

The Battle of Britain

A German Perspective

Lt Col Earle Lund, USAF
Joint Doctrine Air Campaign Course
Campaign Analysis Study
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"I have done my best, in the past few years, to make our Luftwaffe the largest and most powerful in the world. The creation of the Greater German Reich has been made possible largely by the strength and constant readiness of the Air Force. Born of the spirit of the German airmen in the first World War, inspired by the faith in our Fuhrer and Commander-in-Chief—thus stands the German Air Force today, ready to carry out every command of the Fuhrer with lightning speed and undreamed-of might."

H. Göring
Reichsmarschall

(August 1939)



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INTRODUCTION

By the spring of 1940 Germany had become the predominant continental power in Europe. The Luftwaffe--built in just six years from virtual nonexistence--had grown to a force of almost one-half million men and more than three thousand combat aircraft! The air forces had proven their worth in active combat from the Spanish civil war to the fjords of northern Norway. *Blitzkrieg* or 'lightning war', became a household word and with it came the justified fears of aerial bombardment and the growing reputation of the "Stuka" dive bomber. The German propagandists reveled in the seemingly endless successes of their military. Poland, Denmark, Norway, Belgium, Holland, and France had all fallen to the sword. By late summer, few in the world would have disputed that the fate of England could be any different on the eve of what was to become known as the Battle of Britain.

HISTORY, CONCEPTS, AND DOCTRINE

To examine the events leading to the failure of the Luftwaffe to gain control of the skies over southeastern England, one must first understand the thinking of the men involved in its development and who were responsible for its employment in war. It is relatively easy, with the benefit of hindsight, to point out specific decisions, or specific failings of one aircraft type versus another. But, it is only through a balanced understanding of *why* things were, as they were, in late 1940 that a true appreciation of the Battle of Britain can be obtained.

Genesis. Some authors credit Hitler and Goering with the rebirth of the German Air Force between 1933 and 1935. There is an element of truth in the notion that many air force officers commonly saw in Hitler and the

Nazi party an opportunity to achieve their ambition for building a stronger air force. But, the roots can be traced far deeper, probably to Gen Hans von Seeckt, chief of the Army Command, Defense Ministry. It was von Seeckt who in 1920, "was convinced that military aviation would some day be revived in Germany."¹ It was von Seeckt who had handpicked the few key officers to man the aviation positions within his command. Those key officers—Sperrle, Wever, Kesselring, and Stumpff—would one day form the nucleus of the Luftwaffe leadership. It was also von Seeckt who indicated in a 1923 memorandum "that a future air force must be an *independent* part of the Armed Forces."² And it was von Seeckt who in 1924 ensured that a former officer of the old German Flying Corps was named head of the new Civil Aviation Department of the Ministry of Transport. This appointment would virtually guarantee that "the development and control of civil aviation [would continue] under military direction."³

Following World War I, Germany was prohibited by the Treaty of Versailles from maintaining a standing air force. The treaty banned the manufacture of aircraft, aircraft engines, and key components for six months following the war and most military aircraft and aircraft engines were turned over to the allies to be destroyed.

A loophole in the treaty permitted the manufacture of civil aircraft. By 1926, "Germany was left with complete freedom in the sphere of civil aviation."⁴ Thus, a core of trained aviators could be maintained under the civilian umbrella of what would become the premier airline in Europe: the *Deutsche Lufthansa*. Lufthansa's chief executive, Erhard Milch, in 1933, agreed to accept the position of state secretary (under Goering) of

the newly established Air Ministry. There were other, sometimes secret, liaisons in the period before 1933; these included technical assistance projects with Sweden and even with Russia, glider sport-flying clubs, and so forth, but the details are not necessary here.

Concepts. It seems clear from writings, lectures and actions, that the collective military opinion of airmen within the Luftwaffe placed considerable trust in not only the classical military theorists but also in modern theorists, including Giulio Douhet. Hitler voiced an understanding of current air theories during a 1932 meeting with Milch, speaking "at length on the ideas of General Douhet [He] was principally interested in bombing warfare as the best means of *detering* an aggressor."⁵

Certainly Milch fully understood the capabilities of airpower. When he selected an army officer, Gen (then colonel) Max Wever, to be the first chief of the Air Staff he immediately encouraged him "to learn to fly, and gave him Douhet's book to read."⁶ In selecting Wever, Milch had harnessed a brilliant, highly respected and motivated assistant. Both were proponents of airpower as an independent force—to be constructed along Douhetian lines. They agreed that the immediate priority for the Luftwaffe was to develop a heavy bomber. Erhard Milch even looked forward to "a bomber that could fly around Britain from its base in Germany."⁷ Together Milch and Wever established the basic foundations of the new Luftwaffe.

Doctrine. The *Luftkriegfuhrung* or 'Air Conduct of War', contained the Luftwaffe's basic doctrine. The commander of the Air War Academy prepared it under the supervision of Wever. For its day, the doctrine was sound, advocating strong airpower roles with wide-ranging capabilities far beyond mere deterrence as previously described by Hitler. First issued in 1936, the *Luftkriegfuhrung* based the air force strategy "on offense rather than defense, as exemplified by the fact that, of 280 paragraphs in the regulations, only thirty-five were devoted to the latter."⁸ The *Luftkriegfuhrung* further specified that "the mission of the Wehrmacht [the Armed

Forces] in war is to break the will of the enemy. The will of a nation finds its strongest expression in that nation's armed forces. Defeat of the enemy armed forces is the primary objective in war . . . the mission of the Luftwaffe is to serve this purpose."⁹ In many respects the emerging Luftwaffe followed a developmental course not unlike that of the US Army Air Corps.

The *Luftkriegfuhrung* reflected the influence of Douhet by stating "'that air power carries the war right to the heart of the enemy country from the moment war breaks out,' and ' . . . strikes at the very root of the enemy's fighting power and the people's will to resist'."¹⁰ Civilian populations were provided specific protection since the doctrine also stated "attacks on cities for the purpose of terrorizing the civilian population are absolutely forbidden."¹¹

The influence that General Wever had on the development of German air doctrine is perhaps best supported by his 1935 address during the opening ceremonies of the Air War Academy. General Wever expounded upon much of the classical theory of the day. He stated that "the realms of the air are not restricted to the fronts of the Army; they are above and behind the army, over the coasts and seas, over the whole nation and over the whole of the enemy's territory." Wever went on to advocate the doctrine of attack, stressing the offensive. He asserted that "the bomber is the decisive factor in aerial warfare." He warned that it was not sufficient to establish defense with only defensive weapons, instead the initiative must be taken and this meant that "the enemy bomber formations should be attacked at their most vulnerable moment; *when they are on the ground taking on fresh fuel and ammunition and reservicing.*"

In terms of established air policy, emphasis was first on the surprise attack of enemy air forces followed by attacks upon other vital enemy centers of gravity. "An initial assault by the Luftwaffe was to be directed against the enemy air force, including its supporting aircraft and aero-engine factories and ground installations, in order to gain air superiority from the

outset."¹² With air superiority established, the Luftwaffe would be free to conduct other strategic operations. An application of this policy is perhaps evident in the invasion of Holland and the subsequent bombing of the city of Rotterdam in May of 1940.

When viewed in comparison to current USAF aerospace doctrine, General Wever identified several tasks for the Luftwaffe following lines similar to aerospace control (counterair), and force application (interdiction, close air support and strategic attack). In particular, Wever stated that the objectives are to

- *destroy the enemy air force by attacking it with our bomber formations,*
- *prevent the movement of large enemy ground forces to decisive areas,*
- *support the operations of the army,*
- *support our naval operations,*
- *paralyze the enemy armed forces by stopping production in armaments factories.*

But above all else he stressed that *the removal of enemy air power is the basis of the achievement of these objectives.* It is perhaps unfortunate for the Luftwaffe that General Wever would die in a flying accident the following year.

The Army had a somewhat different view point on the utility of the Luftwaffe in war, stating that "the role of airpower was simply to allow the maneuvers of the ground forces as much freedom as possible."¹³ Although the Luftwaffe was constitutionally established as an independent service, it clearly was not expected to operate entirely as an independent force in war time. "It was intended to operate tactically in support of the Army and the Navy, as well as conducting, at certain stages, strategic warfare of its own in defense of German cities and industries or in the attack on enemy industry, shipping and communications."¹⁴

Fighter aircraft were viewed as defensive and secondary to the tactical

support requirements of the army. This concept is further supported by the fact that the twin-engine fighters, established as long-range fighters and escorts, were also intended to act as fighter-bombers in support of the Army. Similarly, antiaircraft units were intended to bear the brunt of home defense requirements, freeing fighter aircraft for offensive operations. The Luftwaffe became so engrossed in the idea of supporting operations for the Army that later in the war "it whole-heartedly, and as a matter of deliberate policy, was prepared to throw in its long-range bomber force for strategic operations intended to aid the Army in its decisive engagements."¹⁵

Blitzkrieg was the propaganda of the day, and any strategic air planning on the part of the Luftwaffe would go no further than that required to ensure the success of planned ground operations. Still, by comparison with the writings of Douhet, the air force was apparently well prepared to act upon the essence of the "theory of the attack"; their combat forces at the beginning of the war were divided roughly 40 percent bomber and 25–30 percent fighter, thereby demonstrating the emphasis being placed on the offensive. This then, was the state of the collective Luftwaffe's air wisdom on the eve of the war in Europe.

AIRCRAFT DEVELOPMENT: WHY THE LUFTWAFFE WAS WHAT IT WAS IN 1939

The development of aircraft was driven by established political guidance, the internal organization of the Luftwaffe, and by practical considerations (economics and technology); all of which were influenced by the Luftwaffe's doctrinal policy to support Army operations. The military generally recognized that after 1940 the prospects of peace in Europe were doubtful. The Luftwaffe was, therefore, instructed to prepare for war with a target date of 1943.¹⁶ Aircraft development programs were necessarily scheduled with this target date in mind. Despite the fact that Germany had virtually built the Luftwaffe from scratch during 1933–1939, there was "no evidence consistent with

active preparation for war until the beginning of August 1939."¹⁷

Political. The guidance received from Hitler (within the Luftwaffe from Goering) consistently led the senior military leaders to believe that war was *not* imminent. As late as July 1939 Hitler informed Adm Erich Raeder "no war was at hand," and Hitler further reinforced this thought in a separate discussion with Milch when he confided "that recently in Rome, Mussolini had stated, 'War is inevitable, but we shall try to postpone it until 1942.'" Hitler reassured Milch that the "Duce's fear of war breaking out even then was quite mistaken."¹⁸ Thus, in many respects, the overall path towards aircraft development appears to have been one of casual complacency.

Organization. There were two agencies with primary responsibility for the development and selection of aircraft: the General Staff and the Technical Office. The General Staff provided "tactical and technical specifications" and the Technical Office then passed on those specifications to industry in the form of research and development contracts. Extensive pre-production testing often resulted in many modifications to original plans (typically between five and twenty thousand changes), but these tests could cause up to 70,000 further alterations to an original design. Very often the whole process could take four to five years to complete.

Early plans for developing a bomber force had to overcome many obstacles. "This was virgin territory, for, apart from some minor efforts in the years 1914–1918, no bomber force had been tried and tested in war according to the precepts of either Douhet or the *Luftkriegführung*."¹⁹ This situation was not helped by the rapid advances occurring in aircraft technology. For example, the speed, range, and bomb load of the typical bomber had more than doubled in the period between 1919 and 1929. As a result there was a significant time constraint under which all aircraft development must operate to be ready for war *by 1943*. "From 1933, there was enough time to develop and produce only two or, with luck, three generations of aircraft."²⁰

In 1934 the Technical Office issued the first requirements for a medium bomber. The specifications called for an aircraft with a speed of 215 miles per hour (mph), a radius of at least 600 miles, and a bomb load of 2,200 pounds. As an example of the external constraints under which the Germans had to operate, in addition to meeting the military specifications the aircraft had to be suitable as a civilian transport to satisfy the treaty requirements of 1918. Three aircraft were selected for further development: the He111, the Do17, and the Ju86. Two of these, the He111 and the Do17, would see extensive service during the Battle of Britain; one, the He111, would continue to serve for most of the war.

The Luftwaffe subscribed to much of the same basic thinking that was being taught by the "bomber advocates" of the US Air Corps Tactical School: the bomber will always get through and the bomber can outpace the fighter's speed, range, and altitude. For a time the Germans gave serious consideration to eliminating all defensive armament on the Do17! Just as the B-17 entered service with the US Army Air Corps as an aircraft ahead of its time, so too had the Do17M-1 entered the Luftwaffe in early 1937, "at a time when it was twenty-five miles an hour faster than the most advanced enemy fighter."²¹

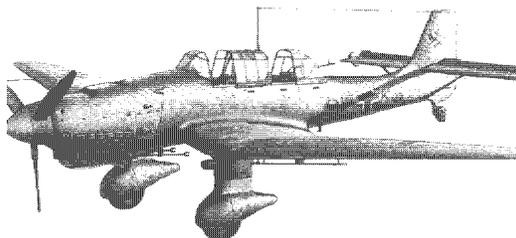
Still, the senior leadership within the Luftwaffe was not satisfied with the bombers at hand. "None was considered to possess all the attributes required of a standard attack aircraft."²² While in some categories these three aircraft met or exceeded the original specifications laid down by the Technical Office, none met all of the requirements. The most significant deficiency was range, especially with maximum payload. For example, the Ju86 had the greatest range of the three aircraft, but it was still limited to a somewhat less than impressive 350 miles. (*Note: The Ju86 was phased out in 1938.*)

The Technical Office had a peculiar tendency to issue requirements and specifications that in many cases might negate the opportunity to take full advantage of the technical capabilities of the day. For

example, in May 1934, "the Technical Office issued specifications for a multi-purpose, high-altitude, long-range reconnaissance aircraft that could adopt the role of bomber." At the same time they realized "that to combine the functions of fast bomber, heavy fighter, and reconnaissance aircraft was impracticable."²³ More sound reasoning eventually prevailed, however, and in 1935 new specifications were issued calling for three separate aircraft to fill the roles of heavy fighter (the Me110), fast reconnaissance (a modification of the Do17), and the *Schnell* or 'fast bomber' (the Ju88).

Practical Considerations. Dive-bombing was an additional interest deeply rooted in the convictions of both the Technical Office and the Air Ministry. Ernst Udet, director of the Technical Office, is cited by most historians as the major advocate of dive-bombing. Indeed, he had flown a US Curtis Hawk in the 1931 Cleveland Air Races and later he convinced Goering and Milch to buy two Hawks for dive-bombing evaluations. There are two good reasons for his position on the issue: munitions shortages and bombing accuracy.

Munitions Shortages. The limitations of the German munitions industry during the mid- to late 1930s were indeed a serious problem. In 1938 the total capacity for munitions production was less than 30 percent of the production capacity available during World War I. Clearly, such limited resources had to be used conservatively and improvements in bombing accuracy "would cut down munitions wastage and thus mitigate possible ammunition shortages."²⁴ The demand for bombs would be so great during the Polish campaign that for a while concrete bombs filled with shrapnel were produced to cover shortages.²⁵



Ju87B Stuka

Bombing Accuracy. Dive-bombing offered several advantages over level bombing. The limited bomb loads and the relative inaccuracy of the level bombers currently available required large numbers of aircraft to achieve the same level of results as dive-bombing could provide. As an example, the Ju87B-1 (the model in service in 1939–1940), "was to prove effective in the hands of expert pilots, who, in dives of eighty degrees to within 2,300 feet from the ground, could deliver a bomb with an accuracy of less than thirty yards. Even average pilots could achieve a twenty-five percent success rate in hitting their targets, a far higher proportion than that attained in conventional, horizontal attack bombers."²⁶ By comparison, US Army air forces typically designated a radius of 1,000 feet as the "target area" aim point for the "pickle-barrel" bombing conducted in Europe. "While accuracy improved during the war, [US Strategic Bombing] Survey studies show that, in the over-all, only about 20% of the bombs aimed at precision targets fell within this target area."²⁷

Generaloberst Hans Jeschonnek, chief of the General Staff of the Air Force from 1939–1943, and at the time head of the operations staff of the General Staff, saw dive-bombing as "the ideal solution to the bomber problem of 1937." That bomber problem was primarily the lack of an effective bomb sight for use with the level bombers. The standard sight was inaccurate and would require considerable practice to achieve acceptable results even for area bombardment. In 1938, "even well-qualified bomber crews could achieve only a two percent bombing accuracy in high-level, horizontal attacks (up to 13,500 feet), and twelve to twenty-five percent accuracy in low level attacks against targets of between 165 to 330 feet in radius, and to make matters worse, the bomb load of the German bombers was very low; only four 550 lb. bombs were carried by the Do17 and six by the He111. Thus, if the target were to be completely destroyed, the only way to compensate for inaccuracy would be to employ large numbers of aircraft."²⁸ The Luftwaffe General Staff announced that, "the emphasis in offensive bombardment has

clearly shifted from area to pin-point bombardment."²⁹ The best solution to inaccurate bomb sights, limited bomber payload, and economics was to adopt a dive-bomber doctrine.

Eventually the twin-engine Ju88 "wonder bomber" (as the propaganda of the day called it), and even the He177 "heavy bomber" were to fall victim to the momentum of the dive-bomber craze. The original specifications and indeed the early prototypes of the Ju88 were quite good when compared to the fighters actually available during the Battle of Britain. "In March 1939, one of the first prototypes established a new 621 miles closed-circuit record by carrying a 4,409 lb. payload at an average speed of 321.25 m.p.h."³⁰ (*The maximum speed for the Spitfire Mk 1: 355 mph, and that of the Hurricane Mk 1: 328 mph.*) But, following extensive (about 25,000) modifications to meet the "dive-bomber" specifications and to provide for additional armament as well as a fourth crew member, the performance of the final production models of the Ju88 were disappointing. As an example, when the production version, Ju88A-1, arrived in September 1939 it had a maximum speed of only 258 mph, and a range of 550 miles with a 2,000-pound bomb load. With a maximum bomb load of 3,800 pounds performance was further reduced to 190 mph with a radius of just 250 miles! However, and this is significant in light of the *reasons* for the modifications to the original design: a production model, when properly flown under *test* conditions, could deliver 50 percent of its bomb load within a 50-meter circle.³¹

The German Air Staff would remain divided on the subject of dive-bombing and the concepts for employing the Ju87. The general consensus was that the Ju87 could be used *both* for strategic operations and for support operations with the Army. From a functional standpoint the Luftwaffe leadership believed, "the employment of the dive bomber was in German Air Staff opinion not to be very different from that of the long-range bomber."³²

THE HEAVY BOMBER. In the prewar years, all four major German aircraft

manufacturers—Dornier, Junkers, Heinkel and Focke-Wulf—had designed and built successful four-engine aircraft. Only small numbers were ever produced and they were used almost exclusively in transport roles by Lufthansa. In October 1935 Hermann Goering stated, "There is no ceiling on the credit for the financing of rearmament."³³ Indeed, from 1933 through 1936 the German aircraft industry grew from nothing to become the fourteenth largest industrial sector within the Reich. Of the approximately sixty-four billion Reichsmarks spent on rearmament prior to the invasion of Poland, roughly 40 percent went to the Luftwaffe. By the end of 1936 the Luftwaffe had taken delivery of almost 9,000 aircraft of all types. As a comparison, the United States devoted 35 percent of her wartime production to the development of air forces.³⁴ At the end of 1937, however, the Luftwaffe's growth had slowed considerably for several reasons.

The chief reason for the slowed growth was the state of the German economy. Additional production delays occurred due to the retooling time and costs for the newer design models. Unforeseen technical delays (some of these were self-imposed such as the dive-bombing specifications), and the intense competition for raw materials (between both the military services and the civilian sectors) caused problems. Certainly there was significant interest within the Luftwaffe hierarchy to recognize the *potential* for strategic bombardment, and "despite the Army's rejection of [the concept of . . .] a heavy bomber, the senior officers of the Air Ministry remained firm in their advocacy."³⁵

It is relevant here to mention three additional factors that also weighed heavily on the decision not to establish a "strategic" air force, and hence a heavy bomber, from the outset. First, shortages of petroleum products, especially aviation fuel, virtually mandated this decision. The procurement of adequate supplies of petroleum products was a problem *before* the war as it was during the war. Investments in the synthetic fuel industry relieved some of the strain, but demand simply outpaced supply throughout the 1930s. For example, in June 1938, the

supplies of aviation lubricants "were as low as 6 percent of mobilization requirements," and reflected Germany's inability to meet petroleum requirements from internal sources.³⁶ These shortages take on even greater importance when considering the Luftwaffe's own estimates that a planned force of 500 heavy bombers would consume 24,000 tons of aviation fuel per month. This represented one-third of Germany's total production rate in 1940!³⁷

The second was the lack of suitable engines to power a heavy bomber. The "difficulties experienced by German engine manufacturers in producing engines that met comparable performance standards of American and British industry," limited the design and performance of their aircraft.³⁸ This was partly due to the late start German engineers had in designing high-performance engine types and partly due to the low octane fuels on hand to operate them. The Germans entered the war using 87–89 octane fuels. This octane rating, however, could only be achieved "by adding 15–18 percent aromatics with tetraethyl lead to the synthetic fuel."³⁹ In contrast, during the Battle of Britain the British used 100 octane fuels supplied by the United States.

The third, and most important factor, stems from the strategic reality of Hitler's decision to rearm the Wehrmacht. Germany was a continental power and certain to enter into land warfare from the outset of hostilities. It can therefore be concluded that, no matter what "theoretical advantages might accrue to Germany through the possession of a 'strategic' bombing force in the late 1930's, the Third Reich faced the possibility of an imminent war. Future 'strategic' bombing capabilities would do nothing for present military difficulties, while the tactical potential of a less sophisticated, more conventional air force would be more quickly realized."⁴⁰ There would be little solace in an effective strategic bombing campaign against London, Paris or Warsaw, if the Allied armies were already dictating peace terms in Berlin!

In spite of all these reasons, several general officers, including Wever, Wimmer and Felmy, continued to emphasize the

importance of an independent air mission in addition to that of air support for the Army. In June 1936 the replacement of two key Luftwaffe leaders brought about some decisive changes in thinking on the issue of the heavy strategic bomber versus the dive bomber; changes that ultimately, and perhaps irreversibly, set the course for future production. Following his death, Wever was replaced by Albert Kesselring and Goering would also replace Wimmer, chief of the Technical Office, with Ernst Udet.

As previously mentioned, Udet is often cited as the main reason for Luftwaffe failure to develop a heavy bomber. He often voiced a preference for lighter, faster, twin-engine aircraft. There was also another constraint: time. They had only six years (1933–1939) to develop the Luftwaffe before the actual start of the war—only ten years based on the planned 1943 "target date" for the beginning of hostilities. Therefore, Kesselring and Udet "advocated the continuance and extension of the Air Force's ground-support role, and argued against the creation of a bomber force along Douhetian lines."⁴¹ The two had reasoned that for the Luftwaffe to support a major *continental war in 1943* (given the constraints under which Germany had to orchestrate its rearmament plans) that a heavy bomber was simply not feasible, nor was it required.

A "continental war" is the key point, because Hitler had assured Goering in the summer of 1938 that "a war against England is quite out of the question!"⁴² Therefore, it could be viewed as prudent that the needs of the Luftwaffe could be more adequately met by emphasis on the Ju88. Udet reviewed the early plans for the He177 with Professor Heinkel and told him that, "we don't need this expensive heavy bomber any more. It eats up far too much material. Our twin-engine dive bombers will fly far enough and hit much more accurately. And we can build two or three of them for one of the four-engine types. *The thing is to be able to build the number of bombers the Fuhrer wants!*"⁴³

INFLUENCE OF THE SPANISH CIVIL WAR

Much of the Luftwaffe strategy for the conduct of air warfare as formulated during the mid- to late 1930s was “confirmed” by the events and experiences of the Spanish Civil War—confirmed, at least, in the minds of the Germans. Varying capabilities existed on both sides (Nationalist and Republican) during the Spanish conflict, but in general the aircraft of the Condor Legion and the Nationalist forces were decidedly inferior to the Russian-built aircraft that served the Republicans. In actuality, “the poor reports sent back to Berlin by the newly established special combat reporting team and by Sperrle's Chief of Staff, Freiherr von Richtofen,” helped to ensure the Legion was supplied with all of the latest German equipment.⁴⁴

Publicity on the use of airpower in civil war focused on the bombing of the city of Guernica (the center of the city was destroyed, killing at least 1,600 civilians) in the spring of 1937. For many observers, the US Air Corps Tactical School included, this situation helped to reinforce the evolving theories on “Douhetian”-style bombing. However, what influenced the Luftwaffe most was an “air support” attack which took place a few days before Guernica. On that occasion, nine He51 fighters, each armed with six 10-kilogram bombs, made low-level attacks (at about 500 feet) on fortified enemy positions. This action helped achieve considerable success for the Nationalist ground forces. The defending soldiers were so terrified by the German aircraft that they fled in panic.⁴⁵

These types of tactical successes on the battlefield, in the German view, tended to confirm the doctrine already established in the early 1930s; the doctrine to support the army in the field. Thus, if the Spanish experiences confirmed anything for the Luftwaffe, it had confirmed that the concepts for strategy and tactics developed earlier from theory and maneuvers in Germany were basically sound. The lessons also served to prove that bombers were extremely effective in the close-air-support role and could be used with great effect against enemy troop concentrations and strong points. In essence then, the Spanish experience helped solidify

the bonds already established between the Army and the Luftwaffe.

The bombers had also carved their niche within the hierarchy of Luftwaffe priorities. In particular “the efficacy of dive-bombing by the Ju87's as compared with the far more inaccurate He111's, was revealed. The success of the Heinkel bomber was found to lie more in low-level, high speed runs against targets, and this vindicated the view that a ‘wonder-bomber’ along the lines of the Ju88 was required, even more so because it would have the capacity to dive-bomb.”⁴⁶

With regards to the performance of the fighter aircraft, the Air Ministry concluded that the Me109s were “excellent weapons against enemy bombers and good defense for friendly formations.”⁴⁷ This conclusion was reached in spite of the fact that the Me109C/Ds were technically inferior to the Russian-made I-16! It was also recognized that bombers were resistant to damage and this led to heavier armament for the fighters to include 20-millimeter (mm) cannon. The short range of the Me109 was also seen as a tactical disadvantage and resulted in greater emphasis being placed on long-range fighters and the continued development of the Me110. *Note: Experimental use of external fuel tanks occurred during the Spanish conflict, but serious further development was not continued.*⁴⁸

ORGANIZATION AND STRUCTURE OF THE LUFTWAFFE

While several previous changes had been made, the structure of the Luftwaffe at the beginning of the Battle of Britain was essentially what emerged from the reorganizations that occurred during 1938 and 1939. Significant emphasis was being placed on mobility, flexibility of operations, and close identity with the Army operational commands. A final reorganization on 1 April 1939 resulted in the establishment of four area commands each called a *Luftflotte* or ‘Air Fleet’.

The strategic policy of the Luftwaffe—close ties to the Wehrmacht—drove the

evolution of its organization. And, because "the support of ground troops was the primary consideration, support which entailed the concerted action of bombers, dive-bombers, fighters, transports and reconnaissance aircraft, territorially-based, mixed commands were needed, to be both flexible and mobile, so that they could be adapted to the activities of the army groups or armies to whose support they were assigned."⁴⁹

The German *Luftflotten* or 'Air Fleets', were therefore organized territorially, not functionally as were their Royal Air Force (RAF) counterparts. Each *luftflotte* was a balanced self-contained force (consisting of bomber, fighter, ground attack, reconnaissance and associated support units). In essence it was a "composite wing" on a much larger scale. The territorial organization was established to align the major air units, the *luftflotten*, to the territorial areas associated with the Army units they were designed to support.

Within each *luftflotten* a clear separation existed between operational and administrative matters. The *luftgau* (air district) handled all logistic, training, and medical matters as well as exercising the operational command of airfields. The *fliegerdivision* (air division), later named *fliegerkorps* were the operational 'fighting forces'. A *fliegerdivision* consisted of the *gruppen* and *staffeln* (groups and squadrons). Within both the *luftgau* and the *fliegerdivision* normal departments (quartermaster, administrative, legal, etc.,) existed for day-to-day matters. The *luftflotte* commanded normal operations. The *luftflotte* issued orders and directed; the *luftgau* handled maintenance and supply, and the *fliegerdivisions* conducted the operations. (See Appendix 5,6, and 7.)

SETUP FOR THE BATTLE OF BRITAIN

Early Planning. Before the beginning of 1938 there had been no planning for the conduct of air warfare against Britain. In February of that year, the Reich Luftwaffe Ministry had "instructed General Felmy's *Luftwaffen-gruppenkommando 2*, whose territory covered the Reich's North Sea coast,

to draw up proposals for action in the event of Britain's intervention in a war in the West."⁵⁰

The emphasis for these contingency air operations would be actions "against the ports and armament factories of London, and against the English Channel ports and air bases in Norfolk, Suffolk and Sussex."⁵¹

After the war, General Felmy indicated that planning for this contingency fell to his command because the General Staff of the Luftwaffe was already overburdened; developing the new air force and planning for operations in Czechoslovakia—"Studie Grun." In the event, two memoranda were produced by Felmy's staff. General Felmy identified the Royal Navy as the most important target. He also pointed out that this would be a fleeting objective because the Navy could easily sail north, out of range of the Luftwaffe bombers. Thus, the major emphasis could be placed on "Kingston-upon-Hull, London, and the ground service installations of the Royal Air Force . . ."⁵² Overall, the memoranda made very clear that an air war against Britain (under the conditions of 1938) could have nuisance value only. There was *no possibility* that the Luftwaffe could act with any decisive effect. One limiting factor identified was the short range of Germany's existing bombers—this would prohibit effective action against Britain from their bases in northwestern Germany—and, therefore, additional airfields in Holland and Belgium would be essential.

The Operations Staff of the Luftwaffe General Staff, on the basis of its own evaluations, arrived at similar conclusions and believed that "in existing circumstances there could be no hope whatever of securing a decisive victory in a combined attack on the British war economy by the Luftwaffe and the Navy. The essential task of the Luftwaffe was to guarantee freedom of action for the ground forces."⁵³ Another study by Felmy's staff was conducted in May 1939, and "held out little hope of success in an onslaught against Britain's fighter force as a preliminary to a general attack at a later date."⁵⁴ Presumably, an offensive against the British fighter forces would be unsuccessful because the German bombers would operate without fighter escort if they were forced to operate only from bases within Germany.

On the basis of map exercises conducted by Felmy's staff at Luftflotte Two—the only such exercises (against Britain) held prior to the war—General Felmy concluded "neither the strength nor the training or equipment of Second Air Fleet forces were adequate to insure a quick victory over Britain in 1939."⁵⁵ The "target date" established for these map exercises had been set at 1942. Based on these staff estimates, it would appear that both Goering and his chief of staff were fully cognizant of the dangers in entering into a war against England before the Luftwaffe was adequately prepared. After an official visit to England in 1938, Milch warned Hitler against Ribbentrop (the German ambassador in London) whom he believed "was damaging relations between the two countries."⁵⁶ Milch also conveyed an additional warning; England was prepared to go to war over the Danzig and Polish corridor question. Goering would express his foreboding when, upon receiving final confirmation of the attack upon Poland, he called Herr Ribbentrop (then the foreign secretary) and shouted at him, "Now you have your war. You alone are to blame." Two days later (3 September 1939), when England declared war on Germany, he is quoted as saying, "May Heaven have mercy on us if we should lose this war."⁵⁷

A study prepared by Oberst (colonel) "Beppo" Schmid, chief of intelligence of the Luftwaffe Operations Staff, further determined that the RAF could reach strengths equal to those of the Luftwaffe by 1940. Therefore, the priorities established for the forced submission of England were the "(1) defeat of the Royal Air Force, (2) incapacitation of the British air armament industry, and (3) elimination of the British Navy."⁵⁸ Subsequent actions could then be directed against port, shipping, and other industries, but strong air forces would still be required to accomplish this. Schmid stated after the war that he briefed the commanders that because of the "high morale of the British people and the improvising skill of British leaders, Great Britain could not be forced to capitulate through air attack alone, but only through actual occupation of the island."⁵⁹

Political Guidance. Hitler's opinion, on the other hand, was that Britain could be defeated through a combination of air and sea blockades. Hitler insisted that, "the moment England's food supply routes are cut, she is forced to capitulate."⁶⁰ If this could be achieved, there would be no need for invasion. Hitler then outlined his strategy in Directive No. 1 for the Conduct of War. The directive called for the invasion of Poland and a strategic defensive in the west against England and France.

According to Directive No. 1, the Luftwaffe was to "take measures to dislocate English imports, the armaments industry, and the transport of troops to France."⁶¹ While planning for the contingency was allowed, no attacks were to be made on the mainland of Britain itself. Hitler would, however, issue a memorandum on 10 October detailing his intentions in the West *if* Britain failed to come to an agreement for peace. Specifically, Hitler identified "Germany's unfavorable geographic location for air warfare, which forced aircraft to fly long distances to reach their targets."⁶² In recognition of this limitation, War Directive No. 6 (dated 9 October 1939), mandated the occupation of "as large an area as possible in Holland, Belgium and northern France as a basis for conducting a promising air and sea war against England."⁶³ Subsequently, Directive No. 9, issued on the 29th of November 1939, identified Britain as "the driving force behind the Western Powers' will to make war. The defeat of Britain . . . was the prime condition for final victory, and the most effective means to bring about this defeat was to paralyze the British economy."⁶⁴

The precedence established for target selection was 1) ports (either by mining approaches or bombing installations), 2) attacks on merchant shipping and associated naval escorts, 3) storage depots followed by transport conveying British troops to the continent, and 4) vital military industries including aircraft and munitions factories. The intention, however, was *not* total war against England, or an invasion, or even an all out air war. What the Germans *did* desire was an economic strangulation of the British Isles to the point that a negotiated

peace could be had. Political attitudes against continued German aggression had stiffened and the peace proposals Hitler presented in the Reichstag on 6 October were soundly rejected by the British.⁶⁵ The fact remains that neither the Luftwaffe nor the German Navy was in a position to blockade England to the extent required by Hitler's memorandums and directives. A factor that Hitler had not yet grasped but also a factor the British seemed to have been quite willing to exploit to their best advantage. Therefore, the "German command had to devise new plans to conquer Great Britain."⁶⁶

Early Operations. Initial German air operations against England in the fall of 1939 met with limited success with the notable exception of those conducted against merchant shipping. The intention was to delay full scale air operations against Britain until suitable air bases were available and sufficient time was allowed to build up strength. Hitler announced in War Directive No. 13, dated 24 May 1940, that "as soon as enough units become available, the Air Force should embark upon its independent mission against the British homeland." The targets remained those as outlined in War Directive No. 9, and further stipulated that operations would begin "with a crushing attack in retaliation for British raids on the Ruhr area." The German Air Staff apparently took a somewhat different view, however, and issued an amendment to War Directive No. 9 directing "the primary target should be the British aircraft industry," as the "last potent weapon which could be employed directly against us." Thus, the first attacks against the British homeland began on the night of 5 June 1940. Over the next few months some 13 airfields, 16 industrial plants and 14 ports, as well as commercial shipping were attacked, apparently with no clear aim or objective in mind. Attacks against shipping were generally quite effective, but for the industrial targets, "the disruption of output caused by men going to their shelters was far greater than that resulting from German bombing itself, and few lives were lost."⁶⁷

Much of the German air planning for the Battle of Britain was based on the considerable successes of earlier campaigns.

But, "no uniformly accepted concept existed concerning the operational conduct of air warfare against England."⁶⁸ The prerequisite for successful land operations was recognized as security, through control of the air. The task for the Luftwaffe, however, was viewed in simplistic terms and approached rather casually; the only difference between the coming battle and others previously fought was "that the R.A.F., being the most powerful single air force yet encountered, would necessarily require for its destruction some time longer than the 12 to 48 hours previously allotted to other air forces."⁶⁹

As an example of the complacency, Erhard Milch, in his capacity as the inspector general, reported (in June 1940) that as a result of his visits to the various captured airfields and the field headquarters, "no preparations at all were being made for air war with Britain."⁷⁰ This is somewhat amazing considering the tremendous logistical problems associated with sustained operations from those airfields. Runways had to be improved, and depots established. Munitions, fuel, and supplies had to be transported hundreds of miles from their sources within Germany.⁷¹ The Germans continued to view the English Channel as little more than a large river. The air force was to support the land forces in another "river-crossing" exercise—an operation not unlike those previously conducted on the Meuse, Maas and Vistula rivers—without regard to the strategic consequences.

The casual approach to the war with Britain was certainly a reflection of the overconfidence resulting from the highly successful campaigns recently concluded in Poland, Norway and especially in France. All, however, were *campaigns where the bomber forces functioned almost exclusively as extensions of the tactical air arm*. But the near exclusive use of the bomber arm for tactical support of the Army inevitably led "to confusion and misconceptions as to the employment of the bomber which lasted throughout the war."⁷² And, in addition to the task of defeating the RAF, the German Combined Staffs issued a directive in July from Field Marshal Keitel stipulating "the

German lack of command of the sea could be substituted by supremacy in the air."⁷³

Some of the Luftwaffe's airmen were more skeptical, and Werner Baumbach, a future General of Bombers wrote, "we know that England is the hardest nut to be cracked in this war. Our experience at the front has shown us that final victory against England can only be attained by the systematic cooperation of all arms of the service and ruthless application of the elementary principle of concentrating all one's strength and effort at the vital strategic point. Even if the air arm is the most important weapon in total war, it cannot by itself ensure the decisive, final and total victory."⁷⁴

Hitler's Directive No. 16, dated 6 July 1940, identified the role of the Air Force in the invasion (code-named Seelowe or "Sea Lion") as prevention of "interference by hostile air forces." (See *Appendix 1 for the complete text.*) In addition, the Luftwaffe was to mount attacks against British strong points, especially those in the landing areas, against troop concentrations and reinforcements, as well as naval units operating in the area of operations. In essence then, the Luftwaffe would provide an "air umbrella" beneath which the invasion could take place. There was little difference in this directive from those used to form the operational basis for the campaigns in Poland, Norway and France. But, there was one significant flaw, and that flaw was a total failure to provide "a special joint command staff to control all three branches of the Wehrmacht—such as the Joint Command organized as Group XXI for the operations in Norway—to assume responsibility for the planning, preparation, and execution of Operation Sea Lion."⁷⁵ Instead, the responsibility for operational planning rested with the three high commands of the Wehrmacht. The Air Force Operations Staff (OKL) translated Hitler's guidance into two main aims, and these were subsequently issued to the Luftflotten. First, eliminate the RAF as a fighting force, including its ground organization. Second, cut external supplies by attacking ports and shipping.⁷⁶

Released on 30 June 1940, Goering's *General Directive for the Operation of the Luftwaffe Against England* closely paralleled the intentions of Hitler's directives. (Note: *This precedes Directive No. 16, but it seems logical that Goering was privy to Hitler's intentions before the directive was issued.*) A discrepancy exists between some authors concerning the intent of Goering's directive. Author Matthew Cooper claims, "the prime mission of the Luftwaffe was, in cooperation with the Navy, to attack merchant shipping . . . in order to cut Britain off from her overseas supplies."⁷⁷ Cajus Bekker, on the other hand, states "the primary target was the Royal Air Force, its ground organization and the industry that fed it."⁷⁸ Karl Klee agrees with Bekker and probably provides the most reliable translation of the original document. According to Klee, "the Royal Air Force was designated as the chief opponent. Independently of the incidental mission of attacking hostile import traffic and hostile naval forces, the paramount mission of the Luftwaffe was to seize every possible opportunity by day and by night for attacks on hostile air units while airborne or on missions."⁷⁹ The three authors do agree that after 11 July, with the release of the *Directive for the Intensified Air War Against England*, operations against British naval and merchant shipping were approved.

Goering also called for the assembly of air forces in their operational areas (Luftflotten 2, 3 and 5), the stockpiling of supplies and munitions, air defense measures and the setup of signal communications. Timing and the selection of targets Goering intended to "closely integrate" with the Luftflotten involved.⁸⁰ During the preparation period, only harassing raids were conducted. On 21 July, Goering conferred with the chiefs of staff of the three Air Fleets concerning the conduct of air operations prior to the intensified air war with England. Goering specified small-scale attacks; except against convoys, and expressly ordered, "that installations needed by the German armed forces in later operations were not to be attacked. As an example he quoted the dock installations in south coast ports."⁸¹

Planning. Much of the planning for the “intensified” air operations was apparently conducted by the Air Fleets and then submitted for approval by the Luftwaffe Operations Staff and ultimately by Goering. What is unclear, however, is how this planning was coordinated. Klee writes that “by 25 July 1940 the air fleets formulated their initial intentions for the conduct of air warfare against Britain, basing their work on appropriate studies submitted by their air corps. On 29 July the Luftwaffe Operations Staff provided comments on the plans submitted. On 1 August the air fleet submitted their revised plans. Again Goering disapproved certain specific points.”⁸² Finally, on 2 August 1940, the *Preparations and Directives for Operation Adler* was released.

British Perceptions. Because the British felt that the Luftwaffe efforts through the beginning of August lacked real aim—the air attacks largely were being viewed as harassment in nature (as they in fact were)—the RAF Fighter Command did not conduct the exhaustive counter operations that the Luftwaffe had hoped for. Instead, Fighter Command chose a more conservative approach; they opposed German raids only when targets on the mainland or major convoys were threatened, and even then “its pilots took care only to engage enemy bombers, and to avoid the fighters whenever possible . . . the material damage inflicted by the Luftwaffe during this phase of operations, known as *KanalKampf* or ‘Channel Fight’, was not inconsiderable. In the six weeks beginning 1 July, it mounted some 7,000 bomber sorties, dropped some 1,900 tons of high explosives, and attacked numerous ships, ports and industries. Roughly 70,000 tons of shipping was sunk.”⁸³ The RAF suffered 142 aircraft losses against 85 for the Luftwaffe.

Intelligence. It is important to note that it was at about this point in the conflict—as the result of intercepted radio transmissions—that the Germans began to realize the RAF fighters were being controlled from ground facilities. It is equally important to note that the Germans correctly interpreted the purpose of these new ground control

procedures, but assessed them as rigid and ineffectual. The existence of a British radar system was well known to the Luftwaffe from intelligence gathered before the war, but “the secret of the highly developed plotting system linked with fighter control had been well kept by the British.”⁸⁴ (See *Addendum for more detail.*)

On 7 August an intelligence analysis of the RAF control procedures concluded that: “as the British fighters are controlled from the ground by R/T their forces are tied to their respective ground stations and are thereby restricted in mobility, even taking into consideration the probability that the ground stations are partly mobile. Consequently, the assembly of strong fighter forces at determined points and at short notice is not to be expected. A massed German attack on a target area can therefore count on the same conditions of light fighter opposition as in attacks on widely scattered targets. It can, indeed, be assumed that considerable confusion in the defensive networks will be unavoidable during mass attacks, and that the effectiveness of the defenses may thereby be reduced.”⁸⁵ (See *German Intelligence Appreciation of the RAF and Comparison with Current Luftwaffe Strength, in Appendix 4.*)

To be fair, however, the British did have some problems coordinating their efforts. An example would be the disagreements between Air Vice Marshals Park and Leigh-Mallory over the concept of Mallory’s “Big Wing” and Park’s (and also Dowding’s) approach to attack with only as much force as is readily available (generally at squadron level). Other examples would be the inaccuracies in the radar system, especially height finding, and the lack of radar coverage once an attacking formation crossed the coastline.

Competing Priorities. It was not until 1 August 1940 that Hitler issued his first clear, guidance for the conduct of the air war through Directive No. 17. (See *Appendix 2 for complete text.*) But before examining the directive, however, it would perhaps be beneficial to examine some ambiguities that were developing within the High Command

concerning the overall plans for the conduct of war in the West.

Army Chief of Staff Generaloberst Franz Halder—writing in his diary—recorded statements made by Hitler in the Berghof on the previous day, 31 July 1940. Halder quotes Hitler as saying, "Russia is the factor by which England sets the greatest store . . . If Russia is beaten, England's last hope is gone. Germany is then master of Europe and the Balkans . . . Decision: As a result of this argument, Russia must be dealt with. Spring 1941."⁸⁶ (Emphasis added.) Earlier in the month, Halder also recorded a similar thought of the Fuhrer's indicating that Hitler was obviously concerned with the unwillingness of Britain to make peace. Clearly, there were competing priorities, at the highest levels, over what the true national objectives were, and what the strategy to attain those objectives would be. There is also some room for conjecture that the entire focus for Operation Sea Lion was actually a great deception aimed at tying down British forces while the Germans prepared for operations elsewhere.

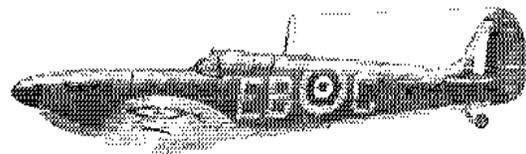
As an example, after the outcome of the air battle over Britain had already been determined, Hitler would write to Mussolini (20 January 1941), "An attack on the British Isles remains the ultimate aim. In this case however, Germany is like someone who has only one shot in his gun; if he misses, the situation will be worse than before. We could never attempt a second landing since failure would mean the loss of so much equipment. England would then not have to bother further about a landing and could employ the bulk of her forces where she wanted on the periphery. So long as the attack has not taken place however, the British must always take into account the possibility of it."⁸⁷

General Warlimont further records a 1943 conversation where Hitler stated "every memorandum I sent to the Duce was immediately transmitted to England. So I put in things which I wished definitely should get to England. That was the best way to get something through to England quickly."⁸⁸ Whether Sea Lion was a deception plan or not, given the levels of preparation that were

taken by the individual branches of the Wehrmacht, especially by the German Navy, it is quite reasonable to assume that if the Luftwaffe *had* been successful that the invasion would have taken place.

The German Navy, however, was not satisfied with the mission assigned to the Luftwaffe by Directive No. 17 and the Naval Operations Staff war diary reflected that "in view of the counteraction to be expected with certainty from the British Navy during the amphibious operation, the Naval Operations Staff holds the opinion that operations against naval ships should be required as part of the intensified air offensive . . ." but, also recognized that, "it will be necessary to wait until the first phase of the air operation is over."⁸⁹ Certain naval records also indicate that Hitler had agreed, during a July conference, that if the Luftwaffe had failed to seriously damage the Royal Air Force within the first eight days that the operation would "be postponed until May 1941."⁹⁰

THE TRADITIONAL "BATTLE OF BRITAIN" DEVELOPS



Spitfire Mk I

In any event, Directive No. 17, *For the Conduct of Air and Naval Warfare Against England*, did outline the intended tasks for the Luftwaffe in rather simple terms:

- Employ all forces available to eliminate the British air force as soon as possible;
- Once temporary or local air superiority is achieved, operations will continue against ports;
- Air operations against hostile naval and merchant ships will be considered a secondary mission;
- The intensified air offensive will be conducted so that adequately strong air forces can be made available whenever required to support naval operations against favorable fleeting targets. (Note:

For the complete text of Directive No. 17, see Appendix 2.)

But the directive missed the critical center of gravity, the one force that could prevent the Luftwaffe from dominating the skies over southern England: RAF Fighter Command. Instead of concentrated attacks focused on Fighter Command and its critical assets, the limited resources of the Luftwaffe would continue to be distributed, piecemeal, on objectives of lesser importance and of little relevance to the stated goal of gaining mastery of the air as the prerequisite for invasion.

The Opposing Forces:

The Royal Air Force. Air Chief Marshal Hugh Dowding commanded RAF Fighter Command. The command consisted of 59 squadrons distributed over Britain in four groups (10, 11, 12, and 13); each group was further subdivided into sectors which composed the main operational unit. The most important group, 11 Group, was commanded by Air Vice-Marshal (AVM) Keith Park. Eleven Group was important because of its proximity to the German forces (southeast England, also including London) and therefore held about 40 percent of the available fighter strength. Also heavily involved in the fighting, to the north of London, was 12 Group commanded by AVM Leigh-Mallory. Groups 10 and 13 were commanded respectively by AVMs Brand and Saul. Number 10 Group was established in July after the occupation of the French coast by the Germans who had exposed Dowding's western flank to air attack (fig. 1).

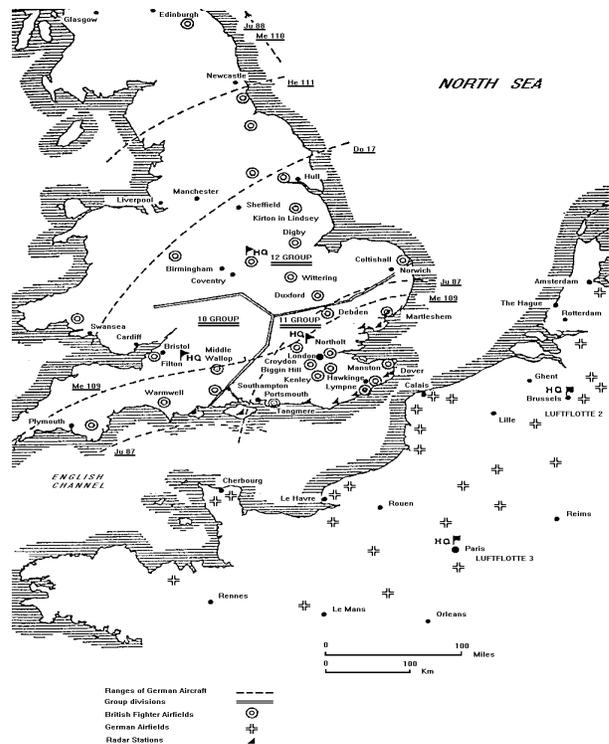


Figure 1

On 1 August RAF Fighter Command strength stood at 570 Hurricanes and Spitfires (two-thirds of these were Hurricanes), and of the total only 367 were operational. Thus, excluding the less capable types, Blenheims, Defiants, Gladiators, and so forth, the German Me109s outnumbered the British forces by almost two to one (367 versus 702). British defenses also included some 1,200 heavy and 650 light anti-aircraft pieces. And, although the Germans considered these insufficient for the defensive task, anti-aircraft fire would account for about 12 percent of the German losses in the coming battles.

The Luftwaffe. On 2 August 1940 the Luftwaffe General Staff issued the plan for the destruction of the RAF, starting the campaign for the Battle of Britain. The plan for *Adlerangriff* or 'Eagle Attack' consisted of three phases:

Phase One—

First 5 days: Attacks made in a semicircle starting in the west and

proceeding south and then east, within a 90- to 60-mile radius of London.

Phase Two—

Next 3 days: Radius from London reduced to between 60 and 30 miles.

Phase Three—

Final 5 days: Attacks concentrated within a 30-mile radius centered on London.

The major Luftwaffe forces committed to *Adlerangriff* were Luftflotte 2, under Kesselring; Luftflotte 3, under Sperrle; and Luftflotte 5 (in Norway), under Stumpff. The spearhead would be Luftflotten 2 and 3, operating from locations in France, Belgium and Holland, supported by Luftflotte 5, operating from locations in Norway. The Luftwaffe simply drew a line through the center of England dividing the majority of the airspace between Luftflotten 2 and 3 (fig. 2).

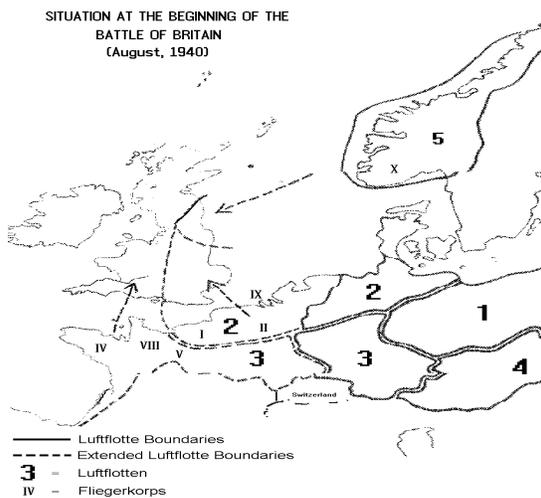


Figure 2

**GERMAN AIRCRAFT AVAILABILITY
10 AUGUST 1940**

The total force available on 10 August was 3,196 aircraft, with 2,485 operational.

Luftflotte 5:

138 He111 and Ju88 (123 operational)
37 Me110 (34)

Luftflotten 2 and 3:

406 Ju87 (316)
282 Me110 (227)
813 Me109 (702)

The Opening Offensive. The Luftwaffe was confident that the entire operation could be completed in just two to four weeks. The Germans believed that the intensity of the fighting in the areas where fighter support was available, especially around London, would draw the peripheral elements of Fighter Command into the fight where they could be systematically destroyed by the Me109s. This strategy would be effective only if the British fighter forces chose to enter the fight. Therefore, "during the fighting, the bombers would be used not only to knock out the R.A.F.'s ground organization and aircraft factories, but also to act as bait for the R.A.F. fighters."⁹¹ This ignored the fact, however, that daylight operations would be limited because of the inability of escort fighters (principally, the Me109) to accompany the bombers to the more distant targets. With characteristic confidence, therefore, the Luftwaffe believed that during the first phase "the destruction of R.A.F. Fighter Command in the South, would take four days."⁹² It should also be remembered that the inadequacies of the Me110 had yet to be revealed to the Luftwaffe leadership, and especially to its greatest admirer, Hermann Goering.

Confidence aside, however, "according to Kesselring, it was recognized that 'permanent air supremacy was impossible without the occupation of the island, for the simple reason that a considerable number of British air bases, aircraft and engine factories were out of range of our bombers [in fact, they were within range, but would be without fighter escort], it was believed that temporary air supremacy over the invasion area would be possible."⁹³ This was considered sufficient to allow Sea Lion to proceed as planned. Since no date had been set for beginning *Adlerangriff*, the

Luftwaffe simply continued with the *Kanalkampf* operations already in progress.

Dissension. Not all of the Luftwaffe leadership was as convinced as the Air Ministry and the General Staff that the *Adlerangriff* plan was the correct strategy. It is significant to note that the two *Luftflotten* commanders, Sperrle and Kesselring, both felt that RAF Fighter Command should be decisively weakened through night attacks before beginning any significant daylight operations.

Theo Osterkamp (a fliegerkorps chief of staff during the battle and later a fighter commander) indicated that this view was expressed by Kesselring and Sperrle during a 1 August meeting with Goering. But, as Osterkamp points out, "Goering, however, would have none of this, believing, as did many in the [Reich Air Ministry], that not only had the R.A.F. Fighter Command already been substantially weakened, but that the Luftwaffe was quite capable of defeating it in daylight operations."⁹⁴ Thus, over the objections of his field commanders, Goering was slowly beginning to take more and more direct control of the operations.

- | |
|---|
| <ul style="list-style-type: none"> (2) 20-mm cannon, nose mounted. (1) 7.9-mm machine gun, rear firing. |
|---|

Phase One. On 6 August, Goering set 10 August 1940 as the start date for *Adlerangriff*, but bad weather forced a postponement until the 13th. Again, during this period the normal *Kanalkampf* operation continued. The 13th, known as *Adlertag* (Eagle Day) began with marginal weather resulting in the cancellation of some missions and sporadic results from others. Targeting was spread among multiple target types; Bomber Command airfields, Fighter Command airfields, Coastal Command stations, channel shipping, aircraft factories, at least nine manufacturing cities, with no immediate objective other than to "test the British defenses."

The Luftwaffe mounted some 1,485 sorties (two-thirds fighter) while Fighter Command opposed with 727 defensive sorties. In combat the Germans lost 20 bombers with 14 badly damaged; 15 Me110s with six damaged; and nine Me109s destroyed. Fighter Command lost 14 fighters and six damaged and no significant damage to airfields or command and control. "The course of the fighting on the 13th highlighted the significant error of judgment on the part of the Luftwaffe . . . the failure to concentrate fully upon the major enemy—R.A.F. Fighter Command. At the beginning of the onslaught the Luftwaffe's choice of targets indicated a lack of knowledge of the precise nature of its enemy's ground organization, with its dependence on an elaborate network of operations rooms, sector airfields, observer posts and direction-finding posts, all of them linked by telephone cables."⁹⁵

For its part, however, the Luftwaffe estimated 134 British aircraft destroyed. And, during the four days when heavy combat occurred, 8, 11, 12, and 13 August, the German Air Ministry reported that "the primary objective of reducing enemy fighter strength in southern England was meeting success: Ratio of own to enemy losses, 1:3 . . . lost three per cent of our first-class

AIRCRAFT PERFORMANCE
<p>Spitfire and Hurricane</p> <ul style="list-style-type: none"> - Each more maneuverable than Me109 and Me110. - Both had tighter turning radii. - Armament: <li style="padding-left: 20px;">(8) .303 Browning machine guns, wing mounted. <p>Me109 and Me110</p> <ul style="list-style-type: none"> - High altitude capability (34,000 ft.). - Faster at all altitudes than Hurricane. - Faster than Spitfire above 20,000 ft. - Superior dive performance to either. - Armament: <li style="padding-left: 20px;">Me109 <li style="padding-left: 40px;">(2) 7.9-mm machine guns, nose mounted. <li style="padding-left: 40px;">(2) 20-mm cannon, wing mounted. <li style="padding-left: 20px;">Me110 <li style="padding-left: 40px;">(4) 7.9-mm machine guns, nose mounted.

bombers and fighters, the enemy fifteen per cent. Fighters: Ratio of losses 1:5 in our favor British will probably not be able to replace losses Eight major air bases have been virtually destroyed."⁹⁶ Actual losses for the period were 136:96 in the Luftwaffe's favor. The fighter ratio was actually 1:2 (46 Me109s to 98 Spitfire and Hurricane) and even lower still if the loss of 35 Me110s is added!

An interesting sidelight to these events occurred on 13 August when Generaloberst Alfred Jodl, chief of Wehrmacht Operations Staff, would argue against an invasion in his "Appreciation of the Situation," communiqué to Hitler. Jodl expressed the view that "under no circumstances must the landing operation fail. The political consequences of a fiasco might be much more far reaching than the military . . . the landing must be considered a desperate venture, something which might have to be undertaken in a desperate situation but on which we have no necessity to embark at the moment." Jodl also indicated that "England can be brought to her knees by other methods" ⁹⁷ These "other methods" were later described as combined operations with Italy, operations in Egypt or possibly Gibraltar, and the use of Italian air forces and submarines in the current operations (i.e., the air and sea blockade against the British Isles).

Also on the 13th, Goering ordered "operations are to be directed exclusively against the enemy air force, including the targets of the enemy aircraft industry."⁹⁸ Basing his decision on results of early radar installation attacks, Goering further decided that it was doubtful any additional effort was worthwhile. Only two minor attacks later occurred on radar sites.

Activities through the 18th—marking the end of the first phase—followed essentially the same pattern. While attacks were directed against Fighter Command sector airfields and supporting bases, generally only limited damage was inflicted with most facilities back in service within a few hours. Luftwaffe sortie rates remained high, reaching 2,000 on the 15th when forces

of Luftflotte 5 joined in the battle for the first and only time. For the most part, considering the identified objective to reduce the effectiveness of Fighter Command, only limited effort was directed against Fighter Command bases, facilities, and command and control capabilities.

The Germans believed it was sufficient to draw up the fighter forces and kill them in the air. They were willing to believe that the strategy was working, but losses proved otherwise. By the 18th, Luftwaffe losses from all causes stood at 350 versus 171 for Fighter Command. Fighter Command's ability to generate defensive sorties remained essentially unchanged. An intelligence report on the 18th "estimated that the British had lost 770 fighters in the period from 1st July to 16th August and that only 300 were still operational, whereas in reality 214 had been destroyed and seventy-one damaged in combat, and more than 600 were still operational."⁹⁹

The highest total losses of the battle occurred on the 18th; 68 British and 69 German. On the 19th Goering, during a meeting at Karinhall, declared: "we have reached the decisive period of the air war against England. The vital task is to turn all means at our disposal to the defeat of the enemy air force. Our first aim is the destruction of the enemy's fighters. If they no longer take to the air, we shall attack them on the ground, or force them into battle by directing bomber attacks against targets within range of air fighters."¹⁰⁰ But, Goering also insisted that in addition to the destruction of the RAF fighters, "at the same time, and on a growing scale, we must continue our activities against the ground organization of the bomber units. Surprise attacks on the enemy aircraft industry must be made by day and by night."¹⁰¹

The main effort was planned against 11 Group's airfields, mostly around London. Luftflotte 2 conducted day raids and Luftflotte 3 flew at night. The theory was that Luftflotte's bombers could lure the Fighter Command aircraft into decisive battle within range of the Me109s. Therefore, daytime

forces were deployed with a protective ratio of three or four fighters for every bomber.

Additional decisions made during the meeting on the 19th resulted in the Ju87 Stuka's withdrawal because of excessive losses. This decision was also justified as a measure to conserve them for support of the invasion forces. Despite a similar high loss rate, Goering refused to allow withdrawal of the Me110s. Instead, he directed that Me109s would be tasked to escort the Me110s as well as the bombers. Additionally, and in spite of the fact that the Me109 accounted for the majority of the RAF kills, Goering would persistently blame the Me109 pilots for lack of aggression throughout the campaign. This even led to the replacement of several senior fighter unit commanders. Finally, the decision not to press attacks against the radar facilities was reaffirmed.

Phase two. Phase two did not immediately follow the first because of reorganization (concentration into the Pas de Calais) of additional fighter forces and because of bad weather. Thus, after a five-day delay the offensive resumed on 24 August with 1,030 daytime sorties. The Luftwaffe concentrated efforts on airfields with major attacks on Manston, Hornchurch and North Weald.

Fighter Command lost 23 aircraft destroyed and six damaged compared with a loss for the Luftwaffe of 35 destroyed and four damaged. New tactics were recognized by both sides; fewer bombers and more fighters in the German formations, and a continued reluctance by the British to do battle with the German fighters. AVM Park had ordered his pilots to accept combat with German fighters only if Fighter Command's sector airfields were threatened. However, over the next several days, continued focus by the Luftwaffe on 11 Group Sector airfields began to take a toll both in air and ground losses and resulted in reduced operations from these critical fields. "On the 31st, Luftflotte 2 launched its heaviest attack of phase two; 1,450 daylight sorties aimed primarily at five aerodromes, Biggin Hill, Debden, Hornchurch, Croydon and Eastchurch."¹⁰²

Persistence in the campaign was paying off—Biggin Hill was attacked six times in three days—and by early September it was becoming clear that the RAF was losing the attrition battle. For the duration of phase two, 24 August to 6 September, the RAF lost 273 fighters in combat plus 49 damaged. The Germans lost 308 fighters and bombers with 62 damaged. The German concentration on Fighter Command airfields was, as the Luftwaffe had hoped, forcing the RAF fighters into combat. The resultant war of attrition was one that Fighter Command could not hope to win. The higher concentration of fighters in the German raids reduced the edge that Fighter Command had previously enjoyed: the Germans could afford to trade Me109s, one for one, with Spitfires and Hurricanes! "It is no coincidence that Fighter Command came closest to defeat in this period. Six of the seven sector airfields were extensively damaged, the telecommunication links to and from the operations blocks proving especially vulnerable."¹⁰³

DESPERATE POSITION OF THE RAF (At the end of Phase 2)

September stood to be the culminating point for Fighter Command. Air Marshal Dowding wrote, "the rate of loss was so heavy that fresh squadrons became worn out before convalescing squadrons were ready to take their place."¹⁰⁴ By the end of the first week in September, Fighter Command was in a desperate situation.

Between 8 August and 6 September, 657 fighters had been lost. By using replacement aircraft (from repairs and storage) Fighter Command managed, until 1 September, to keep frontline strength at about the same levels as were available at the end of July. But, those reserves had dwindled from 518 Spitfires and Hurricanes (in maintenance and storage) on 6 July, to only 292 by 7 September.

British production figures were no more encouraging. In the last week of August, for example, only 91 Spitfire and Hurricanes were produced while losses reached 137 destroyed and 11 seriously damaged. With losses at these rates,

Fighter Command estimated that reserves would be exhausted in three weeks followed by steady depletion of the frontline squadrons. This, of course, would be accelerated if the Luftwaffe could successfully knock out critical production facilities.

Pilots. The critical problem faced by Fighter Command was the loss of trained fighter pilots. In phase one of the campaign (8 to 18 August), the RAF lost 154 pilots (killed, seriously wounded or missing). Only 63 new fighter pilots were available from the training schools for the same period. During phase two, 24 August to 1 September, the figures were even worse as losses reached 231 pilots, or about 20 percent of the total combat strength of the command! Combat strength in the month of August decreased by almost one-third, from 1,434 to 1,023. The squadron average fell from 26 to 16 operational pilots. Naturally, combat experience was similarly reduced.

In July and August, roughly one-fourth of the squadron leaders and one-third of the flight leaders had been killed or removed from flying due to injuries. Experienced pilots numbered no more than 500—less than one-half of Fighter Command's strength—with the remainder often having less than 20 hours flying time on fighters. Daily sortie rates were high and it was not uncommon for pilots to fly three and four sorties a day. Stress was also high. "One squadron, No. 85, based at Croydon, had fourteen of its eighteen pilots shot down in two weeks, two of them twice."¹⁰⁵

On the ground the persistence of the German attacks was beginning to take effect. The RAF was faced with the real possibility of withdrawing 11 Group to bases north of London. "Air superiority over Kent and Essex, at least for a week or two, was in the Luftwaffe's grasp; the aim of *Adlerangriff* was near to being realized."¹⁰⁶

CONDITION OF THE LUFTWAFFE
(At the end of Phase 2)

The Luftwaffe, too, was experiencing difficulties at this point in the campaign. Crew fatigue was evident because the Luftwaffe did not establish a system of pilot rotation as had the RAF. Because of the requirement for extensive escort duties most fighter pilots flew two sorties a day for weeks at a time. Aircrew losses were high, reaching five losses for each British loss. This problem became so serious Goering ordered that only one officer be allowed to fly per aircraft, severely reducing the experience level "airborne" within the bomber forces. Only 97 percent of the pilot requirement could be met for the *serviceable* Me109s. Material losses were also high; in the two week period beginning 24 August some 545 aircraft of all types were lost—200 more than British losses for the same period. By 7 September, Luftflotten 2 and 3 fielded 623 operational Me 109s. This was a reduction of about one-eighth the available strength at the beginning of phase one.

Production of the Me109 (190 per month) was about one-half the British production rate for the Spitfire and Hurricane. Reserves were sufficient to keep most fighter units at 80 percent strength and bombers at 86 percent. While losses of the bombers and Me110s should be considered high, this too was changing. "As the inexperience of the R.A.F. squadrons increased, so also would the success of the German bombers and twin-engined fighters, whose crews were, thus far at least, more easily replaced with experienced personnel."¹⁰⁷ Therefore, the Luftwaffe ended Phase two with a capability to field 623 operational Me109s against a force of only 350 RAF fighters.

Fighter Escort. Fighter escort presented an interesting dilemma for the Germans. On the one hand, the bombers were extremely slow (190 mph) and operated at medium altitudes of 13,000 to 15,000 feet, while the optimum fighting speed for the fighters was about 300 mph at altitudes above 20,000 feet (Me109). So, in close escort the fighters assumed a position of relative disadvantage to intercepting RAF fighters. On the other hand, if the bombers proceeded in daylight without fighter protection, the losses would be unacceptably high. By mid-August a compromise was reached between

the bomber and fighter commanders. One gruppe (48–64 aircraft) of fighters would provide close escort for each geschwader (144–256 aircraft) of bombers. Another gruppe of fighters would arrive over British defenses ahead of the bombers and with optimal positioning, hopefully, could intercept the enemy fighters before they could reach the bombers.

Changing Strategy. As might be expected, there was much dissatisfaction as to the results of Phases One and Two. Not only were losses of men and materials high but also there was significant displeasure generated within the fighter forces because of the inability to draw the British fighters into a decisive conflict. Adolf Galland wrote, "we fighter pilots, discouraged by a task which was beyond our strength, were looking forward impatiently and excitedly to the start of the bomber attacks [on London]. We believed that only then would the English fighters leave their bases and be forced to give us open battle."¹⁰⁸

The bombing of London, as a strategic target to draw Fighter Command into battle, was an idea now growing in favor. In fact, prior to *Adlertag*, Fliegerkorps II had proposed just such an approach. The chief of the Air Staff Generaloberst Jeschonnek also favored the idea and the original general staff plan for *Adlerangriff* reflected this. But Hitler had forbidden attacks on London and reserved to himself the decision to allow such an attack. Now, however, the Luftwaffe was up against a familiar, pressing priority: *time*.

The High Command (OKW) initially set 15 September as the date for the invasion. The Naval Operations Staff informed OKW on 30 August that it was not possible to complete the necessary naval preparations by that date. The German Navy argued that insofar as "air operations had not succeeded in eliminating the ability of the British naval and air forces to take effective action in the English Channel and against the jump-off coastline, and that in view of the objectives set in the current German air attacks these conditions could not be created soon."¹⁰⁹ Thus, a postponement until 21 September was made.

However, because gaining air superiority was still the necessary prerequisite for the invasion, on 3 September, Goering told Kesselring and Sperrle, "We have no chance of destroying the English fighters on the ground. We must force their last reserves . . . into combat in the air." This, it should be recalled, runs exactly counter to the doctrine of the *Luftkriegfuhrung* and to General Wever's assertions to the Air War Academy students during the 1936 opening ceremonies!

It was true that the British were heavily defending their sector air stations, but now the Luftwaffe felt compelled to press the RAF into a final, decisive encounter. The argument ran that if the British would defend their airfields, then they would defend even more vigorously their capital. Since London was within the range of the Me109, and since this was also a geographically limited area, the Luftwaffe could more easily concentrate their fighter forces for the kill.

Intelligence Analysis. Chief of Intelligence "Beppo" Schmid had reported British aircraft serviceability for the end of August "as low as 100 fighters," when in fact operational strength stood at 672 on 23 August.¹¹⁰ A more significant intelligence failure, however, was the fact that the German analysis never considered the main problem then facing Fighter Command: pilots. "The shortage of trained pilots was Dowding's Achilles' heel," yet German analysts continued to believe their original conclusion made on 16 July.¹¹¹ (See *Appendix 4*.) This was "in spite of the fact that intelligence had established that bomber pilots were being called in to replace losses."¹¹²

The Switch to London. Sperrle strongly disagreed with Goering's plan, believing correctly that the British forces were still too strong and could likewise concentrate *too strongly* their own fighter forces for the defense. He favored continued attacks on the airfields. But, Goering's intent was to force the British to make just such a concentrated defense. This time, Kesselring sided with Goering and the decision was made to destroy both the enemy fighter defense and a vital economic center; the London docks.

Considering Hitler's earlier directives against the bombing of London, such a decision would have been academic had not the British launched several night raids upon Berlin in response to an accidental bombing on parts of London on 24 August. Hitler, fearful for his own popularity at home, and also angered by the British attacks, agreed, on 31 August, to reprisal attacks on London. On 4 September Hitler publicly announced "when they declare that they will attack our cities in great strength, then we will erase theirs."¹¹³ Goering, however, did not believe that reprisal attacks on London would achieve the desired results, insisting that the British will was too strong. But, Jeschonnek, supported by much of the air staff argued in favor of the new policy.¹¹⁴ Thus, on the night of 5–6 September, the "Blitz" began.

It is probable that Hitler would have agreed to the London bombing even without the excuse of retaliation for the British raids. He retained serious doubts about the feasibility of the invasion; doubts shared by many within the military leadership. The plan for Sea Lion was initially to encompass a 150-mile front along the British coastline, but this scheme had already been significantly reduced in scope because of concerns that the Navy could not fulfill the transport and supply the requirements. Still, Hitler hoped that the Luftwaffe could inflict sufficient economic hardships upon the British to force their capitulation. Also, it has never been convincingly shown (even his military commanders later wrote of their doubts in this regard) that he was ever fully committed to the invasion. He was, after all, already establishing the groundwork for Operation Barbarossa in the east! "By the beginning of September, therefore, both the Fuhrer and the Luftwaffe high command believed that the time was ripe for the adoption of a 'Douhetian' policy of bombing designed to bring about victory independently of the other two services."¹¹⁵

The main area of disagreement at this point in the campaign was that of targeting. The majority of the air leaders wanted large scale attacks on residential areas. But Hitler, perhaps already aware of the dangers in such provocation—as

evidenced by the retaliatory bombing of Berlin by the British following the accidental bombing of London on 24 August—initially refused. However, by 7 September, the industrial areas in and around London and especially the docks area, did become the prime targets for the Luftwaffe bombers.

Phase Three. On 7 September, Goering assumed temporary, direct command of the air operations. The third phase would begin with a daylight attack on the London docks by 650 bombers and over 1,000 fighters. Substantial damage was achieved on the docks, the Woolwich arsenal and oil installations and factories east along the river. Air losses were 28 RAF with 11 damaged; and, 36 Luftwaffe with 11 damaged. The Me109s performed their mission quite well, accounting for 25 of the Hurricane and Spitfire kills and damage on ten more for an exchange of 14 Me109s with two damaged.

The Germans' change of strategy was working well because their main aim—draw Fighter Command forces up for the final kill—was apparently being achieved. But, from the British viewpoint, and as Churchill was to later write, "If the enemy had persisted in heavy attacks against the adjacent sectors (airfields) and damaged their operations rooms or telephone communications, the whole intricate organization of Fighter Command might have been broken down. . . . It was, therefore, with a sense of relief that Fighter Command felt the German attack turn on to London on September 7th, and concluded that the enemy had changed his plan. Goering should certainly have persevered against the airfields . . . [By departing from the classic principles of war] . . . he made a foolish mistake."¹¹⁶

At this point (7 September and onwards), Fighter Command had indeed been saved from defeat on the ground, *but* the German strategy was actually working and the RAF could still be defeated in the air. Subsequently, OKW would issue "new instructions for the attack, calling for a systematic destruction of London."¹¹⁷ The tasks were divided between Luftflotte 2, conducting daylight raids against key military and commercial targets, and Luftflotte 3,

bombing the areas of government and the docks. Once again, the Luftwaffe failed to apply sufficient mass and persistence to their attacks on London. This is not to say that large raids did not occur.

From 11 to 14 September, London was attacked by two major (over 200 bombers) daylight raids and two minor ones, as well as attacks every night. Additional day raids were also carried out on Southampton (twice), Portland, Brighton, Eastbourne, Canterbury, Great Yarmouth and Norwich. All raids that *could* have focused on the sector airfields around London. *If the intent was, in fact, to draw fighters into combat* then feints were unnecessary and secondary targets inconsequential. Furthermore, not only were some of these targets outside the range of the Me109 (Norwich for example), but also such attacks could only force Fighter Command to remain somewhat dispersed to protect these areas!

The 12 September war diary entry of the Naval Operations Staff would reflect—"the air campaign is being conducted specifically as an air offensive without regard for the current requirements of naval warfare . . . the fact therefore remains that chances for the execution of the landing operations have remained uninfluenced by the effects of the intensified air offensive . . ." ¹¹⁸ But it was the belief of Admiral Raeder, and expressed in a 14 September conference with Hitler, that the air attacks against England, and in particular those against London, must continue without interruption. And, provided suitable weather conditions existed he also believed that those attacks should continue at the expense of the preparations for Operation Sea Lion. Raeder also advocated an increase in the "intensity of the attacks without regard for Operation Sea Lion, because they might bring about a decision of the war." ¹¹⁹ It is not clear here, however, whether Admiral Raeder truly believed this, or if he was merely expressing what he expected Hitler wanted to hear. Certainly, at the time, Hitler would have been most receptive to any proposal that would have reduced the risks involved in the planned invasion. But, in regard to the cancellation of Sea Lion, he thought the invasion "should not

be canceled, since cancellation would considerably relieve pressure on Britain." ¹²⁰

Escort Problems Again. It was at this point in the campaign that Goering, as the "temporary operational commander," would make a fateful tactical decision. Losses due to the daylight operations, both bomber and fighter, had been increasing. The fighter commanders complained that close escort of the slow bomber formations was too rigid and precluded early engagement of the RAF fighters. The high altitudes necessary to avoid antiaircraft fire and slow speeds forced the fighters to weave continuously to maintain position with the formations, thus "giving the R.A.F. fighters the advantage of surprise, initiative, altitude, speed, and above all, fighting spirit." ¹²¹

The bomber commanders insisted on additional close escort due to increased losses. Ultimately, Goering sided with the bomber camp. It would appear that to Goering, at least, the bombing of London was becoming more important than the objective of destroying Fighter Command as the prelude to invasion. On 9 September it was "ordered that the first duty of the fighters was to protect the bombers, not to attack the enemy, and that if substantial enemy opposition was met, the German aircraft should disengage rather than risk loss." ¹²²

During the nine days of Phase three the RAF lost 131 fighters with 37 damaged. This amounted to a daily loss rate of 14 compared to loss rates averaging 19.5 during Phases one and two. Most importantly, however, the loss rate experienced during Phase three could be made up by the output of new aircraft! Total combat losses for the Luftwaffe in Phase three stood at 174 destroyed and 69 damaged. The total losses from all causes saw the Luftwaffe with 321 aircraft destroyed or damaged compared to losses of 178 for RAF Fighter Command.

Additionally, the respite experienced by the RAF airfields allowed the first break in over ten days for the pilots of 11 Group to stand down from conditions of constant readiness during the daylight hours and in many cases also allowed units to enjoy day-

long rests (a pleasure not experienced since mid-July). So great was the effect on Fighter Command that from a state of near exhaustion there would emerge a new vigor within the squadrons; a new vigor that was to prove decisive in the air battles on 15 September, the day that is celebrated as Battle of Britain Day.

The Final Effort. The Luftwaffe High Command fully expected the missions scheduled for 15 September to be the decisive blow. It seems that the leadership, from Hitler on down, optimistically believed that Fighter Command had been broken in spirit, if not materially. RAF resistance to the attacks on 11 and 14 September had been slight; owing, in fact, to errors in coordinating intercepts. Also, a significant number of RAF fighters was being destroyed in air combat in return for acceptable Luftwaffe losses.

Goering had stated on 5 September, "an invasion was probably not necessary," while on the following day Hitler voiced himself of the opinion that "Britain's defeat will be achieved even without the landing."¹²³ Additional inputs through German intelligence operating in the United States indicated that the British morale was low, that Luftwaffe attacks were having devastating effects and that, in the opinion of US military authorities, the British would not be able to hold out. Hitler was further quoted on the 14th, in discussions with his military chiefs, "There is a great chance of totally defeating the British."¹²⁴ Needless to say, there was considerable optimism within parts of the German command.

The attacks on 15 September involved almost 1,300 sorties against London (300 bomber and 1,000 fighters) and another raid of 30 aircraft against Portland and the Southampton aircraft works. Diversionary maneuvers scheduled by Luftflotte 2 failed for unknown reasons and as a result 11 Group was able to commit *all* of its squadrons with precision. Additionally, the resources of 12 Group were called on for support. Thus, the London raid was met by a force of at least 170 Spitfires and Hurricanes, with the luxury of operating from bases close to London *and* which were not under attack.

Fighter Command downed 58 and damaged 25 German aircraft including 26 fighters lost and 8 damaged. Psychologically, the blow to the Luftwaffe was devastating. The Luftwaffe could cope with the material loss, but the clear ascendancy on this day of the "beaten" RAF was a bitter lesson indeed.

In the Aftermath. The Luftwaffe fell immediately into a period of intensive blame laying but initiated little inward critical analysis of the factors leading to the defeat. The bomber crews blamed the fighters for lack of protection. The fighter units reiterated the disadvantages under which they were forced to operate. On the 6th Goering again openly blamed the fighter forces: "The fighters have let us down."¹²⁵ But no blame was placed where it belonged—on the leadership. The fighters were simply identified as "lacking in aggression." In fact, the Me109 and its pilots had proven superior in most one-on-one air combats with the British fighters. The difficulties in escorting the slow bombers, thus giving up the fighter's tactical advantages of speed and altitude, operating at the very edge of their operational range, and the difficulties of scheduling, and airborne assembly seemed of limited importance in the German self-analysis.

It had long been recognized (since the days of the Condor Legion) that lack of suitable range was a critical limitation of the Me109. No mention of this is apparent in German self-criticism of the time, even though Erhard Milch had recommended months before the battle that cheap drop tanks should be developed. Milch's proposal "had been followed up too late, with the result that the crews were untrained in their use and reluctant to employ them."¹²⁶ In fact, a month earlier on 15 August at a meeting with the three luftflotten generals, Goering had criticized the fact that the fighters were "refusing to use drop tanks unless they were armor-plated."¹²⁷ Both Milch and Jeschonnek were present at the meeting.

British "superiority" on the 15th was probably due to the proximity of the RAF airfields to the battle, the freshness of the crews (the airfields were not attacked for the

two days previous) and to the fact that, because there was no effective diversionary raid, 11 Group and parts of 12 Group could also be assembled for maximum effect.

German attacks continued throughout the month with sporadic effectiveness in attempts to “wear down the enemy,” but with none of the strength launched on 15 September. Major raids were flown on 18 (on London), 25, 26, and 27 September and the last major daylight raid of the war, on 30 September. The 30 September mission saw 173 bomber and 1,000 fighter sorties flown against targets in the London area. Luftwaffe losses were 43 aircraft with 11 damaged while the RAF lost only 16 with an additional 17 damaged; marking the first day of the campaign where RAF fighters significantly outperformed their Luftwaffe adversaries. Spitfires and Hurricanes accounted for the loss of no less than 27 Me109s, and an additional four damaged while losing just seven RAF aircraft destroyed! Adolf Galland, following his 40th British kill, told Goering on 27 September, “in spite of the heavy losses we are inflicting on the enemy fighters, no decisive decrease in their number or fighting efficiency was noticeable”¹²⁸

Bombing raids after the debacle of 30 September steadily decreased and massed formations virtually disappeared. By early October, the Luftwaffe “was glad of the excuse of a deterioration in weather conditions to call off daylight operations; it was Goering himself who made the decision. The Battle of Britain had been lost to the Luftwaffe.”¹²⁹ There followed a brief period where the Luftwaffe employed fighter bombers, Me110s and a new version Me109E4, capable of carrying up to a 500-pound bomb load in high altitude bombing operations. Experiments with this tactic had begun in mid-August. While little more than an annoyance factor, the fighter bombers, operating between 25,000 feet and 32,000 feet (above the altitude capability of the Hurricane and at the very limits for the Spitfire), were on the verge of virtual immunity in the air.

These high altitude operations had the added benefits of evading both the radar and observer corps. Even if detected the British had just 20 minutes to intercept. The great inaccuracy of the bombing, however, coupled with the low payloads made such bombing operations inconsequential. But, because the Spitfires were operating outside their optimum envelope, the Germans were actually inflicting more air losses than they themselves experienced.

On 27 September, for example, Fighter Command had to fly 1,007 sorties to score 9 kills. This compared to 974 sorties to kill 67 German aircraft on 15 August.¹³⁰ As time progressed, however, losses began to mount, reaching 103 Me109s for the month of October. The efficacy of the missions grew suspect as the opposition from the RAF fighters steadily increased, and by December the high-altitude missions were ceased altogether.

CONCLUSIONS

Certainly the leadership and the valiant efforts of the men and women, and especially the skill and heroism of the pilots of Fighter Command cannot go without mention. They were defending their homeland, from their homeland and over their homeland. The effectiveness of British tactics; the Big Wing formations (Leigh-Mallory) or squadron formations (Park), and the decision by Park to go “for bombers only” can be debated.

Clearly the British operated at a disadvantage in terms of aircraft performance, and the numbers of aircraft available (frontline fighter on fighter). Also, an additional disadvantage for the British was actually the location of London itself—within range of the Me109—which forced Fighter Command to defend forward using airfields that might otherwise have been abandoned for safer havens outside the range of the Luftwaffe fighters. But these problems could be offset somewhat with early warning through radar, and to a lesser extent through inputs from British intelligence and ULTRA. Thus the British could, within reason, choose the timing and tempo of their defensive

operations. Park and Dowding chose not to fall prey to the German strategy by refusing to be drawn into a final, decisive engagement.

In many ways the development of the German Air Force prior to the Battle of Britain was flawed conceptually, doctrinally, and by the competing demands of its leadership. With few exceptions, the Luftwaffe was equipped with outdated equipment; especially the bombers (i.e., Ju87, He111, Do17, and Me110). Operationally, the Luftwaffe was trained and organized to support the land forces, not to conduct independent operations. But the organization and structure of the Luftwaffe had proven highly effective in previous combat experiences that dated back to the days of the Condor Legion. So, in the optimistic spirit of the day, the Germans would probably have said why argue with success?

The Luftwaffe leadership, with some admitted optimism, was quite willing to accept the success of previous victories as proof of their own beliefs. These factors do not in themselves, however, justify the failure of the Luftwaffe to meet its identified and assigned objectives during the battle. It does, perhaps, provide some insight into why the Luftwaffe proved unable to pursue those objectives to a logical conclusion. One simple question remains; was the RAF Fighter Command sufficiently strong to prevent a *persistent* Luftwaffe from gaining air superiority over *at least* southeastern England?

The critical faults must lie in the conduct of the campaign by the Luftwaffe which, at least twice, held victory in hand, yet failed to gain that victory. The point is simply this, all efforts should have been directly linked to the primary objective, which in both cases they were not. As proponents of Clausewitzian-style theory, and purveyors of the Principles of War—even of Douhet—the Luftwaffe here failed miserably in the application of air warfare. It should be borne in mind, however, that major air operations against Britain were discontinued not "because they were recognized as hopeless or because they could no longer be justified in terms of the

losses incurred . . ." they ceased "by order of top-level command because the German Air Force was needed for the forthcoming war with Soviet Russia."¹³¹

In the final analysis, perhaps the Germans could have won. Perhaps, if they had aggressively pursued *either* campaign strategy they could have won, but that will always remain conjecture.

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88. Ibid., 324.
89. Klee, 179.
90. Ibid., 180. (Note: This date closely coincides with the plans for Operation Barbarossa, which began 22 June 1941); and Richard Suchenwirth, *Historical Turning Points in the German Air Force War Effort* (Maxwell AFB, Ala.: USAF Historical Division, 1959), 67.
91. Cooper, 132.
92. Air Ministry, 79.
93. Cooper, 132.
94. Ibid.
95. Ibid., 139.
96. Ibid., 140.
97. Warlimont, 110.
98. Cooper, 142.
99. Ibid.
100. Ibid.
101. Ibid., 150.
102. Ibid., 145.
103. Michael I. Handel, *Intelligence and Military Operations* (Portland, Ore.: International Specialized Book Service, 1973), 439.
104. Bekker, 170.
105. Cooper, 148.
106. Ibid.
107. Ibid., 149.
108. Ibid., 152.
109. Klee, 186a. (Note: Klee also argues that what the Navy actually wanted was air supremacy, 186–88).

110. Air Ministry, 85.
111. Handel, 436.
112. Air Ministry, 85.
113. Cooper, 152.
114. Samuel W. Mitcham, Jr., *Men of the Luftwaffe* (Novato, Calif.: Presidio Press, 1988), 104.

115. *Ibid.*, 153.
116. *Ibid.*, 107.
117. *Ibid.*, 154.
118. Klee, 190–91.
119. *Ibid.*, 191.
120. *Ibid.*
121. Air Ministry, 86.
122. Cooper, 154. (Note: No corroborating support for this order has been found by this author.)

123. *Ibid.*, 155.
124. *Ibid.*, 155–56.
125. *Ibid.*, 156.
126. Irving, 98; and Wood, 29.
127. *Ibid.*, 100.
128. Cooper, 158.
129. Air Ministry, 86.
130. Cooper, 159.
131. Suchenwirth, 69.

ADDENDUM

LUFTWAFFE AIR INTELLIGENCE DURING THE BATTLE OF BRITAIN

INTRODUCTION

The performance of Luftwaffe air intelligence prior to and during the Battle of Britain was seriously flawed and perhaps doomed it to failure from the outset. British air intelligence was equally guilty of serious miscalculations during this period, but by comparison the Luftwaffe was ill prepared for the task at hand. As will be seen, poor organization and staffing, low esteem of the Luftwaffe's intelligence corps, and the Nazi "system" itself (a system that resulted in an almost complete absence of coordination amongst the various intelligence agencies) all combined to help ensure defeat.

ORGANIZATION

Air intelligence was subordinated to the operations staff at the major levels of the Luftwaffe. (See Appendices 6 and 7.) At the General Staff level, the 5th Abteilung (Detachment) served as the senior intelligence agency. A similar position was retained at the air fleet (Luftflotte) level. It is also significant to note that no intelligence organizations were stationed below the fliegerkorps until 1944.

Because of the organizational subordination of intelligence to the operations staff, it was very often the operations staff officers themselves who would prepare intelligence assessments of the situation. Their reports sometimes included inputs from the intelligence departments but most frequently they did not. This was apparently not considered unreasonable because these "intelligence assessments" also reflected the Luftwaffe's future "operational intentions, objectives or missions."¹

In effect, intelligence officers were perceived as "maids of all work," and were manned with low-quality personnel whose

inputs were considered of limited usefulness to the conduct of future operations.²

Knowledge is power. Nowhere is this axiom more prevalent than within the wartime German state, within the Wehrmacht and of particular importance here, within the Luftwaffe. More than a dozen intelligence collection agencies existed outside the realm of the armed forces.³ All of these agencies competed with one another; none fully cooperated with the others and only at the very highest level—Hitler—did the potential for a true picture exist. The result was information passed "largely vertically, and seldom horizontally." Even within the Luftwaffe's own intelligence agencies the rivalry and mistrust was so great that the 3d Abteilung (signal intelligence; also under the operations staff) rarely coordinated with the 5th Abteilung. The "friction and rivalry between [the two detachments] led directly to erroneous assessments."⁴

Chastise the bearer of unhappy tidings. If not the motto of the Nazi regime, certainly this was the apparent attitude of many individuals, including Hitler, Goering and even Jeschonnek. All three demonstrated a dislike of intelligence reports that did not fit their own personal visions. Intelligence analysis was often watered down to reach conclusions more acceptable to the intended reader. Thus the reputation of the 5th Abteilung's chief, Col "Beppo" Schmid, evolved as one renown "within the Luftwaffe for garnishing his reports to make them more palatable to Goering."⁵

Generally speaking, it was the nature of the German organizations assigned the tasks of collecting information, analysis and the subsequent dissemination of intelligence that proved the fatal flaw. Jealously guarded, intelligence meant power to the chiefs of the various agencies. Intelligence, when made

available to military commanders, was often looked upon with distrust and deemed of limited usefulness. Or, conversely, the reports were selectively believed to their fullest extent. The failings of the system "were so intimately bound up with the political structure of the Third Reich that only a change in regime could have made any fundamental difference . . . the failings of German intelligence can nearly all be traced to the nature of the intelligence organization that had been created."⁶

SIGNALS TRAFFIC AND RADIO DISCIPLINE

In addition to the much touted Enigma (ULTRA) intercepts, British intelligence gained considerable information from other, low-grade Sigint sources. The German communications "were of four types: high-grade ciphers encrypted by Enigma; low-grade W/T traffic, usually to and from aircraft; low-grade radio telephone traffic; and other signals traffic such as navigational beacons."⁷ The problem for the Luftwaffe was that radio discipline of the German bomber and fighter units was relatively poor. Before the war, the bomber and transport aircraft used standard unit call signs. This allowed the RAF to develop a fairly accurate picture of the German air order of battle. After the war began, although the codes were changed, the previous intelligence already amassed by the RAF allowed most operational units to be reidentified by the end of 1939.

By the summer of 1940, RAF exploitation of low-grade sources had increased in efficiency. Intercepts of transmissions by "the German air traffic control service gave early warning of the departure of aircraft, and direction-finding often revealed the bases involved." In addition, combining this information with the low radio discipline of the flying units enabled "frequent early and accurate guesses of the units taking part in a raid."⁸ This later proved operationally significant because the RAF signals interception units "could, on occasion,

determine where enemy aircraft were forming up for a raid outside radar's detection range, give the altitude of the aircraft, and indicate the type of aircraft in the formation."⁹ More importantly, the British signals intercept units established direct telephone links with RAF Fighter Command's Group and Sector headquarters.

EARLY STUDIES

The first major study and analysis of British "air power and economic capabilities" was produced by the 5th Abteilung from January to June of 1939.¹⁰ The study was initiated by Goering and code-named "Studie Blau" (Blue Study). Although the study was conducted and directed by Colonel Schmid, Goering also appointed Milch, Udet and Jeschonnek as permanent members of the study group. Civilian experts from fields such as industry, economics, foreign trade, technology, politics, etcetera, were also enlisted to provide specialized inputs from their areas of expertise. This group operated with relative efficiency and cooperation when compared to studies conducted later in the war. Meetings were held once or twice weekly and were conducted in the form of "lectures, discussions, and interrogations."¹¹

On 2 May 1939, Colonel Schmid issued a report (presumably this was based on knowledge gained during the then ongoing development of Studie Blau) that concluded France and Britain would not "catch up with the major advance in the expansion of the air forces achieved by Germany during the next 1-2 years."¹² Schmid also believed the Western powers could only match Germany's lead in the "technical development of fighters." In other words, they could design, but not produce a superior fighter capable of effecting the outcome of a war in 1939-1940. He believed the lead time required for production placed Germany two to three years ahead in fighters and even more in bombers! Furthermore, Schmid thought the British defenses were inadequate to defend anything more than the general areas

around London. This would leave the rest of England open to attack.

Schmid's report gave no credit to the British radar systems even though they had already been detected by General Martini's 3d Abteilung. This omission presumably led to the further conclusion that the British defense of their island would pose a greater problem than that facing the Luftwaffe in the offense. The British were being forced to rely on ground observation, by the observer corps, to detect incoming German raids. Similar conclusions were reached in the report of 16 July 1940.¹³

The 94-page Studie Blau addressed too favorably the chances of German success and as such portrayed "a mixture of truth and falsehood."¹⁴ The British guarantee, in March 1939, to defend Poland did not prevent Schmid from concluding that it was "quite possible" that in spite of these promises from the West, a war arising in eastern Europe could be localized. As with later reports, the study overestimated the capabilities of German air strength; the final conclusion stating "the German Luftwaffe is at present superior to any single European air force, and this applies not only to the numbers and quality of the equipment and armament of troops, but also to the organization, training, and especially the tactical and command side of the preparation for war in the air."¹⁵

England was considered very vulnerable from the air while at the same time the report stated that even a combined air attack by the British and French upon Germany "had only a small chance of reaching its targets." These conclusions were reached despite the fact that the German bombers would be forced to operate without fighter cover and, more importantly, could not reach most of the "critical" targets because of the circuitous routes they would have to take around Belgium and the Netherlands! The study identified the "weakest points in the overall British economy [as] its dependence on imports from abroad and on sea routes."¹⁶ Therefore the British naval and merchant

shipping ports would be especially susceptible to air attack.

Coincident with the development of Studie Blau, operational exercises conducted by General Felmy's Luftflotte 2 reached an opposite conclusion. The exercises, conducted in May 1939, were carried out in the presence of Jeschonnek, Milch and the chiefs of staff from Luftflotten 1 and 3. The German armament, training, tactics and organization described as "superior" by the 5th Abteilung were found to be inadequate in Felmy's exercises. Aircraft ranges were found to be too short, there were not enough bombers available and crew training, especially instrument flying, was inadequate.

Felmy's conclusions formed the basis of a follow-up Luftwaffe General Staff appraisal "of the 'operational objectives of the Luftwaffe in the event of a war against Britain in 1939' dated 22 May 1939. It was also pointed out that an air war against British imports could not be successful because the western and southern ports lay beyond the range of the Air Fleet Two concerned, and furthermore that terror attacks on London as the stronghold of the enemy air defense would hardly have a catastrophic effect or contribute significantly to a war decision. They would only strengthen the British will to resist."¹⁷

Colonel Schmid presented the final results of Studie Blau in a briefing to Goering only a month after General Felmy's sobering exercises. In attendance for the July briefing were "the Chief of Staff [Jeschonnek], an Under Secretary of State, the Commanding General of the Second Air Fleet [Felmy] and his Chief of Staff."¹⁸ Goering was apparently impressed with the optimism of the Schmid report; a report that both he and Jeschonnek had played a significant role in developing. Perhaps not surprisingly, opposing views were not well received, and even condemned. It was also no coincidence that General Felmy and his chief of staff were present for the

briefing (as it would be the responsibility of Luftflotte 2 to carry out any early offensive against England).

At the outset of hostilities, in September 1939, General Felmy produced another report outlining many of the Luftwaffe's weaknesses that would prove decisive in the coming Battle of Britain. He was subsequently relieved as commander of Luftflotte 2 "on Hitler's orders."¹⁹

CONDUCT OF THE BATTLE

By the late summer of 1940, with France, the lowlands and also Poland having already been overrun, the mood within the Wehrmacht and that of the political leadership was one of optimism. For the Luftwaffe, no task was too great. Ominous indicators existed however, (loss rates against the British during the air battles above Dunkirk for example) but these were either ignored or overwhelmed by the positive optimism resulting from earlier military successes. And the "weaknesses in intelligence both mirrored and contributed to a fatal overconfidence throughout the German High Command. Hitler's own conviction that the British were weak and would capitulate and accept overtures for peace, either before or after a short air offensive, was bound to affect Luftwaffe thinking"²⁰

The air of optimism remained throughout the conduct of the Battle of Britain. Assessments of raid results were almost always overstated. For example, following the raids on 17 August, Luftwaffe intelligence claimed 11 airfields permanently destroyed with another 12 severely damaged. All of these airfields were in fact operational. In a similar manner, estimates of British loss rates were grossly in error. Three and four times the actual loss rates were claimed by German intelligence during the crucial August–September time period. German losses were also high. Considerable confusion developed between the two primary Luftflotten involved in the battle—Luftflotten 2 and 3. "Kesselring claimed

that Fighter Command had been destroyed, while Sperrle claimed it had 1,000 aircraft."²¹ The optimistic view prevailed, supported by Goering, and the inaccurate intelligence estimates, and the German emphasis was soon switched to London.

Radar. Perhaps the greatest failure was the German conclusions about the effectiveness of the British radar stations. As already mentioned, General Martini's 3d Abteilung had detected the British radar before the outbreak of hostilities. To gain additional information, signals intelligence even flew collection missions using the airship Graf Zeppelin. Either General Martini initially failed to pass this information to Colonel Schmid, or Schmid and his team failed to grasp the significance of radar's potential. In any event, little emphasis was placed on sustained attacks against the British early warning system. As the battle progressed, however, Schmid did become aware that Martini's monitoring service had detected that radar information was being passed to RAF fighters by radio. For Schmid, this served to confirm his earlier conclusions and he remained convinced that the mass attacks being conducted by the Luftwaffe would overload what he considered to be an "inflexible" command and control system. In truth, massed formations of German aircraft proved far easier to detect and track.

Further supporting Colonel Schmid's flawed conclusions about radar was the effectiveness of an undetected deception plan derived from a British policy to continue transmitting from damaged radar sites. Thus, radar sites that were incapable of receiving information continued to transmit signals. The German signals intelligence was "deceived into thinking that the bombing of radar stations which was undertaken early in the campaign was ineffective"²² In concert with pilot reports that "led the Germans to believe that the vitals of the radar stations were located in bombproof bunkers," the decision was finally made to

discontinue attacks against the radar sites altogether.²³

Target Selection. The analysis of Great Britain as established by Studie Blau formed the foundation of the bomber offensive conducted during the Battle of Britain.²⁴ In addition, an "England Committee" was established to provide specialized guidance on target selection to the 5th Abteilung. The membership of the committee was similar to that established for the development of Studie Blau. Included were scientists, politicians, and also the former air attaché in London. Curiously, no engineers or economists were included on the committee. Although target lists were prepared by the 5th Abteilung, the final decisions seem to have been made on the spot by Goering and Jeschonnek.²⁵

Needless to say, considerable confusion existed within the Intelligence and Leadership communities of the Luftwaffe over the choice of targets for a strategic campaign. Intelligence weaknesses had earlier been identified when, in 1936, the director of operations of the Luftwaffe General Staff identified the lack of good intelligence as having "very great significance in a bombing war."²⁶ This director further established that the current knowledge and experience within the military was inadequate to properly identify the relative vulnerability of "technical-industrial" systems.²⁷ Thus, the selection of key centers of gravity within the British industrial, economic and military systems would be difficult, if not impossible, without the inclusion of advice from outside civilian expertise.

Throughout the Battle of Britain, a continued omission of expert advice led to "a preference for the choice of a large number of targets for simultaneous attack as a precaution, lest one important target be left out, rather than concentrating on the most important targets . . ."²⁸

One point appears to have received singular agreement. The common belief rose from the experiences of World War

One; civilian populations could be driven to panic, even revolution, as the direct result of aerial bombing. Goering and Jeschonnek obviously shared this view, as did the England Committee.²⁹ Hitler and the England Committee believed that the poorer working classes could "be incited against the rich ruling class to bring about a revolution . . ."³⁰ This ideological and sociological viewpoint pervaded the England Committee and would remain ingrained in the Luftwaffe leadership's thinking until the end of the war.

Within the 5th Abteilung, Group III was responsible for Great Britain. The group advocated "the destruction of the aircraft industry."³¹ It was believed that the industry could be destroyed by focusing on "individual places of concentration of the sub-contractors' works."³² Presumably this also included the suppliers of raw materials as the target types discussed included steel works, the aluminum and magnesium extraction of raw materials, glass factories, engine works and port installations. However, vacillation over centers of gravity and the specific target sets persisted. Somewhere between 31 and 51 target types were finally identified.

Apparently no specific priority for the destruction of the identified target types was established. By September 1940, Jeschonnek had ordered that only small-scale attacks would be allowed on these targets using just a few select crews. The focus was to be on those targets having the greatest effects upon the population. Again the dominant influence of the German belief in the "fear of aerial bombardment" is evident. Furthermore, by mid-October Goering would personally order "frequent changes of targets . . . in order to achieve the necessary effect on the population of London and to confront the enemy's defenses with a new situation."³³

CONCLUSIONS

Both sides suffered from intelligence faults. The British learned from their

failures and improved. The Germans, generally did not. Vacillation over targets, and specifically the determination of centers of gravity (the key components of the British system), persisted throughout the campaign.

The efficiency of the German intelligence network was constrained by its very substance. There were perhaps too many agencies, each with their own power base, their own “secrets,” and their own conclusions. The system further stifled the transfer of information from agency to agency. More important, however, the system stifled the transfer of timely and accurate intelligence to the war-fighting units. The major leaders, Hitler, Goering and Jeschonnek, and to a lesser degree Kesselring and Sperrle, continued in their ideological attempts to break the will of the British people through so-called terror bombing.

But, perhaps above all else, it was rampant optimism, the product of previous battlefield successes that clouded the vision of the senior leaders. It was a handful of leaders who made the key decisions. It was these same leaders who were either unwilling or incapable of synthesizing any reports that did not fit with their preconceived notions. And that's what ultimately spelled defeat.

Notes

1. Michael I. Handel, *Intelligence and Military Operations* (Portland, Ore.: International Specialized Book Service, 1973), 352.

2. *Ibid.*, 426.

3. *Ibid.*, 350–51, for a complete listing of the major intelligence agencies.

4. *Ibid.*, 426–27.

5. *Ibid.*, 427.

6. *Ibid.*, 440–41.

7. *Ibid.*, 429.

8. *Ibid.*, 433.

9. *Ibid.*

10. Paul Deichmann, General der Flieger, *The System of Target Selection Applied by the German Air Force in World War II* (Maxwell AFB, Ala.: USAF Historical Division, Monograph Series, 1955), 50.

11. *Ibid.*

12. Handel, 435.

13. See Appendix 4 of *The Battle of Britain, A German Perspective*; and Handel, 435–37.

14. Handel, 357.

15. *Ibid.*, 356.

16. Deichmann, 52. (An extensive listing of the economic analysis is available in Deichmann's paper on pages 53–58.)

17. Handel, 357.

18. Deichmann, 51.

19. Handel, 435.

20. *Ibid.*, 438.

21. *Ibid.*, 439.

22. *Ibid.*, 437.

23. *Ibid.*

24. Handel, 366.

25. *Ibid.*, 367.

26. *Ibid.*, 368.

27. *Ibid.*

28. *Ibid.*

29. Handel, 368–69.

30. *Ibid.*, 368.

31. *Ibid.*, 369.

32. *Ibid.*

33. *Ibid.*

APPENDIX 1. Directive No. 16

The Fuhrer and CINC of
the Wehrmacht
OKW/WFA/L #33 160/40 g. Kdos.

Fuhrer HQ, 16 July 1940

Fourth of seven copies Geheime
Geheime Kommandosache Chefsache!
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DIRECTIVE No. 16

Concerning preparations for an amphibious operation against England.

Since Britain still shows no sign of willingness to come to an agreement in spite of her hopeless military situation, I have decided to prepare and if necessary carry out an amphibious operation against England.

The purpose of this operation will be to eliminate the English mother country as a base for continuation of the war against Germany and, if it should become necessary, to occupy the entire island.

To this end I order as follows:

1. The amphibious operation must be carried out as a surprise crossing on a broad front extending approximately from Ramsgate to the region of the Isle of Wight, with Luftwaffe elements assuming the role of artillery, and naval units assuming the role of engineers.

Each individual branch of the Wehrmacht will examine from its own viewpoint whether it appears practicable to carry out subsidiary operations, for example to occupy the Isle of Wight or Cornwall County, prior to the general crossing, and will report its findings to me. I reserve the decision to myself.

Preparations for the overall operations must be completed by mid-August.

2. These preparations will include the creation of conditions which will make a landing in England possible:

a. The British air force must be so far neutralized, both actually and in morale, that it will offer no appreciable resistance to the German crossing operation;

b. lanes must be cleared of mines;

c. Both outlets of the Straits of Dover, and the west entrance to the English Channel in a line approximately from Alderney to Portland, must be sealed off by a dense belt of mines;

d. The coastal areas must be commanded and covered by the fire of heavy coastal artillery;

e. It is desirable that all British naval forces should be tied down in action, both in the North Sea and in the Mediterranean—here by the Italians—shortly before the crossing; efforts must be made now already by means of air and torpedo attacks to weaken as far as possible the British naval forces presently in those waters.

3. Organization of Command and Preparations. Under my command and in accordance with my general directives the commanders in chief of the three branches of the Wehrmacht will direct the operations of their forces employed in the operation.

From 1 August on, the operations staffs of the commanders in chief of the Army, the Navy, and the Luftwaffe must be within the area with a maximum radius of 30 miles from my headquarters at Ziegenberg.

To me it appears advisable for the most vital elements of the operations staffs of the commanders in chief of the Army and the Navy to occupy mutual premises in Giessen.

The commander in chief of the Army will thus have to establish an army group headquarters to conduct the operations of the landing armies.

The operation will be given the designation Sea Lion. During preparations and in the execution of the operation the missions of the three branches of the Wehrmacht will be as follows:

a. Army. Preparation of plans of operations and of a crossing plan initially for all units to be shipped in the first wave. The units accompanying the first wave will remain under Army control (under the individual landing groupments) until it is possible to subdivide their mission into responsibility for (1) support and protection for the ground forces, (2) protection of the ports of debarkation, and (3) protection for the air bases to be occupied.

The Army will also allocate shipping space to the individual landing groupments and will define the points of embarkation and debarkation in agreement with the Navy.

b. Navy. Procurement and assembly of the required shipping space at the points of embarkation designated by the Army and in accordance with nautical requirements. As far as possible use will be made of ships from defeated hostile countries.

The necessary naval advisory staff, escort ships, and other protective naval units will be provided by the Navy at each crossing area.

In addition to the protection afforded by the air units employed, naval forces will protect the flanks of the entire movement across the Channel. Orders will be issued regulating the chain of command during the actual crossing.

Another mission of the Navy is to direct the uniform disposition of coastal artillery, namely, of all naval and Army batteries which can be used against naval targets and to generally organize the control of fire.

The largest possible number of the heaviest artillery units will be so placed that they can be brought into effective action as speedily as possible to protect the flanks of the movements against hostile naval attack. For this purpose all railway artillery, reinforced by all available captured guns but minus the K-5 and K-12 batteries earmarked for counterbattery fire against shore-based hostile artillery in England, will be withdrawn from present positions and emplaced on railway turntable mounts.

In addition to the above, all platform guns of the heaviest types will be so emplaced under concrete protection opposite the Straits of Dover that they will be proof against even the heaviest air attacks. They will be so sited that they will command the Straits under all circumstances as far as their ranges permit.

The technical work involved will be carried out by Organization Todt (*a paramilitary labor organization auxiliary to the military forces*).

c. Luftwaffe. The mission of the Luftwaffe will be to prevent interference by hostile air forces. In addition airpower will be employed to neutralize coastal fortifications which could deliver fire in the landing areas, to break the initial resistance offered by the hostile ground forces, and to destroy reserves during their forward movement. These missions will require extremely close contact between the individual air units and the landing forces of the Army.

It will also be important for air units to destroy roads which could be used by the enemy to move reserves forward, and to attack naval units approaching the areas of operations while still far distant from the crossing routes.

I request recommendations on the use of paratrooper and glider and other airborne forces. The question must be examined together with the Army whether it would be wise to withhold paratrooper and other airborne forces during the initial stages as a reserve force which could be moved quickly to critical areas in the event of an emergency.

4. The Wehrmacht chief signal officer will ensure that all necessary preparations are made to establish communications between France and England.

Preparations will be made in cooperation with the Navy to lay what is still available of the 48 miles of marine cable taken up from the East Prussian canal.

5. I request the commanders in chief to submit to me as early as possible:

- a. The measures planned by the Navy and the Luftwaffe to create the conditions necessary for the Channel crossing operation (Item 2, above);
- b. Details on the disposition of the coastal artillery batteries (Navy);
- c. A survey of the shipping to be employed and of the methods of concentration and equipment. All civilian agencies participate? (Navy);
- d. Plans for the organization of air defense in the areas of concentration for troops and for equipment to be used in the crossing operation (Luftwaffe);
- e. Channel-crossing schedule and plan of operations of the Army, and organization and equipment of the first attack wave;
- f. Organization and action planned by the Navy and the Luftwaffe for the defense of the crossing movement itself, for reconnaissance, and for support during the landing;
- g. Recommendations concerning the commitment of paratrooper and other airborne forces and concerning the command of forces after an adequately large area has been brought under control in England (Luftwaffe);
- h. Recommendations for the location of headquarters for the command echelons of the commander in chief of the Army and the commander in chief of the Navy;
- i. Comments by the Army, the Navy, and the Luftwaffe as to whether and what partial operations are considered practicable prior to the general amphibious operation;

k. Recommendations by, the Army and the Navy concerning the chain of command during the crossing, while seaborne.

[Hand-initialed]

J[odl]

K[eitel]

s/ Adolf Hitler

Distribution:

Commander in Chief, Army
Commander in Chief, Navy
Commander in Chief, Luftwaffe
Wehrmacht Operations, Office
National Defense Branch

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Fifth to Seventh Copies

SOURCE: Karl Klee, *Operation "Sea Lion" and the Role Planned for the Luftwaffe*, Monograph 8-115-5 (Maxwell AFB, Ala.: USAF Historical Division, 1955), 66–73.

APPENDIX 2. Directive No. 17

THE FUHRER & CINC

FUHRER HQ1 Aug 1940
OF THE WEHRMACHT

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DIRECTIVE NO. 17

FOR THE CONDUCT OF AIR AND NAVAL WARFARE AGAINST ENGLAND

For the purpose of creating conditions for the final defeat of Britain, I intend continuing air and naval warfare against the English motherland in a more severe form than hitherto.

For this purpose I order as follows:

1. The Luftwaffe will employ all forces available to eliminate the British air force as soon as possible. In the initial stages, attacks will be directed primarily against the hostile air forces and their ground service organization and supply installations, and against air armament industries, including factories producing AAA equipment.

2. Once temporary or local air superiority is achieved, operations will continue against ports, particularly against installations for the storage of food, and against food storage installations farther inland. In view of intended future German operations, attacks against ports on the south coast of England will be restricted to a minimum.

3. Air operations against hostile naval and merchant ships will be considered a secondary mission during this phase unless particularly lucrative fleeting opportunities offer or unless such action will achieve increased effects in the operations prescribed under Item 2, above, or in the case of operations serving to train aircraft crews for the continued conduct of air warfare.

4. The intensified air offensive will be so conducted that adequately strong air forces can be made available whenever required to support naval operations against favorable fleeting targets. In addition, the Luftwaffe will remain prepared to render effective support for Operation Sea Lion.

5. Terrorization attacks as retaliatory measures will be carried out only on orders from me.

6. Intensified air warfare can commence at any time from 5 August on. The Luftwaffe will itself determine the deadline after completion of its preparations and in accordance with weather conditions.

s/ Adolf Hitler

Initialed: K[eitel]

Distribution:

CINC, Luftwaffe First Copy
CINC, Navy Second Copy
CINC, Army Third Copy

Wehrmacht High Command, Chief WFA Fourth copy

Initialed: W[arlimont]

SOURCE: Karl Klee, *Operation "Sea Lion" and the Role Planned for the Luftwaffe*, Monograph 8-1115-5 (Maxwell AFB, Ala.: USAF Historical Division, 1955), 66–73.

APPENDIX 3. Operational Orders of I Air Corps

Operational Orders of I Air Corps for the first attack on

London, September 7, 1940 From G.O.C. I Air Corps

Corps HQ

6.9.40la Br.B.Nr. 10285 g.Kdos. N.f.K.

1. In the evening

of 7.9. Luftflotte 2 will conduct major strike against target: Loge.* To this end
the following units will operate in succession: For the Initial Attack: at 18.00 one KG
of II Air Corps For the Main Attack: at 18.40 II Air Corps
at 18.45 I Air Corps, reinforced by KG 30

*Code name for London.

2. Disposition of I Air Corps Units:

KG 30 (plus II/KG 76): on right
KG 1 : central
KG 76 (less II/KG 76): on left
For target see general Appendix.

3. Fighter Cover

- (a) Purpose of Initial Attack is to force English fighters into the air so that they will have reached end of endurance at time of Main Attack.
- (b) Fighter escort will be provided by Jafu 2 in the proportion of one fighter Geschwader for each bomber Geschwader.
- (c) ZG 76 (for this operation under I Air Corps command) will as from 18.40 clear the air of enemy fighters over I Air Corps targets, thereby covering attack and retreat of bomber formations.
- (d) Jafu 2 guarantees two Fighter Geschwader to cover I and II Air Corps.

4. Execution

- (a) Rendezvous:
To be made with Fighter Escort before crossing coast.
Bombers will proceed in direct flight.
- (b) Courses:
KG 30: St Omer--just south of Cap Gris Nez—railway fork north of "Seveneae"—target.
KG I: St. Pol—"mouth of la Slack"—Riverhead—target.
KG 76: Hedin—north perimeter of Boulogne—Westerham—target.
- (c) Fighter escort:
JG 26 for KG 30
JG 54 for KG 1
JG 27 for KG 76

In view of the fact that the fighters will be operating at the limit of their endurance, it is essential that direct

courses be flown and the attack completed in minimum time.

- (d) Flying altitudes after RV with fighters:
 - KG 30: 15,000–17,000 feet
 - KG 1: 18,000–20,000 feet
 - KG 76: 15,000–17,000 feetTo stagger heights as above will provide maximum concentration of attacking force. On return flight some loss of altitude is permissible, in order to cross English coast at approximately 12,500 feet.
- (e.) The intention is to complete the operation by a single attack. In the event of units failing to arrive directly over target, other suitable objectives in Loge may be bombed from altitude of approach.
- (f). Return flight:
 - After releasing bombs formations will turn to starboard. KG 76 will do so with care after first establishing that starboard units have already attacked. Return course will then be Maidstone—Dymchurch—escort fighter bases.
- (g). Bomb loads:
 - He111 and Ju88: No 100-pound bombs
 - 20 percent incendiaries
 - 30 percent delayed-action bombs of 2–4 hours and 10–14 hours (the latter without concussion fuses)
 - Do17: 25 percent disintegrating containers with BI EL and no SD 50. Load only to be limited by security of aircraft against enemy flak. Fuel sufficient for completion of operation and marginal safety to be carried only.

5. To achieve the necessary maximum effect it is essential that units fly as a highly concentrated force—during approach, attack and especially on return. The main objective of the operation is to prove that the Luftwaffe can achieve this.

6. I Air Corps Operational Order No. 10285/40 is hereby superseded.

By order of the G.O.C.
(signed) Grauert

SOURCE: Cajus Bekker, *The Luftwaffe War Diaries* (Garden City, N.Y.: Doubleday and Co., 1968), Appendix 6.

APPENDIX 4. Intelligence Appreciation of the RAF

GERMAN INTELLIGENCE APPRECIATION OF THE RAF AND COMPARISON WITH CURRENT LUFTWAFFE STRENGTH

I. THE MILITARY VALUE OF THE RAF

a. Strength and Equipment

1. Fighter Formations

With 50 fighter squadrons each having about 18 aircraft, there are 900 first line fighters available, of which about 675 (75 percent) may be regarded as serviceable.

About 40 percent of the fighters are Spitfires and about 60 percent are Hurricanes. Of these types the Spitfire is regarded as the better.

In view of the combat performance and the fact that they are not yet equipped with cannon guns both types are inferior to the Me109, while the individual Me110 is inferior to skillfully handled Spitfires.

In addition to the above formations Blenheim squadrons are available for night fighter tasks as auxiliary heavy fighters and operated in cohesion with particularly intense searchlight defense.

2. Bombing Formations

Assuming the average squadron strength to be 20 aircraft, the 55 or 60 bomber squadrons contain about 1,150 first line bombers, of which about 860 (75 percent) may be regarded as serviceable.

This strength is divided among four types of aircraft of various series, approximately as follows:

Hampden	400
Wellington	350
Whitley	300
Lockheed Hudson	100

Comparison of these types shows that the Hampden has the best qualities as a bomber.

In addition, there is a large number of Blenheim bombers available. Most of these are in training schools but there are also some in operational units. However, in view of its performance, this type can no longer be considered a first line aircraft.

In comparison with German bombers, all these types have inadequate armor, and poor bomb-aiming equipment. However, they usually have strong defensive armament.

3. Other Formations

These include coastal formations equipped with Lockheed Hudsons (reconnaissance) and flying boats and various obsolescent types of aircraft—close reconnaissance and low-level attack aircraft designed for cooperation with the army.

These need not be taken into consideration in this report.

4. Antiaircraft Artillery (AA)

In view of the island's extreme vulnerability to air attack and the comparatively limited amount of modern equipment the number of heavy and light AA guns available (1,194 plus 1,114) is by no means adequate to ensure the protection of the island ground defenses.

The large number of efficient searchlights available (3,200) constitutes an advantageous factor in defense at night.

Only limited importance should be attributed to the numerous barrage balloons, as these can be used only at low altitudes (1,000 to 2,000 meters) owing to the medium wind velocities prevailing over the island. The balloons cannot be raised at all at appreciable wind velocities.

B. Personnel and Training

At present there are no difficulties regarding the number of men available.

From the outset the training is concentrated on the production of good pilots, and the great majority of the officers in particular are trained solely as such. By comparison tactical training is left far in the background. For this reason the RAF has comparatively well-trained fighter pilots while the bomber crews are not up to modern tactical standards. This applies to the bomb-aimers in particular, most of whom are NCOs and men with little service experience. Although there are deficiencies in equipment, the comparatively low standard in bombing accuracy may be attributed to this factor.

C. Airfields

In the ground organization there is a considerable number of airstrips in the southern part of the island and in some areas in the north. However, only a limited number can be considered as operational airfields with modern maintenance and supply installations.

In general, the well-equipped operational airfields are used as take-off and landing bases, while the numerous smaller airfields located in the vicinity serve as alternative landing grounds and rest bases.

There is little strategic flexibility in operations as ground personnel are usually permanently stationed at home bases.

D. Supply Situation

1. As regards aircraft, the RAF is at present almost entirely dependent on home production. American deliveries will not make any important contribution before the beginning of 1941.

If deliveries arriving in Britain in the immediate future are supplemented by French orders these aircraft may be ready for operations by the autumn.

At present the British aircraft industry produces about 180 to 300 first line fighters and 140 first line bombers a month. In view of the present conditions relating to production (the appearance of raw material difficulties, the disruption or breakdown of production at factories owing to air attacks, the increased vulnerability to air attack owing to the fundamental reorganization of the aircraft industry now in progress), it is believed that for the time being output will decrease rather than increase.

In the event of an intensification of air warfare it is expected that the present strength of the RAF will fall, and this decline will be aggravated by the continued decrease in production.

2. Unless an appreciable proportion of present stocks is destroyed, the fuel situation can be regarded as secure.

3. Bombs. Bomb production is limited by the method of manufacture (cast casings). However, there will be no difficulty in the supplies of bombs so long as present stocks are not used and operations continue on a moderate scale. It is believed that these stocks will be adequate for intensive operations lasting several weeks.

Most of the bombs available are of medium caliber (112 and 224 kilogram), of which a large proportion are of an obsolete pattern with unfavorable ballistic qualities (bombs with fins).

E. Command

Command at high level is inflexible in its organization and strategy. As formations are rigidly attached to their home bases, command at medium level suffers mainly from operations being controlled in most cases by officers no longer accustomed to flying (station commanders). Command at low level is generally energetic but lacks tactical skill.

II. THE OPERATIONAL SCOPE OF THE RAF

(a) For its operations the RAF has at its disposal an area of only 200 to 300 kilometers in-depth. This corresponds approximately to an area the size of the Netherlands and Belgium.

There is little possibility of Ireland being used in the system of depth owing to the lack of ground organization and the fact that once RAF units have been transferred there they cannot restore their serviceability.

In contrast the Luftwaffe has at its disposal an area extending from Trondheim, across Heligoland Bay and along the North Sea and Channel coasts to Brest with a practically unlimited zone in-depth.

(b) In view of the inferiority of British fighters to German fighters, enemy bomber formations, even with fighter escort, are not capable of carrying out effective daylight attacks regularly, particularly as escort operations are in any case limited by the lack of long-range single-engine or heavy fighters.

The RAF will therefore be obliged to limit its activity to night operations even in the event of intensified air warfare. These operations will undoubtedly achieve a nuisance value but will in no way be decisive.

In contrast, the Luftwaffe is in a position to go over to decisive daylight operations owing to the inadequate air defenses of the island.

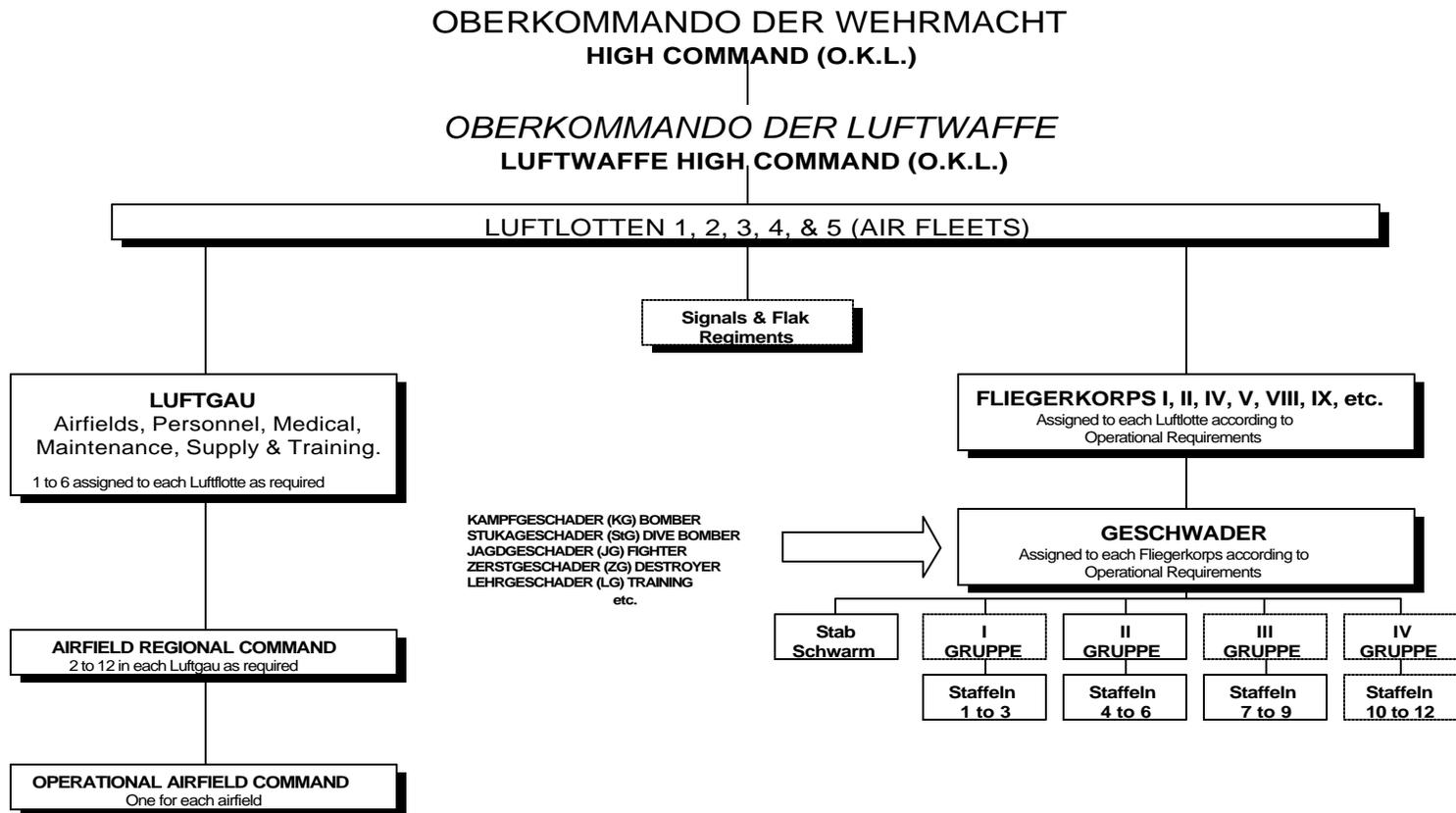
CONCLUSION

The Luftwaffe is clearly superior to the RAF as regards strength, training, command and location of bases. In the event of an intensification of air warfare the Luftwaffe, unlike the RAF, will be in a position in every respect to achieve a decisive effect this year if the time for the start of large-scale operations is set early enough to allow advantage to be taken of the months with relatively favorable weather conditions (July to the beginning of October).

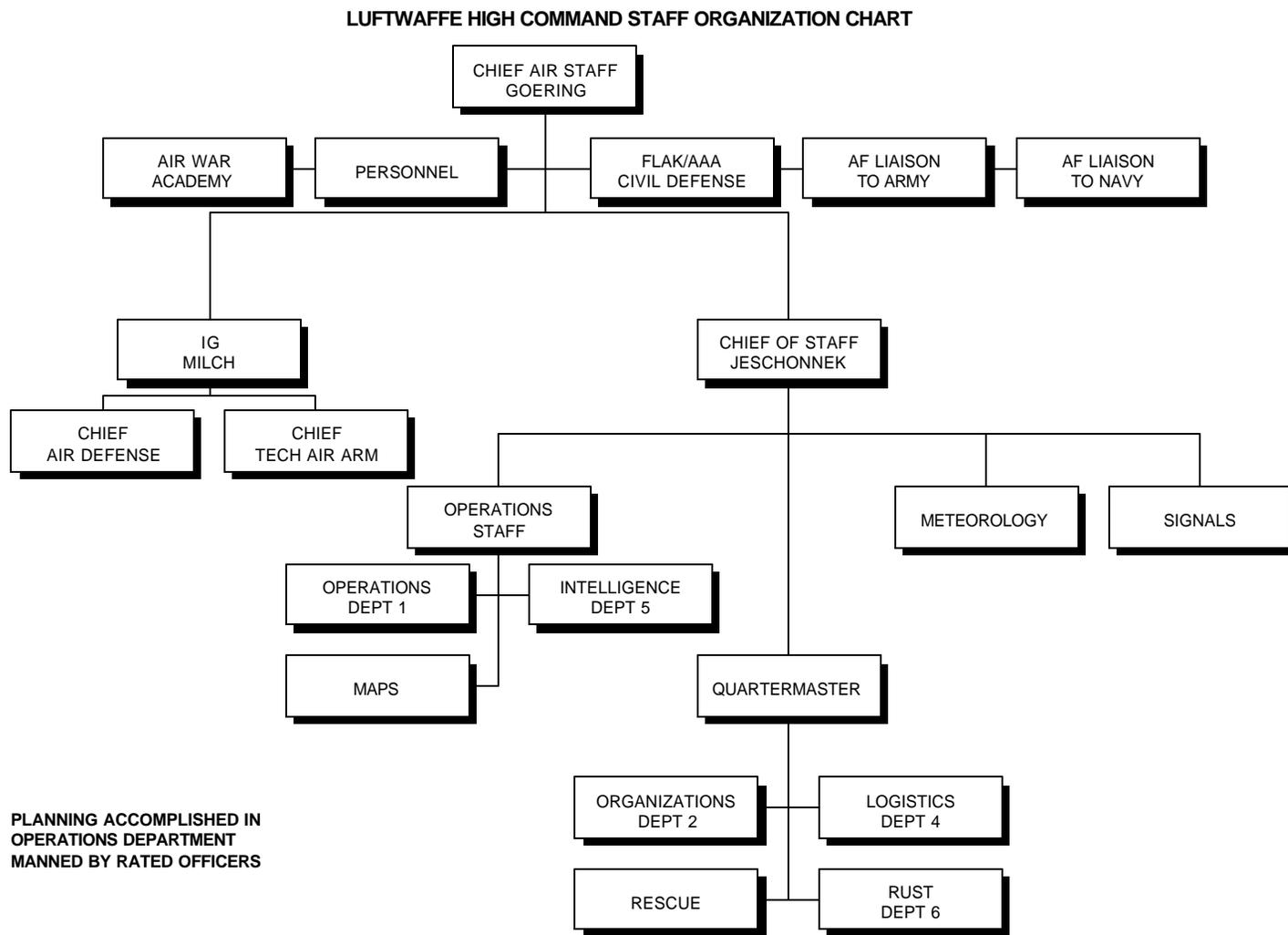
SOURCE: Francis K. Mason, *Battle Over Britain* (Bucks, UK: Bourne End, 1990), Appendix H, 507–8.

APPENDIX 5 Operational Chain of Command in the Luftwaffe

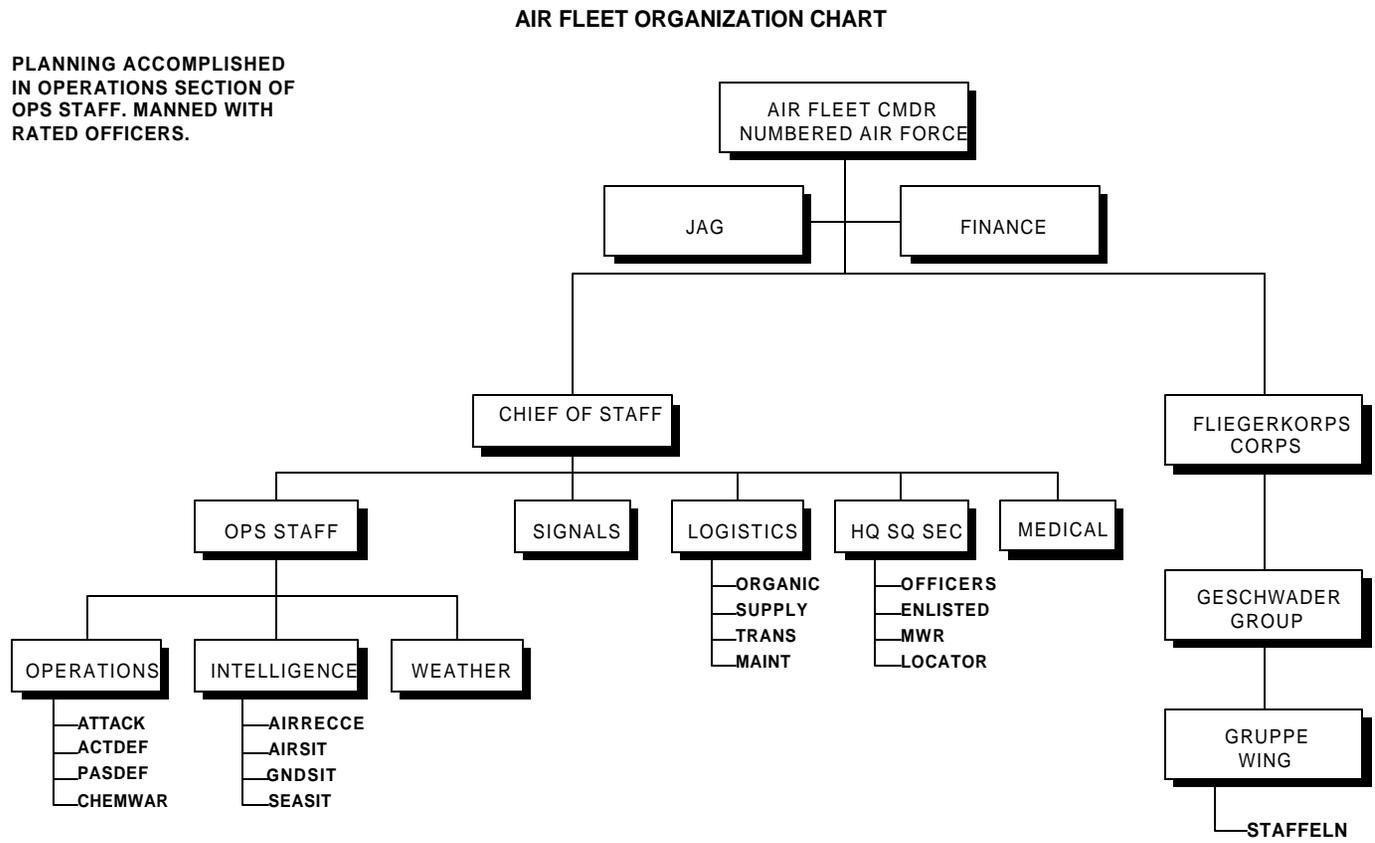
Operational Chain of Command in the Luftwaffe



APPENDIX 6 Luftwaffe High Command Staff Organization Chart



APPENDIX 7 Air Fleet Organization Chart



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