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THE LUFTWAFFE AND THE BATTLE FOR AIR SUPERIORITY

BLUEPRINT OR WARNING?

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SHORTLY AFTER the conclusion of World War I, German military leaders made a decision to base their military strategy on a brief, highly mobile, fast-paced, theater-level offensive. The Luftwaffe was built around this concept of operations. We can measure its effectiveness in how well it performed its most important task: the gaining of air superiority.[1] The Luftwaffe was organized, equipped, and successfully employed to gain air superiority in short-offensive campaigns over continental Europe. This impressive offensive air strategy featured all-out independent operations against opposing air forces as the means to achieve air superiority. Many air forces have since attempted to emulate the Luftwaffe's early victories: impressive successes include Israel's defeat of the Egyptian air force in 1967 and the coalition's defeat of the Iraqi air force in 1991. German success, however, was context-dependent. The Luftwaffe was prepared to win air superiority within the framework of a short-offensive war. The air war over Europe became a protracted struggle on all fronts, and the Luftwaffe was forced onto the strategic defensive. Despite dramatic German adjustments, the Luftwaffe ultimately failed in its quest for air superiority. This failure may serve as a distant warning; the Germans devised a brilliant strategy that was forced into a context in which it could not succeed.

Luftwaffe leaders sought victory within the short-war framework because German lessons of World War I included the understanding that Germany could not

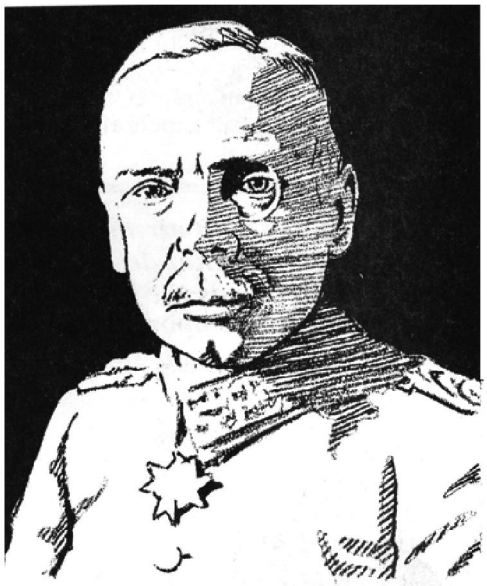
afford to wage a protracted war of attrition. Germany had been overwhelmed by the Allies' materiel and economic superiority. Gen Hans von Seeckt, Army commander from 1920 to 1926, realized that fast mobile offensives would be necessary to avoid the kind of prolonged struggle Germany could not win.[2] This philosophy had an impact on how the Luftwaffe approached air superiority.

To the German airmen, it was widely accepted that defeat of the enemy air force was the best means to attain this all-important goal of air superiority.

The Luftwaffe identified air superiority as its most important task. This belief was founded on German World War I experiences, embraced by senior German military leaders, and established in military regulations. In World War I, the Kaiser's aviators fought and lost a costly battle for air superiority over France and Belgium. Experience revealed that air superiority was desirable because it enabled one's observation and ground attack aircraft to operate freely while denying the same to the enemy.[3] In 1929 General von Seeckt wrote that future war would begin with a clash of air fleets and that the air objective must be the "enemy air force, and only after its suppression can the offensive be directed against other targets."[4] The requirement for air superiority was reflected in interwar regulations. The 1934 army operational doctrine manual, *Truppenführung* (Troop Leadership), stated that "in order to successfully carry out major ground operations, one should seek to establish air superiority over the enemy at the decisive point."[5] That Luftwaffe leaders embraced the need to gain air superiority is also evident in their prewar writings. The first Luftwaffe chief of the general staff, Gen Walther Wever, listed the need "to combat the enemy air force" among the Luftwaffe's priority tasks.[6] Prior to the Polish campaign, Gen Hans Jeschonnek, a later chief of staff, wrote that

> the most proper and essential task is the battle against the enemy air force, and it must be executed vigorously and at all costs. The second task, the support of the army, in the first days of the war cannot claim the same level of importance. . . . What may be achieved in the first two days by using one's own air force against an opposing army does not compare with the damage an enemy air force may inflict if it remains battleworthy.[7]

To the German airmen, it was widely accepted that defeat of the enemy air force was the best means to attain this all-important goal of air superiority.[8] German air doctrine emphasized concentration and



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offensive action. These characteristics are in evidence in the Luftwaffe's approach to air superiority. From the opening minutes of a campaign, German air units focused the bulk of their efforts on the destruction of the enemy air force. Luftwaffe Regulation 16, *Luftkriegsführung* (Conduct of Aerial War), directed that "the enemy air force is to be fought from the beginning of the war . . . . An offensive execution of the battle in the enemy's territory is indispensable. The aerial battle will gain the initiative over the enemy."[9] Offensive action by bomber units was intended to destroy enemy air units on the ground, simultaneously disrupting sortie generation and command and control. Fighter units would then hunt down units that were able to get airborne.[10] Defense was not emphasized. In order to avoid diluting the air offensive, defense was left to flak units. This offensive counterair (OCA) effort was concentrated in time to neutralize the opponent's air force as quickly as possible.

The Luftwaffe was effectively organized and equipped to execute these short operational air offensives to destroy opposing air forces. German air force units were organized into autonomous air fleets (*Luftflotten*) that were well geared for OCA operations. Each *Luftflotte* was capable of conducting autonomous operations against an enemy air force, combining a mixture of mutually supporting combat wings, flak, signals, and support units. More significantly, the *Luftflotten* were commanded by airmen, free from the army chain of command. This independence enabled the Luftwaffe to minimize diversions in support of secondary goals and to concentrate on first defeating the opposing air force.

Technology well supported the Luftwaffe's operational air offensive. Its aircraft were well suited for OCA missions¾preferably destroying air units on the ground. German bombers (Do17, He111, Ju87, Ju88) were good weapons for conducting airfield attacks; their range and payload were adequate to reach air bases most likely to hold the bulk of the enemy air force. Light airbase defenses prevalent at the beginning of the war permitted very low-altitude attacks, enhancing medium bomber accuracy and surprise.[11] Twin-engined fighters (Bf110) were intended to escort the bombers, warding off fighter attacks until the enemy air force was vanquished. Single-engined fighters (Bf109, and later the Fw190) were intended to combat enemy units in the air, preferably over enemy territory. Fighter ranges were adequate to carry the fight to most continental adversaries, but would prove incapable of reaching elements of the more distant English and Soviet air forces.

The equipment that a military organization chooses must support its doctrine but may exclude (doctrinally) unforeseen or undesirable tasks. In the Luftwaffe's case, its equipment enabled it to fight the short- offensive OCA campaign but limited its ability to engage in other forms of air war. Equipped for a short-offensive war, the Luftwaffe was suited for attacking continental air forces *in the field*. It was not, however, well suited for attacks on distant sources of enemy airpower— training bases and aircraft factories located deep in the rear. German bombers lacked the range, payload, and defensive firepower to reach distant targets in England, the USSR, and southwest France. The Bf110's eventual failure as an escort and the short range of the Bf109 only aggravated this operational shortcoming. These limitations are significant because they dictated that Germany's air power could only be sent against air forces in the field, rather than potentially profitable attacks on adversaries' sources of airpower. A prolonged air war between comparable adversaries carries the very real risk of becoming an exhausting war of attrition. Attritional air war relies as much on raw materials, industrial strength, and crew training as it does on doctrine and strategy.

German emphasis on the offensive use of airpower resulted in underdeveloped air defense capability. To the Luftwaffe, defensive air operations represented a failure of the offensive because "pure defense denies the essential character of the air force."[12] Although Luftwaffe doctrine called for the unification of flak, fighters, and a command and control ($C^{2)}$ network under regional defensive commanders, this did not become a reality until 1943, after the first large-scale Allied bomber raid on Cologne.[13] Even after local unification, however, the regional organizations were never

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subordinated to an overarching defense command, resulting in unnecessary competition for resources and poor coordination.[14] Prewar Luftwaffe doctrine was pessimistic about defensive fighter effectiveness, illuminating the difficulty of intercepting high-speed aircraft and noting the possibility that interceptions might have to be conducted on the opponent's return leg.[15] This "defensive skepticism" may have retarded the development and integration of critical defensive technologies such as radar and fighter control systems. However, powerful defensive capabilities were eventually born of necessity when Germany was forced from its preferred short-offensive strategy.

Germany successfully applied its offensive air doctrine in the first two years of the war against Poland, Scandinavia, the Low Countries, France, and the Balkans. Concentrated attacks on enemy airfields eliminated effective air resistance within days. During the battle for France, the Luftwaffe command declared air superiority on the fifth day of the campaign and air supremacy six days later.[16] Surprise attacks on main operating bases destroyed large numbers of aircraft. Enemy air units that had dispersed escaped the initial onslaught but operated at reduced efficiency, making them more vulnerable to the offensive action of German fighters.[17]

One facet of German air success that is easily overlooked is the contribution of German ground forces to the defeat of enemy air forces. OCA campaigns were greatly aided by offensive success on the ground. Simultaneous air and ground offensives placed enemy air commanders on the horns of a dilemma; they were forced to choose between using their air assets to

counter German ground advances or waging all-out counterair campaigns. Concentration on the ground battle could lead to a quick defeat in the air, while a concentration on the air war seemed impractical and pointless when German spearheads were succeeding on the ground. German emphasis on an offensive counterair strategy seemed well-placed as Luftwaffe units remained effective while enemy air forces were smashed trying to stop the onrush of panzers.

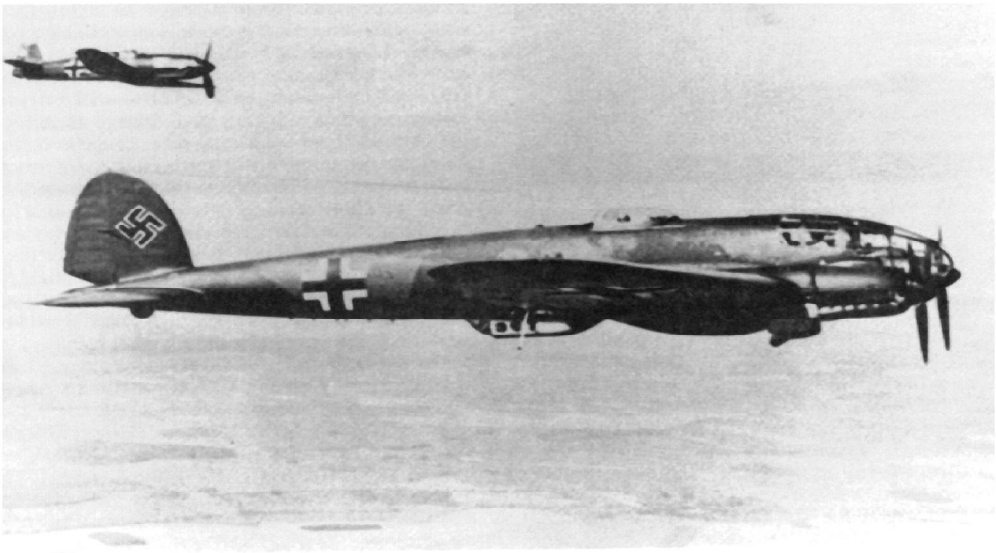
Even with the Luftwaffe's focus on air superiority, its victories were not without cost. Luftwaffe losses were high during each of its offensive campaigns. For example, 36 percent of the Luftwaffe's total strength was damaged or destroyed during the short (two-month) but intense battle for France.[18] This was probably deemed acceptable considering the fact that the French, Dutch, Belgian, and British air forces on the continent were defeated, and France and the Low Countries were overrun. The high loss rate, however, would prove unsustainable in a prolonged air war.

German offensive counterair campaigns failed against England and the Soviet Union when they became protracted struggles. In the summer of 1940, the Luftwaffe attempted to defeat the Royal Air Force (RAF) in a short-offensive campaign against Fighter Command. The operational air goal was to gain air superiority over southeastern England.[19] After an unsuccessful attempt to battle the RAF over the Channel, the Luftwaffe waged a three-week OCA campaign against RAF bases (and to a limited extent, RAF production) in late August. This campaign was making some progress when the Germans changed their attacks to London in an effort to draw RAF fighters into a climactic air battle. Three weeks of day attacks on London failed to defeat Fighter Command, at which point the Luftwaffe abandoned its battle for air superiority over England with a shift to night terror bombing.

The Germans were unable to attain a swift decision in the air for several reasons. The RAF was the Luftwaffe's first adversary armed with an effective defensive air strategy. Fighter Command had a defensive counterair (DCA) doctrine and was effectively trained and equipped for defensive operations. The British were able to successfully wage the defensive air battle without diversion. The absence of a ground campaign meant that the RAF could concentrate on beating back the Luftwaffe. German operational mistakes also contributed to the failure. German intelligence, failing to identify the vulnerabilities of the RAF's defensive C^2 network, overlooked this critical center of gravity. Intelligence also failed to correctly assess the effectiveness of the attacks on Fighter Command's sector airfields, and this had resulted in an ill-fated and premature shift to the blitz of London. Lastly, German will and capability to sustain air losses was found lacking as the campaign extended over many costly weeks. As a result, the Germans were unable to defeat the RAF, and the air war in the west slid into a lengthy stalemate.

The offensive air war against Russia enjoyed initial successes as the OCA effort rapidly gained air superiority over the western Soviet Union. The Red Air

German bombers like the Heinkel He III were good weapons for conducting airfield attacks because their range and payload were adequate to reach air bases that were likely to hold the bulk of the enemy air force.



Airfield attacks were an important element of the German OCA efforts. German bombs fall on an English airfield, summer 1940.

Force was virtually annihilated in a series of powerful attacks against Soviet airfields. Conditions were favorable for the Luftwaffe's OCA "knock-out blow." Soviet airfields were incomplete, increasing the vulnerability of Red aircraft on the ground. Soviet units that made it into the air were quickly swept aside as inferior Red Air Force equipment, training, and organizations were exposed. German armored units overran Soviet bases, dislocating or annihilating Red air units. Air superiority was quickly achieved and the Luftwaffe was able to shift its efforts to interdiction and close air support. During the period of unquestioned German air superiority, however, the Wehrmacht was unable to bring about a decision in the war. The sources of Soviet airpower were shifted out of range (east of the Urals) and the Red Air Force began a slow recovery. During the Battle of Moscow, the Soviets were able to bring previously uncommitted Siberian air and ground units to bear as the Luftwaffe was severely hampered by the winter conditions. After Moscow, the Red Air Force grew steadily as the Luftwaffe withered. The immensity of the Eastern Front swallowed the small Luftwaffe. Unable to cover vast sections of the front, air units had to be concentrated at critical points. Concentration was crucial in the battles for local air superiority, but it provided no guarantees of success. In the skies west of Stalingrad, the Red Air Force and winter weather foiled the German attempts to resupply the Sixth Army. After this costly battle, the dramatic decline in Luftwaffe strength caused attempts to gain air superiority to be very limited in area and duration. Sharp battles for air superiority developed over the Kursk and Kuban areas in 1943 as the Red Air Force slowly gained the upper hand. As the German air force in the east proved incapable of destroying the resurgent Soviet air force, it slowly lost its independent mission and shifted its emphasis to direct army support.[20] The Eastern Front became a constant drain on the Luftwaffe, weakening it for the fatal blow to be administered in the west.

German emphasis on the offensive use of airpower resulted in underdeveloped air defense capability.

In 1921 General von Seeckt directed that the "opponent is to be pushed onto the defensive, and his power and aggressiveness broken by the destruction of numerous aircraft."[21] The German failure to gain air superiority over the British Isles allowed the Allies to achieve this same goal against the Luftwaffe. Allied air superiority over England provided a sanctuary for an Allied bomber buildup. The Allies were able to launch the Combined Bomber Offensive, which had to be answered by the Luftwaffe. Having already abandoned the offensive in the west, and heavily committed in the east, the Luftwaffe was forced into a DCA battle. This defensive struggle gradually exhausted the German air force as hopes for air superiority on the periphery were sacrificed to sustain the costly battles over the Reich.

The prolonged defensive air war forced changes to Luftwaffe organization, equipment, and employment. Although the Germans were able to make a dramatic shift from an offensive air strategy to a defensive one, they were ultimately overwhelmed in the air by Allied production in a battle of attrition. Without a substantial defensive doctrine, the German DCA efforts drifted into an attempt to impose prohibitive losses on the Allied bomber force. The preferred German strategy of annihilation was impractical, however, since OCA was precluded by Allied air superiority over England and offensive action by Allied bombers was optional. Luftwaffe generals clung to the hope that if enough fighters could be massed against a bomber formation, it could be scattered and decimated, presumably resulting in a suspension of the air offensive.[22]

Defensive air organizations evolved steadily from 1941 to 1944 in response to operational requirements. Defense of the Reich was initially entrusted to a single *Fliegerkorps*, but eventually grew to two *Luftflotten* controlling five fighter divisions. The fighter divisions

controlled air communications and control regiments, aircraft warning regiments, fighter groups, and flak regiments.[23] This defensive organization expanded and was refined as the threat posed by the Allied air offensive grew.

Defensive counterair requirements spawned numerous technical changes. The Luftwaffe produced and integrated air surveillance radars, airborne intercept radar, flak fire-control radars, and automated fighter control systems.[24] Armor and armament grew, sacrificing range and maneuverability (attributes desirable for offensive fighters) to counter Allied bombers.[25] German fighter armament expanded to include bomber-killing aerial bombs, rockets, and heavy (30-mm) cannon. Aircraft production reflected the shift to the defensive as bomber production was sacrificed for the sake of increased defensive fighter production. As the Luftwaffe lost its offensive capability, former bomber and transport pilots were converted to fighters for the defensive battle.

To the Luftwaffe's credit, defensive operations achieved some successes through 1943. Although German fighters were unable to turn back the bomber raids, they quickly forced the RAF's Bomber Command into less effective night operations and inflicted prohibitive losses on unescorted bombers of the American Eighth Air Force. Daylight operations over Germany were suspended after the second Schweinfurt raid. This German success was, however, only a pyrrhic victory. By Schweinfurt, the Luftwaffe had lost hundreds of valuable planes and irreplaceable pilots. Although Luftwaffe leaders had displayed considerable doctrinal and operational flexibility in the shift to the defensive, the air war had become an attritional struggle the Luftwaffe could not win. When the Americans resumed the offensive in 1944, the unexpected appearance of long-range escort fighters tipped the exchange rate in the air clearly in their favor.

The Combined Bomber Offensive wrested the initiative from the Luftwaffe. Defensive fighter operations were reactive in nature and incapable of forcing a favorable outcome for the Luftwaffe. Marvelous technological improvements such as jets, rocket fighters, and surface-to-air missiles that might have negated Allied long-range fighters came too late to be of consequence. Allied numbers drove the Luftwaffe from the skies. Amidst a quickly failing defensive campaign, the Luftwaffe held onto its deep-rooted offensive preference. The waning German bomber and fighter forces each performed swan songs in OCA efforts. The last meaningful achievement of the Luftwaffe manned bomber force was the June 1944 raid on the Ukrainian city of Poltava. Night bombers caught the American shuttle bombing force on the ground, damaging or destroying 69 B-17s.[26] In the west, the last major fighter operation took place on 1 January 1945 when the Luftwaffe's entire operational fighter force was committed to Operation *Bodenplatte* (Ground Plate), a raid against Allied airfields in the Low Countries and France.[27] *Bodenplatte* highlights the emasculation of the Luftwaffe. The operation was executed by single-engine fighters (the bomber force was nearly nonexistent), by inexperienced pilots in a mission holding little possibility of success. Trained and equipped for air-to-air, the German pilots suffered approximately 30 percent losses in this single mission.[28] Although both these operations destroyed Allied aircraft on the ground, they amounted to little more than pinpricks considering the numbers of aircraft the Luftwaffe still faced.

In analyzing Luftwaffe performance in World War II, many have found it easy to criticize Luftwaffe leadership. A generation of American and British strategic bombing advocates have taken German air leaders to task for failing to build four-engined heavy bombers, yet these two great insular nations (which were able to devote far more resources to their bomber fleets) were unable to produce enough heavy bombers to yield meaningful results before 1944. Furthermore, American heavy bombers were unable to operate freely over Germany until effective long-range escort fighters were widely available. A criticism with more merit was that the Luftwaffe High Command, particularly Chief of Staff Hans Jeschonnek, was shortsighted. German training practices tended to support this position; in particular, Jeschonnek's commitment of Luftwaffe training units in contingencies was quite damaging considering the fact that training assets are crucial in lengthy wars of attrition.[29] The Luftwaffe was slow to recognize that it was in an attritional air war and to implement the measures needed to wage one successfully. There is a strong possibility that Hermann Göring and Jeschonnek were guilty of overconfidence in their short-offensive air war strategy.[30] The Luftwaffe High Command failed to seriously prepare for the possibility that their preferred strategy could fail.[31] Nevertheless, the Luftwaffe made remarkable adjustments in the shift from offensive to defensive air operations, and it is a credit to the German Air Staff and operational commanders that the Luftwaffe remained a factor for so long against such staggering opposition.

After 1941, the Luftwaffe faced a situation it could not win. The question this suggests for contemporary strategists is, How does one keep from stumbling into a strategic box canyon? The Luftwaffe experience suggests that we must recognize that there are limitations to a nation's preferred military strategies. Simply stated, there are battles and adversaries one will be armed and trained to fight, and there will be fights that

one must avoid militarily. Unfortunately, military officers are not able to pick the wars they are ordered to fight. Facing such a situation, the general and his staff must be aware that the endeavor they are contemplating may not conform to preconceived doctrine, and their forces may not be optimally trained, organized, or equipped for the situation. Furthermore, the commander must realize that he can enter a conflict under favorable conditions, but he may not be able to dictate the nature of a war once begun. When this happens, he must first recognize the fact that the war is no longer of the nature desired. He must then adjust his strategy to the situation as it exists. Hopefully, the commander and his staff have thought out alternate possibilities and made preparations for them. The Luftwaffe's experience, however, warns us of the very real possibility that adjustments may only be able to affect situations at the margins and that no amount of doctrinal or operational flexibility can save a hopeless situation. After 1941, the only solution to the Germans' problems was political, not military. This leads us back to the start: the general may have to tell the politician that there are limits to what can be done militarily. The alternative is to try to make the best of a descent into an abyss.

Notes

1. For the purposes of this article, air superiority is considered to be the ability to pursue one's goals in the air without prohibitive interference from the enemy. In the World War II context, this interference stemmed from the offensive and defensive action of opposing air forces.

2. Von Seeckt's position was soundly based on a comprehensive postwar analysis conducted by the German staff. James Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform* (Lawrence, Kans.: University Press of Kansas, 1992), 37, 66.

3. The benefits of air superiority were evident to the German air staff. This study called for the fighter force to "shoot down as many enemy aircraft as possible in order to provide our own aerial forces with freedom of movement, to protect our own aerial observation, to hinder enemy observation and protect our troops, installations and cities from aerial attack." Truppenamt (Luft), *Studie einer Offiziers über die Fliegerwaffe und ihre Verwendung* (circa 1925).

4. Hans von Seeckt, *Gedanken eines Soldaten* (Berlin: Verlag für Kulturpolitik, 1929), 93-95.

5. German Army Regulation 300, *Truppenführung* (1934), par. 759.

6. Richard Muller, *The German Air War in Russia* (Baltimore: Nautical and Aviation Publishing, 1992), 7.

7. Ibid., 36.

8. General Wolfram von Richthofen was a notable exception. He questioned early air superiority efforts if they had to come at the expense of ground support during the attack on Poland. Cajus Bekker, *Luftwaffe War Diaries* (New York: Ballantine Books, 1966), 16.

9. Luftwaffe Regulation 16, *Luftkriegsführung* (1935), pars. 103-4.

10. "Surprise attacks by our forces at the start of the war can catch the enemy forces at their peacetime bases. Even if they take rapid evasive measures, the enemy leadership may experience crippling damage." Ibid.

11. John F. Kreis, *Air Warfare and Air Base Air Defense* (Washington, D.C.: Air Force Office of History, 1988), 91.

12. Truppenamt (Luft), *Richtlinien für die Führung des Operativen Luftkrieges*, May 1926, par. 40.

13. General der Flieger Joseph Kammhuber, "Problems in the Conduct of a Day and Night Defensive Air War," USAF Historical Study no. 179 (Maxwell AFB, Ala.: USAF Historical Division, 1 October 1953), 123.

14. Generalleutnant Adolf Galland, "Defeat of the Luftwaffe: Fundamental Causes," *Air University Quarterly Review* 6, no. 1 (Spring 1953): 30.

15. *Luftkriegsführung*, pars. 265, 275.

16. General der Flieger Wilhelm Speidel, "The GAF in France and the Low Countries, 1939-1940," USAF Historical Study no.152 (Maxwell AFB, Ala.:USAF Historical Division, 1958), pt. 3, vol. 2a, pars. 248 and 263. With air superiority achieved over the entire Western Front, the Luftwaffe was able to dedicate nearly all of its efforts to army support after 14 May 1940. Speidel was chief of staff, *Luftflotte* 2, during the campaign. See Karl F. Hilebrand, *Die Generale der Deutschen Luftwaffe, 1935-1945*, vol. 3 (Osnabrück: Biblio Verlag, 1992), 320-22.

17. Dispersal reduced the generation and sustainability of sorties and hampered command and control.

18. Williamson Murray, *Strategy for Defeat: The Luftwaffe, 1933-1945* (Maxwell AFB, Ala.: Air University Press, 1983), 40.

19. Strategic goals were less clear-cut, but the first step of any plan required air superiority.

20. Muller estimates that 60 to 80 percent of the Luftwaffe's effort went to direct army support in 1942-43. Muller, 103.

21. German Army Regulation 487, *Führung und Gefecht der Verbundenen Waffen* (1923), pt. 2, par. 77.

22. Adolf Galland, *The First and the Last: The Rise and Fall of the German Fighter Forces, 1938-1945*, trans. Mervyn Savill (New York: Bantam Books, 1978), 199.

23. Stephen McFarland and Wesley Newton, *To Command the Sky: The Battle for Air Superiority over Germany, 1942-1944* (Washington, D.C.: Smithsonian Press, 1991), 51.

24. Kammhuber describes automated Luftwaffe systems including the *Y- Gerät* (a transponder) and *Uhu 2* (a ground-to-air data link) in his air defense analysis. Kammhuber, 194,199.

25. General Galland asserted that Bf109s "defaced in this way were as good as useless for fighter combat." Galland, 152.

26. Muller, 213.

27. *Bodenplatte* was launched after the Luftwaffe failed to achieve local air superiority (with fighter patrols) over their ground forces advancing through the Ardennes.

28. Danny S. Parker, *To Win the Winter Sky: Air War over the Ardennes, 1944-1945* (Conshohocken, Pa.: Combined Books, 1994) 448.

29. Richard Suchenwirth identifies Jeschonnek's neglect of the training program and "ruthless raids" on training resources as a major factor in the defeat of the Luftwaffe. Richard Suchenwirth, "Historical Turning Points in the German Air Force War Effort," USAF Historical Study no.189 (Maxwell AFB, Ala.: USAF Historical Division, 1959), 20-28.

30. For example, in February 1940, Göring ordered further aircraft development halted "based on his optimistic assumption that the war would be a short one as Hitler had promised." Richard Suchenwirth, *Command and Leadership in the German Air Force*, USAF Historical Study no.174 (Maxwell AFB, Ala.:USAF Historical Division, 1969), 158.

31. Kammhuber warned in his postwar writings, "It is better to prepare for the least favorable turn of events, even though it may not occur, than to be caught unprepared." Kammhuber, 3.

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