

THE LUFTWAFFE'S CAMPAIGNS IN POLAND AND THE WEST 1939–1940: A CASE STUDY OF HANDLING INNOVATION IN WARTIME

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Abstract

Although the Luftwaffe won a signal victory in the Polish campaign in September 1939, the campaign also exposed many serious flaws in the doctrine, tactics, equipment and organization of the Luftwaffe. The Luftwaffe used the experience of the Polish campaign in a very effective program to examine and revise the Luftwaffe's doctrine and tactics in time for the great campaign in the West in May/June 1940. Germany's success against the Western powers in 1940 was, in large part, due to the superior doctrine and tactics of the Luftwaffe. This article is a case study of how a military force can effectively learn from recent operations and quickly apply the lessons in the form of doctrinal change.

Key words: World War II, Polish campaign 1939, Campaign in the West 1940, airpower, Luftwaffe, military doctrine

Introduction

During and after the campaign in Poland in September 1939 the Luftwaffe staff and leaders conducted an analysis of the performance of tactics, organization and equipment with the intent of modifying doctrine and equipment for the conduct of future operations. In many respects the Luftwaffe leadership proved to be very adept at learning lessons from campaigns and quickly putting those lessons to work. The lessons learned in Poland, when the Luftwaffe was at the

peak of its operational effectiveness vis a vis its opponents, played a major role in determining the course of Luftwaffe doctrine for the rest of the war. Studying the Luftwaffe in this period also provides some insights into how well an air force can adapt itself to the rapidly changing conditions of warfare.

The Luftwaffe entered World War II with a large combat force of 4,333 aircraft¹. Ever since World War I, the secret air staff of the Reichswehr and, after 1935, the Luftwaffe had been hard at work developing doctrine and equipment and testing its doctrine in maneuvers and in actual war. The Luftwaffe's basic doctrine, Luftwaffe Regulation 16 (*Luftkriegführung*) stressed strategic air war as well as deep interdiction campaigns to support a ground campaign. The air superiority battle was given considerable role in Luftwaffe doctrine and, from World War I on, the Luftwaffe put considerable emphasis upon air defense with flak forces. While close air support of the ground troops had been part of German operations and doctrine since World War I, the extensive and decisive use of the German Condor legion in close support operations in the Spanish Civil War had recently placed a greater emphasis on this aspect of aerial warfare in Luftwaffe doctrine.

The Luftwaffe saw developing doctrine as part of an ongoing and dynamic process. Throughout the 1930s, new equipment, organizations and tactics were tested in large-scale maneuvers. Some of the maneuvers included army divisions and hundreds of aircraft. The operational staffs critically analyzed each of the major maneuvers and wargames and air staff in order to glean lessons. The war in Spain from 1936–1939 served as an extended “live fire” exercise in which the Luftwaffe not only tried out its latest aircraft models, such as the Me 109 fighter and Ju 87 dive bomber, but also conducted most types of air operations to include strategic bombing, interdiction, naval air strikes and close air support. The successive Condor Legion commanders and staff sent regular reports to the air staff in Berlin which used these lessons as a basis for rewriting operational doctrine and also modifying the force organization, aircraft and equipment. One example of the successful use of war experience in modifying doctrine is the new fighter tactics developed in Spain by Luftwaffe ace Werner Mölders. Mölders developed

¹ On 1 Sept. 1939 the Luftwaffe had 1,180 bombers, 771 fighters, 408 Me 110 destroyers, 40 Hs 123 Attack planes, 721 reconnaissance planes, 240 naval aircraft and 552 transports. See Hans Detlef Herhudt von Rohden. *Die Deutsche Luftrüstung 1935–1945*. Luftkrieg Heft 6. MS Air University Library circa 1950.

a very flexible and effective fighter tactics using pairs of aircraft and groups of pairs (finger-four formation) and proved the superiority of these tactics in battle. The air staff brought Mölders back from Spain and put him to work on writing a fighter tactics manual for the Luftwaffe.² Superior tactics gave the Luftwaffe fighters a great advantage over their British and French opponents who went into battle in 1940 with awkward and ineffective squadron “V-formations” and “line astern” squadron formations. In 1939, the air staff formed a special section devoted specifically to analyzing air operations and developing and adapting doctrine in light of experience. The doctrinal changes were published in a series of bulletins circulated throughout the Luftwaffe. In short, when World War II began, the Luftwaffe possessed a fairly sound methodology for developing and modifying doctrine, equipment and organization. As a consequence, the Luftwaffe entered the war with a well-balanced doctrine and organization capable of conducting a wide variety of operations.

Preparation for the Polish Campaign

In many respects, the Germans were well prepared for a war against Poland. Throughout the 1920s Poland was at the top of the Reichswehr’s list of likely war enemies and a standard scenario of the 1920s exercises and wargames was an attack upon Germany by a Polish-French alliance. Even in the 1920s German military thinking favored the employment of large mobile formations against the Poles, and encircling and destroying Polish armies in large envelopment operations. The secret Luftwaffe staff put considerable thought into an air campaign designed to cripple the Polish forces. The “operational air war” concepts developed in the 1920s were especially suitable for fighting Poland. An important German advantage in planning for a war against Poland was good intelligence. Since Poland had long been the focus of German war planning the military and civilian intelligence

² Ernst Obermaier and Werner Held, *Jagdflieger Oberst Werner Moelders* (Stuttgart: Motorbuch Verlag, 1986) p. 14.

agencies had collected a large amount of information about the Polish forces, Polish war industries and Polish defenses.³

The Germans had a good understanding of the Polish forces and their strengths and weaknesses and the Luftwaffe was poised to exploit the Polish weaknesses. In the air war doctrine of 1920s and 1930s, the first priority of the air force, would be to gain air superiority by attacking and destroying the enemy air force on the ground. Once the Luftwaffe had air superiority the next target priority for the air forces would be the military infrastructure and national rail net.⁴ Poland, a nation with few good roads and few vehicles, was almost completely dependent upon its railroads for moving and supplying its army. If the rail network were crippled, the Polish army would be unable to effectively respond to a rapid German advance.⁵ The Polish forces that attempted to maneuver against the Germans would be interdicted by the Luftwaffe and hopefully wrecked as a cohesive force long before they reached the front lines. A lower priority for the Luftwaffe was providing direct close support for German forces engaged in the ground battle.

The Germans needed to exploit every advantage against Poland because a quick victory was a strategic necessity. Although Hitler did not expect Britain and France to fight over Polish rights, if the Western allies did honor their commitments and went to war the western border of Germany would be highly vulnerable to attack as the Wehrmacht's best forces were all committed to the war in the east. In 1939 German rearmament was in high gear and there were ample first line army and Luftwaffe forces to provide a decisive superiority over the Poles – but Germany's forces were not enough to fight a two front war against the Western Allies as well. The campaign in Poland required the commitment of all of Germany's elite panzer

3 Some German intelligence documents from the 1920s on Poland still exist. In January 1927 the Luftwaffe Section of the Reichswehr's Intelligence office produced a detailed analysis of the Polish Air Force, its organization, equipment and major bases. See NARA T-177, Roll 9 Memo: T.A. (Luft) *Polnische Luftstreitkräfte*. Berlin 25 January 1927.

4 On the major doctrine documents of the "Operational air war" see James Corum and Richard Muller, *The Luftwaffe's Way of War* (Baltimore: Nautical and Aviation Press, 1998). See the 1926 Operational Air Doctrine, pp. 86-112, and Luftwaffe Regulation 16, which was the main operational doctrine for the Luftwaffe, pp. 118-157.

5 In 1934 the Luftwaffe staff carried out a study on how to paralyze the Polish forces in case of war and concluded that the Polish rail system was especially vulnerable to German Stukas and bombers and would be the center of gravity for a German attack. See NARA T-78 Roll 128 Reichswehr Ministerium, "Die Zukünftige Kriegführung in der Luft und ihre Auswirkung auf die Bewegungen des Heeres".

and motorized divisions as well as its best trained and equipped infantry units. Most of the Luftwaffe would have to be deployed if the Polish Air Force were to be destroyed quickly and the Polish transportation net crippled. As long as the Wehrmacht was committed to Poland only a few dozen infantry divisions, mostly reserve units in a low state of training, would be available to defend Germany's western border. If the French and British attacked while the main force of the Wehrmacht fought in Poland they would have superiority in troop numbers and armored forces, and artillery. In the air the meager Luftwaffe forces defending the Western Front would also face far superior Allied forces.⁶

Hitler gambled that if the Britain and France came to Poland's aid they would not move quickly against Germany. Still, for the weeks that the main German forces were in the east Germany would be highly vulnerable. Therefore, the Polish campaign was planned with speed as the top priority. Poland would have to be defeated quickly so the Wehrmacht could redeploy its forces to the west. However, the Germans had good reasons to believe that they could gain a rapid victory in Poland. The Germans outnumbered the Poles in the air by a factor of seven to one and the Germans had a huge advantage in terms of the quality and amount of their equipment on the ground and in the air. While the Poles had a large army it possessed few tanks or even motor vehicles. Its artillery was far inferior to the Wehrmacht's and it was desperately short of essential equipment such as radios. Because the German military had long planned for a war with Poland it had a highly developed logistics infrastructure in place near the Polish border to support its forces. The Luftwaffe was especially well-prepared for operations in the east. On Poland's southern flank the Luftwaffe's 4th Air Fleet had 74 airfields and 19 airfield companies to support its operations. On the northern flank the 1st Air Fleet had 29 airfields and 20 airfield companies in Pomerania and additional airfields and units available in East Prussia.⁷

⁶ During the Polish campaign the Luftwaffe forces on the Western Front consisted of the 2nd Air Fleet with 557 planes and the 3rd Air Fleet with 579 planes for a total of 1136 combat aircraft—a force far inferior to what the Western Allies could deploy. See E. R. Hooten, *Phoenix Triumphant: The Rise and Rise of the Luftwaffe* (London, 1994) p. 189.

⁷ Hans Detlef von Rohden, *Luftkrieg Heft 5: Die Planung und Vorbereitung des Luftkrieges gegen Polen*, MS Air University Library, 1946. Anlage 6.

The army and Luftwaffe plans for the campaign against Poland were developed and finalized in a major wargame in May 1939 and the Luftwaffe staff issued detailed guidance to the 1st and 4th Air Fleets that were tasked to support the campaign.⁸ German plans followed thinking that had evolved since the 1920s: the Luftwaffe would first cripple the Polish air force on the ground and then bomber and Stuka units would hinder the Polish mobilization and troop movement by bombing the rail network. The Luftwaffe would support a rapid advance by the army by air interdiction of Polish troop formations moving to the front. The army and Luftwaffe planned to crush Poland through two great simultaneous offensive thrusts from the north and south. Five armies of the northern and southern army groups would advance on Warsaw using the armored and motorized divisions in task forces to drive ahead and encircle the Polish armies deployed along Poland's western and southern borders. The 1st Air Fleet, with 1,105 combat aircraft under the command of General Albert Kesselring, was based in northeast Germany and East Prussia and was tasked to support the operations of the Northern Army Group (the 3rd and 4th Armies under the command of Colonel General Fedor von Bock). The 4th Air Fleet was under General Alexander Lohr, the former chief of the Austrian Air Force who joined the Luftwaffe on the Anschluss of Austria with Germany in March 1938. Based in southeast Germany and Slovakia the 4th Air Fleet would support the Southern Army Group (8th, 10th and 14th Armies under the command of General Gerd von Rundstedt). The 4th Air Fleet deployed 729 combat aircraft in the campaign. In addition to the combat aircraft of the two air fleets the two army groups had 262 Luftwaffe reconnaissance aircraft, mostly light Henschel 126 planes that operated under army command and were to serve as the tactical eyes of the army. Another 100 fighters were posted along the Polish border for home air defense and another 56 aircraft assigned to naval reconnaissance in the Baltic. This gave the Germans a German total of 2,152 aircraft for the eastern campaign.⁹

The main German thrust would be made by von Rundstedt's Southern Army Group which was allocated four of the army's six panzer divisions. Rundstedt decided that the main effort to break the Polish army would be made by Colonel General von Reichenau's 10th Army and his army was allocated two panzer divisions, two light divisions (motorized divisions with some tanks) and two motorized divisions. This

8 Oberbefehlshaber der Luftwaffe, *Planstudie 1939*, 1 May 1939 NARA T 321 Roll 172.

9 Hooton, *Phoenix Triumphant*, p. 177.

was an awesome concentration of mechanized might for 1939.¹⁰ The 10th Army's mission was to drive northeast to Warsaw from Silesia. Its left flank would be covered by the 8th Army and on the right flank the 14th Army, with two motorized divisions, would drive into central Poland from Slovakia. The Poles positioned their armies along the frontier, with the bulk of the forces in Western Poland, so a German drive on Warsaw would have to overrun some of the Polish forces while leaving most of the Polish forces deployed on Poland's western border to be encircled and annihilated. Once the path to Warsaw was cleared the capitol was expected to fall quickly. With Warsaw gone Polish resistance was expected to collapse. At the time of the spring and summer wargames Hitler did not tell his military leaders of his secret negotiations with Stalin that would ensure Poland's rapid destruction by inviting the Soviet Union to ally with Germany and invade Poland from the east. The German-Soviet Pact announced in August 1939 was a master stroke that ensured the swift defeat of Poland. With the Russians to join the war the Poles had no option to retreat to the east.

The Luftwaffe of 1939 and 1940 possessed significant advantages. First of all, it was a much better trained force than any of its opponents. The Polish and Western Allied air forces had good pilot training programs that produced individual pilots equal to the Germans, but the Luftwaffe had also emphasized training its large units and staffs to ensure that they were mentally and doctrinally prepared for a modern rapid-moving war of maneuver. From 1935 on the Luftwaffe carried out an extensive program of large-scale maneuvers and had stressed training in cooperation with the army. Following the German general staff tradition the Luftwaffe staffs conducted a regular program of wargames and communications exercises to familiarize the air corps and air fleet staffs with the complexities of major combat operations.¹¹ Air warfare doctrine and plans were tested in wargames as a means to expose flaws and identify requirements for new tactics, munitions and equipment. The Luftwaffe's most dangerous opponents, namely the Western Allies and the USSR, generally failed to conduct these types of large scale unit and staff training exercises and failed put their own tactics and doctrine to the test.

10 Robert Citino, *The German Way of War* (Lawrence: University Press of Kansas, 2005) pp. 257-262.

11 See James S. Corum, "Preparing the Thunderbolt: Luftwaffe Training Exercises Before World War II." in 1998 National Aerospace Conference; *The Meaning of Flight in the Twentieth Century*, ed. John Fleischaer (Dayton OH: Wright State University, 1999) 294-302.

The only example of a comprehensive testing of doctrine and development of concepts in Europe through large scale exercises was the air defense system of the UK. It is also no coincidence that this was the one notable victory for the Allied powers in from 1939 to 1942. Given the fairly slight numerical and technological advantages that the Luftwaffe had in 1939 against the combination of the combined allied air forces the remarkable success of the Luftwaffe in 1939 and 1940 can be largely attributed to the superior training program, the Luftwaffe's experience of large scale aerial combat in Spain, and the ability of the Luftwaffe to quickly and critically analyze the lessons of recent combat and to make rapid changes in doctrine, equipment and force structure to correct flaws.¹²

German Operational Air Doctrine on the Eve of War

On 1 August 1939 the Luftwaffe's new chief of staff Hans Jeschonnek sent senior commanders guidelines for the use of the Luftwaffe in support of ground forces.¹³ The guidelines were based on the Luftwaffe's experience in Spain and on the current German operational thinking. The first principle laid out was that the air commanders would decide where and how to employ air forces against ground targets.¹⁴ Senior commanders were encouraged to think of the larger picture, i.e. the objectives of the whole campaign, and not just about their immediate mission. The guidelines reminded commanders that attacks against enemy transportation targets, depots and rear areas might have an even greater operational effect than attacks on frontline enemy forces.¹⁵ The directives viewed air support for the army mainly in terms of interdiction operations designed to cut off the forward elements of the enemy forces by destroying the roads and rail nets in the rear and attacking enemy columns on the roads. Such interdiction operations denied the

¹² James S. Corum, "The Luftwaffe and Lessons Learned in the Spanish Civil War." in *Air Power History: Turning Points from Kitty Hawk to Kosovo*, Eds. Sebastian Cox and Peter Gray (London: Frank Cass, 2003) 66-92.

¹³ Oberbefehlshaber der Luftwaffe (signed Jeschonnek), *Richtlinien für den Einsatz der Fliegertruppe zur unmittelbaren Unterstützung des Heeres* 1 August 1939. In NARA File T 321 Rolle 76.

¹⁴ *Ibid* para. 1.

¹⁵ *Ibid* para 15-16.

enemy's ability to maneuver or retreat. In any case, it was far simpler and more efficient to destroy an enemy column on the road than one that was dispersed and deployed for battle. Attacking the enemy army well behind the front lines also reduced the possibility of "friendly fire" casualties.

In line with traditional German thinking about employing mass against the enemy "Schwerpunkt", the guidelines recommended that the Stuka groups not be broken into small groups for individual missions but used in mass, usually group strength (30–40 aircraft), in order to achieve an operational effect and to be sure of destroying the target.¹⁶ The directives of the Luftwaffe chief of staff noted that aircraft were best employed outside the range of the army's artillery except on special occasions when aircraft delivered bombs might be required to ensure destruction of an important target.¹⁷ This advice was particularly important because in 1939 the Luftwaffe, although it had a sophisticated communications network for the time, still did not have the capability to control or guide air attacks from the ground. The army practiced various ground signaling measures such as laying out panels, marking their lines with colored smoke and displaying swastika flags on the top of German tanks and armored cars as means to ensure that Luftwaffe aircraft did not bomb German troops by mistake. German ground troops were to be warned when the Luftwaffe was about to make attacks in their vicinity.¹⁸ Yet the closer the Luftwaffe flew to German ground troops the greater the chances for accidentally bombing one's own troops. At 12,000 to 15,000 feet, the usual height for Stukas to begin their diving attacks, German guns, troops and vehicles on the ground looked no different from Polish troops. To deal with this fact the Luftwaffe and army commanders would determine a "bomb line" along the army front and forbid the Luftwaffe to bomb short of the line unless the circumstances were exceptional or in the case of a carefully planned attack upon a clearly identifiable enemy target.

Major Luftwaffe combat formations, the air corps and some air divisions, had a "Close Battle Commander" (Nahkampffuehrer) who had the responsibility of tasking aircraft to conduct close air support of ground operations. Doctrine specified that close air support would not be used in "penny packets' distributed

16 Ibid para 12.

17 Ibid para 14.

18 Ibid para 22.

throughout the army (although many of the army commanders favored such an approach), but was to be used in accordance with the high command's priorities with support concentrated and devoted to the army units at the *Schwerpunkt* of the campaign. The Luftwaffe and air fleet daily orders designated the *Schwerpunkt* for each day's operations.¹⁹

As a result of the Spanish experience, the Luftwaffe began to place considerable emphasis upon close support of ground troops and in the Summer of 1939 the Luftwaffe created a new kind of air unit, the "Special Purpose Force", a provisional air division composed of four Stuka groups (160 aircraft), one Hs 123 group (40 aircraft) a reconnaissance squadron and two fighter groups for escort.²⁰ This force was placed under the command of Major General Wolfram von Richthofen who had proven the capabilities of CAS (close air support) as chief of staff and commander of the Condor Legion.²¹ This force would be used in mass and deployed to support the German forces at the "*Schwerpunkt*" of the campaign.

Richthofen put together a first rate staff, heavy on veterans with experience in Spain. His air division chief of staff was Lieutenant Colonel Seidemann, who had served in Spain with Richthofen. It was a very effective partnership and Richthofen worked well with Seidemann. Thanks to their Spanish experience these two airmen knew much better than other German commanders just what kind of problems they could expect in Poland. Richthofen's chief of logistics was Major Paul Deichmann, another Spanish veteran. Both Seidemann and Deichmann would serve with Richthofen in other campaigns and in the course of the war both would be promoted to general rank and given major commands of their own. Von Richthofen had Major Siebert attached to the staff to manage communications. Siebert served as communications officer for the Condor Legion in 1936–1937 and Von Richthofen gave much of the credit for the operational successes in Spain to Siebert, who Richthofen thought was brilliant in his ability to establish effective communications nets. The Spanish experience shaped von Richthofen's approach

¹⁹ The Luftwaffe close air support doctrine was outlined in Oberbefehlshaber der Luftwaffe, *Richtlinien für den Einsatz der Fliegertruppe zur unmittelbaren Unterstützung des Heeres*, Air Staff: Berlin, 1 Aug 1939.

²⁰ Hans von Rohden, ed. *Luftkrieg. Heft 5: Die Planung und Vorbereitung des Luftkriegs gegen Polen 1939*, MS: Air University Library, Nov. 1946, p. II.

²¹ Wilhelm Speidel, *Die Luftwaffe im Polenfeldzug 1939*, USAF HRA, Karlsruhe Collection, K 113.106-151, p. 18.

to the battle in Poland. In his guidance to his commanders, and in his meetings with superiors and army commanders, Von Richthofen insisted that his strike forces should only be used in mass, with at least an entire Stuka or attack group (30–40 airplanes) employed on a mission. Richthofen had learned in Spain that major operational effects could only be achieved by delivering major blows with many airplanes.

The Luftwaffe in the Polish Campaign September 1939

In most respects, the German air campaign against Poland went according to the plan. The Germans began with an air superiority campaign against the Polish airfields. The next priority was a series of deep interdiction attacks that paralyzed the Polish rail system and major bridges which greatly hindered Polish Army movements and mobilization.

The effectiveness of close support operations in Poland was especially dramatic. Large Polish formations in well-fortified positions, such as at Modlin, were subjected to heavy aerial bombardment with a consequent collapse of morale of the defenders.²² In other cases, large Polish units on the road were discovered by the Luftwaffe's tactical reconnaissance forces and cut to pieces by the Luftwaffe in the Radom-Deblin area and on the Byzura River.

Some of the best critical sources for understanding the Luftwaffe's air campaign in Poland and on the Western Front are the diaries of Major General Wolfram von Richthofen. The commander of the Special Purpose Division maintained a detailed daily log book that included notes of all the problems the Luftwaffe encountered as well as a log of daily operations. Through von Richthofen we have a clear idea how the air campaign in Poland developed. The Special Purpose Division supported the 10th Army, which was the *Schwerpunkt* of the campaign and carried out interdiction, close support and long range bombing missions. Throughout the campaign Von Richthofen or his chief of staff coordinated daily

²² Hans von Rohden ed., *Die Planung und Vorbereitung des Luftkriegs gegen Polen 1939*, p. II.

operations with the 10th Army and most Stuka and Henschel strikes on any day were upon targets chosen by the Special Purpose Division after consultation with the army headquarters. Generally at least one Stuka or attack group with a squadron or two of Me 109s for escort would be kept fueled and armed and ready to take off immediately to strike any target identified by the army or by the Special Purpose Division's own reconnaissance planes. Within minutes of receiving an attack order the Stuka or Henschel group would be on its way and protected by its escorts. For 1939 this was a highly advanced system. However, as the 10th Army's tanks advanced rapidly through the Polish Krakow Army, the main problem for both the army and the Luftwaffe was maintaining a "bomb line", a clear demarcation between German and Polish units in order to prevent the Luftwaffe from bombing German troops. The advance of the German armor forces was so rapid that neither the 10th Army nor its corps or division headquarters were clear as to the location of the most advanced German forces. By the third day of the campaign von Richthofen's most common complaint was a lack of clear information as to the location of the 10th Army's units. The Luftwaffe officers attached to the army, and possessing their own reconnaissance aircraft, were no more helpful than the army in providing clear information on German or Polish troop dispositions. Von Richthofen deployed his own reconnaissance aircraft and his Flivos assigned to the 10th Army and the corps headquarters to get information. Finally, he took to flying around the battlefield himself in his Fiesler Stork and he carried out personal coordination with General von Reichenau and the 10th Army headquarters on an almost daily basis.

One of the reasons von Richthofen needed to coordinate operations face to face is that he believed that the senior army commanders did not understand the capabilities of airpower and that unless he took the initiative to propose missions and advise the army commanders how his air units might support their operational objectives, then the Luftwaffe would either not be used, or would be deployed in small units across the front, trying to answer every request and failing to have a decisive effect. At various times during the Polish campaign, when higher headquarters did not offer specific directives or provide clear requests for Luftwaffe support, von Richthofen would take the initiative to provide operational directives for his air units to attack the Polish transportation net behind the front—attacks which had much greater operational effect on the battlefield than close air support. When clear guidance from the air fleet headquarters was lacking,

von Richthofen would send out his own reconnaissance units to find Polish troop concentrations in the rear. On 16 September von Richthofen, on his own initiative, sent his air units to attack Polish troop concentrations and rail transport east of Lublin, and thus hindered the Polish counterattacks.²³

The campaign in Poland exposed a number of serious flaws in the German doctrine, organization and equipment. The most serious problem in the campaign was the lack of effective command and control of the Luftwaffe units flying in close support of the army. This was von Richthofen's constant refrain in his diary. At the start of the war, the Luftwaffe had two different and unconnected command organizations for supporting the army. The first was a Luftwaffe officer assigned to each army to command the short-range air reconnaissance units detailed to provide the army with tactical intelligence. The Koluft (Kommandeure der Luftwaffe – commander of the Luftwaffe) was under the army command. He could communicate with the major Luftwaffe field headquarters but had no authority to order attack missions in support of the army. His control was limited to the light reconnaissance units under his command. The second means of army/Luftwaffe coordination were teams of air liaison officers (Flivos – Flieger Verbindungsoffiziere). The Flivos were usually fairly junior officers with a communications team who were attached to army corps headquarters and at the divisional headquarters of the panzer and motorized divisions. The Flivo's were tasked to keep the Luftwaffe air corps and air fleets informed of the situation on the ground. The Flivos remained under Luftwaffe command and had no authority to call in strike missions or command aircraft. The lack of common radio frequencies between the army and the Luftwaffe also posed a serious barrier to quickly passing vital information between the Luftwaffe and army and resulted in von Richthofen's headquarters often being in the dark as to the location of German army units and the conditions at the front.²⁴

At the start of the campaign von Richthofen remained close to his headquarters reading reports as they came in and issuing attack orders. But by 4 September he was complaining about the lack of information he was getting from the front. Although the army was supposed to provide him with constant updates he noted that "army communications are worse than ours."²⁵ As in Spain, von Richthofen found it necessary to personally visit the front lines to see what was happening.

23 Von Richthofen Diary 16 September 1939.

24 E.R. Hooten, *Phoenix Triumphant*, pp. 183-184.

25 Von Richthofen Diary, 4 September 1939.

Leaving his chief of staff Seidemann to manage the battle operations von Richthofen would fly to Reichenau's army headquarters to personally coordinate operations. He also flew over the front to conduct his own reconnaissance. On 6 September he landed near the headquarters of the 1st Panzer Division, Reichenau's lead division on the drive towards Warsaw, to get an accurate view of the situation. Von Richthofen found out that the lead units of the 1st Panzer had run into some heavy Polish resistance and that the division's own artillery was stuck in a column to the rear and would take three to four hours to move up to provide effective fire support. Von Richthofen used the army's communications net, which for once seemed to work, and called Colonel Seidemann back and had him order the HS 123 group to immediately fly up to attack the Polish units in front of the 1st Panzer Division. The Henschels soon arrived and broke up the Polish counterattacks and allowed the 1st Panzer Division to continue its advance.²⁶ However, after bailing out the army, in his diary von Richthofen noted that the army had left its artillery far to the rear and that CAS should not be a substitute for artillery.²⁷

Logistics were another serious problem for the Luftwaffe in Poland. As the 10th Army drove rapidly forward the short-range Stuka and fighter units of the Special Air Division needed to deploy forward in order to provide effective support to the army and to maintain a high sortie rate. However, supply columns were slow to catch up with the panzer and motorized troops advance. A panzer unit could carry several days of food and enough ammunition for a couple of days of combat on its own vehicles, but needed a great deal of fuel to keep moving. Fuel supplies became the factor that limited German operations. The 4th Air Fleet allocated one Ju 52 transport group to support both General Reichenau and Richthofen and by 3 September the transports were already being used to fly fuel forward to keep up the momentum of the advance. The further the panzers advanced into Poland, the more urgent the need for air transport of fuel became. On 3 September the Luftwaffe transports brought 30 tons of fuel forward for the 10th Army's 1st Panzer Division and on 5 September this requirement jumped to 74 tons. At the same time, von Richthofen began to move his short ranged Stuka and fighter units forward to former Polish airfields and he needed all the air transport he could get to keep his planes supplied with fuel and bombs.

26 Von Richthofen Diary, 6 September 1939.

27 Von Richthofen Diary 5 September 1939.



Ju 52 transports were important to the Luftwaffe in moving men and materiel forward to captured airfield – Luftwaffe photo

The first jumps forward initially went well and Luftwaffe airfield companies quickly repaired the formerly Polish airfields for occupation by Richthofen's units. But maintaining a high sortie rate that forward bases allowed also meant a rapid expenditure of fuel and munitions. By 8 September Richthofen complained to his air fleet commander, General Lohr, that his supplies of fuel and munitions were so low that he would have to reduce his sorties. Shortages were so acute that on 11 September Richthofen reduced the sortie rate for some of his Stuka and fighter groups to one sortie per day. The problem was eased on 13 September when the Luftwaffe allocated two additional Ju 52 squadrons to support the 4th Air Fleet. Von Richthofen's forward groups were immediately given transport priority and the Stukas returned to their usual high tempo of four or more sorties.²⁸

Through the campaign von Richthofen noted a number of friendly fire attacks by the Luftwaffe on German army units.²⁹ This was a constant problem for the Luftwaffe and the army in Poland and was the result of an awkward liaison system and the lack of common radio frequencies between the Luftwaffe and the army. All these issues would be addressed by the Luftwaffe staff after the Polish campaign.

²⁸ Hooten, p. 184.

²⁹ Von Richthofen Diary 16 September 1939.

The Bombing of Warsaw

Warsaw had been targeted several times in the first week of the campaign and specific military targets including airfields and railyards were struck by the medium bombers. On 12 September, with the Luftwaffe's short ranged Stukas and attack aircraft now stationed close enough, the Luftwaffe high command ordered both air fleets to make major air attacks on Warsaw General Grauert's 1st Air Division of the 1st Air Fleet attacked the city from the north. However, von Richthofen's Special Purpose Division, was still heavily engaged in the ground battle, and could muster only 183 sorties for the raid. When they arrived over the city Von Richthofen's pilots found that many targets were obscured by smoke from Grauert's attack so they could not bomb accurately. Von Richthofen complained loudly that neither his nor Grauert's attack was coordinated and no bomber units attacked on schedule and the attack apparently had little effect upon the Warsaw's defenders.³⁰ Von Richthofen met Goering in Radom the next day while Goering was making a tour of the front. At this meeting Richthofen argued that a single air commander needed to be appointed for the air assault upon Warsaw so that further attacks could be properly planned and coordinated. Richthofen also pointed out that he would be the best choice to command the operation, a bit of arrogance on his part as he was outranked by many other Luftwaffe generals in Poland. On the other hand, with the Spanish experience behind him, he also had more experience than any other Luftwaffe general in Poland in coordinating large operations.³¹

Forcing a quick surrender of Warsaw was viewed by the German high command as a strategic necessity. Von Richthofen believed that massive air attacks upon the city would break Polish morale and force a quick surrender—so he planned for a massive aerial attack with all available forces for the 25th of September. Von Richthofen's attack on Warsaw had characteristics of an indiscriminate terror raid. Hundreds of sorties were flown and by the end of the day Von Richthofen's air units had dropped 632 tons of high explosive and incendiary bombs on Warsaw.³² Since the Luftwaffe had already begun deploying some of its bomber formations

³⁰ Hooton, p. 186.

³¹ Hooton, p. 186.

³² In the 25 September attack on Warsaw the Luftwaffe dropped 560 tons of high explosive and 72 tons of incendiary bombs. Only two Ju 52s were lost in the attack. See Hooton, *Phoenix Triumphant*, p. 188.

back to the Western Front Von Richthofen could only conduct a large attack by using his Ju 52 transports as bombers. The Ju 52s flew over the city as airmen shoveled thousands of incendiary bombs out the cargo doors – nothing that one could describe as attacking only military targets or “avoiding unnecessary civilian casualties.” On the other hand, by the rules of war in 1939 Warsaw was a defended city under siege – and therefore a lawful target of war.³³

Von Richthofen’s terror attack lowered the little morale the Poles still possessed. Yet, ironically, the massive air raid, the largest that had been seen to that time, was not the cause of Warsaw’s surrender. The Polish commander in chief, then interned in Romania, was already aware that the situation in Warsaw was hopeless and he issued the order for Warsaw to capitulate on September 26 while he also initiated negotiations to surrender the last major pockets of Polish forces. The Polish government, already in exile, was not terrorized into surrendering Warsaw, but simply saw that nothing could be gained by further resistance. By 29 September, the city of Warsaw and all the remaining organized Polish military forces had surrendered to the Germans.

Although Von Richthofen’s bombing of Warsaw had a small effect on the outcome of the Polish campaign it gave rise to a part of the mythology of Blitzkrieg. The international press reported the numbers of casualties from the aerial attack on Warsaw as between 20,000 and 40,000 dead and that the one attack had destroyed more than 10% of the buildings in the city and such figures remained in the history books over sixty years later.³⁴ In reality, sober analysis has to place the casualties and damage at a far lower level. If Warsaw’s casualty rates were equal to the most lethal bombing raids of World War II in Germany then the casualty rates would be between 6,000 and 7,000 dead.³⁵

33 Hooten, *Phoenix Triumphant*, p. 188. The French air attaché in Warsaw noted that the German attack had been in accordance with the laws of war and that civilian casualties had been located close to legitimate targets. On the French air attaché’s comments see Mike Spick, *Luftwaffe Bomber Aces* (London: Greenhill Books, 2001) p. 40.

34 For the 20,000 figure see “Wir warden sie ausradieren,” *Der Spiegel*, No. 3 vol. 13, 13 January 2003, p. 123. Hooten gives the figure of 40,000 Poles killed. See Hooten, *Phoenix Triumphant*, 188.

35 The most deadly bomb raids of World War II were Hamburg in August 1943 and on Dresden of February 1945. In those two raids the fatality level was 7.2-10.2 fatalities for each ton of bombs dropped. The popular figures given for Warsaw casualties in 1939 would have made that attack four to six times more deadly than the Hamburg or Dresden raids - an utter improbability as both Hamburg and Dresden saw huge firestorms. See James S. Corum, *Inflated by Air: Common Perceptions of Civilian Casualties by Bombing*, Air War College thesis (Air University: Maxwell AFB, AL, April 1998) 14-15.



End of Polish campaign – Von Richthofen Greets Hitler. General von Reichenau, in center with monocle. Hitler took a great liking to von Richthofen, who he considered one of his best generals – USAF photo

Another irony is that the sensational tone of the press coverage in the Western nations did nothing to help the Polish cause, but instead served the Nazi cause wonderfully. The international press presented the basically false image of the Luftwaffe as a force that could level whole cities and kill tens of thousands instantaneously— a capability way beyond the Luftwaffe’s powers in 1939–1940. The Western media coverage presented a picture of Germany’s ability to crush any nation that might resist Germany— all of which fit in nicely with the Nazi propaganda themes. Shortly after the end of the campaign Josef Goebbels’ Propaganda Ministry amplified the Western media’s description of the campaign in the film “*Feuerteufe*” (*Baptism of Fire*) that was shown in Germany and abroad. This dramatic film portrayed the German army in Poland as a mechanized force consisting of thousands of the most modern tanks and motor vehicles and gave a large role to the Stuka attacks. In fact, only a small part of the German army (less than a quarter of the army in 1939) consisted of modern motorized and mechanized divisions. The Stukas were impressive weapons, but were also highly vulnerable to anti-aircraft fire. Most of the German army of 1939 (and through the end of the war) consisted of infantry divisions that used horses as the main motive power to pull supply wagons and artillery pieces. But the German Propaganda Ministry very cleverly provided the world with a false vision of ultramodern and, hence,

unstoppable German forces. The Western media coverage of Poland, coupled with the official German propaganda, magnified the Luftwaffe's effectiveness and served the Nazi cause by demoralizing the civilians and military forces of the Western European nations that would soon be Germany's targets. The images of the bombing of Warsaw and the films of German tanks rolling through Poland shown in the West had much to do with the rapid collapse of Holland and Belgium and France in May and June 1940.

Lessons from the Polish Campaign

Warsaw was still burning when the Luftwaffe and the army began to analyze their operational performance in order to learn lessons as quickly as possible and to adapt their doctrine, force structure, equipment, and tactics to correct deficiencies exposed in Poland. For the Luftwaffe, it had not been an especially hard campaign. In one month of combat the Luftwaffe lost 285 planes from all causes (among them 67 fighters, 78 bombers and 31 Stukas) while a further 279 planes suffered more than 10% damage. This was a loss rate of under 10% of the aircraft used in the campaign.³⁶ These losses were quickly made good as new aircraft flowed from the factories and replacement personnel was sent from the training schools and the expansion of the Luftwaffe continued. Starting in October 1939 the Luftwaffe began publishing a series of tactical bulletins that were distributed to major Luftwaffe commands that highlighted problems seen in Poland and provided updates of tactical and operational doctrine.³⁷ The army established a similar office and moved to correct its flaws in equipment, organization and tactics.

The first lesson learned in the Polish campaign by the Wehrmacht's senior leaders was the importance of full cooperation of the army and Luftwaffe units. When the Luftwaffe and the army commanders were co-located and worked together

³⁶ Adolph Galland, Karl Ries, *Die Deutsche Luftwaffe 1939–1945* (Dornheim, Podzun Verlag, 2000) p. 19.

³⁷ Examples of the tactical directives outlining lessons from the Polish campaign sent by Luftwaffe headquarters to the air fleets are found in: Luftwaffe General Staff, Operations Branch, *Richtlinien (Directives) to Luftflotte 2 (October 1939-January 1939)*. See NARA T-321 Roll 172.

decisive results were achieved. In the Luftwaffe's first assessment of the lessons learned from Poland in October 1939 the Luftwaffe general staff requested improved army/Luftwaffe communications links to enhance the cooperation of both services.³⁸ This lesson very likely came directly from von Richthofen. Even though the Luftwaffe had an extensive communications system prior to the campaign it had still proved insufficient under actual war conditions.³⁹ Richthofen had been vociferously critical about his communications problems. In the case of pre-planned attacks the communications system was sufficient. But under the pressure of rapid mobile operations the liaison system often broke down.

The Luftwaffe staff was not happy with the Koluft system. Koluft officers and reconnaissance units that served the army could have been very useful to the Luftwaffe in identifying targets, but the Koluft was not in the same communications system as the Luftwaffe air divisions and corps. Therefore, the Koluft played little role in supporting the Luftwaffe. In combat it often took hours for the Koluft's reports to work through the army communications system to reach the air fleet headquarters. The Flivos only operated at the higher army headquarters and during the rapid ground advances of the Wehrmacht were often unable to provide a current and accurate depiction of the ground situation. Thus, the Luftwaffe was often unsure of the location of the army units and this was the cause of the incidents of Luftwaffe Stukas and bombers attacking German columns.⁴⁰ To improve liaison senior Luftwaffe commanders started following Von Richthofen's example and developed closer personal liaison with the senior army commands.

In the light of the Polish campaign neither the army nor the Luftwaffe was happy with the liaison system. The army wanted better communications and more authority to the Koluft to direct operations. The Luftwaffe did not like the Koluft system as it divided liaison, information exchange and coordination into two channels. On the other hand, the Luftwaffe rated the Flivos' performance in

38 "Taktik Luftwaffe: Taktische Erfahrungen Nr. 2. Ausfertigung für Führungsstellen," Circa October 1939. in BA/MA RL 2 II/280. p. 15.

39 For a good analysis of the Luftwaffe's communications system in the Polish campaign see Karl Klee, "Die Luftpnachrichtentruppe im Feldzug gegen Polen." *Wehrwissenschaftliche Rundschau* No. 4, 1954. 71-123. The Luftwaffe deployed 70,000 signal troops for the campaign with five Luftwaffe signals regiments deployed as well as parts of two others.

40 Wilhelm Speidel, *Die Luftwaffe im Polenfeldzug 1939*, USAF HRA Karlsruhe Collection Doc 113.106-151. pp. 157-158.

Poland as fairly effective and created more Flivo teams and gave the Flivos better communications and more mobility.⁴¹ This reform would have a major impact on the 1940 campaign in the West. A top priority for the Luftwaffe after the Polish campaign was to improve the communications and reporting nets.⁴² Eventually, in 1942, the Luftwaffe would dispense with the Koluft system and place all short-range reconnaissance aircraft under Luftwaffe operational command. In the short term, however, some improvements made Luftwaffe communications in time be used in the spring of 1940. In Poland Hs 126 light reconnaissance planes could only transmit information to the artillery in Morse code. For the spring 1940 campaign they had voice radios installed for more effective artillery spotting.

Another major problem noted by the Luftwaffe leaders was the difficulty of maintaining logistics in the middle of the campaign. This was the greatest limiting factor for an organization such as the Special Purpose Division that had mostly short range aircraft and needed to fly from forward airfields. Although the Luftwaffe had a considerable number of motorized supply columns and airfield companies for the Polish campaign, units such as the Special Purpose Division still ran low on fuel and munitions at forward airfields. The air transport assets allocated to the Luftwaffe tactical units had been insufficient. For future operations the Luftwaffe would need more transport units if it wanted to support a blitzkrieg-type campaign.

Yet the Luftwaffe failed to take the limitations of a logistics system designed only for short campaigns seriously. While the Luftwaffe's airfield units could keep forward units supplied with fuel and bombs, the Luftwaffe groups and wings had only a minimal capability to repair and rebuild aircraft. If an aircraft needed major repairs it had to be loaded onto a truck or rail car and shipped back to Germany where damaged planes were repaired or rebuilt at the factory. This lean repair and maintenance infrastructure saved the Luftwaffe money but it also meant that damaged aircraft were out of action for a long time. The system worked in the short campaigns of 1939 and 1940 when the Luftwaffe could throw every available aircraft into the battle, win quickly and rebuild the force after the battle.

41 Ibid. p. 149.

42 Williamson Murray, "The Luftwaffe Experience, 1939-1941" pp. 71-114 in *Case Studies in the Development of Close Air Support* ed. Benjamin Franklin Cooling (Washington DC: Office of USAF History, 1990) 78-79.

However, if the air war became an attrition war, the lack of forward maintenance and repair units guaranteed that the unit aircraft serviceability rates would drop precipitously. Starting with the Russian campaign in 1941, this is precisely what happened.

After the Polish campaign the Luftwaffe support had greatly impressed senior army commanders and the army gave much of the credit for the success of the campaign to the effect of Luftwaffe interdiction attacks and attacks on Polish forces. The interdiction attacks had worked well to cripple the Polish army's mobility and in some cases large Polish units on the road were discovered by the Luftwaffe's tactical reconnaissance forces and cut to pieces by the Luftwaffe—features of the destruction of Polish forces in the Radom-Deblin area and on the Byzura River.⁴³ Even the Luftwaffe seemed surprised at the effectiveness of Stuka attacks on Polish ground forces. Colonel General von Reichenau declared that the attacks of the Luftwaffe's "Special Purpose Force" had "led to decision on the battlefield."⁴⁴

The Luftwaffe noted other strengths of their doctrine and organization in Polish campaign and decided to reinforce these successes for the 1940 battles to come. One of the great successes in the Polish campaign had been the flak units of the Luftwaffe. Germany had a large flak force in 1939 (over 10,000 flak guns compared with about 1,000 in France) and a large part of this force was in motorized units attached to the army for air defense. The flak units, which belonged to the Luftwaffe but were under the army's operational control, were distributed throughout the army in battalions and regiments. The flak force worked very effectively in their primary mission of air defense and usually shot down or drove off the few attacks made by the Polish Air Force.⁴⁵ However, the most important lesson from the Polish campaign was the effectiveness of the flak units, particularly the heavy 88 mm gun batteries, in direct fire against ground targets. The 88 mm guns had been used extensively in Spain for that purpose, so the flak units were already trained and prepared for that mission. In numerous cases, the 88 mm guns proved to be a superb and accurate weapon for taking out Polish bunkers and fortifications.⁴⁶

43 Murray, "The Luftwaffe Experience, 1939–1941" p. 81.

44 Speidel, *Die Luftwaffe im Polenfeldzug*, pp. 9-11.

45 On German flak in Poland see Horst-Adalbert Koch, *Die Geschichte der Deutschen Flakartillerie 1933–1945*, (Bad Nauheim: Verlag Hans-Henning, 1955) pp. 35-36.

46 Ibid.

In the aftermath of the Polish campaign, the chief of the Flak troops reorganized the flak forces to provide more effective anti-aircraft and direct fire support to the army. Two flak corps were created as permanent organizations for field support of the army. Each flak corp was composed of 3-4 flak regiments and supporting troops. The flak corps would be assigned to the armies with the main weight of the attack and would be under operational control of the army. However, the modified flak doctrine specified that flak units were to be kept well concentrated to cover the primary troop movements at the points of decision and were also to serve as an operational reserve for the army.⁴⁷ For example, as von Kleist's army group was given the primary mission for the advance into France, one of the flak corps was assigned to Gruppe Kleist. Other army units with a lower priority would get along with the support from the light flak units that were integral to the army (Heeresflak).

The Luftwaffe staff carefully studied the results of its air attacks against Polish targets and set to work to adapt its munitions to reflect the experience of the campaign. The Luftwaffe's standard 250 KG and 500 KG bombs worked quite effectively against interdiction targets such as the Polish rail system. Against strong fortifications, the Luftwaffe discovered that it needed heavier bombs with delayed fuses and deep penetration capability. Against ground troops in the open, the Luftwaffe discovered that a larger number of smaller bombs were more lethal than a few large bombs. By the campaign in France, a 1000-KG bomb with a delayed fuse and rocket assist would be ready to use against French fortifications⁴⁸. The requirement for a light, antipersonnel bomb resulted in the development of the SD-2 cluster bomb. This was a canister that contained ninety-six bomblets of three pounds each –the first modern cluster bomb. When dropped, the container would break open and scatter the bomblets, armed with contact fuses, over a broad area with a devastating effect upon ground troops and unarmored vehicles. This weapon was ready by the Russian campaign where it would prove to be tremendously lethal.⁴⁹

47 Koch, p. 38.

48 Speidel, W. *The Campaign for Western Europe, Part 1*, USAF HRA Karlsruhe Collection. Doc K 113.107-152, Pt. 1, p. 144.

49 Green, *The Warplanes of the Third Reich*, p. 382.

Absorbing the Lessons of Poland – Contrasting the Luftwaffe and Western Allies

From October 1939 to April 1940 the Germans used the lull in operations to absorb the lessons learned in the Polish campaign. In the winter of 1939/1940 the Luftwaffe kept to a busy schedule of exercises and staff wargames. The lessons from the Polish campaign had to be absorbed quickly as the Luftwaffe would face a much more formidable enemy than the Poles. In the winter of 1939/40 the Luftwaffe paid particular attention to improving communications links through the Flivos and air force headquarters and also developing better communications nets with the army.⁵⁰ The army and the Luftwaffe procedures were examined and staffs found many things to improve. For example, one of the major problems in coordinating air support between the army and the Luftwaffe was that the two services used different maps with different scales. Because the Wehrmacht had a program of wargames and planned exercises that involved both the airmen and army staffs this problem was examined and the army and the Luftwaffe commanders decided upon a common map for the campaign in the West. To simplify reconnaissance and air support Wehrmacht maps were marked with a common numbered grid system to plot enemy locations more easily and mark sites for Luftwaffe attack in the midst of battle.⁵¹ The army/Luftwaffe staff exercises discussed the delivery of fuel and munitions to army Panzer units by Luftwaffe transport and these exercises culminated in a live exercise in early April 1940 where the Luftwaffe practiced delivery of fuel and munitions by airdrop. The army and the Luftwaffe supply units learned the art of loading and unloading transport aircraft and packaging supplies and rigging parachutes.⁵²

Von Richthofen's unit, now expanded and renamed the VIIIth Air Corps was active with staff wargames and unit exercises and von Richthofen made improving liaison and communications his top priority. On 7 November von Richthofen

50 Michael Forget, „Die Zusammenarbeit zwischen Luftwaffe und Heer bei den Französischen und deutschen Luftstreitkräften im Zweiten Weltkrieg“, in *Luftkriegführung im Zweiten Weltkrieg*, ed. Horst Boog, Herford (1993) pp. 497-525, see esp. pp. 511-512.

51 Florian Rothbrust, *Guderian's XIXth Panzer Corps and the Battle for France* (Westport: Praeger, 1990) pp. 40-42.

52 Ibid. pp. 42-43.

received the armored cars he had requested for his Flivos and modified them with appropriate radios so that they could effectively operate with the front line Panzer units.⁵³ In the spring von Richthofen also experimented with controlling Stuka attacks from the ground using his Flivos in their armored cars. The exercises showed promise but this experiment had to wait for the Russian campaign to be realized.⁵⁴ In November 1939 the VIIIth Air Corps received 10 Fi 156 Fiesler “Storks” for use as liaison planes. The Fieslers, with their astounding ability to take off and land in short fields, were a perfect airplane for liaison work. The ten Storks also provided the headquarters and staff of the air corps with the means to quickly move personnel to forward headquarters as they relocated during the battle.⁵⁵ Through November and December 1939 von Richthofen and his staff held talks with Reichenau’s army staff and with General Dessloch of the newly-formed 2nd Flak Corps which would be supporting the ground forces and forward the Luftwaffe units on the northern flank of the offensive into France.⁵⁶ From October through April the Luftwaffe and the army planned the May attack together.

The Luftwaffe used the pause in operations to conduct unit training at all levels. For squadrons and groups this meant at the gunnery ranges and flying mock dogfights. Bomber units practiced flying and navigating at night. Headquarters conducted staff wargames. Army and Luftwaffe maneuvers were conducted with an emphasis on conducting joint operations. The contrast between the Wehrmacht and the Allied armed forces during this period, which came to be known as the “Phony War” is striking. The Germans trained and prepared with a sense of urgency for the campaign they knew was coming. The Allies carried out their normal battalion and regimental training exercises but very few large unit maneuvers or staff exercises. The French maintained an almost peacetime approach to training, while the BEF in France, 10 divisions by the spring of 1940, generally ignored any large unit training. When General Bernard Montgomery, then 3rd Infantry Division commander with the BEF, conducted a series of division

⁵³ BA/MA N 671/5. Nachlass von Richthofen. Kriegstagebuch der VIII Fliegerkorps 5.10.39- 9. 5. 40. Page 8.

⁵⁴ Williamson Murray, “The Luftwaffe Experience, 1939–1941”, p. 89.

⁵⁵ BA/MA N 671/5. Nachlass von Richthofen. Kriegstagebuch der VIII Fliegerkorps 5.10.39- 9. 5. 40. see 6.

⁵⁶ BA/MA N 671/5. Nachlass von Richthofen. Kriegstagebuch der VIII Fliegerkorps 5.10.39- 9. 5. 40.see 9-10.

exercises it was seen as a rare and revolutionary event. Indeed, Montgomery made some scathing comments about the lack of division and corps training in the British army of 1940. He pointed out that “In the years preceding the outbreak of war no large-scale exercises had been held in England for some time.”⁵⁷ When the BEF was formed and shipped to France in the fall of 1939 there “was a total lack of any common policy or tactical doctrine throughout the BEF, when differences arose those differences remained and there was no firm grip at the top.”⁵⁸

The French air force and the RAF contingent sent to France were no better than the Allied armies in their attitude towards training. While the Luftwaffe airmen and ground crews complained that they were being worn out by constant training, a French Air Force officer noted the “inactivity of the months before 10 May...” on the part of the Allied air units.⁵⁹ While the Germans worked on absorbing the lessons of the Polish campaign the Allied powers seemed indifferent to learning from this most recent experience of large scale warfare. The several thousand Polish officers who had seen the German blitzkrieg escape the final capitulation and made their way to France and Britain could provide detailed information about German tactics, doctrine and equipment. But senior Allied commanders took little notice of the experience of their defeated Polish allies and maintained a solid confidence that French and British doctrine, organization and weapons were more than a match for anything the Wehrmacht could throw at them.

The Battle for France and the Low Countries

The Luftwaffe faced an exceptionally tough battle in the campaign against France and the Low Countries in May 1940. The scope of the Luftwaffe’s operations at the start of the campaign was enormous as the Luftwaffe had to simultaneously support major paratroop and air landing operations in Holland, provide close support for the army units advancing upon Northern France and Belgium and

57 Bernard Montgomery, *The Memoirs of Field Marshal Montgomery* (New York: Signet, 1958) 43.

58 Ibid. 43, 49.

59 Anthony Cain, *The Forgotten Air Force: French Air Doctrine in the 1930s* (Washington: Smithsonian Institution Press, 2002) 124.

Holland and carry out attacks against the British and French air forces. Unlike the Polish campaign, the Germans faced strong opposition in the air and had only a marginal superiority in the quantity and quality of aircraft available for the campaign. Hence, better doctrine and tactics would be the key for the Luftwaffe in gaining air superiority and effectively supporting the German army offensive.

There had been enough time between the Polish campaign and the Battle for France for the Luftwaffe to absorb the lessons learned in Poland and make significant changes to its organization and doctrine. The Luftwaffe's innovations proved effective in the Spring 1940 campaign. The Luftwaffe's ground organization had been strengthened and proved very efficient in putting captured Belgian, Dutch and French airfields into operation as fighter and Stuka bases. With the British and French air forces still fairly intact after the first wave of German attacks upon forward Allied air bases, the Luftwaffe could only carry out its support missions and gain air superiority by means of a higher sortie rate than the Allies. The efficient operations of the Luftwaffe's mobile supply and airfield units enabled the Luftwaffe's fighter and Stuka units to maintain an average of four sorties per day throughout most of the campaign. The Luftwaffe's bomber aircraft maintained an average of one sortie per day. This is in stark contrast to the French Air Force whose fighters flew an average of only one sortie per day in the campaign and whose bombers flew an average of only one sortie every four days. Thus, the allies were overwhelmed in the air, not by the number of German aircraft, but rather by a more effective ground organization. The failure of the French Air Staff to plan or organize for the broader requirements of technology was directly translated into extremely low readiness rates for French aircraft in May, 1940. Exact figures for aircraft operational rates are not available (another sign of French disorganization) for May, 1940 but a fair estimate from the numbers of aircraft that flew on missions is an average operational rate of about 50–60% for fighter units and no more than 40% for bomber units.⁶⁰ The French records of the campaign of 1940 are spotty but some French squadrons probably had no more than 40% of their aircraft available for operations before May 1940 and French military historians estimate a very low operational rate for the French Air Force at the height of the

⁶⁰ See Charles Christienne and Pierre Lissarague, *A History of French Military Aviation* (Washington DC: Smithsonian Institution Press, 1986) p. 335.

battle in May 1940. The French Air Force consistently made group attacks with no more than 40–50% of the official group strength.⁶¹

The Flak corps proved to be tremendously effective in the campaign and the army after action reports noted the contribution of the large flak organizations to the campaign. Massed Luftwaffe flak forces, operating with the forward forces of the army, decimated whole Allied squadrons attacking the crucial bottleneck at the Meuse River crossing at Sedan on 13 and 14 May. Throughout the campaign, the Flakkorps I and II shot down 586 allied aircraft.⁶² The other major contribution of the Flak force was in its role as direct fire artillery. The high velocity 88 mm flak guns were superb weapons for destroying bunkers and fortifications facing German troops. There were several cases in the campaign in which flak guns blasted a way through French and Belgian defense lines for the advancing German troops. Flak Korps I claimed 30 bunkers and fortified positions destroyed and Flak Korps II claimed 17 major fortifications.⁶³ Finally, the 88-mm Flak gun proved its effectiveness as one of the premier anti-tank weapons of the war. The two flak corps, which both put Luftwaffe flak units close to the front lines of advance, claimed a total of 326 Allied tanks destroyed or damaged during the 1940 campaign.⁶⁴ After 1940, the Luftwaffe would create more flak corps and the organizations saw extensive service in Russia where they excelled in both the anti-aircraft and ground support roles.

Other innovations made themselves felt in the 1940 campaign. In attacks against some of the outlying forts of the Maginot Line at Brisach, Stukas dropped the new 1000-KG armor-piercing bombs on the French bunkers. These proved fairly effective against even the strongest fortifications.

61 Williamson Murray, *Strategy for Defeat* (Maxwell Air Force Base: Air University Press, 1988) p. 43. See also Pierre Paquier, *l'Aviation de Bombardement Française en 1939–1940* (Paris: Berger-Levrault, 1948) See pp. 8-9 and pp. 208-235, for a log of French air activity between May 10-20, 1940.

62 Koch, pp. 42-43.

63 Koch, pp. 42-43.

64 *Ibid.*



Air view of attack on Allied column, France 1940 – USAF HRA

The most dramatic changes demonstrated in the battle for France were new tactics for the close air support units of the Luftwaffe. General Wolfram Von Richthofen proved himself to be the most innovative of the senior air leaders in this regard. Unhappy with the poor communication between the Luftwaffe and the army in the Polish campaign, Von Richthofen placed his own headquarters adjacent to the army headquarters that he was supporting. When a situation arose that required employing airpower, Von Richthofen or his chief of staff could confer with the army commander and chief of staff, make a decision and send dispatch aircraft to the front lines. In order to get a better picture of the ground situation, Von Richthofen put additional Flivo teams into armored cars in order to get them closer to the front lines. Throughout the campaign, the VIII Fliegerkorps kept one Stuka group and one Me 109 group for escort available at a forward airfield ready

for immediate takeoff. Good reconnaissance, better communications and close coordination with the army enabled Von Richthofen to make quick decisions to employ his forces in close support operations. Once the decision was given, the Stukas, covered by the Me 109s, would be in the attack within 45–75 minutes. By the standards of 1940, it was remarkably effective close air support.⁶⁵ It was a better performance than in Poland and it shows how hard the Luftwaffe had worked to learn the lessons of the Polish campaign.

The most dramatic operational innovation for airpower in the campaign came on 16 May, after Gruppe Kleist had crossed the Meuse at Sedan. The rapid advance of the German armored forces across the Meuse caused consternation in the German High Command as a gap had opened between the fast moving armored formations and the slow-moving infantry divisions that had the mission of protecting the flanks of the German advance. On 16 May Army Group Commander von Rundstedt ordered von Kleist to slow his advance in order to allow the infantry divisions time to catch up.⁶⁶ Von Richthofen, whose air corps had been providing support to the army's offensive in the north and to the forces advancing through the Ardennes since the start of the offensive believed that his forces should be concentrated to support Gruppe Kleist, who was conducting the primary German attack. Von Richthofen believed that the VIII Fliegerkorps could effectively protect the flanks of von Kleist's panzer force. On 16 May, von Richthofen convinced Reichsmarschall Goering to issue order directing the VIII Fliegerkorps to "follow Panzer Group von Kleist to the sea."⁶⁷

The army initially doubted that von Richthofen could do well on his promise to protect the panzer divisions' flanks. However, as it became clear that the French would not mount another "miracle on the Marne", the High Command ordered the Panzer advance to continue. Von Richthofen directed his forces to screen and protect Panzergruppe Kleist's open flanks as their primary mission and to execute attacks in front of the panzer advance as the secondary mission.⁶⁸ Von Richthofen quickly did well on his promise to protect Panzergruppe Kleist's flanks. The reconnaissance units of the VIII Fliegerkorps spotted French divisions moving to

65 Speidel, *The Campaign for Western Europe*, Pt. 1, p. 181.

66 Alistair Horne, *To Lose a Battle: France 1940* (New York: Penguin, 1969) pp. 474-475.

67 Speidel, *The Campaign for Western Europe*, Pt. 1, p. 171.

68 Speidel, *The Campaign for Western Europe*, Pt. 1 pp. 185-186.

counterattack and relentlessly bombed troop columns, and French tank units that appeared on the German flanks. Von Richthofen's Stukas helped repel attacks by De Gaulle's 4th Armored Division at Montcornet on 17 May and on the 19th at Crecy-sur-Serre.⁶⁹ The Luftwaffe attacks on enemy tanks were rarely successful as direct bomb hits on tanks were rarely achieved and the Ju 87s and Hs 123s of the VIII Fliegerkorps carried no heavy cannon. However, the aircraft attacks separated the tanks from their supporting fuel and ammunition vehicles and inflicted heavy damage to the French infantry and artillery units.

The VIII Fliegerkorps carried out its mission of flank protection and close support very effectively. The French and British forces that threatened the German advance were decimated or, at least, thrown into confusion. The infantry divisions were granted enough time to move up and protect the Panzergruppe's flanks. Airpower, in the form of close air support and close interdiction, had proven to be a decisive factor in enabling the tremendous German victory in France 1940. The Germans had learned the effectiveness of interdiction attacks in Poland. That the flanks of rapidly-moving formations could be protected by airpower was a revolutionary concept for the evolution of ground warfare.

Conclusion

In the first part of World War II the Luftwaffe was a highly effective learning organization, and it was this ability to rapidly learn lessons and adapt that made the German victory against the Western Allies possible in the spring of 1940. In the Polish campaign the Luftwaffe had learned many key lessons, especially about conducting joint warfare. The Luftwaffe senior commanders, with a few key leaders such as Wolfram von Richthofen playing a central role, objectively looked at the many flaws in doctrine, organization and equipment exposed by the one month of hard fighting in Poland, and went to work to correct these failing in the six month period before the campaign in the West. At this stage of the World War the Western Allied military leaders present a model of incompetence in the top echelons. Despite having plenty of information, the senior British and French

69 Horne, *To Lose a Battle* 481,-82, 527-28.

military leaders took little interest in learning lessons, or in critically examining their doctrine and organization and training. there was little interest in testing doctrine or tactics through exercises. Unlike the Polish campaign, where the Germans held an overwhelming superiority and non one ever seriously doubted the outcome, in the West the Germans and Allies were evenly matched. Thus, the dramatic failure of the Western Allies in May–June 1940, and especially in their ability to use their air forces, lay not in any deficiencies in equipment, but solely in the cognitive sphere.