

17AL4395

### Past is Prologue: An Analysis of D-Day Air Superiority

“A great tragedy has ended. A great victory has been won. The skies no longer rain death.” These words spoken by General Douglas MacArthur after the surrender of the Empire of Japan properly illustrate the power of air superiority in the Second World War.<sup>1</sup> Both the Imperial Japanese Army Air Force (IJAAF) and the German Luftwaffe used the skies to empower their armies to bring death and oppression to the peoples of Asia and Europe respectively. Conversely, the Allies’ use of air power was critical in stopping the fascist forces across the globe; however, perhaps the most decisive employment of air dominance was during the D-Day invasion.<sup>2</sup> Allied air superiority allowed the events of D-Day to occur, and it set in motion a chain of events that would lead to the liberation of Europe.

The initial Nazi conquest of Europe had been largely assisted by the forces of the Luftwaffe. A clear example of this would be the invasion of Poland, during which four hundred Luftwaffe’s fighters, primarily Messerschmitt Bf 109s, were used to strike the Polish Air Force in the sky. Moreover, nine hundred bombers, mainly Dornier Do 17s, were used to strike the Polish Air Force on the ground when the planes were refueling, undergoing maintenance and

---

<sup>1</sup> MacArthur, Douglas. General MacArthur's V-J Day Radio Broadcast, September 2, 1945. From the Papers of Richmond Kelly Turner. Naval History and Heritage Command, 2021.

<sup>2</sup> Wueschner, Silvano. “Key to success: Allied airpower at Normandy.” [www.maxwell.af.mil](http://www.maxwell.af.mil), May 29, 2019,

<https://www.maxwell.af.mil/News/Display/Article/1859844/key-to-success-allied-airpower-at-normandy/>

repairs, or changing personnel.<sup>3</sup> The result of this overwhelming air superiority by the Nazis on the Polish front was a decisive German victory and the understanding that air superiority could cripple an otherwise solid defense, and minimize casualties, and contribute to overall success of the mission. This fact was used by the Allies during D-Day to secure victory on the land by first securing victory in the skies. So, how did the Allies manage to achieve superiority over the Axis powers? There are a number of factors that allowed for supremacy including the use of radar, an increase in aircraft manufacturing, and technological military innovation.

The first aspect of the allied air force that gave them a competitive edge over the Nazis was the development and use of radar (radio detection and ranging) and other sophisticated and innovative uses of radio. The Battle of Britain was perhaps the most influential instance where radar played a decisive role. The construction of radar arrays throughout the southern coast of the United Kingdom allowed the Royal Air Force to identify and intercept aircraft incoming from the channel to a range of up to 80 miles.<sup>4</sup> The popular myth that carrots improve visual acuity originates from a propaganda campaign stating the Royal Air Force knew the Luftwaffe was approaching due to the fact that they ate an abundance of carrots, and could see well in the dark. The same radar systems that helped during this battle also played an important role in D-Day, as it helped the allies determine the position of Germany's air force.

---

<sup>3</sup> Cartwright, Mark. "Messerschmitt Bf 109" [www.worldhistory.org](http://www.worldhistory.org), March 22, 2024, [https://www.worldhistory.org/Messerschmitt\\_Bf\\_109/](https://www.worldhistory.org/Messerschmitt_Bf_109/);

<sup>4</sup> "How Radar Changed the Second World War." Imperial War Museums. Accessed March 22, 2024.

<https://www.iwm.org.uk/history/how-radar-changed-the-second-world-war#:~:text=Radar%20could%20pick%20up%20incoming,early%20warning%20of%20German%20attacks.>

Another factor that helped the allies gain a competitive edge over the Luftwaffe is the qualitative and numerical superiority of planes produced by the aviation industry in the US and Britain. In 1941 alone, the US produced more than double the amount of planes than Germany.<sup>5</sup> German aircraft manufacturers under the national socialist system simply could not outcompete the economic advantage of Boeing, Martin, and Douglas in the free market conditions of America. Furthermore, Germany's use of slave labor and migrant workers from occupied northern France and the collaborationist Vichy regime, working forcefully out of fear, did not have the same motivation as American workers, working voluntarily for the prosperity of the free world.<sup>6</sup> Ultimately, the worsening economic conditions of Germany, and the improvement of economic conditions in the United States, led to greater industrial productivity which empowered aircraft manufacturers to create more planes for the ever-expanding United States Army Air Force (USAAF).

An extremely important contributor to Allied air superiority was the technological innovations and effective designs of the various aircrafts used in war. The B-17 Bomber had a number of innovative features that increased its overall effectiveness. One of these features was a more effective supercharger, a device that delivered compressed air to the engine, significantly upgrading propulsion. Another advancement was thirteen .50 caliber machine guns, which

---

<sup>5</sup> HARRISON, Mark. *The Economics of World War II: Six great powers in international comparison*. CAMBRIDGE EDINBURGH BLDG. - SHAFTESBURY ROAD: CAMBRIDGE UNIVERSITY PRESS, 1998.

<sup>6</sup> Malloryk. "Nazi Forced Labor Policy in Eastern Europe: The National WWII Museum: New Orleans." *The National WWII Museum* | New Orleans, March 13, 2022.

<https://www.nationalww2museum.org/war/articles/nazi-forced-labor-policy-eastern-europe>.

earned it the nickname “flying fortress”. Perhaps most notably, four modified Wright R-1820 Cyclone engines replaced the standard two for strategic bombers. Those modifications made the B-17 the formidable bomber that brought about the end of Nazi Germany.

The P-51 Mustang (specifically the P51-D) also had a number of new features that gave the Allies a competitive aerial advantage. The Rolls-Royce Merlin, an engine adapted and supercharged for the P-51, gave it the propulsion it needed to be an effective long-range fighter; the “bubble” canopy allowed for increased visibility by the pilot; and two additional M2 Browning machine guns were added to its already impressive arsenal to give it more firepower<sup>7</sup>.

The stage had been set with radar coverage, a plethora of planes, and innovative designs all implemented seamlessly into the USAAF. So how was air superiority used to achieve supremacy on the battlefield? Three elements played critical roles throughout the Normandy invasion. The first strategy was preliminary bombardments by the B-17 Flying Fortress flying in a wedge formation at high altitude.<sup>8</sup> Contrary to the Germans, who in both World Wars focused on night bombing to utilize the cover of darkness, the B-17 was able to effectively make precision strikes during the day. Despite flying at high altitude and possessing a large amount of .50 caliber machine guns, the B-17 Bomber did not have the maneuverability required to

---

<sup>7</sup> “P-51.” Encyclopædia Britannica, February 19, 2024.

<https://www.britannica.com/technology/P-51>.

<sup>8</sup> “B-17 Bomber Flying Fortress - the Queen of the Skies - Home.” B17 Bomber Flying Fortress The Queen Of The Skies The Boeing B17 Flying Fortress bomber in WW2 With database about the fate of each single aircraft. Accessed April 8, 2024.

<https://b17flyingfortress.de/en/details/formationsflug/#:~:text=The%20B%2D17%20usually%20formed,as%20tactics%20changed%20over%20time>.

effectively combat a German ambush. The P-51 solved this problem by enabling the B-17's operational success. The doctrine of destroying the enemy's infrastructure and fortifications was applied liberally to Normandy, and the effect of these operations gave the ground forces the opening they needed to successfully establish a foothold on the beaches. Destroying fortifications and anti-air installations on the coast allowed for easier movement by Allied ground forces and close air support respectively.

The second element that ensured air superiority was troop delivery via transport aircraft. Paratrooper delivery was a necessity for the success of D-Day. The Wehrmacht had already proven themselves as masters of encirclement, so if the invasion of Normandy was to result in the formation of another front, the allied flank needed to be secure. The delivery of Paratroopers to key strategic locations fulfilled this requirement; this operation however, could not have been accomplished without extensive support from strategic bombers and escort fighters.<sup>9</sup> The B-17's bombardments had eliminated a significant amount of anti-air installations that otherwise would have proven fatal to the heroic paratroopers, such as the 101st Airborne. The P-51 Mustang also played a critical role in supporting the allied paratroopers, eliminating German interceptors before they could shoot down the transport planes. Overall, the combined operations of the B-17 Flying Fortress and the P-51 Mustang enabled the success of troop deliveries across the English Channel and the ultimate success of Operation Overlord.

The third element which utilized the allies' air superiority over the Luftwaffe was the role of escort fighters in combat support. The P-51 long range fighter provided sufficient close air support to the invading forces. However, despite its firepower and maneuverability, it was still

---

<sup>9</sup> Tillman, Barrett. D-Day encyclopedia: Everything You Want to Know About the Normandy Invasion. Washington, DC: Regnery Pub., 2014.

vulnerable to the anti-air batteries on the Normandy coast. The B-17 complemented this weakness, and allowed the fighters to support the troops on the ground without fear of retaliation from the now-destroyed anti-air installations. As a result, the P-51 was able to successfully support the troops on the ground and destroy any reinforcements from the Luftwaffe.<sup>10</sup>

The sum of these factors resulted in the optimal aerial conditions for success during the D-Day invasion. When examined carefully, these events teach very important lessons today. Firstly, cooperation can provide us with the greatest opportunities to succeed. Had there not been collaboration between the Allied air forces, or if production had not increased to the volume that it did, or if the aerospace engineer team had not innovated the way that they did, the B-17 Bomber and P-51 Mustang could not have worked together to provide sufficient air superiority. The B-17 and P-51 had their strengths and weaknesses, but they complemented each other and helped each other achieve a common goal of defeating the Luftwaffe and providing support to the soldiers on the ground.

The events of D-Day, and the air superiority required for it to succeed has made a significant impact on my life and the lives of others. As a future history major with a specialization in European history, I am inspired to continue to study the innovation and heroism that made our great country what it is today. The liberation of the free world through the collaboration of various air force components has ensured that neither I, nor anyone else, need to live under the oppression of tyrannical powers. As for the future, it is evident that the forces of freedom have the capacity to innovate and outperform the forces of evil and oppression. As a nation, we must remember our history and the brave men and women that have worked hard to

---

<sup>10</sup>“D-Day and the Aerial Battle for Normandy.” Imperial War Museums. Accessed April 8, 2024.

<https://www.iwm.org.uk/history/d-day-and-the-aerial-battle-for-normandy>.

build the nation we now enjoy. In the words of Dwight D. Eisenhower “Guns and tanks and planes are nothing unless there is a solid spirit, a solid heart, and great productiveness behind it.”<sup>11</sup>

---

<sup>11</sup> “Quotes.” Eisenhower Presidential Library. Accessed April 8, 2024.

<https://www.eisenhowerlibrary.gov/eisenhowers/quotes>.

## Bibliography

“B-17 Bomber Flying Fortress - the Queen of the Skies - Home.” B17 Bomber Flying Fortress

The Queen Of The Skies The Boeing B17 Flying Fortress bomber in WW2 With database about the fate of each single aircraft. Accessed April 8, 2024.

<https://b17flyingfortress.de/en/details/formationsflug/#:~:text=The%20B%2D17%20usually%20formed,as%20tactics%20changed%20over%20time.>

“D-Day and the Aerial Battle for Normandy.” Imperial War Museums. Accessed April 8, 2024.

<https://www.iwm.org.uk/history/d-day-and-the-aerial-battle-for-normandy.>

“How Radar Changed the Second World War.” Imperial War Museums. Accessed March 22, 2024.

<https://www.iwm.org.uk/history/how-radar-changed-the-second-world-war/#:~:text=Radar%20could%20pick%20up%20incoming,early%20warning%20of%20German%20attacks.>

“P-51.” Encyclopædia Britannica, February 19, 2024.

<https://www.britannica.com/technology/P-51.>

“Quotes.” Eisenhower Presidential Library. Accessed April 8, 2024.

<https://www.eisenhowerlibrary.gov/eisenhowers/quotes.>

Cartwright, Mark. “Messerschmitt Bf 109” [www.worldhistory.org](http://www.worldhistory.org), March 22, 2024,

[https://www.worldhistory.org/Messerschmitt\\_Bf\\_109/;](https://www.worldhistory.org/Messerschmitt_Bf_109/)

HARRISON, Mark. *The Economics of World War II: Six great powers in international comparison.* CAMBRIDGE EDINBURGH BLDG. - SHAFTESBURY ROAD: CAMBRIDGE UNIVERSITY PRESS, 1998.

MacArthur, Douglas. General MacArthur's V-J Day Radio Broadcast, September 2, 1945. From

the Papers of Richmond Kelly Turner. Naval History and Heritage Command, 2021.

Malloryk. "Nazi Forced Labor Policy in Eastern Europe: The National WWII Museum: New Orleans." The National WWII Museum | New Orleans, March 13, 2022.

Tillman, Barrett. D-Day encyclopedia: Everything You Want to Know About the Normandy Invasion. Washington, DC: Regnery Pub., 2014.

Wueschner, Silvano. "Key to success: Allied airpower at Normandy." www.maxwell.af.mil, May 29, 2019,

<https://www.maxwell.af.mil/News/Display/Article/1859844/key-to-success-allied-airpower-at-normandy/>