The Battle of Britain: A Not So Narrow Margin

By Wing Commander John Shields

What General Weygand called the Battle of France is over. I expect that the Battle of Britain is about to begin……..Upon it depends our own British life, and the long continuity of our institutions and our Empire……. Let us therefore brace ourselves to our duties, and so bear ourselves that, if the British Empire and the Commonwealth last for a thousand years, men will say, "this was their finest hour".[1]

Winston Churchill's speech to parliament on 18 June 1940 made clear that the United Kingdom faced a struggle to survive in the face of an apparently omnipotent Germany. The options open to the British government were to either fight on, against apparently impossible odds, or to attempt to seek terms with Hitler. Few were under any illusion that the latter option would risk the imposition of crushing terms and conditions which hindered Britain's freedom of action and guaranteed Nazi domination of Europe.

The Germans, buoyed by their military success across Europe, had to decide on how to deal with the British, but it appeared that they had the advantage. Hitler, puzzled by the refusal of the British to accept their hopeless position, issued instructions for the development of a plan to invade Britain, Operation Sea Lion. Although there is some debate as to whether or not he in fact intended to launch such an operation (perhaps hoping that Britain would belatedly heed his 'appeal to reason'), the desired outcome was clear – a quiescent Britain, removed from the war and leaving Germany free to turn its attention against the Soviet Union. The campaign to knock Britain out of the war was to be dominated, at least at the start, by the *Luftwaffe*, which was to gain control of the air to enable further operations. This had implications – to be in a position to defeat the British and to be prepared to attack the USSR, it was necessary for the *Luftwaffe* to avoid heavy attrition. While this had proven a relatively straightforward task in early 1940 (even if the extent of German losses in Norway, France and the Low Countries are not always appreciated), this was far from the case when it came to facing Britain with a well-organised Fighter Command at the heart of a modern air defence system.

The hypothesis of this article is that while the Battle of Britain had the potential to be 'a close run thing' and has often been portrayed as such, it was not. It was lost by the *Luftwaffe* as a result of a series of errors which can be traced back to the development of the Third Reich's air arm, through to the faulty execution of the campaign. The paper addresses four key areas: first, the preparation for the Battle undertaken by the RAF. Second, the way in which the *Luftwaffe's* early successes influenced its thinking and approach to operations is considered. Next, the efficacy of the German attempt at a strategic air campaign is examined, before the article concludes with an analysis of the ability of both sides to sustain operations. As part of this, the battle is seen through the lens of Philip Sabin's 'Force Gradient' model. Before beginning this examination, though, it is necessary to establish the parameters of the Battle in terms of its duration. German and British definitions have long varied – the Air Ministry set the dates as being between 10 July and 31 October 1940, while German commentators – if they accept that there was a distinct 'Battle of Britain' at all - place the dates between mid-August 1940 and the commencement of Operation Barbarossa against the USSR on 22 June 1941. For convenience,

this paper makes use of the British official dates to bound its contentions, but recognises that there are alternative interpretations which have equal validity in terms of framing consideration of the duration of the Battle.

In the aftermath of the First World War, air power thought expanded greatly. There was a considerable amount of unanimity amongst theorists and visionaries with regard to the effect that air attack might have in a future war. It was held that bombing of targets in the enemy homeland – be that the morale of civilians or 'vital centres' which underpinned the enemy's war-making potential, and this idea became widely accepted within Britain. Stanley Baldwin's oft-cited remarks about the bomber always getting through were a reasonable representation of popular and political opinion. This did not mean that the RAF was idle in attempting to counter the threat from enemy air attack, even if it was not immediately obvious in years immediately following 1918 which nation would provide that threat. The culmination of the RAF's efforts was the 'Dowding System' with which it fought the Battle of Britain in 1940, but it is important to stress that this was the end of a long-running evolutionary process, supported by revolutionary technological development in the form of Radio Direction Finding (RDF, later radar).

The threat to British airspace had been appreciated since before the First World War.[2] Concerns that the development of powered flight would leave Britain vulnerable to attack had been proven correct during the war, with attacks by both airships and aircraft between December 1914 and early 1918. This had led to the development of a defensive system around the nation's capital, namely the London Air Defence Area (LADA). This was founded in 1916, but came into its own when LADA's command passed to Major General EB Ashmore. Ashmore took the basic LADA construct and developed a basic networked system which formed the basis for the future air defence of the United Kingdom. It was necessarily limited in scope, and represented perhaps the most that could be done to defend London at that time with the available technology – but it was the genesis for the system which led to Dowding's successful prosecution of the Battle of Britain. The development of LADA occurred alongside the deliberations which led to the creation of the Royal Air Force, driven by the investigations into air defence headed by General Jan Smuts. Smuts issued two reports on air power, concluding that having control of the air might become as important a factor in the defence of the British empire as being able to control the sea.

The question of how to control the air was one which exercised Air Staff thinking during the inter-war period. Sir Hugh Trenchard firmly believed that the best form of defence lay in attacking the enemy, rather than waiting in a defensive posture for enemy air attack to come. This led to the logical conclusion that the battle for control of the air, and thus the first line of national defence 'lay over an enemy's airfields and aircraft factories.'[3] Trenchard, as Chief of the Air Staff, wished to shape his force so that fighter aircraft were retained as little more than a sop to public opinion, arguing that staying on the defensive was rather akin to staying on the defensive during a football match – the team which failed to attack simply could not

hope to win.[4] This opinion enabled Trenchard to argue that the RAF could meet the principle enunciated by the Salisbury Committee that Britain should maintain 'a Home Defence Force of sufficient strength adequately to protect us against an attack by the strongest air force within striking distance of this country' through the provision of a force of 52 squadrons, dominated by bombers rather than defensive fighters.[5]

It is important to note, though, that Trenchard's views were not those of the Air Staff as a whole. Much to his frustration, the notion that a defensive fighter force was a necessity did not die out; many senior RAF officers, while respecting Trenchard's opinion, could not agree that defence against the bomber was impossible. As John Ferris has shown, the result of this was that the RAF spent a great deal of time, physical and intellectual effort and money during the inter-war period building upon the principles which had served the nation well during the last year and a half of the First World War.[6] The development of radio direction finding helped to revolutionise the potential of air defence, and proved to be a critical element within the refreshed integrated air defence network which was in place when the Second World War broke out.

At the heart of this network was RAF Fighter Command, led by Air Chief Marshal Sir Hugh Dowding. Dowding was an articulate proponent of an alternative perspective to the 'bomber will always get through' school of thought, and believed that the deterrent effect presented to an opponent by possession of an effective fighter force should not be ignored.[7] While the Air Staff may not have all shared this view, the provision of effective fighter aircraft was a key concern, leading to a number of Air Staff targets and requirements for the most modern fighters that could be obtained; this culminated with the procurement of the Hawker Hurricane and Supermarine Spitfire, the two types which were the mainstay of the Battle of Britain. Despite the importance of these aircraft, the biggest advantage Dowding had lay in the series of Chain Home radar stations sited along the British coast, allowing the detection of incoming enemy raids. While the Germans had developed radar in parallel with the British, they had not linked it to a centralised command and control system. With its integrated air defence system (IADS) Fighter Command was able to concentrate its efforts in time and space, rather than squander its assets on nugatory standing patrols.[8] As a result, the RAF could efficiently apportion its limited resources in a timely fashion. The importance of this was such that it was the Chain Home system and its capabilities which formed Fighter Command's centre of gravity. Even in the later stages of the Battle of Britain, German commanders did not understand the efficiency of the RAF's warning system.[9] The robust layered defence system which Dowding had nurtured and then led during the Battle inflicted the first notable defeat upon Germany during the war.

The British also benefitted from unity of command, unlike their German counterparts. Dowding's calls for the cessation of providing fighters to France, supported by the Chief of the Air Staff, Sir Cyril Newall, proved to be a decisive step in ensuring victory. While the decision was controversial, particularly in terms of Britain apparently refusing to support its

key ally, there is little doubt that Fighter Command's strength would have been whittled away as the Battle of France headed towards its conclusion, and to no obvious result. The Command might have been weakened to the point of failure. It must be understood that possession of sufficient assets to enable the exploitation of the British IADS was a critical component for success; while there may have been a popular sentiment since the war that the Battle of Britain was the result of daring, pluck and innovation, it is equally clear that it was hardly an improvised victory, but the result of long-standing plans to counter an enemy air campaign against the country.

This is not to say that the IADS was without flaws. The rapid expansion of the RAF to keep pace with the emerging German threat meant that many aspects of the Service were struggling to adapt. Fighter Command was dominated by Hurricane and Spitfire squadrons, but there were still obsolete types such as the Blenheim and Defiant in service during the Battle. The Defiant only equipped two squadrons, but the heavy losses it sustained meant that the type was swiftly withdrawn from the fray and ultimately re-roled as an improvised – and fairly effective – night fighter. The Blenheim, as a twin-engined derivative of a light bomber, could only be used for night fighting and long-range operations, often in support of Coastal Command, where it was unlikely to encounter German fighters. Furthermore, the difference of opinion between Air Vice-Marshals Keith Park and Trafford Leigh-Mallory, the Air Officers Commanding of 11 and 12 Groups respectively, did not contribute to the unity of effort within Fighter Command. It also, on occasion, caused confusion and missed opportunities to intercept enemy aircraft. Finally, the Chain Home system could only look 'out', that is over the sea. Once aircraft had crossed the coast, plotting their progress depended upon the Royal Observer Corps (ROC). While the ROC was extremely efficient and effective in daylight, the lack of an 'inward' looking radar system for control of defending fighters was to become a notable problem when the Germans moved over to night raiding. Despite this, Britain's air defence system was at the cutting edge of technology, and represented a world-leading capability.[10] Rapid expansion, introduction of new aircraft, sensors and command and control systems were coupled with decisive leadership to create and preserve an effective IADS which presented the *Luftwaffe* with a formidable challenge. General Adolf Galland believed 'we could do no other than knock frontally against the outstandingly well-organised and resolute direct defence of the British Isles.'[11] Dowding had developed a system which was greater than the sum of its parts, and well-deserved the praise from Winston Churchill for his foresight: 'an example of genius in the art of war.'[12] In 1940, Fighter Command was given the opportunity to fight almost precisely the battle it had planned. It was, therefore, ready for the challenge, but what about its opponent?

The Luftwaffe's Initial Successes

James Corum notes that 'much of the *Luftwaffe's* success from 1939-1942, and some of its failures, can be traced to lessons that were learned, or not learned, during the Spanish Civil War.'[13] In this campaign, many Germans were blooded in the art of air warfare, including key protagonists in the Battle of Britain such as the fighter pilots Werner Mölders and Adolf Galland.

Also, many of the aircraft which would see action in the Battle of Britain, such as the Me109 and He111 were used operationally for the first time in Spain. As a result of their experiences there, the Germans' air power thinking would become enshrined and many of their lessons would be incorporated into the Battle of Britain. For example, German fighter tactics were first-rate. The fluid and efficient German *Schwarm* fighter formation used during the Battle is still used by air forces today.[14] In contrast, RAF fighter tactics were rigid and ridiculed by their opponents who called the RAF fighter formations *idiotenreihen* or 'rows of idiots'.[15] However, many RAF pilots, such as Squadron Leader 'Sailor' Malan, quickly adapted their tactics to mirror those used by the Germans.[16] As a result, the Luftwaffe's tactical advantage over its opposition reduced as the Battle progressed.

Although the Germans held the initial advantage in the tactical arena, their strategic prowess is questionable. Some commentators would refute this point by hinting that the *Condor Legion's* prosecution of strategic bombing against the Spanish town of Guernica highlights a Douhetian mindset in the early days of the *Luftwaffe*.[17] However, others would suggest that the death of Major General Wever in 1936, Germany's own 'Douhet' and Chief of Staff, saw the collapse of the *Luftwaffe* as a strategic air arm and see them wedded to an all-arms capability.[18] This is a little misleading, since the picture was rather more complex. There is clear evidence that the *Luftwaffe* did not abandon the notion of using long range bombers to achieve a strategic effect, but that procurement policies, driven by a desire for numbers, led to the production of fighters and medium bombers rather than the aircraft types necessary to sustain a bombing offensive.[19]

The image of a tactically-focussed air force was, though, reinforced by events: 'Poland was visible proof to the *Luftwaffe* of the success of *Blitzkrieg* and the overwhelming superiority of its air arm. To Goering all propaganda claims were vindicated, but in fact the *Luftwaffe*, although executing a highly effective attack, learned nothing.'[20] From this, historians such as Wood and Dempster reinforce the notion that the *Luftwaffe* was in essence a tactical entity suggesting that, 'the Germans regarded aircraft mainly as a sophisticated form of long-range artillery which must be subordinated to the land armies and used tactically to clear a path for the fast moving armoured spearheads and motorised infantry.'[21] As the *Luftwaffe* entered the Battle, its successes at a tactical and operational level, coupled with the lack of development of a strategic arm left it with a tactically successful but arguably strategically naïve mindset, hoping to deliver a rapid victory over Britain just as it had against Poland, Norway and France.

Although the *Blitzkrieg* was highly successful, it came at a great cost to the *Luftwaffe*. Macksey suggests that following Dunkirk, and with a wounded Britain in retreat, the Germans were presented with an ideal opportunity to push home their advantage.[22] However, this fails to grasp the scale of damage inflicted on the *Luftwaffe* up to that point; the *Luftwaffe* lost 2,888 aircraft with a further 1,562 damaged during its *Blitzkreig* campaigns.[23] Material losses were, of course, accompanied by casualties amongst the aircrew. This point was not lost on *Reichsmarschall* Goering, who thought such a high risk proposal to take advantage of the

chaos in the UK by launching an invasion was 'nonsense.'[24] Thus, while at face value it may seem that waiting to attack Britain represented a missed opportunity, any attempt to execute the campaign earlier would have been folly; both sides required an operational pause to allow the recuperation of men and regeneration of force strength. The additional benefit of the operational pause was that it allowed Germany to assess the British willingness to fight and create an effective air campaign strategy. The *Luftwaffe* had proven itself as a ruthlessly efficient tactical entity but it had yet to be blooded as a strategic air arm. Due to the physical constraints of the English Channel, the *Luftwaffe* would be divorced from its traditional method of warfighting and forced into conducting what was, in effect, an independent strategic air campaign during the Battle of Britain. However, could it deliver higher command's intent?

The Luftwaffe's Strategic Failure

After the Battle of France, there was disagreement amongst the German leadership about what to do next. Some, such as General Felmy, commanding *Luftflotte 2*, concluded that a strategic air offensive against Britain could not be launched before 1942 due to the lack of suitable bombers.[25] However, most senior *Luftwaffe* staff were in favour of a campaign against Britain and the need to achieve control of the air prior to any operation. At the forefront of this argument was Goering:

> *'Until the enemy air force has been broken, the over-riding principle behind air operations is to attack the enemy's flying units at every favourable opportunity, by day and by night, on the ground and in the air, without regard to any other tasks.*[26]

Other influential German figures, such as Galland, inferred that Germany should conduct operations against Britain's lines of communication and slowly starve the nation into defeat.[27] However, Germany could not afford a long drawn out campaign, particularly when Hitler's focus was drawn further east and a future campaign against Russia. In order to deliver a short and effective campaign, the identification and successful prosecution of the enemy's centre of gravity is required. However, despite German doctrine embracing Clausewitz's concepts, they failed to identify and target the British Centre of Gravity.[28] The *Luftwaffe* instead chose to employ kinetic effect across the full spectrum of targets rather than against the enemy's critical vulnerabilities. Put simply, the German leadership demonstrated their lack of understanding of the potential strategic effect of air power by failing to take advantage of their numerical supremacy. Furthermore, in breach of one of the principle tenets of warfare, they failed to concentrate their force on the enemy's operational centre of gravity – Fighter Command.

By destroying Fighter Command, the Germans would have created freedom of manoeuvre over Britain and allow their forces to conduct follow on operations at will. Analysis would suggest that Fighter Command's strength came from its ability to detect raids early and deploy sufficient fighters to counter the emerging threat. As Bungay suggests, the primary objective of the *Luftwaffe* should have been to focus upon Fighter Command, destroying its early warning and command and control systems, followed by its aircraft and pilots.[29]

Instead, the *Luftwaffe* wasted 33% of its effort on non-Fighter Command targets with only 40% of effort put against the key Sector stations, which controlled the Fighter Command assets, and the bulk of these attacks did not begin until the end of August 1940.[30] These apportionment figures dovetail with Goering's intent which was based on geography rather than the enemy's 'weaknesses: 'for the first five days the *Luftwaffe* would aim at targets within 150-100 kilometres radius south of London, then for the next 3 days assault within a radius of 100-50 kilometres, then for the final five days attack targets within a 50 kilometre radius extending right round the British capital.[31] As shown in Figure 1, Goering's strategy encompassed all the key Fighter Command targets but, critically, did not attack them in priority order. The Germans might have prosecuted a far more effective plan based on neutralising enemy strengths rather than slowly destroying generic targets based on geography. Moreover, successful implementation of any strategic targeting plan is predicated on the availability of effective intelligence – and here, the *Luftwaffe* intelligence staffs displayed an inability to deliver the required product.

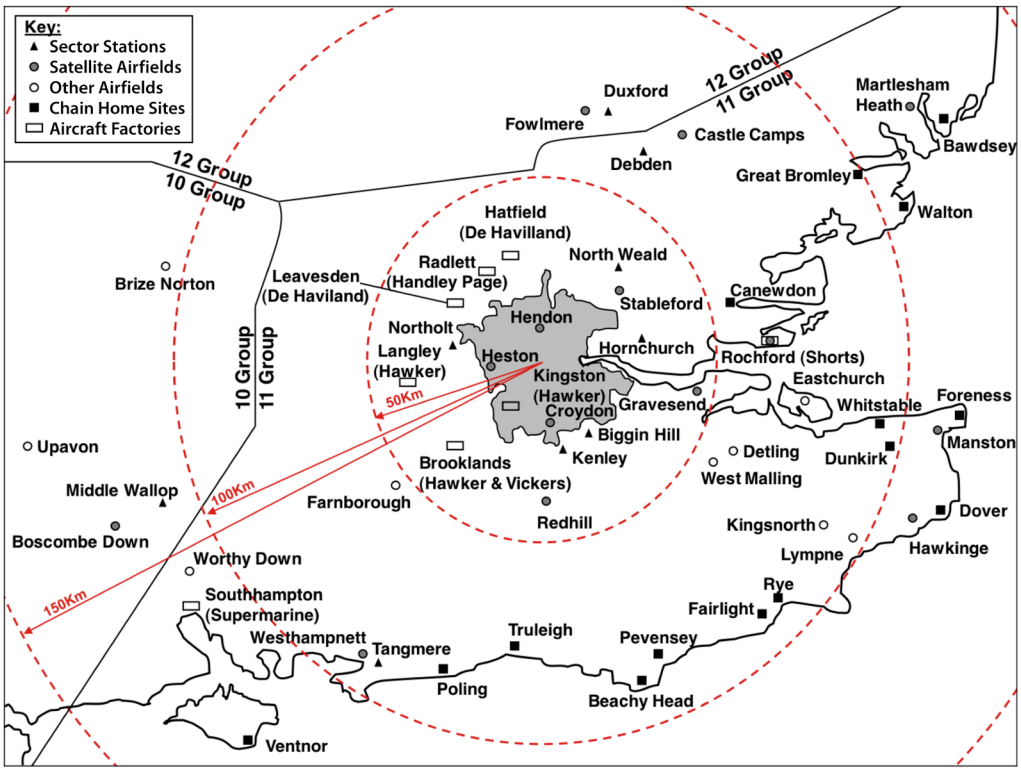

Figure 1: The Air Power-Related Targets during the Battle of Britain.

Wood and Dempster suggest that while Germany possessed the world's most powerful air force in 1940, the 'intelligence system was disorganised and inefficient.'[32] Central to this theory is *Studie Blau* (Study Blue) written by *Oberst* Joseph 'Beppo' Schmid, which became the basic reference on which attacks on Britain were planned.[33] Schmid consistently and grossly

underestimated the number of British fighters, their capabilities, and production numbers as well as making no mention of the critical contribution radar made to Fighter Command.[34] Ultimately, Schmid's failings were widespread and fundamental.[35] These intelligence errors, which ran throughout the Battle, led the *Luftwaffe* into poor decision-making.

With incoherent strategy and fundamentally flawed intelligence it is not surprising that the *Luftwaffe* meandered its way through the Battle of Britain. As its planners dithered on the strategy to take against Britain, the *Luftwaffe* took needless losses that were contrary to the needs of a short and sharp campaign in order to preserve forces for the follow on campaigns. Although the Germans did not recognise this phase as part of the Battle of Britain, which they termed *kanalkampf* or Channel Fight, Gooderson's analysis shows that during the period 10 July – 7 August 1940, 70% of the *Luftwaffe's* effort was directed against coastal targets; shipping, port facilities and naval bases.[36] The *Luftwaffe* lost a significant number of assets during this phase without real tangible gain, nor did it obtain any insights to the centrality of Britain's use of radar that would have ultimately assisted their efforts to achieve control of the air over southern England. This phase can be assessed as an early example of the *Luftwaffe* failing to grasp the ways and resource limitations in achieving their desired end state.

Hitler's intent for the main assault, codenamed *Adlerangriff*, or 'Eagle Attack' was clear – to rapidly overwhelm and dominate the RAF.[37] However, the *Luftflotte* commanders' interpretation of this guidance led to an eclectic target set being developed which included harbours, shipping, dockyards and warships.[38] The *Luftwaffe* suffered from 'requirement creep' where an uninformed leadership curtailed a potentially campaign-winning effect from developing. Although *Luftwaffe* raids on radar sites and airfields took place, ineffective bomb damage assessment meant that the Germans wrongly concluded that the targets they had attacked were permanently out of action.[39] However, the reality was somewhat different. Manston, which was not one of the vital Sector stations, was the only Fighter Command airfield to be put permanently out of action.[40] Also, through the use of mobile transmitters, the Chain Home radar capability remained effective throughout the battle.[41] Even with all the flaws in the plan, it was perhaps inevitable that the weight of effort meant that at times the Germans would enjoy some success. For example, in late August 1940, the *Luftwaffe's* success was gained not so much by the damage it caused to British aerodromes, but by the slow attrition which bled Fighter Command of experienced pilots, a point examined below.[42]

The trigger point for the start of the last phase of the Battle of Britain between 6 September and 31 October 1940, marked the start of the *Luftwaffe* bombing campaign against London. This saw another breach of the principle tenets of warfare - the preservation and maintenance of the aim. There are several theories as to why Hitler elected to change his tactics. Many suggest that Hitler demanded revenge for the punitive RAF strikes against Berlin.[43] Others contend that the *Luftwaffe* command believed it was destroying the RAF at a rate 3 times greater than it was, thus placing them on the verge of victory.[44] Goering and Kesselring, Commanding *Luftflotte 1*, wanted to entice the RAF into the air for a great air battle over

London that would finally destroy Fighter Command.[45] In some respects, the exact reason for the switch from an offensive counter air campaign to one which sought strategic effect does not matter – the results were telling. In addition to allowing the harassed Fighter Command to recuperate German bombers would become increasingly vulnerable over London as the *Luftwaffe's* Me109 fighter was limited to ten minutes fighting time over London, with concomitant effects upon the preservation of German strength for future operations.[46]

The War of Attrition

A number of analysts suggest that the Battle of Britain was, in essence, attritional. In terms of equipment, Maier agrees with the *Luftwaffe's* desire to eliminate the aircraft industry as it would make it impossible for the RAF to replace its losses.[47] To return to Bungay's point, the *Luftwaffe* failed to prioritise correctly, and should have been targeting Fighter Command's warning and control systems and then its assets, leaving the aircraft industry as a much lower priority, even if it was a valid target set.[48] Furthermore, Gooderson's analysis suggests that the number of aircraft allocated to Fighter Command, despite operational and training losses, remained consistent throughout the period of the Battle.[49] This would suggest that the RAF was able to replenish its front line with sufficient assets highlighting the importance of the aircraft industry, including its shadow factories, to the outcome of the Battle. Gooderson also shows that the *Luftwaffe* attacks against the aircraft industry were ineffective. The *Luftwaffe's* failings stem from the lack of reach of the Me109 fighters to escort their bombers to the shadow factories in the Midlands, the lack of precision bombing and the prosecution of non-Fighter Command related production facilities. Further proof of poor *Luftwaffe* intelligence comes from the inaccurate reporting of fighter production figures which suggested that only 280 RAF fighters per month could be built.[50] Despite *Luftwaffe* attacks, British fighter production was in fact fairly consistent throughout the period of the Battle, varying between 467 and 496 fighters per month.[51] In comparison, the German aircraft industry was being out-produced by 47% during 1940.[52] When considering the war of attrition in terms of equipment, there is little doubt that the RAF won.[53]

However, as Wood and Dempster note, the main challenge for the RAF was the shortage of fighter pilots: 'This, and not aircraft, could have lost the RAF the Battle of Britain.'[54] The rapid expansion of Fighter Command had been limited by its inability to man the equipment. In particular, fighter pilot manning vexed many leaders, both prior to and during the battle.[55] The shortage of fighter pilots was exacerbated by the loss of 300 Fighter Command pilots during the Battle of France and it was still 130 pilots short of its establishment at the beginning of August.[56] This deficit increased to 181 pilots at the end of August when the *Luftwaffe* was conducting more efficient Offensive Counter Air campaigns against the key Sector airfields.[57] Moreover, during August 1940, RAF casualties outstripped the training output - the training system delivered 260 inexperienced pilots but there were 300 casualties.[58] As a result Fighter Command was haemorrhaging the quantity and quality of pilots it had in the early stages of the Battle. In order to stem this flow, Fighter Command seconded pilots from the Fleet Air Arm, Army Cooperation squadrons as well as those from foreign and commonwealth nations,

including squadrons formed from pilots who had escaped German-occupied Europe. By the end of the battle, Fighter Command had more aircraft and pilots than it had at the start of the campaign but it was still undermanned and it had lost many experienced operators.[59] Even here, though, we must be careful – since the position articulated by Wood and Dempster is challenged by the work of Richard Overy. Overy notes that the number of pilots between June and August, with a constant supply of between 1400 and 1500 pilots in August and September. The shortfall, although notable, was never more than 10 per cent.[60] The *Luftwaffe*, in contrast, was a third short of its established strength of fighter pilots, and only able to cope with this shortage by virtue of a lower overall loss rate amongst its fighter forces.[61] The Germans had an opportunity to inflict a fatal blow against Fighter Command within their grasp – but through poor leadership, strategy and intelligence the opportunity to win the Battle passed.

The Force Gradient Model

For all the efforts put into the Battle by the *Luftwaffe*, they achieved very little of strategic worth.[62] As the numerically superior attacking force, the Germans held the advantage as they could dictate timing, scale and tempo of operations but they failed to push it home. This is worth considering through the lens of Philip Sabin's Force Gradient Model, as seen in Figure 2, since it appears to offer a number of useful pointers as to the challenge that the *Luftwaffe* faced even without misdirected targeting and confused leadership.

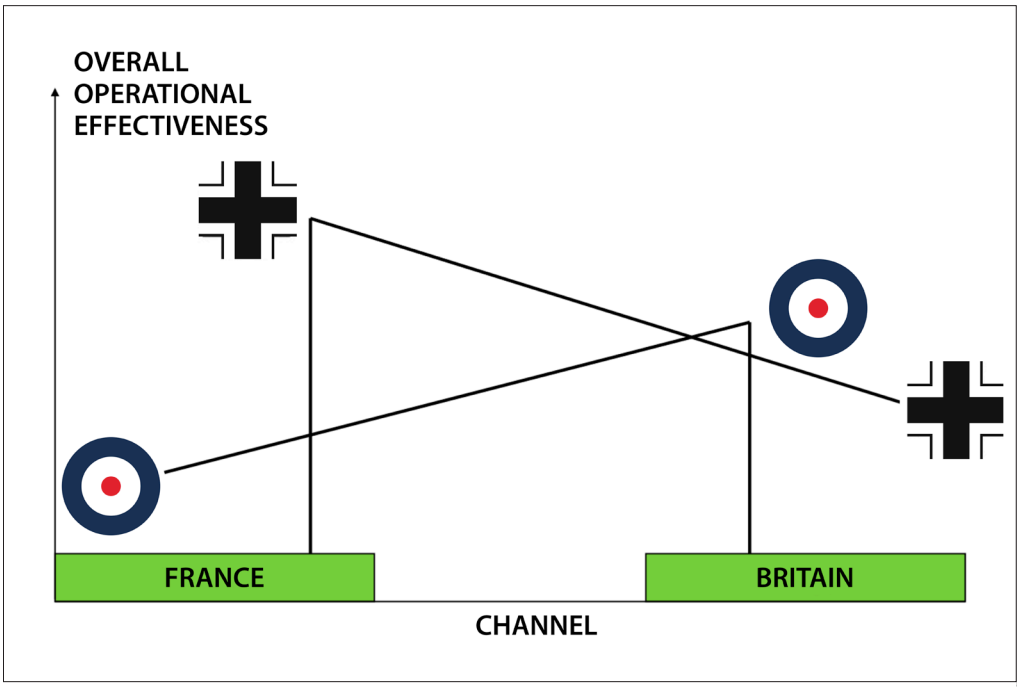

Figure 2: Force Gradients.

Over France, the *Luftwaffe* had the upper hand as it outnumbered its opponents. Although Bomber Command damaged 10-13% of the German invasion fleet, their operations suffered heavy losses as they were: limited in number, unescorted and vulnerable.[63] Conversely, when forced to operate over the English Channel, although the *Luftwaffe's* effectiveness diminished with range, it retained its advantage due to AVM Park constraining his squadrons to overland operations in order to preserve pilot numbers and concentrate his force.[64] Once the Germans were above Britain the picture is very different. The Luftwaffe faced a world-leading system specifically designed to counter the very threat which confronted them. Contrary to Galland's belief that, 'it is indisputable that Germany had air superiority', the statistics tell a different story.[65] During the Battle the Germans only achieved a kill ratio of 1:1.8.[66] Moreover, this kill ratio was significantly less than the 5:1 kill ratio *Generalmajor* Osterkamp, Commanding *Jagdgeschwader 51*, advocated as being necessary to ensure that the *Luftwaffe* might conduct air operations following the Battle.[67] The need to retain military capability is important in enduring campaigns, and the Germans clearly had aspirations for further military campaigns, this was not the case for the RAF.[68] Not so for the RAF in 1940, it was a fight for national survival. Therefore, the RAF could, and nearly had to, deplete Fighter Command to achieve its desired end state. Also, the RAF's ability to retain its advantage over southern England can also be attributed to the *Luftwaffe's* eclectic targeting policy. Ultimately, the RAF managed to maintain a competitive advantage over the *Luftwaffe* above the vital ground - London. Therefore, the Force Gradient Model' neatly demonstrates that Britain had a critical geographical advantage over its opponent.[69]

Conclusion

Bungay's view that, 'the winners make fewer mistakes than the losers' is certainly true for the Battle of Britain.[70] The battle had the potential to be a close contest but was not. A series of critical decisions made by each side shaped the eventual outcome.

Although the Germans had the numerically superior forces, they were doomed to failure from the outset as they had insufficient resources to defeat Fighter Command and then subsequently support an invasion of Britain or Russia, and certainly not both. Fighter Command knew exactly what was needed to protect Britain and, through many years of effort during the inter-war years - much of it still unappreciated in popular history - delivered a world-leading integrated air defence system. In contrast, the *Luftwaffe* had turned into an effective tactical air force that had been highly successful during the *Blitzkreig* campaigns, but it found it difficult to adapt to the strategic and independent air campaign. The RAF benefited from unity of command whereas the German orders were ambiguous and open to interpretation. As a result of poor leadership and intelligence, the prosecution of a varied target set meant that the Germans lacked concentration of force and wasted valuable assets on non-essential targets. The same cannot be said of Fighter Command, which had developed into an efficient machine capable of delivering the required effects at the right time and at the right place. Although it originally lacked the tactical acumen of its nemesis, the RAF quickly adapted its tactics and procedures to become more proficient and effective.

Galland's suggestion that, 'he who wants to protect everything, protects nothing' can, by substituting 'attack' for 'protect' offer some insight into the issues associated with the *Luftwaffe's* campaign during the Battle of Britain.[71] The *Luftwaffe* failed to grasp the essential elements that were delivering Fighter Command's strengths and as a result failed to prosecute those critical components. Although the Chain Home radar sites were attacked, the *Luftwaffe* failed to blind the RAF by removing the key element that allowed the RAF to inflict the first defeat on Germany during the war. Moreover, by failing to preserve and maintain the aim by switching its attacks to London and away from the enemy's critical vulnerabilities, the *Luftwaffe* only highlighted further their flawed strategic mindset and poor intelligence. With Fighter Command pilot numbers at their nadir at the start of the London bombing campaign, it can be seen that the Battle of Britain had the potential to be a close run thing. However, Germany's failure to implement the principles of war meant that, along with a resolute defence by Fighter Command, a 'home win' was actually in many ways a foregone conclusion in what was undoubtedly Britain's 'finest hour'.

Notes

[1] *Parliamentary Debates* (Hansard), 18 June 1940, Column 60
[2] Richard Hough and Denis Richards, *Battle of Britain*, (Barnsley: Pen and Sword, 2007) p.6
[3] Derek Wood and Derek Dempster, *The Narrow Margin*. (Barnsley: Pen and Sword, 2003), p.24
[4] Sir Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany, Volume IV*, 'Notes of a Meeting in CAS's Room, 19 July 1923', p.66.
[5] Hough and Richards, *Battle of Britain*, p.21
[6] John Ferris, 'Fighter Defence Before Fighter Command: The Rise of Strategic Air Defence in Great Britain, 1917-1934', in *The Journal of Military History*, Volume 63:4 (1999), pp.845-84.
[7] Stephen Bungay, *The Most Dangerous Enemy* (London: Aurum Press, 2000), p.59.
[8] David L Preston, 'The Key to Victory: Fighter Command and the Tactical Air Reserves During the Battle of Britain', *Air Power History*, Volume 41:4 (1994), p.26
[9] Hough and Richards, *Battle of Britain*, p.90.
[10] Williamson Murray, 'How did 'The Few' win?', *Quarterly Journal of Military History*, Volume 2:4 (1990), p.12.
[11] Bungay, *Most Dangerous Enemy*, p.69.
[12] Ibid, p.220.
[13] James S Corum, 'The Luftwaffe & Lessons Learned in the Spanish Civil War' in Sebastian Cox and Peter Gray (eds.) *Air Power History – Turning Points From Kitty Hawk to Kosovo* (London: Frank Cass, 2002), p.66.
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[17] K. Maier, "The Luftwaffe" in Paul Addison and Jeremy Crang (eds.)*The Burning Blue*. (London: Pimlico, 2000), p.16.
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[28] Corum and Muller, *The Luftwaffe's Way of War*, p.121.
[29] Bungay, *The Most Dangerous Enemy,* p.377.
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[50] Maier, *Germany and the Second World War Volume 2*. p.382
[51] Ibid.

[52] Bungay, *The Most Dangerous Enemy*, p.94.
[53] Ibid., p.368; Alfred Price. "Myth and Legend." *Aeroplane Monthly*, Volume 25, Number 10 (1997), p.21.
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