

**Extended Essay**

**Group 3: History**

**Did the RAF win the Battle of Britain or did the Luftwaffe lose it?**

**3996 Words**

### **Abstract**

The Battle of Britain, which was fought in 1940 between Britain's Royal Air Force (RAF) and Germany's Luftwaffe, was the Nazi war machine's attempt at neutralising the RAF as a precursor to an air and seaborne invasion of Britain. The failure of the Luftwaffe to achieve this was a significant turning point in the Second World War. There is wide debate on the causes of the British victory, which raises the research question: **Did the RAF win the Battle of Britain or did the Luftwaffe lose it?**

The contributions the British made towards their victory and the errors Luftwaffe committed that lead to its defeat are more closely examined than RAF errors and German successes. Secondary sources detailing the opinions and reasoning of various historians with regard to the Battle are scrutinised in the main, with the addition of a limited number of primary sources to buttress the argument.

Despite being a tactical rather than strategic air force, the superior numbers and tactics of the Luftwaffe could have won the Battle for Germany. The loss appears to have been the product of faulty leadership, unfocussed strategy and flawed intelligence. The British defended well using the sound strategy of the 'Dowding system', aided by comparatively reliable intelligence and by the inherent advantages of fighting over friendly territory. They also possessed aircraft that were at least the equal of the Luftwaffe's. Nevertheless, the technical and numerical superiority of the Luftwaffe made them the likely victors. It was the Luftwaffe's errors, particularly in strategy and intelligence, which lost the Battle of Britain. It is likely that this loss was fundamental in both symbolic and practical terms to the German loss of the Second World War.

282 Words

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## Introduction

Early in the Second World War, starting from July 10, 1940 (Ray, 1994, p. 48), the Battle of Britain pitted Germany's Luftwaffe against Britain's Royal Air Force (RAF) in a bid to secure air superiority over southern England. This key German offensive was designed to pave the way for a sea and airborne invasion of Britain as an extension of Hitler's Blitzkrieg campaign in Western Europe. My grandparents lived through WWII and my maternal grandfather served in combat with the RAF, inspiring me with a life-long interest in air warfare. The Battle of Britain was significant not only as the first solely aerial conflict (Overy, 2000, p. 267), but also because a German success could have changed the course of the Second World War dramatically. Indeed, at the end of the war the most senior *Wehrmacht* (German army) commander asserted that the Battle of Britain represented the most decisive conflict of the entire campaign (Bungay, 2000, p. 386). The immediate context was that the Luftwaffe, fresh from victories on the continent, confidently claimed that it could gain complete air superiority over the Channel and invasion area and thus prevent the Royal Navy and the RAF striking against the invasion force (Cox, 2000, p. 57). It is evident that the Luftwaffe did not achieve its aim and that the Battle of Britain was a British success, for on September 17, 1940 Hitler indefinitely postponed his planned invasion of Britain (Bungay, 2000, p. 386). The research question is 'Did the RAF win the Battle of Britain or did the Luftwaffe lose it?'

The popularly accepted view of the Battle is that the courageous pilots of the RAF were the winning heroes of the Battle that safeguarded England. This gave rise to Churchill's oft-repeated quotation "Never ... was so much owed by so many to so few" (1940, p. 1167) and the development of the mythology of 'the Few' through his writings. Reinforcement of this mythology comes from the many autobiographical stories of the Battle, written by front line British pilots, who attacked numerically superior German formations, giving them the myopic impression they were vastly outnumbered. A more balanced view of the British victory is that this heroism was supported by Dowding's defensive system, a high rate of fighter production and superior leadership (Ray, 1994, p. 175; Bungay, 2000, p. 384). However historians such as Cooper (1981), Bellamy (2009) and Luftwaffe ace Adolf Galland (1955) argue that the Luftwaffe's errors played the greatest part in the outcome of the Battle, with Harris (1947, p. 42) referring to Germany's "large and catastrophic mistakes". These errors were primarily faulty leadership, flawed intelligence and an unfocussed strategy, which counteracted the Luftwaffe's inherent advantages of superior numbers, better tactics and more experienced pilots. It appears that the myth of 'the Few' is overstated. The greater significance of Germany's errors, particularly given its opportunity for victory, meant that the Luftwaffe lost the Battle rather than Britain winning it.

### The Case for a British Victory

The RAF contributed significantly to the triumph of the Battle of Britain. The basis of this success was the Dowding system of air defence, developed primarily by Air Chief Marshal Hugh Dowding. This national system was highly structured and hierarchical, with numerous Sectors reporting to four Groups, which in turn reported to Fighter Command Headquarters (map in Appendix A). This structure allowed Fighter Command Headquarters an extensive, strategic overview of the battle, supplemented by the priceless advantage of RDF (radar) systems, which enabled Fighter Command to estimate in advance the composition and position of approaching enemy forces. The RDF system reported directly to Fighter Command and helped negate the attacker's advantage of surprise. However, the system was devolved in that each Sector Station controlled all other defence systems except radar in its zone. These included the fighter airfields, the observer corps, the anti-aircraft guns, the direction-finding radio stations (to locate the RAF fighters) and the balloon barrage. This local control allowed rapid and relevant decision making and constituted a significant home advantage. Fighter Command was both the focus of receiving intelligence and the source of command; this meant that the incapacitation of a single control station would not affect the ability of Fighter Command to function as an effective defence (Ministry of Defence (United Kingdom), 2004). The effectiveness of this system was demonstrated on September 7: 350 German bombers, escorted by fighters, attacked London in three waves. These aircraft were detected on radar and Air Vice-Marshal Keith Park (commander of 11 Group) ordered six squadrons to intercept the first while holding back eight squadrons for the next wave and the remainder of the Group for the final wave. Aircraft from 10 and 12 Groups were used to protect 11 Group's airfields (Overy, 2001, p. 84). The radar early warning allowed Park to deploy his forces quickly and appropriately against attack and rally support from other Groups. This comprehensive early warning and coordination system, operated under the skilled leadership of Dowding, described by Churchill as "one of the very best" (Ray, 1994, p. 11), and Park, "a great man" (Bungay, 2000, p. 382). It was the best contemporary system (Ray, 1994, p. 57) and while interpreted by the Germans as rigid and ineffective, offered the RAF "... an essential counter to the element of surprise ..." (Overy, 2001, p. 42) and was a key factor in the RAF's victory.

The conventional view, propounded by authors including Bellamy (2009), is that Dowding's air defence system was enhanced by his strategic deployment of air forces: withholding squadrons from the main battle area effectively conserved the fighting power of the RAF. This occurred on two main occasions. During the Battle for France, Dowding rejected requests for more aircraft to support the army in France, thus preserving them for effective deployment in the prepared British defence system (Farmer, 2004, p. 42). Nevertheless the RAF was short of fighters when France fell. Dowding also withheld support from 11 Group, which was hard pressed for the majority of the Battle. Wing Commander H. R. Allen in his book *Who Won the Battle of Britain?* (1974) disagrees with Dowding's deployment of forces,

arguing that Park (11 Group) "... had far too few resources within his remit ..." (p. 96). However since Allen fought with 11 Group and experienced the exhaustion of 'front line' pilots he is likely to have favoured immediate action, rather than taking the broader strategic context into account. Dowding's strategy was not only conservative (Farmer, 2004, p. 42), but preventative, aimed at repelling incursions from Scandinavia and Normandy by keeping enough fighters in 10 and 12 Groups. This strategy was passively assisted by fighting over friendly territory: if a pilot survived the destruction of his aircraft a German pilot would be imprisoned and lost to the battle, while an RAF pilot would swiftly return to frontline duties. Considering that only five-eighths of the aircraft losses caused pilot casualties this was a significant advantage (Farmer, 2004, p. 43; Ministry of Defence (United Kingdom), 2005). Dowding's air defence system and strategic deployment of forces were important factors in winning the war for the RAF.

The rapid replacement of aircraft lost during the Battle was also significant in the British success, averaging over 450 aircraft a month compared to under 200 a month for the enemy (Ray, 1994, p. 47; Overy, 2001, p. 50). The quality of these aircraft is also significant. The slow and poorly armed aircraft of the Polish air force, for example, had been outclassed and quickly destroyed in 1939 (Crosby, 2002, pp. 101, 128). The quality of their aircraft was enhanced by the RAF's use of high-octane fuel, which provided a 30% increase in engine power (Correll, 2008). The rate of aircraft production meant that the RAF's fighting capacity was never drastically reduced, and indeed the number of fighters available for operations increased from 565 in June to 721 in November (Wood and Dempster, 1961, p. 344). Bungay (2000, p. 96) believes this exceptional productivity was due to the completion in time for the Battle of the lengthy process of preparation for mass production of new products. However the conventional view is that this was mainly due to Churchill's appointment of Lord Beaverbrook as Minister of Aircraft Production. Beaverbrook cut through the excessive bureaucracy associated with aircraft production (Churchill, 1949, p. 286). He also engaged civilian participation, through schemes such as 'Saucepans to Spitfires', whereby civilians donated aluminium to be used in aircraft production. He even lobbied for and achieved some American production of aircraft (Overy, 2001, p. 34). The quality and availability of British fighters during the Battle was a key to the successful defence of Britain's air space. Churchill attributes this to Beaverbrook who "... rendered signal service" (Churchill, 1949, p. 286). Churchill naturally supports the political appointment of his friend, but other historians surpass Churchill's praise of Beaverbrook. Allen (1974, p. 129), for example, states that "... but for Beaverbrook's genius and utter forcefulness the Germans would have won [the Battle]."

The RAF's speed in adopting viable air warfare tactics was an important factor in their victory. The tactics enshrined in the *Training Manual* were essentially "... a parade ground exercise unrelated to ... reality" (Ray, 1994, p. 61). At the start of the Battle, the British used the rigid 'vic three' formation, with the wingmen maintaining constant position behind the



leader, which reduced the defensive aid they could render (Overy, 2001, p. 66). They also employed textbook attacks that “were poor preparation for the reality of August 1940” when the Luftwaffe protected its bombers with fighters attacking with the advantages of sun and height (Ray, 1994, p. 62). By early August, the RAF had learnt from its mistakes and essentially copied the Luftwaffe’s small-scale tactics (Overy, 2001, pp. 66–67), consisting of a paired leader and wingman (Ray, 1994, p. 39). Generally two pairs operated together in a ‘finger four’ formation, with the fingertips representing the positions of the four planes, each ‘fingertip’ about 200 yards apart (Bungay, 2000, p. 259). Allen (1974, p. 79), a Battle veteran, states that if his squadron (and the RAF) had used the German formation initially, they would have been “four times more effective.” Another successful tactic involved the majority of the squadron flying in three lines astern, covered by the remainder of the squadron flying above and behind. No. 609 Squadron employed these tactics and was able to remain on the front line for the entire period. In contrast, No. 145 Squadron stayed with the official tactics and was “virtually destroyed” (Ray, 1994, p. 63). In addition to this, the RAF fighters were cleverly deployed to capitalise on their particular advantages. The Supermarine Spitfire was the best fighter the British possessed, being highly manoeuvrable, and of comparable performance to its chief opponent, the Messerschmitt 109 (Bf/Me 109). Accordingly the 19 squadrons of Spitfires available at the start of the Battle were mainly deployed against the German fighters, distracting them while the slower, sturdier and more numerous Hurricanes (33 squadrons) were employed to destroy the German bombers wherever possible (Overy, 2001, p. 97). The RAF’s flexibility in adopting innovative tactics rather than rigidly following procedure allowed it to gain tactical advantages.

Britain’s intelligence gathering system also contributed to its victory. While British intelligence concerning the Luftwaffe was not entirely accurate, the fact that its strength was overestimated was possibly advantageous. The Germans were judged to possess 2500 bombers, 2500 fighters and 7000 reserve aircraft, compared to approximate actual numbers of 1800 bombers, 1250 fighters and 900 reserves, (Bungay, 2000, pp. 104, 191). There is some debate over this ‘actual’ number, with Correll (2008) claiming over 1450 German fighters. Overestimation of both aircraft numbers and aircraft production may have proved ultimately advantageous in stimulating motivation and discouraging complacency (Bungay, 2000, pp. 104, 191). Additionally, through their possession of the ‘Enigma’ coding machine, the British could intercept and decode German secret messages, providing insights into German policy (Hinsley *et al.*, 1979, p. 109). A specific example of this occurred when the ciphers were decoded before the heavy air raids of 15 August (Bickers, 1990, p. 59). Dowding knew which German *Luftflotten* (air fleets) would be making the attacks and that they were to be timed to stretch the defenders to the full throughout the day. Bickers argues (1990, p. 59) that Dowding found this a great help in planning his response. However Gilbert (1983, p. 849) suggests that Dowding did not know about Enigma until mid-October, and would have warned Air Vice-Marshal Leigh-Mallory on August 15 (when he was visiting an aerodrome in his Group) had he been aware of this intelligence. The RAF was also served by intelligence from ‘Y Service’. This informed Fighter Command of German movements and

strength through the simple expedient of listening to German frequencies on the radio (Ministry of Defence (United Kingdom), 2005). This provided data that were so “remarkably accurate” that captured German fighter pilots found they were interrogated by intelligence officers who knew “... more about their units than they did.” (Bungay, 2000, p. 192). The British intelligence provided Dowding and the Groups with valuable forewarning, which stripped the Luftwaffe attackers of their great advantage: surprise.

The RAF mustered an effective defence that facilitated its victory. The established system of air defence gave rise to superior strategy. There was a high level of aircraft production, without which the British could not have sustained the Battle. The British had access to higher quality intelligence than the Luftwaffe. The ready adoption of improved tactics allowed the RAF to be on equal terms with the Luftwaffe in small-scale conflicts.



### The Case for a German Loss

The aim of the Luftwaffe was to "... gain and ... maintain local air superiority over the invasion area." (Allen, 1974, p. 164). The British believed the Germans possessed overwhelming numerical superiority; in fact this was not the case. Both Overy (2001, p. 32) and Ray (1994) claim that early in August 1940 the Luftwaffe fielded approximately 1200 combat fighter aircraft compared to the 715 available to Fighter Command. Additionally the Luftwaffe possessed over 1800 bombers (Bungay, 2000, p. 191; Correll, 2008), with British intelligence estimates suggesting that numbers were even higher (Bungay, 2000, p. 191). The Luftwaffe also had better prepared aircrew through their experience in the Spanish Civil War and in Europe (Galland, 1955, p. 68).

The Luftwaffe's poorly focussed strategy diluted its efforts such that it became ineffective. This became evident in the lull between the British evacuation of Dunkirk (June 4) and *Aldertag* (Eagle Day, August 13), "... the day designed to be the beginning of the end of Fighter Command" (Bungay, 2000, p. 210). Although Britain was the target of frequent, but weak, raids, this period was used effectively by the RAF to improve its communication system and study German tactics (Overy, 2001, pp. 66–67). The delay allowed Germany to rearm after the Battle of France, when over 1400 aircraft were destroyed and almost 500 damaged (Bungay, 2000, p. 105). In this lull the "... learning-curve was principally of value to the defender." (Overy, 2001, p. 66). Dilution of effort was added to delay when the Luftwaffe attacked coastal convoys, south coast radar stations, installations of the British aircraft industry and RAF airfields, in addition to attempting to destroy the RAF in the air and defending its own airspace (Bellamy, 2009). This dissipation of attacking effort meant that targets were rarely disabled, and in particular the radar stations essential to the Dowding system were left relatively unscathed (Boog, 2000, p. 46). For example, the most heavily attacked British airfield was unserviceable on only six days of the entire battle (Overy, 2001, pp. 69–70). Numerous authors suggest the Luftwaffe's concentration on the bombing of London was an unintended result of stray German bombing of the city and the subsequent mutual retaliatory bombing of Berlin and London ordered by an enraged Hitler (Ray, 1994, p. 93; Correll, 2008). Historians such as Cooper (1981), Saward (1985) and Correll (2008) regard this shift as *the* crucial moment that decided the outcome of the Battle. This supposedly took the pressure off the airfields and allowed the RAF to recover (Correll, 2008), providing what Churchill (1949, p. 292) describes as a "breathing space". The bombing of London took the German fighters to the edge of their range and brought 12 Group into the Battle (Bellamy, 2009). Even Göring, the Luftwaffe commander, recognised that "... it's stupid to drop bombs on cities. It's certainly no way to win the war!" (Julian, 1967, p. 256). Ray's views are less extreme than Correll and Saward. While he admits the change of targets "offered some respite for Fighter Command" (1994, p. 95), he does not consider this the turning point of the Battle. Price (1979) goes further, arguing that the attacks on the airfields were so ineffective that the switch to London was immaterial. The shift of the Luftwaffe's

focus to London clearly provided a respite for Fighter Command and proved a turning point in the Battle of Britain, if less significant than that argued by Correll, Cooper and Saward. An author like Correll, writing a short, punchy article for the *Air Force Magazine* may feel a single conclusion, blaming Hitler, to be simpler and more appropriate for his non-specialist readership, but the reality is more complex. The delays and diffusion in Luftwaffe strategy were serious flaws that contributed to the German loss of the Battle of Britain.

The Luftwaffe's principal role was to provide close support for the army, as demonstrated effectively in the Blitzkrieg advance through Western Europe: it was a tactical, not a strategic air force. Total warfare, therefore, was not a task that suited the Luftwaffe, despite Göring's assertion that he could crush the RAF. The Luftwaffe was deficient in two principal areas: the lack of heavy bombers and the short range of the Luftwaffe's only effective fighter, the Bf 109. The bombers of the German air force were all medium capacity, twin-engine machines that did little damage per crew member compared to the large Allied bombers used later in the war (Galland, 1955, p. 73). The possession of a heavy bomber would have made a "crucial difference" (Ray, 1994, p. 36). The Junkers 87 (Stuka) dive bombers were highly accurate but intended for use in conditions of air superiority and were "sitting ducks" for the RAF fighters (Saward, 1985, p. 192). Unacceptably high losses led to the Stuka being withdrawn on 18 August (Overy, 2001, p. 72), reducing Göring's bomber force by a third (Saward, 1985, p. 192). The short (125 mile) range of the Bf 109 meant it could barely provide cover to bombers over London (Galland, 1955, p. 85; Bungay, 2000, p. 181). According to German ace Adolf Galland (1955, p. 66), "this [short range] was the most acute weakness of our offensive." Galland as a fighter pilot would have been acutely aware of technical problems, including the constant pressure of his emptying fuel tank. Beyond this range German bombers flying in daylight endured unacceptably heavy casualties. As Churchill (1949, p. 44) wrote after the 15 August debacle when 30 out of 100 German bombers sent to raid Tyneside were shot down for the loss of only two British aircraft, "[n]ever again was a daylight raid attempted outside the range of the highest-class fighter [Bf 109] protection." This shortcoming of the Bf 109 could have been remedied easily by using disposable drop tanks to carry extra fuel, but this was never implemented (Galland, 1955, p. 73). The German air force was suited to tactical warfare; its bomber capacity was restricted in range and relatively defenceless against fighter attack. The Luftwaffe arsenal, essentially unsuited to the type of warfare to which it was committed by its leaders, could maintain local air superiority but could not neutralise the RAF.

The role of faulty intelligence in the Luftwaffe's defeat was considerable. The report, by the head of the Air Intelligence Department, on which much of Göring's strategy was based, contained many falsehoods. The role of the RDF stations was underestimated and the organisation of the RAF was regarded as "inflexible" (Mason, 1969, Appendix H, pp. 507–508), German aircraft were thought to be superior to the RAF's and British aircraft production was estimated at 180–300 planes a month, when the average was over 450 (Ray, 1994, p. 47). These misconceptions were due to a sycophantic tendency by the intelligence

agencies to send favourable reports, compounded by the competitive nature of the German intelligence services, with eight agencies providing (at times conflicting) information on the air defences of Britain (Ray, 1994, p. 48). For example, Schmid as Head of Luftwaffe General Staff, reported to Göring that the Bf 110 was superior to the Hurricane, when in fact, during later stages of the Battle the Bf 110 had to be protected by Bf 109s (Ray, 1994, pp. 46–47). Additionally, consistent reports of heavy RAF losses gave the illusion that the Luftwaffe was always close to winning the air war. In early September, Göring believed that Fighter Command had only 100 serviceable fighters when it had over 700 (Overy, 2001, pp. 72–73). Morale progressively declined as victory was continually “four or five days of good weather” away (Bell, 1966, p. 61), although the strength of the defence never seemed to decrease. The assumed superiority of the Luftwaffe in machines and men (Galland, 1955, p. 67) contributed to German complacency and resulting loss of morale. However the misinterpretation of the importance of the RDF stations and the British system of air defence were the most costly of the German intelligence mistakes. The failure to appreciate the importance of radar resulted in only six major raids against the twenty-plus RDF stations (Overy, 2001, p. 69). This allowed the RAF to maintain a functioning early warning system throughout the Battle. The German intelligence system proved a significant weakness in the Battle of Britain as it consistently under-estimated Allied forces and seriously misjudged the value of the British air defence system and its radar capability.

Poor high-level German leadership debilitated the dynamism of the Luftwaffe. The two German leaders, Göring and Hitler, were less than competent. Hitler had a basic misunderstanding of the concept of air power, demonstrated through his ineffective decision to switch bombing attacks to London, and since “... few men were brave enough to offer [him] honest opinions”, he remained uninformed (Ray, 1994, p. 43). Churchill recognised Hitler’s limited understanding of air warfare, when he recorded that “Hitler is using up his fighter force ... he will wear down and ruin this vital part of his Air Force. That will give us a great advantage.” (Churchill, 1949, p. 290). Göring spent the majority of the Battle away from the combat zone, pursuing his own pleasures rather than taking an active interest in the war (Ray, 1994, p. 43). When Göring personally intervened, Galland (1955, p. 78) believed “he went about it the wrong way” using “reproaches” rather than inspiration. Galland (1955, p. 79) also complained of “... the lack of understanding and the stubbornness with which the command [Göring] gave us orders we could not execute ...”. The lack of leadership further dispersed the Luftwaffe’s efforts and demoralised it, contributing to loss of the Battle.

While initially the Luftwaffe’s tactics were superior to those of the RAF, as the Battle progressed, the constraints of bomber protection limited German tactics. Early in the Battle the bombers would fly as bait in front of and below the fighters, allowing RAF fighters attacking the bombers to be ambushed in turn (Overy, 2001, p. 67). The German leaders blamed the fighter pilots for the bombers’ losses (Galland, 1955, p. 71) and the fighters were ordered to provide “proper convoy protection” (Overy, 2000, p. 68) by their active presence

around the bomber stream. This gave the bombers the illusion of security (Galland, 1955, p. 74). But Boog (2000, p. 48) argues that this tactic “robbed the Me 109s of their best feature – free chase.” The Luftwaffe became very inflexible because of its need for bomber protection.

Given the limited range of the Bf 109, it would have been difficult for the Luftwaffe to destroy the RAF. However, with its advantages in tactics and numbers, the acquisition and maintenance of air superiority over the invasion area through a precise and well directed campaign was well within the means of the German Air Force. These advantages were partially offset by its operational deployment. The advantages of the Luftwaffe were wasted through a delayed and diffuse strategy of attacks initiated by inept leadership, which was in turn misinformed by their intelligence services.

## Conclusion

Although the evidence is equivocal, the Luftwaffe, to a large degree, lost the Battle of Britain. Early in the Battle, the Luftwaffe possessed numerical and tactical advantages, and vastly more experienced personnel. Unfortunately, the Luftwaffe's principal role was as army support rather than as a strategic air force. It was therefore unsuited to winning total air superiority against the RAF. In addition, the RAF benefited from a well prepared defence system that incorporated radar technology and a home soil advantage. Both sides had high-quality fighter planes, although many Luftwaffe bombers were obsolescent. The Germans lost the Battle through delayed and unfocussed strategy that left many military targets largely undamaged. This problem was severely exacerbated when they switched bombing attacks to London, rather than focussing on purely military targets. Poor leadership from Göring and Hitler (and a hierarchical Nazi-Germanic culture), coupled with poor intelligence based on optimistic data, was a major cause of these problems. The RAF, presenting a near-mirror image of the Luftwaffe's position, was able to capitalise on the superior defensive strategy of the 'Dowding system' and possessed high-quality leadership provided with conservative intelligence. The high priority given to British aircraft production meant the RAF rapidly replaced destroyed aircraft, enhancing its endurance capability. Yet even with the RAF's well-organised defences, the Luftwaffe should have had the technical capacity to secure air superiority over the Channel and invasion area, to win the Battle of Britain and possibly to cripple the RAF. Whether it could have secured a successful invasion of Britain is another matter and not the subject of this paper. It was the Luftwaffe's errors, particularly in strategy and intelligence, which lost the Battle of Britain. According to many commentators, this loss was fundamental in both symbolic and practical terms to the German loss of the Second World War.



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## Appendix A

Appendix A: The four Groups into which Fighter Command was organised at the time of the Battle of Britain (Ministry of Defence (United Kingdom), 2005).

