 26 June with the surrender of the German commander. However, mopping up operations in the area continued for several more days.[63]

Air attacks against targets in the Cherbourg area were continued following the main assault. Between 23 and 29 June a total of eight fighter-bomber and six medium bomber missions were flown. The attacks were concentrated on strong points and gun positions. The fighter-bomber missions were largely carried out by a pair of squadrons though some missions employed just a single squadron while others were carried out in group strength. During this period, air operations were severely restricted by weather from 26 to 28 June. No aircraft from England were able to participate on these days, but some sorties were flown by fighter-bombers based on the continent.[64]

Initial appraisals of the effectiveness of the Cherbourg attacks were disappointing. The slow rate of advance by the ground forces seemed to indicate the failure of the attacks. General Quesada, in particular, was dismayed with the results. He felt that the strafing operations were a "waste of bullets."[65] In terms of destroying enemy morale, the air attacks have to be declared a complete failure. There was no indication of a precipitous drop in German morale. The defenders of Cherbourg continued to fight tenaciously until the very end. By the end of 23 June, only a small portion of the target area had been overrun by the ground troops. One report concluded that it was possible the results did not justify the losses (25 aircraft destroyed and 137 damaged) and expenditure of fuel, ammunition and ordnance. Another report written after the war declared Cherbourg to be, "one of the few significant misapplications of tactical air power in the entire career of the Ninth Air Force in the European Theater of Operations."[66]

The air support for the Cherbourg drive was not a complete waste, however. There is no doubt that the air attacks did materially speed up the advance of the VII Corps. The interrogation of POWs following the battle revealed that the air attacks, especially the dive bombing and strafing, did affect German morale to some extent. Though the defenders fought hard, there were indications that they were dazed, slow to react and resigned to the fact that they were going to be defeated. With the element of time so important in this operation, it was estimated that the air attacks hastened the capture of Cherbourg by 48 hours.[67] This was the first large scale application of tactical air power following the invasion. In many respects the expectations placed on the air support of the operation were unrealistic. The Ground Forces had hoped that the Air Force would be able to eliminate resistance so it only had to take possession of the battlefield after the attack. The Air Force also thought this was possible. Judged by these standards it can be seen why the application of tactical air power at Cherbourg was initially viewed as unsuccessful. It had not yet been fully worked out how the aircraft could be used to greatest effect on the battlefield. Cherbourg showed that close air support was not the ultimate weapon. It could contribute to the success of a battle but could not win it on its own. However, the air support at Cherbourg did facilitate the ground action and judged by the standards in place by the end of the summer, the attacks were quite successful.

The support rendered during the final drive on the city received mixed reviews. A Ninth Air Force report on the operations stated that in most cases the attacks by P-47s had "good" to "excellent" results with bombs seen to fall in the target area. Reports given by pilots were generally accurate with regard to where their bombs fell, but their interpretation of results must be taken with caution. In most attacks, fighter pilots did not see their bombs hit the ground. They were too busy trying to get out of the target area in one piece. In certain types of attacks, the pilot could not even see the target when he released the bomb. He sighted on the target and when it passed beneath his nose he counted to a predetermined number and then released his bomb. It must also be considered that a hit on a "target area" does not automatically mean a hit on the "target." This is the difference between accuracy and effectiveness. A particular close air support attack can be very accurate with most bombs falling in the target area. A good example is an attack on a group of buildings. It is possible for the bombs to fall into the target area, but hit the ground between and around the buildings without causing serious damage to the buildings themselves. The effectiveness of that attack can only be determined by the ground troops based on the resistance they meet when attacking the objective. This difference was very evident during operations on the Cotentin Peninsula. In a classic example of this dichotomy, 12 P-47s attacked a heavily defended position east of la Glacerie on 24 June. An Army historian reported that this was "one of the most accurate dive-bombing missions thus far seen in the operation." A total of 24 500-pound bombs were dropped on the target and remarkably, all but one hit the target. In spite of this attack, and a subsequent artillery barrage, the German defenders remained resolute. The strongpoint was not taken until the infantry called on tank support. When it was finally captured, the troops found that almost all of the guns in the position were intact.[68] There were also examples at the other extreme. An attack by Company K, 3rd Battalion, 22 Infantry towards an enemy position near Digosville on the same day met strong resistance. A request for an air strike was answered by a squadron of P-47s. This air attack was closely followed by an infantry and tank assault which quickly secured the position.[69] On 29 June an attack was carried out by Ninth Air Force fighter-bombers on the Cherbourg breakwater forts. The bombs caused little material damage to the solid defences but the concussion and shock were sufficient to force the garrison to surrender immediately after the attack. In part the success of this attack can be attributed to the fact that Cherbourg had already been lost by this time.[70] From these examples it can be seen that the effectiveness of a particular attack depends on a number of factors including the nature of the target, the degree of cooperation between the air and the ground, and the determination and resolve of the attackers and defenders. It was not limited to the accuracy of the attack.

Above all, Cherbourg proved to be an operational laboratory in the provision of close air support. Many mistakes were made, but from them lessons were learned which improved the entire system. Planning for the operation was too rushed. This had a significant effect on the coordination between the Ground and Air Forces. Though it was possible to conduct effective last minute planning, it was necessary to have close cooperation between everyone involved. This did not happen for the Cherbourg operation. There was no Army representative present during the planning stages. This resulted in poor coordination once the attack started. POW reports clearly remarked that the air attacks caused a good deal of disorganization. German officers could not keep their troops together in the face of continuous dive bombing and strafing attacks. However, the effect of this demoralization was short-lived. The American ground forces did not launch their attacks soon enough after the air attacks were completed. This gave the German defenders time to recover before they were overrun. The full effect of the air attacks could only have been capitalized on by the ground forces through close coordination with the Air Force.[71]

A second lesson learned from the experience of Cherbourg was that fighter-bomber attacks had a much greater effect on the morale of the enemy than did level bombing by medium bombers. This suggested a rethinking of the method of employment. At Cherbourg the first attacks were delivered by the fighter bombers with the mediums attacking at the same time the troops began their advance. If fighter-bomber attacks had a greater effect on morale, and if that effect was short-lived, then it made sense to use the medium bombers first to attack targets farthest from the bomb line and then use the fighter-bombers to attack close to the troops in immediate anticipation of their advance. This strategy also made sense due to the greater accuracy of the fighter-bomber compared to the mediums. In Operation "Cobra" this lesson was correctly applied.[72]

Cherbourg also provided experience in a number of other areas. The first was cooperation between the air and the artillery. Most discussions on air-artillery coordination have focused on aerial spotting for artillery. Very little credit has been given to the support given by artillery to tactical air missions. In the Cherbourg operation, this occurred in two ways. Prior to the air attack the artillery engaged in counterbattery fire to suppress the German anti-aircraft defences. The results of this kind of support are largely intangible, but it is likely that aircraft losses would have been much greater without it. The second variety of support rendered by the artillery was the marking of the bombline and targets with smoke. Though some friendly fire casualties did occur, the existence of a "visible" bombline cut down on the chances of this occurring. There were some reports that the use of smoke for marking targets, especially white smoke, was worthless since the smoke quickly dissipated and become mixed with smoke and dust from previous attacks. If nothing else, smoke shells fired by artillery could indicate to the attacking planes the general location of a target. This made the job of the pilot much easier. The effect of target marking was greatly enhanced if the air and the ground were in close contact so the pilot can be told when to expect the laying on of smoke. In this way it was much more likely that the correct target would be struck. In the Cherbourg operation the use of smoke was rated a moderate success and enough potential was seen to recommend the continued use of artillery fire to mark targets.[73]

Lessons were learned on the importance of communications. Each division involved in the Cherbourg attack had Air Support Parties to relay requests for air su port. So far in the invasion ASPs had only been used to a limited extent to guide aircraft onto their targets. Cherbourg showed how important this function was. Many infantry commanders were dissatisfied with the air support they received because the targets they needed neutralized were not being hit. One reason for this was a lack of terminal control. The importance of direct contact between the front line troops and the aircraft was reinforced during the air attacks on 22 June. Three infantry regiments, the 22nd, 47th, and 60th radioed their headquarters to implore that attacks on them by American aircraft be halted.[74] It was not a quick process to go up through channels to get the attacks called off. By the time the message was conveyed, the planes had already finished their attacks. This was a function that could be directly fulfilled by the ASP without reference to a higher headquarters.

With the fall of Cherbourg, American forces turned their attention to the south. In the period following the operation to capture Cherbourg the Ground and Air Forces moved towards closer cooperation. By the middle of July it had become standard practice for incoming flights to contact the ASPO about five minutes before they reached the target area. This allowed the pilots to be briefed on the latest target intelligence and be informed which coloured smoke would be used. Once the attack had been completed the flight or squadron leader would radio the results of his attack to the ASPO and thus provide the Army with the most up-to-date intelligence.[75] The principle advantage of this evolution, or maturation, of the air support system was increased flexibility. No longer was it necessary to provide the pilots with a detailed pre-flight briefing as had been emphasized in the recommendation made following Exercise "Tiger."[76] It was now possible for missions to be arranged very quickly, even while the aircraft were in the air. The pilots could be contacted by the ASPO and briefed on the location and nature of the target. When the aircraft arrived in the general area, the artillery would mark the exact targets to be attacked. In many cases the aircraft would be diverted from low priority missions such as armed reconnaissance to attack important targets requested by the army. This was a significant change from the manner in which operations were conducted during the early days of Overlord.

The full capabilities of the evolving air support system were shown by an incident which occurred on the evening of 17 July. In the push to capture St. Lo, the 116th Infantry Regiment of the 29th Division found itself low on ammunition and facing a strong German counterattack. The first small probing attacks were repulsed with the aid of artillery fire, but a force of enemy tanks could be seen preparing for a renewed assault. At about 2000 hours a request for air support was sent to IX TAC. The call was answered in just over an hour by a squadron of Thunderbolts from the 404th Fighter Bomber Group based at Airfield A-5 in Chippelle, France. The pilots received their final briefing in the air from the ASPO of the 29th Division, Major Horace B. Wetherall, and spent 60 minutes bombing and strafing all potential targets. The air strikes were made immediately in front of the American lines. The attacks were so close, in fact, that the soldiers were ordered to place red panels and even their undershirts on the ground to mark their positions. The air attacks were so effective that it was reported numerous German soldiers ran into the American lines to avoid being bombed. It seems they would risk being shot and/or captured rather than face the American fighter-bombers. Though the pilots reported seeing no tanks and claimed bomb hits on only one vehicle and a house, Major General C.H. Gerhart, Commanding General, 29th Infantry Division, credited the air strike with a major role in repelling the counterattack. It was through the close coordination of the squadron and the ASPO that the pilots were quickly briefed and kept informed of the American positions so they could safely conduct their attacks extremely close to the troops they were protecting.[77] Major General Charles C. Corlett, Commanding General of XIX

Corps, expressed in a letter to General Bradley how pleased he was with the air support his forces had received from IX TAC:

> The air force participation in breaking up a German counterattack late on the afternoon of 17 July contributed materially to the success of the operation and the saving of American lives.
>
> Air strikes arrived on time and on target. This close support by the air forces of ground troops exemplifies the teamwork so essential to success and is most appreciated by the front line fighting troops to whom it was a life and death matter.[78]

As well as crediting IX TAC with stopping the counterattack, Corlett attributed to them a number of intangible effects such as raising the morale of his troops and curtailing German fire by the mere presence of aircraft over the battlefield. The attack in support of the 29th Division by IX TAC was just one of six missions flown in support of XIX Corps on 17 July.[79] A tribute of this nature indicates that the close air support system had been functioning well for XIX Corps in the weeks preceding the letter.

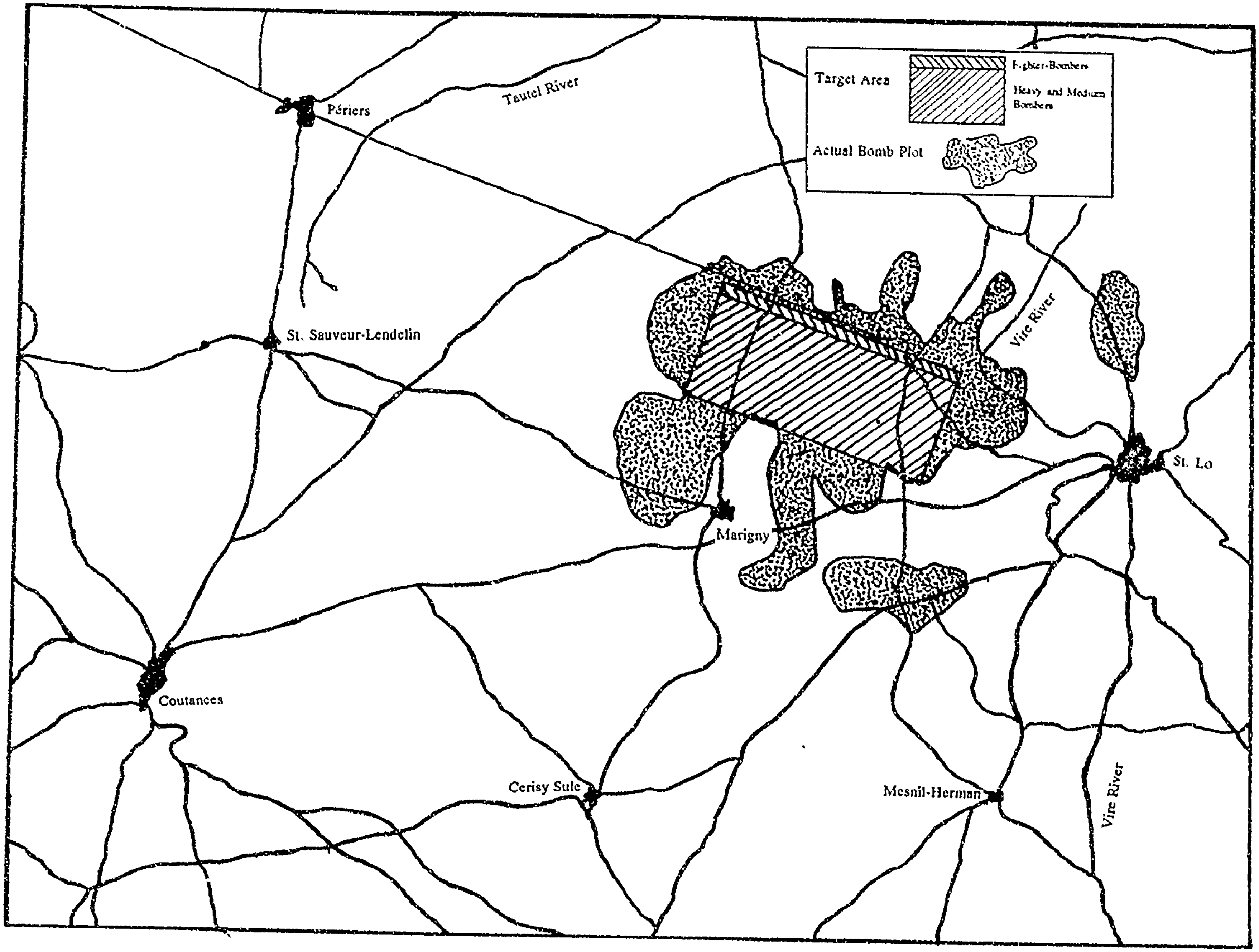
By the end of June the Allied command began to seriously worry that the Germans would contain them in Normandy. Planners were told to devise a plan to break the stalemate. Various solutions were offered. The British 21 Army Group planners were very interested in launching a secondary amphibious assault against Brest and the Brittany Peninsula. Other plans called for an airborne operation to relieve the pressure in Normandy. Eisenhower eventually vetoed these ideas on the grounds that such ancillary operations might weaken and distract the main force. An alternative solution soon developed. General Bradley envisioned a powerful combined operation in which a devastating aerial bombardment preceding a massive and vigourous ground attack. By 11 July this concept had developed into Operation Cobra. Cobra was unique in that it was largely developed by two men - Bradley and Collins. General Bradley had worked out much of the plan on his own but he accepted the suggestions of Collins to improve its design. The plan was complete by 21 July and the forces were ready. It would be put into effect as soon as there was suitable weather to allow air participation.[80]

Planning for air involvement in Operation Cobra was much more of a joint effort than was the case for the attack on Cherbourg. The ground plan was complete by 18 July. The next day, General Bradley flew to the AEAF headquarters at Stanmore to meet with Air Chief Marshal Sir Arthur Tedder, Air Chief Marshal Sir Trafford Leigh-Mallory, Air Marshal Sir Arthur Coningham, Major General Carl Spaatz as well as Ninth Air Force representatives Brereton and Quesada. Bradley began the meeting by outlining the VII Corps plan for Cobra.[81] Three infantry divisions, the 9th, 4th and 79th, were to launch their attack immediately after the aerial bombardment. These divisions were to crack open the German line for exploitation by the 1st Division, a motorized unit, and the 2nd and 3rd Armoured Divisions. Their objective was to encircle Coutances and disrupt the German defences west of the Vire River in preparation for later exploitation by the VIII Corps. The aerial attack was seen as a critical prelude to the ground assault. In part, this was due to a shortage of artillery ammunition in Normandy, but in spite of that, carpet bombing by heavy bombers would be able to lay down a much heavier barrage in a shorter period of time than could all the guns of the First Army.[82] A number of options were negotiated at this meeting. Bradley demanded that 100-pound fragmentation bombs be used. This was deemed necessary to avoid excessive cratering that would slow down the ground advance. This was a lesson that had been learned from the British experience in Operation "Charnwood." A second point was the distance between the bombline and the American troops. Bradley wanted to place his troops 800 yards behind the lines. The air representatives wanted the safety margin to be at least 3,000 yards or they could not guarantee the safety of the troops. Bradley was very reluctant to agree to such a move after his units had to fight so fiercely to acquire the ground. At least one of his division commanders, Major General Manton Eddy of the 9th Infantry Division, did not want to concede any of the hard-fought ground. After arguing the point it was decided to withdraw the troops 1,200 yards behind the St. Lo - Périers road which marked the northern edge of the target area. In effect, this created a safety margin of 1,450 yards between the heavy bomber target zone and the American troops. The extra 250 yard margin was created by the zone allocated to the Ninth Air Force fighter-bombers. One concession that was granted to the Air Force was the right to determine the timing of the attack. This important detail was left in the hands of the air planners since the assault could not start until the bombers had relatively clear weather. A final point of contention was the direction of the bomber attack. Bradley wanted the bombers to attack parallel to the bombline. He believed that this would prevent any short bombings since the pilots could use the highly visible St. Lo - Périers road as a reference guide. The Air Force, however, wanted the attack to be made perpendicular to the target area, out of the north. This would make the bombers much less prone to German anti-aircraft fire. The meeting ended with Bradley believing the attack would take place parallel to the bombline.[83]

Adverse weather delayed the start of Operation Cobra. On the evening of 23 July a window of opportunity finally appeared and the green light was given to commence operations the next day. The forecast did not hold, however, and after a two-hour delay the operation was scrubbed. Unfortunately, a large number of aircraft had taken off before the cancellation reached them. Three fighter-bomber groups bombed the target area with no results observed. As well, over 1,500 bombers were dispatched on the mission. A majority of the planes of the first two bombardment divisions returned with their bombs because they were unable to locate the target area through the heavy cloud. The weather improved slightly for the third formation and it was able to complete its mission - with dire results. The overcast greatly degraded bombing accuracy and a large number of bombs fell among American troops. Most of the casualties were sustained by the 30th Infantry Division. In total, over 25 men were killed and 160 wounded.[84]

General Bradley was furious when he learned of the short bombing. His anger was as much a result of the Air Force deviation from the plan as from the casualties caused. He was shocked to learn the bombers had attacked out of the north rather than from the east or west. That was not the plan he agreed to. One of Bradley's primary concerns in the planning of the bombardment was the avoidance of friendly casualties. A bombing run perpendicular to the target area, across American lines, greatly increased the chance of short bombings. However, this approach was deemed necessary by the Eighth Air Force to allow all its bombers to get through the target area in the minimum amount of time. An approach parallel to the bombline, on the narrow end of the target would greatly restrict the number of aircraft that could bomb at any one time. This illustrates the danger of miscommunications between the Air and the Ground. The Army had expected one type of attack, but another was delivered. Bradley insisted that a parallel approach had been agreed to at the conference on 19 July.[85] Miscommunications such as this could rapidly destroy any sense of trust that had developed. Though it was the strategic force that had miscued, the tactical air forces also lost a modicum of respect. The 30th Infantry Division is a good example of this. It was hit hard on 24 July and again on the 25th by short bombs. Major General Leland S. Hobbs, commander of the division became very distrustful of air support following the beating sustained by his division at the hands of the USAAF. The day after Cobra, Hobbs refused an offer of air support to capture a German position his division had been rebuffed from on five separate occasions. Right up to the end of the war the division remained wary of the Air Force. This attitude was reflected in a series of post-war questionnaires on the effectiveness of tactical air power.[86] Cobra was not off to a good start. [See Map 4.]

The operation was remounted the next day with the advent of better weather. At 0938 hours on 25 Ju[illegible] attacks by eight squadrons of Ninth Air Force fighter-bombers opened Operation Cobra. Their target was the slender band immediately



Map 4 — Operation Cobra

opposite the American troops poised to attack. This area, south of the St. Lo - Périers highway, was 250 yards wide and 7,000 yards long. The fighter groups took turns attacking the eastern and western halves of the target area. As the aircraft approached the target area, they found their assigned orbit point where they formed up in squadrons for the attack. From the orbit point they went to the initial point where they checked in with the Flying Control. If the target area was clear of aircraft, each squadron attacked in column formation. The majority of aircraft made glide attacks and released their bombs at about 2,000 feet. The aircraft carried a variety of 500-pound and fragmentation bombs. To aid the pilots in distinguishing the target area, the ends and centre of the target area were marked with red smoke. As well, the ground troops displayed yellow and cerise panels to mark their positions. The fighter-bombers were followed by heavy and medium bomber attacks. They saturated the target area, extending 1500 yards beyond the fighter-bomber target area. Unfortunately there were again short bombings which caused a large number of casualties (over 600) and a great deal of disorganization among the waiting troops.[87]

Despite the confusion caused by the short bombings, the ground attack began only slightly late, at 1100 hours. At the same time, the second wing of fighter-bombers commenced their attacks. They concentrated on the same strip of land. The IX TAC judged the results of its missions to be "excellent and beyond our expectations."[88]

In examining the results of the air attacks it is difficult to distinguish the effects of the fighter-bombers from the destruction caused by the heavy bombers. In part, the effectiveness of the fighter-bombers can be judged by the experience of the 330th Infantry Regiment. This regiment, from the 83rd Infantry Division, was located on the far right side of the American line, just outside of the bombing area for Cobra. It was given the task of capturing a section of the main highway to prevent the possibility of a German counterattack from Périers. The assault battalion jumped off with the rest of the Cobra forces at 1100 hours. Excellent progress was made for the first 40 minutes of the attack. During this period Ninth Air Force fighter-bombers continued their attacks on German positions at the northern end of the bomb zone. Though no attacks were made in front of the 330th Infantry, the mere presence of aircraft over the battlefield was sufficient to keep the German troops under cover. Unfortunately, when the air attacks stopped, the Germans realized there was no longer an aerial threat and they began to put up a fierce defence. The attack soon ground to a halt in that sector and the 330th Infantry was unable to gain its objective.[89] This was a common story on the afternoon of 25 July. There is no doubt that the target area was completely saturated. One German officer referred to his positions after the attack as a *Mondlandschaft* (moonscape). He estimated that over 70 per cent of his personnel were incapacitated by the attack and over three-quarters of his tanks were destroyed. But, the bombardment did not smash the German defences. As a result, the American advance on the first day of "Cobra" was much slower than expected. Planners had calculated that the assaulting divisions would move as much as two kilometres on 25 July. In fact, the American troops did not advance much past the St. Lo - Périers highway. Early assessments were so pessimistic that it was feared the attack had failed. It was true that resistance was resolute, but the defensive crust had been broken. German forces were in disarray, communications disrupted and morale badly shaken. General Collins' decision on the morning of 26 July to commit the armoured divisions was more than enough to tilt the balance in favour of the Allies and ensure the success of Cobra.[90]

Following the initial fighter-bomber attacks on 25 July, units of the IX TAC were allocated to support the VII Corps for the remainder of the day. A number of immediate request missions were flown against targets such as ammunition and petrol dumps, troop concentrations, and gun positions. Two church steeples being used as observations posts by the Germans were destroyed. A number of armed reconnaissance and interdiction missions were also carried out. These missions engaged and destroyed a variety of targets ranging from motor transport, tanks, and horse-drawn vehicles to a number of bridge and railway targets. At the end of the day, P-47s from the 366th and 368th Fighter Groups deployed a series of delayed action bombs on the crossroads around Coutances. The bombs were fused to detonate after one to twelve hours in the hope of disrupting German convoys using the cover of darkness.[91]

In retrospect, it is easy to see that Cobra was the turning point in the Normandy campaign. The massive bombardment paved the way for the breakout by the U.S. armoured divisions and forced the Germans to re evaluate their position in France. This was recognized within days by FUSA. On 28 July, Bradley wrote to Eisenhower to express his optimism:

> To say that the personnel of the First Army Headquarters is riding high tonight is putting it mildly. Things on our front really look good. . . .
>
> This operation could not have been the success it has been without such close cooperation of the Air. In the first place, the bombardment which we gave them last Tuesday [July 25] was apparently highly successful even though we did suffer many casualties ourselves. The cooperation of Quesada's IX TAC Air Command has been outstanding. He has kept formations over the advancing columns continuously.[92]

Bradley alludes to the introduction of a new tactic in the provision of close air support which changed the pattern of operations - Armoured Column Cover.

The Breakout and Support of Mobile Operations: 26 July to 29 August 1944

During the planning stages of Operation "Cobra" there was concern over the ability of the tactical air commands to provide close air support to the mobile tank columns once they had broken through. Up to that point in the campaign, the most effective air support had been provided during periods of static warfare. The relatively slow speed with which air support requests were processed could make them out of date by the time the aircraft reached the target area. A request system was needed that could adapt to a rapidly changing environment.

In his autobiography, General Bradley recounted an exchange with General Quesada which marked the birth of the Armoured Column Cover (ACC) concept. Quesada told Bradley that it would be possible to keep the armour and aircraft in direct contact with each other through a mobile ASP. However, Quesada stated that, "it may be tough on my boys with your columns. They'll be riding in open radio jeeps while yours are riding in tanks."

"Well," responded Bradley, "why not put your air-support parties in tanks?"

To this suggestion, Quesada responded with boyish wonder, "Do you mean it General? By golly, that would do it!"[93]

By all other accounts it was General Quesada who came up with the idea for ACC.[94] He had to persuade Bradley to assign him a Sherman so he could conduct tests to determine the feasibility of the concept. It took awhile for IX TAC to get its tank. The first tank ordered was mistakenly delivered to the 9th Armoured Division by an ordnance officer who believed that the destination "IX TAC" on his orders was a typo. On the second try at delivery, the tanks were refused at IX TAC headquarters by an Air Force officer who was unaware of Quesada's plan. It took a third attempt before the situation was straightened out. Once the conversion was complete tests were successfully carried out showing that a tank could be used as a mobile ASP.[95]

The basic concept of armoured column cover was quite simple. An Army crew manned a Sherman tank which contained a VHF radio (type SCR 522) run by a division air support party officer. This tank operated at the front of an advancing armoured column. In support of the column, and in direct contact with it, was a flight of four fighter-bombers. The air-ground team worked very closely together. The tank commander benefitted from the air cover in two ways. First, he could use the aircraft as an immediate source of information. The pilots could be asked to scout ahead of the column and locate areas of enemy resistance. The pilots would also communicate anything they saw that could be a possible hazard to the ground forces. The second, and more revolutionary innovation of ACC was the delegation of target control to the commander of the armoured combat command. Any targets that blocked the path of the armoured column could be assigned to the orbiting aircraft. These targets would then be immediately attacked. If the target was larger than the flight could handle or if the aircraft expended their bombs, ammunition or fuel, additional aircraft could quickly be summoned. Successive flights of aircraft would provide cover during daylight hours for the column. Each flight would remain on station for 30 to 90 minutes. It would then be replaced by another flight. Besides answering the requests of the armoured column, the ACC flight was free to seek out and destroy targets of opportunity.[96]

Armoured column cover was used for the first time on 26 July. On that day 75 ACC missions were dispatched comprised of over 300 aircraft. Only three flights did not complete their missions. The next day an even greater effort of over 100 missions was mounted.[97]

The scale of air effort put forth by the IX TAC in the period following Cobra was enormous. From 26 July to 31 July, the Command executed 9,185 sorties. To put this effort in perspective, the average number of sorties/day during the month of July was 489. Following Cobra, an average of 1,312 sorties were flown each day. A significant proportion of those sorties were committed to ACC.[98]

From the start, ACC was very well received by both the air and the ground. Lieutenant Colonel James L. Zimmerman was an Air Support Party Officer attached to Combat Command A of the 2nd Armoured Division from 22 July to 6 August 1944. During his time with the division he was very impressed with the results obtained through the use of ACC. He compared the role of the ASPO to that of the artillery forward observer. The commander of Combat Command A, Brigadier General Maurice Rose, was very skeptical of the role of close support aircraft. He had become very wary of their usefulness after being bombed repeatedly by friendly aircraft in Italy. However, Zimmerman reported that in his experience the accuracy of the supporting fighter-bombers had been excellent. He attributed the success to the ability of the ASPO to direct the aircraft right onto the target.[99] The G-3 Air of FUSA was equally lavish in his praise of ACC. He credited the new system with the destruction of over 2,000 motor vehicles, 200 tanks and 80 artillery pieces in the first week following its implementation. As well, ACC was responsible for disrupting the movement of German reserves, destroying the retreating columns and ensuring the continued success of the breakthrough.[100] The FUSA Report on Operations stated that ACC produced results, "far beyond all expectations. . . ."

> The results obtained by the employment of the tank-air team in mobile, fast moving situations are recognized as being an outstanding achievement in air ground cooperation and represent the development of an unbeatable combination.[101]

The Ninth Air Force was no less ebullient in its praise of ACC:

> However, the outstanding development in connection with the rendering of direct support by the Ninth Air Force has been the establishment of full cooperation between Fighter Bombers and armoured columns.[102]

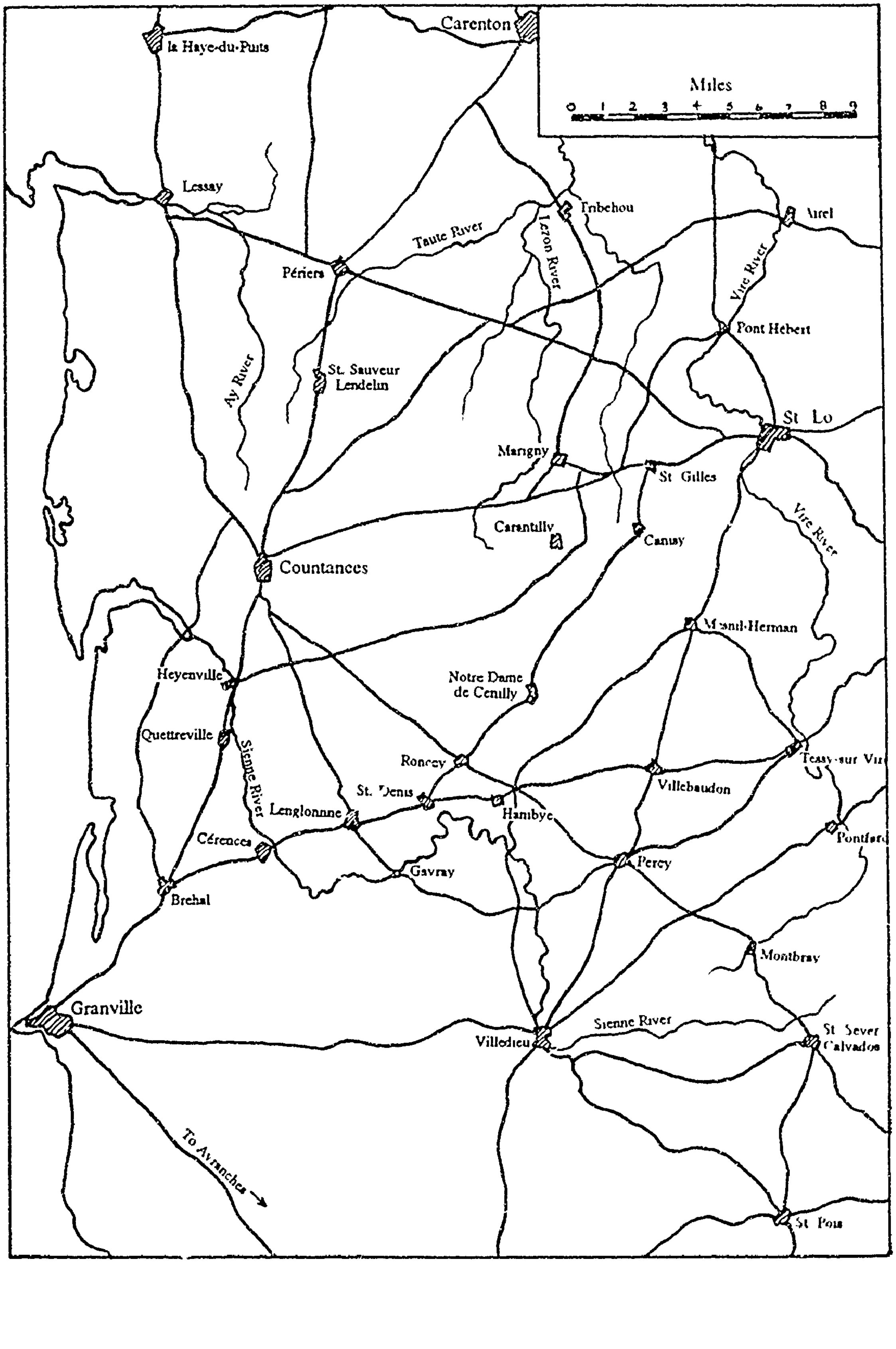
Close cooperation between the air and ground became the norm rather than the exception. On 27 July, Combat Command B of 2nd Armoured Division was racing south in an attempt to encircle the retreating German forces. The spearhead was being led by the 82nd Reconnaissance Battalion. For the most part light resistance was being met. However, at the town of Quibou a German roadblock was encountered. In a model of combined operations, a detachment from the reconnaissance troops kept pressure on the front of the position while another detachment attempted to outflank it. They received artillery support from the self-propelled guns of the 78th Armoured Field Battalion and air support from a squadron of IX TAC P-47s tasked to fly ACC for Combat Command B. German resistance crumbled in the face of this concerted attack.[103] There are numerous accounts that attest to the effectiveness of ACC. In one case a single Sherman tank found itself surrounded by 13 German tanks. Its call for help was quickly answered by a flight of four Thunderbolts. The air attacks were able to distract the German armour long enough to allow the Sherman to beat a hasty retreat.[104] In another incident, tanks of Combat Command A, 2nd Armoured Division were blocked by a German force located nearby. The divisional ASPO contacted the IX TAC flight overhead to request an attack. The aircraft made repeated passes over the target, so close that it made the ASPO very nervous. However, he reported that, "not a single bullet hit our tanks, and the resistance was knocked out."[105]

Tactical air operations in the period following the breakout were not limited to ACC missions. There were still a wide variety of missions taking place including planned, request and armed reconnaissance missions. Following Cobra request missions most often originated with infantry divisions that were not accorded the privilege of ACC. This was partly due to the fact that aircraft were busy with other tasks, but the primary reason infantry divisions did not get ACC was the belief that their air support needs could be met through other channels. There is no doubt that the infantry commander would have loved to have the flexibility imparted by ACC, but in most situations infantry actions were of a more static nature than armoured operations. As a result time was not as critical a factor and most air support needs could be met through the established planned and request channels.

In early August there was debate amongst Ninth Air Force commanders concerning the utility of armed reconnaissance missions. General Quesada argued that the resources could be used more efficiently by sending out tactical reconnaissance flights to search for targets which could then dispatch aircraft waiting on-call at the airfields to deal with them. Brigadier General Richard E. Nugent, Commander of the XXIX Tactical Air Command, believed that armed reconnaissance flights should continue. He felt the importance of these flights had been proven in operations to date.[106] The use of armed reconnaissance continued. By August, armed reconnaissance flights had become largely indistinguishable from ACC. The only difference was that ACC flights were given a specific unit to support while armed reconnaissance filled a more free-ranging role. It was not unusual for armed reconnaissance flights to be diverted from their assigned patrol areas. The same was true for ACC. If the ground unit they were supporting had no need for air support, the aircraft would be released to fly armed reconnaissance.[107]

An example of the symbiotic nature of the air and the ground forces occurred on the afternoon of 29 July. The lightning advance of 2nd Armoured Division's Combat Command B had allowed it to outflank the German forces in the Roncey area by the night of 28 July. This placed the unit directly in the path of the retreating German forces. With pressure from the north applied by the 3rd and 4th Armoured Divisions, the Germans found themselves in danger of being cut-off. During the night they tried to break free but were unable to get by the cordon set up by Combat Command B. The next day a flight from the 405th Fighter Bomber Group on an armed reconnaissance mission found a huge concentration of German traffic, in places bumper-to-bumper, lined up around Roncey trying to escape the pocket. One pilot estimated there were over 500 vehicles trapped. Between 1510 and 2140 hours aircraft from IX TAC took turns attacking the mass. It was described as a "fighter-bomber's paradise." To add to the chaos, American artillery, tanks and tank destroyers fired at the trapped enemy. When it was all over, any chance at a German breakout had evaporated. Over 100 tanks and 250 vehicles were found in various stages of destruction and numerous more were found abandoned intact. The reduction of the enemy forces in the Roncey pocket was largely accomplished by air attack, but it was ground forces that encircled the Germans, creating the pocket. It can thus be seen how cooperation between the air and the ground could achieve results that neither could accomplish on its own.[108] [See Map 5.]

In August, the pace of operations started at the end of July continued. Close air support continued to be the primary focus of operations by the IX TAC. It is notable that the IX TAC played a major role in stemming the major German counterattack at Mortain in the second week of August, and then contributed a large number of sorties to the destruction of German forces trapped in the Falaise-Argentan



Map 5 — Breakout from Normandy

pocket. These operations contributed to the Allied success in Normandy, but most importantly they showed the growing ease with which the Ground and Air Forces worked together. There were no major advances in the system of cooperation in August, only a growing competence with the system at hand.

NOTES

1. John Keegan, The Second World War (New York, 1989), p.378.

2. It should be pointed out that the USAAF wing is equivalent to the RAF group and the USAAF Group to the RAF wing.

3. Robert H. George, "Memorandum: Direct Air Support," Headquarters Ninth Air Force, 29 June 1944, (LCMSDS roll B5725 [This refers to microfilm obtained from the United States Air Force Historical Research Centre held in the collection of the Laurier Centre for Military Strategic and Disarmament Studies]); and Robert H. George, Ninth Air Force, April to November 1944, Army Air Forces Historical Study No.36, October 1945, pp.56-59. (LCMSDS roll K1005)

4. George, Ninth Air Force, April to November, p.25.

5. "The Effectiveness of Third Phase Tactical Air Operations in the European Theater, 5 May 1944 - 8 May 1945," Prepared by the Army Air Forces Evaluation Board in the European Theater of Operations, August 1945, pp.48-49, (LCMSDS roll A1174); and "Overlord: Direct Air Support," Headquarters 21 Army Group, 23 April 1944, p.3. (LCMSDS roll B5725)

6. Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 June 1944 to 30 June 1944, c.15 July 1944, p.2. (LCMSDS roll B5849)

7. "The Effectiveness of Third Phase Tactical Air Operations in the European Theater," p.48.

8. "Overlord: Direct Air Support," Headquarters 21 Army Group, 23 April 1944, p.2; and W.A. Jacobs, "The Battle for France, 1944," in Case Studies in the Development of Close Air Support, edited by B.F. Cooling (Washington D.C., 1990), p.254.

9. Brigadier General V.H. Strahm, "Summary of Operations of Ninth Tactical Air Force, June 1944," Headquarters, Ninth Air Force, 1 August 1944, pp.2-4. (LCMSDS roll B5861); and George, Ninth Air Force, April to November 1944, p.13.

10. "Ninth Air Force Invasion Activities, April Thru June 1944," Headquarters, Ninth Air Force, 17 February 1945, pp.46, 48-49 & 52. (LCMSDS roll B5593)

11. Field Manual FM 100-20, "Command and Employment of Air Power" (Washington D.C., 21 July 1943), pp.10-11. (LCMSDS roll A1927)

12. M.J. Dauer Jr., "Air-Ground Coordination and Planning," AAF School of Applied Tactics, AAF Tactical Center (Orlando, Florida, 18 November 1943), pp.5-6. (LCMSDS roll A2801)

13. Field Manual FM 100-20, p.10.

14. Dauer, "Air-Ground Coordination and Planning," pp.5-6.

15. George, Ninth Air Force, April to November, p.14.

16. Craven and Cate, III, p.196.

17. "Ninth Air Force Invasion Activities," p.53; and "A Record of Air Support Request Missions flown at 21 Army Group and Army Request," n.d. (LCMSDS roll B5725)

18. Wesley Frank Craven and James Lea Cate, general editors, The Army Air Forces in World War II, Volume 3, Europe: Argument to V-E Day, January 1944 to May 1945 (Chicago, 1951), p.194.

19. "Ninth Air Force Invasion Activities," p.53; and Jacobs, "The Battle for France, 1944," pp.256-257.

20. "Ninth Air Force Invasion Activities," p.53.

21. Craven and Cate, III, pp.196-197; and "Notes of Commanders Meeting, PM, 6 June," DC/S Ops Journal [Deputy Chief of Staff, Operations], Ninth Air Force. (LCMSDS roll B5636 frame 897)

22. Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 June 1944 to 30 June 1944, p.2.

23. "Ninth Air Force Invasion Activities," p.51.

24. Lewis H. Brereton, The Brereton Diaries: The War in the Air in the Pacific, Middle East and Europe, 3 October 1941 - 8 May 1945 (New York, 1976 (1946)), p.282.

25. Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 June 1944 to 30 June 1944, p.4.

26. Gordon A. Harrison, Cross-Channel Attack, United States Army in World War II: The European Theater of Operations (Washington, 1989 (1951)), pp.321-351; and Omaha Beachhead, 6 June - 13 June 1944, American Forces in Action Series (Washington, 1984 (1945)), pp.58-136, especially 111 & 119.

27. George, Ninth Air Force, April to November, p.83.

28. "A Record of Air Support Request Missions"; and Robert H. George. "Memorandum: Weather and Air Operations: 6 June to 23 July 1944" Headquarters Ninth Air Force, 24 July 1944, (USAFHRC roll B5745)

29. George, Ninth Air Force, April to November, p.97; and Craven and Cate, III, p.204.

30. TWX [Teletypewriter Exchange] Adv 9 TAC, 17 June 1944 contained in George, "Direct Air Support."

31. DC of S, Ops Journal, Headquarters Ninth Air Force, 16 June 1944.

32. Johnson, "Air Support Report," pp.3-7.

33. "Standard Operating Procedures for Air Support Parties," IX Tactical Air Command Memorandum No.20-2, Headquarters IX Tactical Air Command, 3 August 1944, contained in Air-Ground Joint Operations, Headquarters First U.S. Army G-3 Air Section and Headquarters IX Tactical Air Command, n.d. pp.46-47; and "Report on Visit to Normandy Beachhead, 7 July to 16 July 1944," Intelligence Information Bulletin, VIII Fighter Command, n.d., p.10. (LCMSDS roll A5218)

34. Col. E.L. Johnson, "Air Support Report," 6 August 1944, contained in Air-Ground Joint Operations, Headquarters First U.S. Army G-3 Air Section and Headquarters IX Tactical Air Command, n.d., pp.5 & 7-8, (LCMSDS roll B5724); and "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," c.15 August 1944, p.12. (LCMSDS roll B5849)

35. "Standard Operating Procedures for Air Support Parties," pp.46-47.

36. Johnson, "Air Support Report," p.4; "Unit History, July," pp.13-14; and "Standard Operating Procedure for Air Support Parties," pp 46-47.

37. First Army and IX TAC Air Support Requests, 1 July 1944 to 7 July 1944.

38. First Army and IX TAC Air Support Requests, 1 July 1944 to 31 July 1944.

39. "Standard Operating Procedure for Air Support Parties," p.44.

40. Colonel Edwin L. Johnson, "Information regarding Air-Ground Joint Operations." Headquarters First United States Army, G-3 Air Section, 16 July 1944, contained in Air-Ground Joint Operations, Headquarters First U.S. Army G-3 Air Section and Headquarters IX Tactical Air Command, n.d., p.33; and Jacobs, "Battle for France," pp.255-256.

41. "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 August 1944 to 31 August 1944, 15 September 1944, p.3. (LCMSDS roll B5849)

42. Lt.Col. William S. McCrea, "Memorandum to Chief, Training Branch, G-3 Section," Headquarters Twelfth Army Group, 24 September 1944, p.1, (Sheffield Edwards Papers)

43. William A. Jacobs, "Tactical Air Doctrine and AAF Close Air Support in the European Theater, 1944-1945," in Aerospace Historian, Volume 27, Number 1, (Spring/March 1980), p.45.

44. McCrea, "Memorandum to Chief," p.1; and Jacobs, "Tactical Air Doctrine," p.45.

45. Lt.Col. W.S. McCrea, "Close Air Support Within Twelfth Army Group," Immediate Report No.1 (Combat Observation), Headquarters ETOUSA, pp.15-6, (LCMSDS roll A5060)

46. "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," p.14.

47. "Unit History, IX Fighter Command and IX Tactical Air Command Covering the Period 1 August 1944 to 31 August 1944," p.3.

48. McCrea, "Memorandum to Chief," p.1.

49. "The Effectiveness of Third Phase Tactical Air Operations in the European Theater" pp.227-228. (LCMSDS roll A1175)

50. McCrea, "Memorandum to Chief," p.1.

51. There is some discrepancy over the actual title of these officers. Some sources define "ALO" as Air Liaison Officer. Other sources refer to this army representative as a Ground Liaison Officer. In most cases it is Army sources that use the term ALO while Air Force sources use the term GLO.

52. Brigadier General Ralph F. Stearley *et al*, "The Tactical Air Force in the European Theater of Operations." Study No.54, United States Forces, European Forces, General Board, c.1945-1946, p.5. (LCMSDS roll A5048)

53. Johnson, "Information Regarding Air-Ground Joint Operations," p.37.

54. "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," p.14.

55. Johnson, "Information Regarding Air-Ground Joint Operations," pp.36-37 & 40-41.

56. Harrison, Cross-Channel Attack, pp.422-426; Omar N. Bradley, A Soldier's Story (New York, 1951), pp.213-214; Russell F. Weigley, Eisenhower's Lieutenants: The Campaign of France and Germany 1944-1945 (Bloomington, 1981), pp.101-103; and Carlo D'Este, Decision in Normandy (New York, 1983), pp.200-201.

57. Colonel Melon Hall, "Memo on Cherbourg," Headquarters Ninth Air Force, 19 June 1944. (LCMSDS roll B5725)

58. "Air Force Operations in Support of Attack on Cherbourg, 22 June thru 30 June 1944," n.d., pp.1-2. [This report was appended to a letter from General Brereton to General Arnold dated 29 July 1944.] (LCMSDS roll B5724)

59. "Air Force Operations in Support of Attack on Cherbourg," pp.2-3.

60. "Air Force Operations in Support of Attack on Cherbourg," pp.2-3.

61. "Support for VII United States Corps on Cherbourg," Second Tactical Air Force Operation Order No.188, 22 June 1944, (LCMSDS roll B5725)

62. "Air Force Operations in Support of Attack on Cherbourg," pp.3-4; "Support for VII United States Corps attack on Cherbourg"; and Harrison, p.429.

63. Harrison, pp.428-438.

64. "Air Force Operations in Support of Attack on Cherbourg," pp.8-10; and "Summary of Operations of Ninth Tactical Air Force, June 1944," p.7.

65. Ninth Air Force Commanders' Meeting, 23 June 1944, (LCMSDS roll B5602)

66. Craven and Cate, III, p.200, Air Force Operations in Support of Attack on Cherbourg," pp.4 & 7; and Condensed Analysis of the Ninth Air Force in the European Theater of Operations (Washington, 1984 (1946)), p.23.

67. "Air Force Operations in Support of Attack on Cherbourg," pp.6-8; and Weigley, p.105.

68. Roland G. Ruppenthal, Utah Beach to Cherbourg (Washington D.C., 1984 (1947)), pp.183-184.

69. Ruppenthal, Utah Beach to Cherbourg, pp.184-185.

70. "Report on Activities of Ninth Air Force for Period 6 June - 20 August 1944," Report to Major General L. Kuter, 27 September 1944, p.3. (LCMSDS roll B5636)

71. "Air Force Operations in Support of Attack on Cherbourg," pp.5-7.

72. "9th Air Force Operations, 1-30 June, 1944, With Special Study of Close Air Support in the Assault on Cherbourg," AC/AS, Intelligence, 27 July 1944. (LCMSDS roll B5725)

73. "Air Force Operations in Support of the Attack on Cherbourg," p.5.

74. Ruppenthal, Utah Beach to Cherbourg, p.172.

75. Johnson, "Information Regarding Air-Ground Joint Operations," pp.32-33; and Johnson, "Air Support Report," p.1.

76. Brigadier General D.M. Schlatter, "Cover Report - Exercise 'Tiger,'" Advanced Headquarters Ninth Air Force, 27 May 1944. (LCMSDS roll B5739)

77. St. Lo, 7 July - 19 July 1944, American Forces in Action Series (Washington, 1984 (1946)), p.110; Martin Blumenson, Breakout and Pursuit, United States Army in World War II, The European Theater of Operations (Washington, 1970 (1961)), p.167; Craven and Cate, III, pp.206-207; First U.S. Army and IX TAC Air Support Requests for 17 July 1944; and Major General C.H. Gerhart, "Close Support of an Infantry Unit," Headquarters 29th Infantry Division, 18 July 1944 contained in AAF Evaluation Board, "Report on Tactical Air Cooperation, Organization, Methods and Procedures with Special Emphasis on Phase III Operations" 31 July 1945, p.71 (LCMSDS roll A1174)
It should be pointed out that in Craven and Cate this incident is incorrectly stated to have occurred on 15 June rather than 17 July.

78. Major General Charles H. Corlett, "Letter of Commendation to CG FUSA." Headquarters XIX Corps, 20 July 1944 contained in 70th Wing Unit History, July 1944.

79. IX TAC flew a total of 45 missions on 17 July. Four were 1st phase, 27 were 2nd phase and 13 were 3rd phase missions. An additional 20 missions (primarily 3rd phase) were cancelled as a result of poor weather or because they were improper requests. [First Army and IX TAC Air Operations Summary for 17 July 1944.]

80. Blumenson, Breakout and Pursuit, pp.185-188; Weigley, pp.147-150; and Brereton, The Brereton Diaries, p.311.

81. Bradley, A Soldier's Story, pp.339-340.

82. Blumenson, pp.218-219.

83. Bradley, A Soldier's Story, pp.340-341; and Weigley, pp.150-151.

84. Craven and Cate, III, pp.228-230.

85. Bradley, A Soldier's Story, pp.346-349; and Weigley, pp.152-153.

86. Blumenson, Breakout and Pursuit, p.250; and "Answers to Questionnaire for Key Commanders on the Effects of Strategic and Tactical Air Power on Military Operations, ETO," 1945. (LCMSDS roll B5724)

87. "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," pp.2-3; and Blumenson, pp.235-236.

88. "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," p.3.

89. Blumenson, Breakout and Pursuit, p.242.

90. "The Effectiveness of Third Phase Tactical Air Operations," p.259; Blumenson, Breakout and Pursuit, pp.244-46 & 329; and Bradley, A Soldier's Story, p.349.

91. "First Army and IX TAC Air Operations Summary for 25 July 1944" (LCMSDS roll B5860)

92. Bradley to Eisenhower, 28 July 1944 on Cobra, Bradley Papers, USAMHI, Correspondence with Famous Persons, Eisenhower File, Quoted in Weigley, pp.161-162.

93. Bradley, A Soldier's Story, p.337.

94. Craven and Cate, III, pp.238-239; Weigley, p.165; and Brereton, The Brereton Diaries, p.311.

95. Bradley, A Soldier's Story, p.338; Craven and Cate, III, pp.238-239; Weigley, p.165; and Brereton, The Brereton Diaries, p.311.

96. Johnson, "Air Support Report," pp.10-11; "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," p.5; and Major Brody. "Air Support of Ground Force Operations," Immediate Report No.30, (Combat Observations), Headquarters Twelfth Army Group, 25 August 1944. (LCMSDS roll B5059)

97. "First Army and IX TAC Air Operations Summary for 26 July 1944," and "First Army and IX TAC Air Operations Summary for 27 July 1944," (LCMSDS roll B5860)

98. "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," pp.5 & 10.
   The average figure for July is a little misleading due to the fact that there were many days when air operations were limited or cancelled due to the weather. As a result the number of sorties flown per operational day would be somewhat higher. However, against that it must be considered that during the intense operations in late July there were no down days to allow pilots to be rested and aircraft serviced. Reconnaissance flights are not included in these figures.

99. Lieutenant James L. Zimmerman, "Air Support of Armoured Columns," Immediate Report No.46, (Combat Observations) Headquarters Twelfth Army Group, 3 September 1944. (LCMSDS roll A5059)

100. Johnson, "Air Support Report," p.1.

101. First United States Army Report on Operations, 20 October 1943 to 1 August 1944, p.121. (Wilfrid Laurier University microfilm D 769.26 1st U5.)

102. "Report on Activities of Ninth Air Force for Period 6 June - 20 August 1944." Report to Major General Kuter, 27 September 1944, p.6. (LCMSDS roll B5636)

103. Blumenson, Breakout and Pursuit, pp.272-273.

104. "Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944," p.5.

105. Zimmerman, "Air Support of Armoured Columns"

106. "Commanders' Meeting," Ninth Air Force, 9 August 1944, p.3. (LCMSDS roll B5602)

107. Craven and Cate, III, p.255.

108. Craven and Cate, III, p.242; and Blumenson, Breakout and Pursuit, pp.277-279.

CONCLUSION

Attitudes towards close air support in the U.S. military changed substantially between 1939 and 1944. During the North African campaign the Air Force fought long and hard to keep its aircraft from being used on combat air patrols. This type of mission was highly favoured by the Army as protection against enemy air attacks. The Air Force, however, considered the missions wasteful of their limited resources arguing that aircraft were better employed in offensive operations that would contribute materially to the outcome of the campaign. There was also concern in Air Force ranks that if they did not assert their independence they would risk being accorded a subservient role not far removed from that of the artillery. For these reasons the ideas of Air Marshal Coningham, a battle-seasoned RAF veteran, were seized upon to demonstrate to the Ground Forces the correct manner of employing a tactical air force. The ideas developed by Coningham and the British were not "new." As was shown, many of the same ideas existed in the U.S. Army Air Forces prior to the North African campaign. The problem was that the American doctrine was untried and unproven, and the U.S. Army Ground Forces were very reluctant, even antagonistic, towards adopting these ideas. The chief advantage of the British air support system (and the reason for its subsequent impact on the American military) was not its revolutionary nature, but the fact that it was tried, tested and proven to be successful against a very formidable opponent - Rommel's legendary Afrika Korps. Prior to the commencement of operations in Normandy, a serious attempt was made to incorporate pre-war American ideas on tactical air power, and experience from the Desert into an effective system of support. This was accomplished in theory and tested in Sicily and Italy. However, once operations in Normandy began, it was found difficult to translate the doctrine into an effective system of close support for the troops fighting in the tactical conditions of North-west Europe. The general framework was useful, but experience rather than doctrine became the model for the employment of tactical air power in First U.S. Army and IX TAC.

It should be noted that Armored Column Cover, though a type of combat air patrol, was very different from the defensive missions flown in North Africa. ACC was by definition offensive in nature. Rather than waiting for the enemy to come to them, aircraft on ACC missions sought out their targets. In many cases the defensive patrols in North Africa intercepted no enemy aircraft or were otherwise ineffective. The majority of ACC missions contributed materially to the ground campaign through the destruction of the enemy or by providing valuable intelligence.

While the doctrine of close air support was changing, so to was the playing field. In North Africa the Luftwaffe was a significant factor — in Normandy it was not. In North Africa the Allies were chronically short of aircraft, men, supplies and other essentials. In Normandy, by the standards of 1942-43, there was an abundance of almost everything. These two factors alone accounted for much of the change. Another factor that cannot be overlooked was the fact that by 1944 the Air Force no longer considered it probable that they would be engulfed by the Army. Because of this they were prepared to endorse a more decentralized air support system in order to improve its efficiency.

The question of training did not end with the commencement of intensive operations. If anything, the problem became more acute. Replacement pilots for the IX TAC were sent from the Combat Crew Replacement Centres. These centres provided competent pilots but they were schooled only in the basics and were not proficient in the tactics of close air support such as strafing and bombing techniques. As a result, IX TAC had to train these pilots in the theatre. Unfortunately, operational demands made it difficult to find the time and instructors to acclimatize these new pilots to the theatre of combat. The command was further hindered by the lack of suitable dive bomb ranges as well as the obvious complications of trying to conduct training in an active zone of operations. The various problems were eventually remedied, but not until well after the Normandy campaign.[1] There were also difficulties in the training of the other personnel associated with the air ground team. This became blatantly obvious with the dismissal of a number of Army G 3 Airs and GLOs early in the campaign. A thorough training program would have largely prevented this breakdown by providing the officers with the necessary knowledge to effectively carry out their duties, or have recognized the unsuitability of certain individuals at an early stage and screened them out.[2] The greatest flaw of the various training programs was the failure to inculcate a familiarity of the needs and capabilities of the other half of the air-ground team. The Air Force needed to know what the Ground Forces required from them while the Army had to understand the capabilities and limitations of tactical air power. In effect the air-ground team was operating with players that did not know the entire game plan. It was only through actual combat experience that this deficiency was overcome.

In retrospect, it is evident that the level of training that the Ninth Air Force and First Army went into Normandy with provided a sound base for growth. By no means was the training comprehensive, but each member of the team was skilled in their own specialty and sufficiently proficient in terms of air-ground cooperation that an effective system of air support was in place from 6 June onwards And, as the campaign progressed, experience filled in the gaps left open during the training period. This was a definite improvement over operations in the early stages of the Tunisian campaign.

From the evidence presented in this study it can be seen that there had been a significant shift in thinking since the beginning of the Normandy Campaign. During the invasion a very centralized system of air support control was in effect. It was so strict that Air Support Parties were prohibited from speaking directly to aircraft overhead. As operations progressed and the level of experience grew the system was gradually decentralized. In return, the quality of support increased. The pinnacle of decentralization was reached with the introduction of Armoured Column Cover after Operation "Cobra." Air support requests no longer had to be sent back to a combined operations room but could be immediately filled by a flight of aircraft working closely with the armoured unit below. By no accounts had the perfect close air support system been created by the end of the fighting in Normandy. What had evolved, however, was an efficient system that allowed the Ground and Air Forces to form an effective working relationship. Neither side had completely abandoned its hopes for dominance or independence, but together they had learned, under less than ideal circumstances, how best to work together.

This study provides an in-depth examination into the question of the effectiveness of close air support in Normandy and the evolution of relations between the Army and the Air Force. There remain, however, many question that will shed additional light on the subject. For instance, more work needs to be done on the communications equipment employed in Normandy. Its impact has been briefly mentioned in this study, but a good deal remains to be learned of how advances in technology (or the lack thereof) contributed to the success of the air support system. A related topic concerns the use of radar and the impact made by the forward director posts in leading aircraft to their targets. Another area that warrants additional study is the cooperation that took place between the artillery and the tactical air force. Much has been written about the tiny spotter aircraft that helped the artillery to improve its accuracy, but little of the inverse relationship where artillery aided the Air Force in finding its targets. Finally, it would be of tremendous interest to examine the themes in this study using a bottom-up, rather than top-down approach. Out of necessity, this study has made use of various reports and studies written and compiled by senior officers in First Army and Ninth Air Force. There remains much to be learned from a detailed study of the individual unit records in FUSA and the squadron and group papers of IX TAC that are still available. Though this approach would require much research, it is believed that questions of effectiveness could be directly addressed without all the baggage inherent in studies of Army-Air Force relations.

NOTES

1. "Unit History, IX Fighter Command and IX Tactical Command Covering Period 1 August 1944 to 31 August 1944," p.2 and Richard H. Kohn and Joseph P. Harahan, general editors. Condensed Analysis of the Ninth Air Force in the European Theater of Operations. Washington D.C.: Office of Air Force History, 1984 (1946). p.13.

2. Lieutenant Colonel W.S. McCrea, "Close Air Support Within Twelfth Army Group." Immediate Report No.1 (Combat Observation). Headquarters ETOUSA. p.8. (LCMSDS Roll A5060 [This refers to microfilm obtained from the United States Air Force Historical Research Centre held in the collection of the Laurier Centre for Military Strategic and Disarmament Studies])

BIBLIOGRAPHY

PRIMARY SOURCES

Documents and Reports

Air Corps Field Manual 1-5, "Employment of the Aviation of the Army." 15 April 1940 as quoted in Daniel R. Mortensen A Pattern for Joint Operations: World War II Close Air Support, North Africa. Washington D.C.: Office of Air Force History and U.S. Army Center of Military History, 1987.

"Air Force Operations in Support of Attack on Cherbourg, 22 June thru 30 June 1944." n.d. [This report was appended to a letter from General Brereton to General Arnold dated 29 July 1944.] (LCMSDS roll B5724)

"Air Plan for Exercise "Fabius."" 11 Group and IX Fighter Command. 28 April 1944. (USAFHRC roll B5739)

Angell, Robert C. "Memorandum on Air Support Indoctrination Courses." Headquarters Ninth Air Force. 25 February 1944. (LCMSDS roll B5725)

"Answers to Questionnaire for Key Commanders on the Effects of Strategic and Tactical Air Power on Military Operations, ETO." 1945. (LCMSDS roll B5724)

"A Record of Air Support Request Missions flown at 21 Army Group and Army Request." n.d. (LCMSDS roll B5725)

"Biographical Notes on Brigadier General E.R. Quesada." Headquarters IX Fighter Command. 14 November 1943. (LCMSDS roll B5838)

Brereton, Lewis H. "Direct Air Support in the Libyan Desert." 22 August 1942. (LCMSDS roll B5593)

________. "Directive for Exercise "Tiger." Advance Headquarters Ninth Air Force. 15 April 1944. (USAFHRC roll B5739 frames 1102-1106)

Brody, Major. "Air Support of Ground Force Operations." Immediate Report No.30. (Combat Observations). Headquarters Twelfth Army Group. 25 August 1944. (LCMSDS roll B5059)

Cobb, W.L. "Organization of a Tactical Air Force." AAF School of Applied Tactics. AAF Tactical Center. Orlando, Florida. February 1944. (LCMSDS roll A2801 frames 1439-1454)

"The Combined Bomber Offensive from the United Kingdom (*Pointblank*) as approved by the Combined Chiefs of Staff, 14th May 1943." in Charles Webster and Noble Frankland. The Strategic Air Offensive Against Germany 1939-1945. Volume IV: Annexes and Appendices. London: HMSO, 1961.

"Commander's Meeting - 29 March 1944." IX Air Support Command. 1 April 1944. (LCMSDS roll B5838)

"Commanders' Meeting." Ninth Air Force. 9 August 1944. (LCMSDS roll B5602)

Coningham, Sir Arthur. "Talk by Air Vice Marshal Sir A. Coningham to assembled British and American General and Senior Officers". Tripoli, 16 February 1943. (DHist Air 8/984).

Corlett, Major General Charles H. "Letter of Commendation to CG FUSA." Headquarters XIX Corps. 20 July 1944 contained in 70th Wing Unit History, July 1944. (LCMSDS roll C0026)

Dauer, M.J. "Air-Ground Coordination and Planning." AAF School of Applied Tactics. AAF Tactical Center. Orlando, Florida. 18 November 1943. (LCMSDS roll A2801, frames 403-411).

Deputy Chief of Staff, Operations Journal. Headquarters Ninth Air Force. 16 June 1944. (LCMSDS roll B5636)

"The Eighth Army Break-Through at El Hamma on 26th March, 1943." Northwest African Tactical Air Forces. n.d. (LCMSDS roll A6011)

Exercise "Duck." Headquarters V Corps. 14 November 1943. (USAFHRC roll B5739 frames 1062-1063)

First U.S. Army and IX Tactical Air Command Summary of Air Operations, 14 June to 30 June 1944. (incomplete) (LCMSDS roll B5860 and B5861)

First U.S. Army and IX Tactical Air Command Summary of Air Operations, July 1944. (LCMSDS roll B5860 and B5861)

First U.S. Army and IX Tactical Air Command Summary of Air Operations, August 1944. (LCMSDS roll B5860 and B5861)

George, Robert H. "Memorandum: Direct Air Support." Headquarters Ninth Air Force. 29 June 1944. (LCMSDS roll B5725)

________. "Memorandum: Weather and Air Operations: 6 June to 23 July 1944." Headquarters Ninth Air Force. 24 July 1944. (USAFHRC roll B5745)

Gerhart, Major General C.H. "Close Support of an Infantry Unit." Headquarters 29th Infantry Division. 18 July 1944 contained in AAF Evaluation Board. "Report on Tactical Air Cooperation, Organization, Methods and Procedures with Special Emphasis on Phase III Operations." 31 July 1945. p.71 (LCMSDS roll A1174)

Hall, Colonel Melon. "Memo on Cherbourg." Headquarters Ninth Air Force. 19 June 1944. (LCMSDS roll B5725)

"Historical Record of IX Fighter Command Covering Period 18 October 1943 to 31 December 1943." 15 January 1944. (LCMSDS roll B5838)

Johnson, Colonel E.L. "Air Support Report." 6 August 1944. contained in Air-Ground Joint Operations. Headquarters First U.S. Army G-3 Air Section and Headquarters IX Tactical Air Command. n.d. (LCMSDS roll B5724)

Kuter, Laurence S. "Organization of American Air Forces." Northwest African Air Force Headquarters. 12 May 1943. (LCMSDS roll A6011)

McAfee, J.B. "The Tactical Air Force in the Sicilian Campaign." AAF School of Applied Tactics. AAF Tactical School. Orlando, Florida. February 1944. (LCMSDS roll A2801 frames 1219-1224)

McCrea, Lieutenant Colonel William S. "Close Air Support Within Twelfth Army Group." Immediate Report No.1 (Combat Observation). Headquarters ETOUSA. (LCMSDS roll A5060)

________. "Memorandum to Chief, Training Branch, G-3 Section." Headquarters Twelfth Army Group. 24 September 1944. (Sheffield Edwards Papers. U.S. Army Military History Institute, Carlisle Barracks, Pa.)

Memo 50-2, "Training." HQ IX Fighter Command. 1 November 1943, as quoted in John Ramsey. Ninth Air Force in the ETO: 16 October to 16 April 1944. Army Air Forces Historical Study No.32. Washington D.C.: AAF Historical Office, 1945.

"Memorandum on Exercise "Beaver" - 27-31 March 1944." HQ IX Air Support Command. 3 April 1944. (USAFHRC roll B5895 frames 928-929)

"Minutes of a Meeting held at Headquarters 21 Army Group on Monday, 20 March 1944 to examine the preliminary problems connected with the final assault exercises and the build-up exercise to follow during the period 3-8 May 1944." HQ Ninth Air Force. 24 March 1944. (USAFHRC roll B5739 frames 1025-1026)

Montgomery, B.L. "Some Notes on High Command in War." Second Edition. Italy, September 1943. (DHist Air 8/984).

"Notes of Commanders Meeting, PM, 6 June." DC/S Ops Journal [Deputy Chief of Staff, Operations], Ninth Air Force. (LCMSDS roll B5636 frame 897)

Ninth Air Force Commanders' Meeting. 23 June 1944. (LCMSDS roll B5602)

"Ninth Air Force Invasion Activities, April Thru June 1944." Headquarters, Ninth Air Force. 17 February 1945. (LCMSDS roll B5593)

"9th Air Force Operations, 1-30 June, 1944, With Special Study of Close Air Support in the Assault on Cherbourg." AC/AS, Intelligence. 27 July 1944. (LCMSDS roll B5725)

Operation Memo No.17. "Combat Aviation in Direct Support of Ground Units." Allied Force Headquarters. Quoted in Daniel R. Mortensen. A Pattern for Joint Operations: World War II Close Air Support, North Africa. Washington D.C.: Office of Air Force History and U.S. Army Center of Military History, 1987.

"Overlord: Direct Air Support." Headquarters 21 Army Group. 23 April 1944. (LCMSDS roll B5725)

Portal, Sir Charles. "Air Power in the Land Battle: A Note by the Chief of the Air Staff." Air Ministry, June 1943. (LCMSDS Roll A1927 frames 1737-43).

"Report on Activities of Ninth Air Force for Period 6 June - 20 August 1944." Report to Major General L. Kuter. 27 September 1944. (LCMSDS roll B5636)

"Report on Visit to Normandy Beachhead, 7 July to 16 July 1944." Intelligence Information Bulletin, VIII Fighter Command. n.d. (LCMSDS roll A5218)

Schlatter, Brigadier General D.M., Assistant Chief of Staff, A-3. "Cover Report - Exercise "Tiger."" Advanced Headquarters Ninth Air Force. 27 May 1944. (USAFHRC roll B5739 frames 1178-1182)

Shea, Edward H. "Memorandum: Exercise "Duck."" Headquarters IX Air Service Command. 13 January 1944. (USAFHRC roll B5739 frames 1108-1109)

Stearley, Brigadier General Ralph F., *et al.* "The Tactical Air Force in the European Theater of Operations." Study No.54. United States Forces, European Forces, General Board. c.1945-1946. (LCMSDS roll A5048)

Strader, J.W. "Training of Combat Crews in the Combat Area." AAF School of Applied Tactics. AAF Tactical Center. Orlando, Florida. February 1944. (LCMSDS roll A2801, frames 1240-1244)

Strahm, V.H. "Indoctrination Course." Headquarters Ninth Air Force. 17 January 1944. (LCMSDS roll B5725)

________. "Summary of Operations of Ninth Tactical Air Force, June 1944." Headquarters, Ninth Air Force. 1 August 1944. (LCMSDS roll B5861)

"Support for VII United States Corps on Cherbourg." Second Tactical Air Force Operation Order No.188. 22 June 1944. (LCMSDS roll B5725)

Talley, T.P. "Air-Ground Coordination." AAF School of Applied Tactics. AAF Tactical Center. Orlando, Florida. February 1944. (LCMSDS roll A2801)

Taylor, Henry L. "Proposed Schedule of Fighter Bomber Training." Headquarters IX Air Support Command. 13 February 1944. (LCMSDS roll B5838).

Taylor, J.F. "Memorandum to General Quesada on Exercise "Beaver."" IX Air Support Command. 31 March 1944. (USAFHRC roll B5895 frames 936-937)

26th Statistical Control Unit. "Statistical Summary of Ninth Air Force Operations, 16 October 1943 - 8 May 1945." n.d. (LCMSDS roll A1716 frames 713-762)

Unit History, IX Fighter Command for the Period 1 to 31 January 1944. HQ IX Fighter Command. 1 March 1944. (LCMSDS roll B5838)

Unit History IX Fighter Command and IX Air Support Command Covering Period 1 February 1944 to 29 February 1944. HQ IX Fighter Command. n.d. (LCMSDS roll B5838)

Unit History IX Fighter Command and IX Tactical Air Command Covering Period 1 April 1944 to 30 April 1944. HQ IX Fighter Command. n.d. (LCMSDS roll B5849)

Unit History IX Fighter Command and IX Tactical Air Command Covering Period 1 May 1944 to 31 May 1944. HQ IX Fighter Command. n.d. (LCMSDS roll B5849)

Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 June 1944 to 30 June 1944. HQ IX Fighter Command. c.15 July 1944. (LCMSDS roll B5849)

Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 July 1944 to 31 July 1944. HQ IX Fighter Command. c.15 August 1944. (LCMSDS roll B5849)

Unit History, IX Fighter Command and IX Tactical Air Command Covering Period 1 August 1944 to 31 August 1944. HQ IX Fighter Command. 15 September 1944. (LCMSDS roll B5849)

War Department Basic Field Manual 31-35. "Aviation in Support of Ground Forces." Washington D.C., 9 April 1942. (Bolling AFB, K170.13-31-35.)

War Department Field Service Regulations FM 100-20, Command and Employment of Air Power. Washington, 21 July 1943. (LCMSDS Roll A1927, frames 1720-1736).

Wilson, Lt. Col. Donald, to Lt. Col. L.F. Stone, Command and General Staff School, 23 September 1939. Quoted in Thomas H. Greer. The Development of Air Doctrine in the Army Air Arm, 1917-1941. USAF Historical Study No.89. Maxwell AFB, 1955.

Wilson, Wasson J. "The Tactical Air Force." AAF School of Applied Tactics. AAF Tactical School. Orlando, Florida. 15 February 1944. (LCMSDS roll A2801 frames 1107-1143)

Zimmerman, Lieutenant James L. "Air Support of Armoured Columns." Immediate Report No.46. (Combat Observations) Headquarters Twelfth Army Group. 3 September 1944. (LCMSDS roll A5059)

Memoirs and Autobiographies

Bradley, Omar N. A Soldier's Story. New York: Henry Holt and Company, 1951.

Brereton, Lewis H. The Brereton Diaries: The War in the Air in the Pacific, Middle East and Europe, 3 October 1941 - 8 May 1945. New York: Da Capo Press, 1976 (1946).

Butcher, Harry C. My Three Years with Eisenhower: The Personal Diary of Captain Harry C. Butcher, USNR, Naval Aide to General Eisenhower, 1942-1945 New York: Simon and Schuster, 1946.

Collins, J. Lawton. Lightning Joe: An Autobiography. Baton Rouge: Louisiana State University Press, 1979.

Tedder, Lord. With Prejudice: The War Memoirs of Marshal of the Royal Air Force, Lord Tedder. London: Cassell, 1966.

SECONDARY SOURCES

Angelucci, Enzo and Paolo Matricardi. World War II Airplanes. Volume 2. Chicago: Rand McNally & Company, 1976.

Blumenson, Martin. Breakout and Pursuit. United States Army in World War II. The European Theater of Operations. Washington: Office of the Chief of Military History, United States Army, 1970 (1961).

Coles, Harry L Ninth Air Force Participation in the Desert Campaign to 23 January 1943. Army Air Forces Historical Study No.30. Washington: Assistant Chief of Air Staff, Intelligence; Historical Division, February 1945. (LCMSDS roll K1004)

Condensed Analysis of the Ninth Air Force in the European Theater of Operations. Washington D.C.: Office of Air Force History, 1984 (1946). p.23.

Corum, James S. "The Luftwaffe's Army Support Doctrine, 1934-1941." A paper presented to the 59th Annual Meeting of the Society for Military History, Fredricksburg, Virginia, 10-12 April 1992.

Craven, Wesley Frank, and James Lea Cate, eds. The Army Air Forces in World War II Volume 2: Europe: Torch to Pointblank, August 1942 to December 1943. Chicago, 1983 (1949).

________. The Army Air Forces in World War II. Volume 3: Europe: Argument to V-E Day, January 1944 to May 1945. Chicago: The University of Chicago Press, 1951.

________. The Army Air Forces in World War II. Volume 6. Men and Planes. Washington D.C.: Office of Air Force History, 1983 (1955).

D'Este, Carlo. Decision in Normandy. New York: Harper Perennial, 1983.

"The Effectiveness of Third Phase Tactical Air Operations in the European Theatre, 5 May 1944 to 8 May 1945." AAF Evaluation Board (ETO). August 1945. (LCMSDS roll A1174)

First United States Army Report on Operations, 20 October 1943 to 1 August 1944. (Wilfrid Laurier University microfilm D 769.26 1st U5.)

Futrell, Robert Frank. Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force 1907-1964. Alabama, 1980 (1971).

George, Robert H. Ninth Air Force, April to November 1944. Army Air Forces Historical Study No.36. October 1945. (LCMSDS roll K1005)

Greenfield, Kent Roberts. Army Ground Forces and the Air-Ground Battle Team including Organic Light Aviation. Study No.35. Historical Section Army Ground Forces. 1948.,

________, Robert R. Palmer and Bell I. Wiley. The Organization of Ground Combat Troops. United States Army in World War II: The Army Ground Forces. Washington D.C., 1947.

Greer, Thomas H. The Development of Air Doctrine in the Army Air Arm, 1917-1941. USAF Historical Study No.89. Maxwell AFB, 1955.
Harrison, Gordon A. Cross-Channel Attack. United States Army in World War II. The European Theater of Operations. Washington: Center of Military History, United States Army, 1989 (1951).

Howe, George F. Northwest Africa: Seizing the Initiative in the West. The United States Army in World War II, The Mediterranean Theater of Operations. Washington D.C., 1957.

Huston, James A. "Tactical Use of Air Power in World War II: The Army Experience." Military Review. July 1952. pp.33-49.

Jacobs, William A. "The Battle for France, 1944." in Case Studies in the Development of Close Air Support. edited by B.F. Cooling. Washington D.C.: Office of Air Force History, 1990. pp.237-294.

________. "Tactical Air Doctrine and AAF Close Air Support in the European Theater, 1944-1945." in Aerospace Historian. Volume 27, Number 1. (Spring/March 1980). pp.35-49.

Keegan, John. The Second World War. New York: Penguin Books, 1989.

Kohn, Richard H. and Joseph P. Harahan, eds. Air Superiority in World War II and Korea. An interview with General James Ferguson, General Robert M. Lee, General William Momyer, and Lieutenant General Elwood R. Quesada. Washington, 1983.

________, general editors. Condensed Analysis of the Ninth Air Force in the European Theatre of Operations. Washington D.C.: Office of Air Force History, 1984 (1946).

Kuter, Laurence S. "Goddammit, Georgie: North Africa, 1943: The Birth of Tac Air Doctrine." Air Force Magazine. February 1973. pp.51-56.

Mets, David M. "A Glider in the Propwash of the Royal Air Force? General Carl A. Spaatz, the RAF, and the Foundations of American Tactical Doctrine." Paper delivered at the annual conference of the Society for Military History, Kingston, Ontario, 22 May 1993,

Mortensen, Daniel R. A Pattern for Joint Operations: World War II Close Air Support, North Africa. Washington D.C.: Office of Air Force History and U.S. Army Center of Military History, 1987.

_______. "Laurence Kuter, Disciple of American Tactical Doctrine." Paper delivered at the annual conference of the Society for Military History, Kingston, Ontario, 22 May 1993.

Murray, Williamson. "The Luftwaffe Experience, 1939-1941." in Case Studies in the Development of Close Air Support. edited by B.F. Cooling. Washington D.C.: Office of Air Force History, 1990. pp.71-114.

Omaha Beachhead, 6 June - 13 June 1944. American Forces in Action Series. Washington: Center of Military History, United States Army, 1984 (1945).

Orange, Vincent Coningham: A Biography of Air Marshal Sir Arthur Coningham. London: Methuen, 1990.

Playfair, I.S.O., C.J.C. Molony, F.C. Flynn and T.P. Gleave. The Mediterranean and Middle East. Volume IV: The Destruction of Axis Forces in Africa. London: HMSO, 1966.

Ramsey, John. Ninth Air Force in the ETO: 16 October to 16 April 1944. Army Air Forces Historical Study No.32. Washington D.C.: AAF Historical Office, 1945. (LCMSDS roll K1004)

"Report on Tactical Air Cooperation, Organization, Methods, and Procedures with Special Emphasis on Phase III Operations." AAF Evaluation Board (ETO). 31 July 1945. (LCMSDS roll A1174)

Ruppenthal, Roland G. Utah Beach to Cherbourg. Washington: Centre of Military History, United States Army, 1984 (1947).

St. Lo, 7 July - 19 July 1944. American Forces in Action Series. Washington: Center of Military History, United States Army, 1984 (1946).

Schlight, John. "Elwood R. Quesada: Tac Air Comes of Age." in John L. Frisbee, ed. Makers of the United States Air Force. Washington D.C.: Office of Air Force History, 1987. pp.177-204.

Spires, David N. Air Power for Patton's Army: The XIX Tactical Air Command in the Second World War. Washington, 1992. Draft Manuscript.

Syrett, David. "The Tunisian Campaign, 1942-1943." in Case Studies in the Development of Close Air Support. edited by B.F. Cooling. Washington D.C.: Office of Air Force History, 1990. pp.153-192.

"Tactics and Technique Developed by the United States Tactical Air Commands in the European Theater of Operations." AAF Evaluation Board in ETO. 1 March 1945. (LCMSDS roll A1174)

Terraine, John. The Right of the Line: The Royal Air Force in the European War, 1939-1945. London: Hodder and Stoughton, 1985.

Watson, Mark Skinner. Chief of Staff: Prewar Plans and Preparations. United States Army in World War II. Washington D.C., 1950.

Weigley, Russell F. Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945. Bloomington: Indiana University Press, 1981.

White, Thomas D. "The Development of Tactical Doctrines at AAFSAT and AAFTAC." Army Air Forces Historical Study No.13. July 1944. (LCMSDS roll K1004).

Witt, Alan F. "Allied Cooperation in Sicily and Italy, 1943-1945." in Case Studies in the Development of Close Air Support. edited by B.F. Cooling. Washington D.C.: Office of Air Force History, 1990. pp.193-236.