CHAPTER 4

C-47 Skytrain transport plane

Courtesy of the US Air Force

The Early Air Force

Chapter Outline

"Allied air power was decisive in the war in Western Europe. . . . In the air, its victory was complete. At sea, its contribution, combined with naval power, brought an end to the enemy's greatest naval threat—the U-boat; on land, it helped turn the tide overwhelmingly in favor of Allied ground forces."

The United States Strategic Bombing Survey, 1945

LESSON 1

The Army Air Corps

Quick Write

The Army, Navy, and Congress were reluctant to create an equal branch of the military dedicated to air power. Why did Brig Gen Billy Mitchell want to do so and how did he draw attention to air power's potential?

Learn About...

- the predecessors of the US Air Force
- how the Army Air Corps developed
- the Air Force's path toward independence

After World War I Brig Gen William "Billy" Mitchell wanted to find a way to get military leaders and the US Congress to pay attention to his calls for an independent air service. He'd seen how air power helped turn the war in the Allies' favor. This included the major role of aircraft in the Battle of Saint Mihiel in 1918.

Air power was emerging as an offensive weapon and a powerful defensive tool. Mitchell thought the Army Air Service ought to be under its own command. But the Army, Navy, and Congress saw things differently. To them, air power was auxiliary—*functioning as a branch of another military organization*—to the Army's ground forces. In their view, aircraft played secondary roles. For example, they thought the role of aircraft was to provide reconnaissance and ground-troop support, not to lead attacks.

THE BOMBING OF THE *OSTFRIESLAND*

Brig Gen Billy Mitchell's pilots bomb the German battleship *Ostfriesland*.

Courtesy of the US Air Force

In 1920 Mitchell proposed a test to challenge prevailing notions about the country's defense. He suggested that his Airmen sink ships. (At that time the Navy's battle fleet was America's first line of defense.) The test would show how planes could defend the country against an attack from the sea.

In 1921 the Navy reluctantly agreed to the test. It provided several German vessels captured during World War I. One of the ships was the "unsinkable" battleship *Ostfriesland*.

On 13 July Mitchell's pilots sank a destroyer off the coast of Virginia with light bombs. On 18 July they hit a cruiser. It went under, too. They tried to sink the *Ostfriesland*, but even 1,000-pound bombs couldn't do the job. So on 21 July the pilots dropped 2,000-pound bombs. The "unsinkable" battleship rolled over and sank in about 20 minutes. But the Army and Congress still weren't convinced. They didn't believe an independent air service could help the armed forces. Navy admirals disagreed, however. They immediately ordered that aircraft carriers be built. The United States had its first aircraft carrier within eight months of the *Ostfriesland*'s sinking.

Vocabulary

- **auxiliary**
- **grades**
- **ordnance**
- **incompetent**
- **treasonable**
- **insubordination**
- **bombsight**
- **overhaul**
- **corps**
- **pursuit aircraft**
- **annex**
- **logistics**
- **autonomy**

THE SINKING OF THE *OSTFRIESLAND*

Using 2,000-pound bombs, Mitchell's pilots sank the *Ostfriesland* on 21 July 1921.

Courtesy of the Library of Congress

The Predecessors of the US Air Force

Most changes come in small steps. So air power in the United States went through a number of makeovers. The major changes occurred between 1907 and 1947, a stormy period that saw the flowering of aviation and two world wars.

Even before the US government bought the *Wright Flyer* in 1909, it had set up the Aeronautical Division within the US Army Signal Corps. The Signal Corps started with balloons, and then added planes. The division existed from 1907 to 1914. Many consider its creation the birth of the US Air Force.

Next came the Aviation Section, US Army Signal Corps (1914 to 1918). It was up and running during World War I. The number of pilots grew to 10,000 by the end of the war. These pilots took on many roles. They went on reconnaissance missions after the United States joined the war in 1917. By 1918 they were taking part in dogfights and bombing runs.

The Creation of the Army Air Service

One of the first major steps toward an independent air service took place around the time the Great War ended. President Woodrow Wilson used his executive powers to create the Army Air Service in May 1918. Under this order, the Air Service became a combat arm of the Army. The Army Air Service existed between 1918 and 1926. Although it was still part of the Army, it was a step closer to separate-but-equal footing with the Army and Navy.

With the Army Reorganization Act of 1920, Congress wrote the change into law. The Army Air Service was no longer auxiliary to the ground forces. It was its own branch within the Army. This change gave the Air Service more control. But it still answered to the Army.

The Different Stages of the US Air Arm From 1907 to Present

Aeronautical Division, US Army Signal Corps	1 August 1907 – 18 July 1914
Aviation Section, US Army Signal Corps	18 July 1914 – 20 May 1918
Division of Military Aeronautics, Secretary of War	20 May 1918 – 24 May 1918
Army Air Service	24 May 1918 – 2 July 1926
Army Air Corps • General HQ Air Force	2 July 1926 – 17 September 1947 1 March 1935 – 1 March 1939
US Army Air Forces	20 June 1941 – 17 September 1947
US Air Force	18 September 1947 – Present

President Woodrow Wilson used his executive powers to create the Army Air Service in 1918.

Courtesy of The Granger Collection, New York

The National Defense Act, also passed in 1920, established the number of men and ranks in the Air Service. The service could have 16,000 enlisted men. But Congress had cut back on defense spending after World War I. So the Air Service didn't have enough funds to enlist 16,000 men. Today's Air Force still uses the grades—*ranks*— authorized under that act.

The Creation of the Army Air Corps

Funds were in short supply after the war. Congress no longer emphasized national defense. It was more concerned with needs at home. As a result, the Army was tightfisted in how much it passed along to its air arm. This only increased the Air Service's desire for separate-but-equal footing with the Army and Navy.

Brig Gen Billy Mitchell believed that air power would be crucial to winning any future wars or to defending American soil. He believed it would be easier to direct air power if the Air Service were equal in stature to the Army and Navy. An independent service would also get a larger share of government money.

The US Department of War disagreed with Mitchell. It believed in a three-pronged national defense based on:

1. the Navy's battle fleet
2. the Navy's coastal defenses
3. the Army's coastal defenses.

But based on what he'd seen in Europe during 1917 and 1918, Mitchell believed air power was a necessary tool. First, casualties from trench warfare would decrease if bombers could cross enemy lines to hit supply routes and factories. Soldiers would no longer be stuck in one place. They would no longer die in waves of assaults. Second, as the Battle of Saint Mihiel showed, a mass of aircraft could overwhelm the enemy and bring the battle to him. Finally, planes could now carry heavier loads and fly greater distances. Before long, the Atlantic and Pacific oceans would no longer guarantee safety for the US coasts. Mitchell thought US air power could thwart an enemy arriving by sea better than sea power could. So he launched a major public relations campaign for an air force independent of the Army and Navy.

CAPSULES

Enlisted Men After the Great War

At the end of World War I, the Army Air Service had 195,000 enlisted men. Of these, 74,000 were overseas. What would these men do once the fighting stopped?

The Army worked with the government to find jobs for some. In other cases, commanders wrote letters of recommendation for their enlistees. For instance, they would do this for their mechanics. They kept other Airmen in the service, even after discharge, until they could find work.

Demonstrations to Gain Independence

Mitchell's biggest, splashiest campaign maneuver was the sinking of the German battleship *Ostfriesland* in 1921. Although that event convinced the Navy to build aircraft carriers, not much else happened after that. So Mitchell tried new tactics. His goal was to draw the public's attention to the wonders of flight. If he got the public eye, he thought, people might ask their congressmen to support air power.

In 1922 Mitchell arranged for two pilots, 1st Lt Oakley Kelly and 1st Lt John Macready to fly nonstop across the United States. Their first two tries didn't succeed. They finally made it on the third try, in 1923. Kelly and Macready flew from New York to San Diego in 26 hours and 50 minutes. The flight was 2,520 miles long. Their Fokker T-2 aircraft had a 400-horsepower engine. They took advantage of a tailwind during the flight. Plus, they hoped having little fuel left by the end of their voyage, and therefore less weight, would help them cross the Rocky Mountains.

In 1924 Mitchell tried an even bigger stunt—an around-the-world trip. He started out with four airplanes. Two of them—the *Chicago* and the *New Orleans*—finished the 26,345-mile journey. The trip took 175 days. The pilots visited cities around the globe, starting and finishing in Seattle, Washington. Also in 1924, Mitchell sent 1st Lt Russell Maughan in a Curtiss PW-8 from New York to San Francisco. To people's astonishment, Maughan finished the trip in a single day. This showed that if the country were attacked, airplanes could fly in one day to defend the area under attack.

Around the World

One of the Douglas Aircraft that completed Mitchell's around-the-world trip in 1924

Courtesy of E. Bacon/Topical Press Agency/Getty Images

THE USS *NEW JERSEY*

The USS *New Jersey* after Sgt Ulysses Nero's hit on 5 September 1923

Courtesy of the Airmen Memorial Museum

In 1923 Mitchell conducted a second series of bombing tests against ships. This time, the Navy let him use two World War I battleships, the USS *New Jersey* and the USS *Virginia*. Ten of Mitchell's 11 bombers missed the *New Jersey*. But one pilot, Sgt Ulysses S. Nero, had two hits. Mitchell wouldn't let Nero continue, because the pilot hadn't followed instructions. But when the other pilots couldn't sink the ships, Mitchell gave him another chance.

From 6,900 feet in the air at 85 miles per hour, Nero released his first ordnance through the *New Jersey*'s smokestack. Ordnance *is military supply such as weapons, ammunition, combat vehicles, and equipment*. The ship sank. Next he dropped a bomb on the deck of the *Virginia*. It, too, sank to the bottom of North Carolina's coastal waters.

Mitchell pushed in other ways for an independent air force. He gave talks. He wrote articles. Meanwhile, the US House of Representatives and the Army General Staff formed committees to study possible directions for the Army Air Service.

PRESIDENT CALVIN COOLIDGE

Courtesy of Bettmann/Corbis

In 1925 President Calvin Coolidge instructed a group of experts to find the "best means of developing and applying aircraft in national defense." This group, the Morrow Board, made three proposals:

1. Rename the Army Air Service the Army Air Corps
2. Give the Army Air Corps a seat on the Army General Staff
3. Appoint an assistant secretary of war for air power.

Congress adopted these recommendations. The Air Corps Act became law on 2 July 1926.

BRIG GEN BILLY MITCHELL IN 1922

Courtesy of the Airmen Memorial Museum

Brig Gen Billy Mitchell's Stamp on Air Power

Brig Gen William "Billy" Mitchell (1879–1936) was a controversial figure in US air power. He played a vital role in the creation of the US Air Force. He believed the bomber should be a key weapon of warfare. He thought it could bring the battle to the enemy and shorten wars.

Mitchell got off to a great start in life. He was the son of a US senator from Wisconsin. In 1895 he entered George Washington University in Washington, D.C. He was only 16 and the youngest student at that time to enter that school. By age 18, he was a second lieutenant in the Wisconsin Volunteers. At 19, he was promoted to first lieutenant. By 23, he was a captain in the US Army.

Mitchell graduated from the Army Staff College in 1909. At age 32 he was assigned to the Army General Staff. The General Staff oversees the Army and makes any decisions on major policy changes. Mitchell was the youngest person ever posted to it.

During World War I Mitchell was chief of the Air Service for American forces in Europe. Experiencing battlefield action helped persuade him of the great possibilities of air power. The battles also convinced him that the air arm needed its independence.

After World War I Mitchell was named deputy chief of the Air Service. During those years, he conducted bombing tests such as the one against the *Ostfriesland*. He also spoke publicly and wrote about the need for a separate air force.

But in 1925 Mitchell got into trouble. He harshly criticized senior officers in the military. A Navy plane had recently disappeared during a flight to Hawaii. And a Navy dirigible had crashed, killing 13 crew members. Referring to these events, Mitchell said, "The high command of both the Army and the Navy are guilty of incompetency, criminal negligence, and almost treasonable administration of the national defense." Someone who is incompetent *is lacking the qualities needed for effective action*. A treasonable act is one that *involves a violation of allegiance towards one's country*.

Because he so openly criticized military officers, Mitchell was court-martialed for insubordination under the 96th Article of War. This article forbids "all conduct of a nature to bring discredit upon the military service." Insubordination *is a refusal to submit to authority*.

Mitchell was convicted. Rather than face a five-year suspension, he resigned from service in 1926. But he continued to speak for an independent air force. Unfortunately, Mitchell died in 1936. He never got to see the advent of powerful bombers such as the B-17 that played crucial roles in World War II.

In 1946, 10 years after Mitchell's death, Congress awarded him the Medal of Honor. The award recognized his insightful air-power theories.

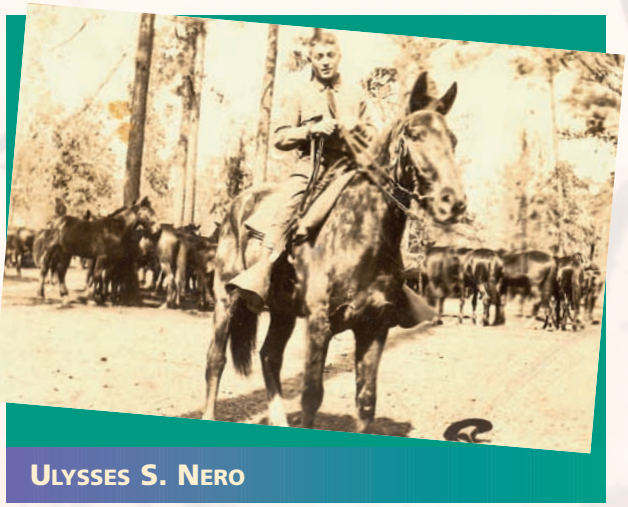
Mitchell and Pearl Harbor

Some people are not only smart. They're also imaginative. They can put what they know in a new perspective. Brig Gen Mitchell was such a person. He predicted, as early as 1924, the Japanese attack on Pearl Harbor.

Mitchell visited Japan in 1924. He noticed the country seemed bent on expanding its territories. He wasn't sure when that would be. But he figured if Japan went to war to expand its influence in the Pacific, it would attack US bases in Hawaii and the Philippines from the air and sea. He wrote:

> Attack will be launched as follows:
>
> Bombardment, attack to be made on Ford Island [at Pearl Harbor in Hawaii] at 7:30 a.m. . . . Attack to be made on Clark Field [in the Philippines] at 10:40 a.m.

Seventeen years later, on 7 December 1941, the Japanese attacked Pearl Harbor in Hawaii. They struck Ford Island at 7:55 a.m. They hit Clark Field at 12:35 p.m.



Ulysses S. Nero in the 13th Cavalry, I Troop, Fort Riley, Kansas, in 1917

Courtesy of the Airmen Memorial Museum

Col Ulysses S. Nero: Bombardier, Inventor, Engineer

Col Ulysses S. Nero (1898–1980) spent most of his career in the US military. He was an intelligent, confident, yet modest, man. His family sent him to work in a shipyard when he was 14. He completed high school at age 15 by taking night classes.

Nero enlisted in the US Army in 1917 as a private. He retired in 1952 as a colonel. In between, he served in World War I, World War II, and the Korean War. His contributions to the military were extraordinary. They included 12 patents for military equipment.

Nero's adventure in the military began in the Army's 13th Cavalry. His unit performed the US military's last horse-cavalry mission. It pushed Mexican bandit Pancho Villa back to his homeland. (In late 1917 artillery units replaced horse cavalry.)

Nero then transferred to the US Army Signal Corps. He served in France in the Great War. He joined the Aviation Section of the Signal Corps in 1918, the same year it became the Army Air Service. In 1919, he returned to civilian life. But he felt he could do better in the military. So he reenlisted in 1921.

Nero became an expert bombardier. He made two important advances during his early years with the Air Service. In 1922 he invented a wireless means for pilots and ground crews to communicate. This brought him to the attention of Brig Gen Mitchell. Second, Nero invented a bombsight—*a device that helps determine when to drop a bomb*—that let bombardiers place their loads more accurately. He dropped nearly 10,000 bombs while running tests at the Aberdeen Proving Grounds in Maryland.

In 1923 Nero sank the USS *New Jersey* and the USS *Virginia* during tests arranged by Mitchell. This led Mitchell to promote him. The two men became good friends.

Over the next 30 years or so, Nero developed more inventions. For example, he designed bomb fuses. He entered World War II as a master sergeant and became well known not only for his combat skills but also for his ability to maintain aircraft. During the Korean War, he was the first to overhaul a jet engine. To overhaul *is to go over carefully and make needed repairs*.

Many people today call Nero the "father of US Air Force precision bombing."

Ulysses S. Nero as an officer (around 1942–1951)

Courtesy of the Airmen Memorial Museum

How the Army Air Corps Developed

Changing the name of the Army Air Service to Army Air Corps was significant. It boosted the idea that the air arm was no longer only in "service" to ground troops. The corps could conduct independent missions. A corps *is a branch or department of the armed forces having a specialized function*.

The Army Air Corps wouldn't gain full independence for another 21 years. It got off to a slow start for several reasons. First, many people felt that World War I was the "war to end all wars." They thought the world would never again fight such an all-out battle. As a result, Congress drastically reduced defense spending. Most Airmen returned to civilian life. Furthermore, when the Great Depression hit in 1929, neither people nor countries had cash to spare.

But important changes would soon take place. By the late 1930s many people feared that war was about to break out in Europe. This helped lead to a growth spurt in the Air Corps. In addition, the years between World War I and World War II saw major advances in bombers and pursuit aircraft, or *fighter planes*.

The Growth of the Army Air Corps

The fear of war was well founded. War shadows grew in Europe during 1938. Germany annexed Austria that year. To annex *is to incorporate territory into an existing political unit such as a country*. Austria didn't resist when German troops marched across its borders. Meanwhile, Italy waged war in Africa, and Japan had invaded China.

On 12 January 1939, President Franklin D. Roosevelt spoke to Congress about the need to rebuild the US military. US forces, he said, were "utterly inadequate." Three months later, Congress approved increasing the number of Army Air Corps pilot officers from 1,200 to 3,203.

Civilian Flight Schools

Meanwhile, the chief of the Air Corps, Maj Gen Henry "Hap" Arnold, knew the corps didn't have the facilities to train more than 550 pilots a year. If a second world war broke out, the United States would need to train thousands of pilots a year—far more than the 3,203 pilots authorized by Congress.

Arnold had a great idea. Why not train military pilots in civilian schools? He asked Congress for the funding, but lawmakers turned down his request.

Arnold went ahead with his plan anyway. He approached eight World War I and civilian pilots. He asked them if they would train pilots for the Army. Although he offered no guarantee of pay, all eight agreed to do it. Congress finally authorized contracts for civilian flight schools in July 1939.

Under this plan, volunteers would check in with the Army for a physical and a psychological test. If they passed, they'd attend a civilian flight school close to home. Once a volunteer graduated, a military pilot would take him for a "check ride." If it went well, the volunteer would report for combat training at an Army base.

Arnold's idea eventually produced some 110,000 pilots per year. But more were needed.

Civilian Reserve Pilots

In 1939 the Air Corps tried another idea: the Civilian Pilot Training Program. Under this program, civilians could volunteer to train as civilian pilots. This reserve of civilian pilots would be available in case of a national emergency. Congress set aside $7 million a year for the program. In 1942 the name was changed to the Civil Aeronautics Authority War Training Service. About 300,000 reserve pilots earned their private-pilot certificates by the time the program ended in 1944.

Black Pilots

Black men were not permitted in the Army Air Corps or in the Civilian Pilot Training Program. But two African-American pilots-—Dale White and Chauncy Spencer—refused to accept this. They wanted to draw attention to the exclusion of black pilots from the military. So they made a 3,000-mile flight across the United States in May 1939 that brought them through Washington, D.C. While in D.C., they met Senator Harry Truman of Missouri. They told him about their mission. He was impressed and got Congress involved. On 22 March 1941 the all-black 99th Pursuit Squadron of Tuskegee, Alabama, was born. It was made part of the Civilian Pilot Training Program.

THE TUSKEGEE AIRMEN

Courtesy of AP Photo/USAAF

All three of these steps—civilian flight schools, civilian reserve pilots, and acceptance of black pilots—greatly increased the number of pilots available to the Army Air Corps and helped the United States prepare for war.

Significant Missions Conducted by the Army Air Corps

In the 1930s Army Air Corps officers focused on aircraft development. They believed that if they could get the aviation industry to build a powerful, fast aircraft that could travel long distances, they could fulfill Billy Mitchell's dream of a long-range bomber.

Airplane manufacturers at that time were focusing on commercial aircraft—because that's where the money was. To get the manufacturers' attention, the Army Air Corps held a design competition for a multiengine bomber.

As you read in the previous lesson, Douglas Aircraft came out with two commercial aircraft, the DC-2 (1934) and the DC-3 (1936) about this same time. These aircraft put Boeing's commercial 247 out of date. Army officers gave Boeing a suggestion for its entry in the design competition. Instead of using a typical two-engine plane, they said, why not design a four-engine aircraft? Boeing did just that—building the Boeing 299.

Boeing's 299 flew to the contest site at Wright Field in Dayton, Ohio, in July 1935. It won the Army competition easily. The aircraft had speed, range, and altitude. The Air Corps ordered 13 of them. It renamed the plane the B-17. The corps could now finally fly long-range strategic bombing missions using one of the most important aircraft of this era.

The Piper J-3 Cub

The Civilian Pilot Training Program used Piper J-3 Cubs to train pilots.

Courtesy of the EAA/Jim Koepnick

The Boeing 299

Courtesy of the US Air Force

The B-17 Flying Fortress

Courtesy of the US Air Force

The Curtiss P-36 Hawk

Courtesy of the Air Force National Museum

The B-17 was faster than any pursuit aircraft in the United States. This made the Army realize that it now needed better pursuit planes. It signed contracts for the Curtiss P-36 and the Seversky P-35. (The "P" stands for "pursuit.") These aircraft could guard American bombers and attack enemy bombers. It developed other important pursuit aircraft, as well. When the United States entered World War II, it had Lockheed P-38s, Bell P-39s, and Curtiss P-40s in its pursuit arsenal.

One more important invention took place during these years. The Army borrowed the Norden Mark XV bombsight from the Navy to use in B-17s. This allowed the Air Corps to conduct precision daylight bombing by just a few aircraft in a tight formation instead of raids by a large number of planes saturating a wide area.

The Air Force's Path Toward Independence

The Army Air Corps officially became the Army Air Forces on 20 June 1941. The new Air Force remained under the command of the Army. But it could now oversee its own functions in combat, training, and maintenance. Maj Gen "Hap" Arnold took command of the Army Air Forces.

The Rationale of Advocates for an Independent Air Force

After Brig Gen Mitchell's resignation in 1926, others carried his ideas forward. The foundation of his air-power theory was the long-range bomber. Once Boeing built the B-17, long-range bombing missions could become a reality. Here was a concrete reason for an independent air service. Air power was an offensive weapon. It could strike at military bases and factories in enemy lands. It could do much more than protect ground troops. And it didn't need to be under the command of Army officers.

As long as air power was a part of the Army, air advocates believed it would remain underfunded and underdeveloped. They were right—air power was suffering. As late as 1928, the Army placed greater emphasis on observation aircraft than on bombers.

In 1934, air power faced another setback. President Roosevelt turned over airmail delivery to the corps. Within short order, nine fatal crashes occurred. The crashes were not entirely the corps' fault. It didn't have enough money, for one thing. Its aircraft weren't outfitted with night instrument panels and other equipment. Pilots weren't well trained for night flight. These things made it clear to such people as Mitchell that air power needed to go its own path to grow.

The Rationale of Objectors to an Independent Air Force

The Army General Staff was the biggest proponent of keeping the Air Corps in the Army. The Army was, after all, steeped in history. Ground forces had been a part of war for thousands of years. Many in the Army saw air power as no more than long-range artillery. They wanted the Army to keep total control of its air arm, just as the Navy controlled its own air arm. But major advances in technology such as the B-17 would make the old ways more difficult to maintain.

Flight Paths

Maj Gen Benjamin Foulois: From Army's First Pilot to Air Chief

Maj Gen Benjamin Foulois (left) was chief of the Air Corps from 1931 to 1935.

Courtesy of the US Air Force

Benjamin Foulois (1879–1967) started his military career as an enlistee. He spent the last four years of his career as chief of the Air Corps—quite a leap. Like Brig Gen Billy Mitchell, he spoke out for an independent air force.

Foulois was only 5 feet, 6 inches, tall. But he loved adventure. And he loved to fly. Even when he was chief of the Air Corps, he spent more time in the air than many of his junior officers.

Even in his early years of service, Foulois achieved several milestones. He became the Army Signal Corps' first pilot when he flew Dirigible No. 1 in 1908. He rode with Orville Wright in 1909. With the Wrights' help, he learned to pilot a plane while stationed at Fort Sam Houston, Texas.

Foulois served in World War I at home and abroad. After the war, he testified before the Senate Military Affairs Committee. He suggested that the committee sponsor a bill to create an air department.

Foulois held strong opinions, which helped and hurt him throughout his career. In oral and written statements, he criticized the Army and Navy for failing to support an independent air force. Nonetheless, he ended up as chief of the Air Corps from 1931 to 1935. He resigned in 1935 when he came under attack for the Air Corps' mishandling of the airmail mission.

Creation of a Separate Air Corps Headquarters

When two sides can't agree, a compromise is often necessary. In 1933, Maj Gen Hugh Drum headed an Army board that explored possible changes in the structure of the Air Corps. The board recommended that the War Department form a General Headquarters Air Force (GHQ). The GHQ would command the aerial combat arm. The Air Corps would retain training and logistical duties. Logistics *is the aspect of military operations that deals with the procurement, distribution, maintenance, and replacement of materiel and personnel*. Secretary of War George H. Dern endorsed the plan. But nothing happened for a few years.

In 1934, the War Department set up another board. Former Secretary of War Newton Baker chaired this group. It, too, proposed a combat group separate from training and logistical duties.

The recommendations of the Drum and Baker boards were implemented in March 1935, when the GHQ set up camp at Langley Field, Virginia. GHQ remained within the Air Corps and answered to the Army. Brig Gen Frank Andrews was senior officer of GHQ. In the past, Air Corps commanders had shared responsibility for tactical units. Now all combat aircraft would fall under Andrews's command. During peacetime, Andrews would answer to the Army chief of staff. In war, he'd report to a regional combat commander.

With the formation of the Army Air Forces in June 1941, the Air Corps and GHQ now fell under unified control. Maj Gen Arnold was in charge of the Air Forces. Under him was Maj Gen George Brett, who was chief of the Air Corps. Lt Gen Delos C. Emmons headed the new Air Force Combat Command (formerly known as the GHQ).

This last change came not a moment too soon. By the end of the year, the United States would find itself fully engaged in war in both Europe and the Pacific. The experiences gained during that war, and the performance of the Army Air Forces, would finally lead to complete autonomy—*independence*—of the US Air Force with the passage of the National Security Act of 1947.

CHECKPOINTS

Lesson 1 Review

Using complete sentences, answer the following questions on a sheet of paper.

1. What was the name of the captured German battleship that was supposed to be unsinkable?
2. Which American president established the Army Air Service in May 1918?
3. What is the name of the Army air branch that Congress created in 1926?
4. What happened to Brig Gen Billy Mitchell when he criticized senior officers in the Army and Navy?
5. What is Col Ulysses Nero considered the father of?
6. Why did President Roosevelt ask Congress in 1939 to increase the number of officers in the Army Air Corps?
7. When the Army Air Corps didn't have enough facilities to train pilots, what was one of the programs the corps set up?
8. What was one of the most important aircraft the Army Air Corps ordered during the 1930s?

Applying Your Learning

9. Why do you think it took so many years to convince Congress that the Air Force should be independent, rather than a branch of the Army?

LESSON 2

Air Power in World War II

Quick Write

Explain why SSgt Henry Erwin earned the Medal of Honor.

SSgt Henry Erwin

Courtesy of the Air Force Heritage Research Institute

SSgt Henry E. Erwin (1922–2002) was a radio operator on a B-29 bomber in the Pacific. On 12 April 1945 he and his crewmates were targeting a chemical plant in Koriyama, Japan. Erwin's other duty on board was to light and drop phosphorus smoke bombs.

One of the bombs he lit blew back up the bomb chute and struck him in the face. The bomb's flare was 1,100 degrees. It burned off his nose and one of his ears, and temporarily cost him his sight. In terrible pain, Erwin knew he had to get the fiery bomb canister out of the plane. For one thing, he was afraid the canister would burn through the metal floor into the bomb bay. For another, the smoke was making it impossible for the pilot to navigate. The aircraft was diving toward earth.

Although gravely injured and on fire, Erwin carried the burning bomb canister to the front of the aircraft. He tossed it out of the copilot's window. The smoke cleared enough for the pilot to level out at 300 feet and make an emergency landing on Iwo Jima.

No one thought Erwin would live. Senior Army Air Force officers approved awarding him the Medal of Honor so they could give it to him while he was still alive. But he survived. Gen Curtis LeMay himself presented the medal. Erwin went through 30 months of surgery and rehabilitation. He received a disability discharge as a master sergeant in 1947. He went on to work for 37 years for the Veterans Administration. He was the last enlisted man in the US Army Air Forces to receive the Medal of Honor. Erwin died in 2002 at age 80.

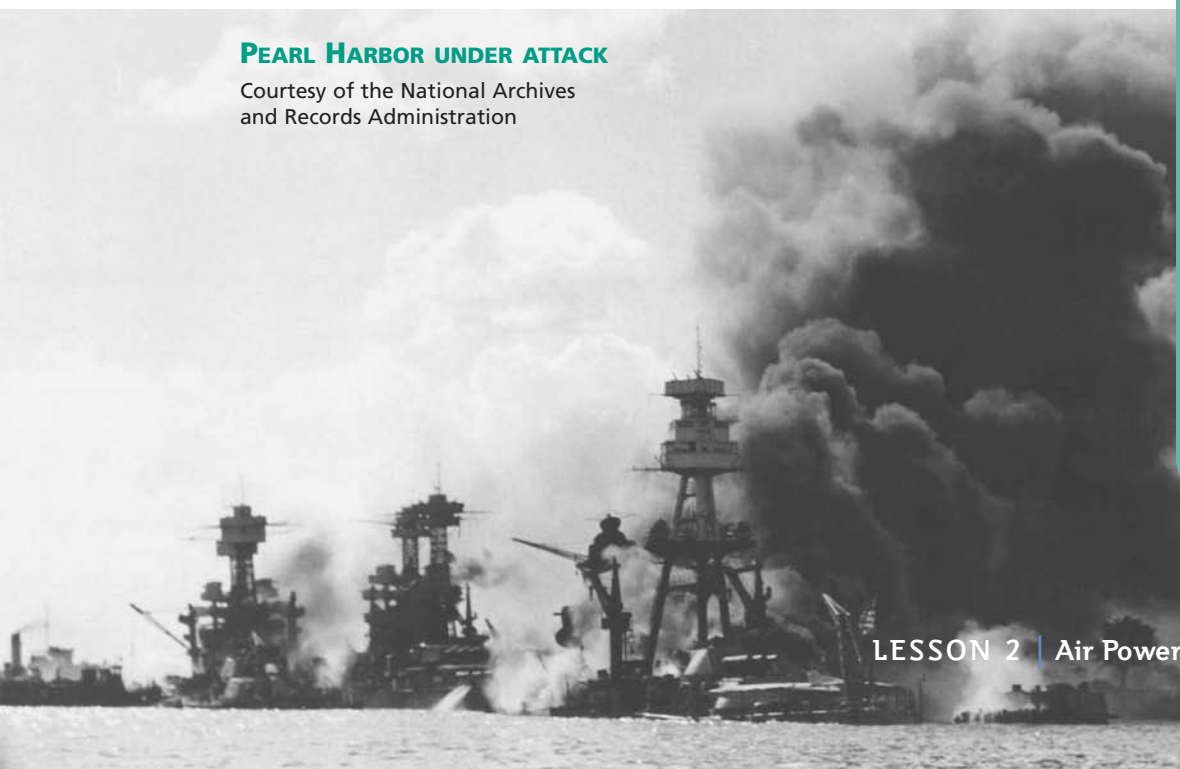
In 1997, the Air Force created the Henry E. Erwin Outstanding Enlisted Aircrew Member of the Year Award. It is given each year to an airman, noncommissioned officer, and senior noncommissioned officer in the active-duty or reserve forces. It is only the second Air Force award named for an enlisted person.

The Role Air Power Played in World War II and Its Significance

"To! To! To!" (Japanese code for "Charge! Charge! Charge!"). With that order, Japanese pilots plunged from the skies over Pearl Harbor in Hawaii at 7:55 a.m. on 7 December 1941. Fifty fighters and 140 bombers strafed and bombed the US base. Less than an hour later, 40 more Japanese fighters and 130 more bombers dropped their deadly loads.

The Americans were caught off guard. They weren't prepared for an attack from the air. The Army and Navy thought any assault on Pearl Harbor would come by foot. Only a little more than a week before, they'd ordered all planes and ships grouped in clusters. They placed guards around the aircraft. The officers wanted to protect against sabotage—*the destruction of property by enemy agents in time of war*. This move proved disastrous for the American forces. For Japanese pilots, the clusters of planes must have looked like bull's-eyes.

In all, the Japanese destroyed 96 Army planes and 92 Navy aircraft. They crippled 159 more. They sank three US battleships—the *Arizona*, *California*, and *West Virginia*. They capsized the battleship *Oklahoma*. They also damaged four other battleships, three cruisers, three destroyers, and a seaplane. The casualties—*military persons lost through death, wounds, injury, imprisonment, or missing in action*—were high. The Navy and Marine Corps lost 2,117 members. Another 960 were missing and 876 wounded. The Army and Army Air Forces suffered losses, too: 226 killed and 396 wounded.



Pearl Harbor under attack

Courtesy of the National Archives and Records Administration

Learn About...

- the role air power played in World War II and its significance
- how air power was developed during World War II
- the significance of the Allied air campaigns

Vocabulary

- sabotage
- casualty
- Allies
- Axis Powers
- Holocaust
- theater
- Luftwaffe
- occupation
- isolationist
- infantry
- squadron
- flight
- blitzkrieg
- combined arms
- tactical
- interdiction
- transport
- materiel
- escort
- paratrooper
- embargo
- incendiary bombs

During the raid, the Army got just six fighters into the air. The Navy sent up 36 airplanes. But the Japanese lost only 28 planes and 64 men. The only real break for US forces was that the enemy did not touch a single aircraft carrier of the US Pacific fleet. All four ships were out on exercises.

The United States declared war on Japan on 8 December 1941. Three days later, on 11 December, the United States declared war on Japan's allies, Germany and Italy. England and its allies had already been fighting Germany and Italy for two years. The British joined America in declaring war on Japan.

The Japanese attack on Pearl Harbor is a fitting place to begin a discussion of America's entry into World War II. In many ways, this attack was symbolic of this major war. Another name for World War II is the "air war." For Americans, the air war began with the Japanese air attack on Pearl Harbor. The war ended in 1945, when American aircraft dropped atomic bombs on the Japanese cities of Hiroshima and Nagasaki. The air war began for Britain and Europe in 1939, when Germany invaded Poland.

There were two sides during World War II. The Allies included *Britain, France, the United States, the Soviet Union, and China*. (The Soviet Union was the new name for Russia after the Russian Revolution overthrew the czar in 1917.) The Axis Powers included *Germany, Italy, and Japan*. Many other countries contributed to the Allies' effort, and a few others fought for the Axis Powers. In Chapter 2, Lesson 3, you read that during World War I, a slightly different group of countries referred to themselves as the Allies; they were Russia, France, Britain, the United States, and Italy. A country's loyalties can shift as circumstances change.

The War's Causes

World War II was the most horrific war in history. As the chart nearby shows, more than 50 million people died.

The roots of the war lay in the end of World War I. After that war, Japan was the biggest power in the Far East. But it had few of the natural resources, such as oil, that a modern economy needs. So it was looking for ways to expand. Germany was also hurting. Britain and France had forced it to pay huge sums of money for war damage, which hurt Germany's economy.

In 1932 the Great Depression threw millions of workers out of work around the world. It hit Germany especially hard. The people wanted change. So Adolf Hitler's National Socialist Party—the *Nazis*—won the 1933 elections. The Nazis preached a vicious brand of racism. They believed that other ethnic groups, such as Jews and Slavic peoples, were less human than Germans. They wanted to remove these groups—or even kill them—to make "living space" for a German master race. They wrongly blamed Jews for Europe's economic problems. They imprisoned or murdered anyone who disagreed with their teachings. The Nazis were responsible for the Holocaust, *or the mass murder of some six million Jews, mostly in death camps*.

Meanwhile, in Italy, dictator Benito Mussolini led his country into a series of wars. This included taking over Ethiopia, in Africa. Mussolini was a Fascist. The Fascists held views like those of the Nazis.

In the Far East, Japan was fighting in China and elsewhere for control of other people's countries and resources.

The final major player was Joseph Stalin, the dictator who headed the Communist Party in the Soviet Union. The Communists believed that the state should own all the means of production. They permitted no private ownership of land, factories, or businesses. Like the Nazis, they imprisoned or murdered those who disagreed with them.

Most Europeans and Americans rejected the Communists' views. The Nazis and Fascists particularly hated them. This didn't stop Hitler and Stalin from signing a treaty that allowed Germany to conquer most of Poland. The Soviet Union got the rest. It also took over the Baltic countries of Lithuania, Latvia, and Estonia.

But in 1941 Hitler double-crossed Stalin. He attacked the Soviet Union. Millions of Soviet civilians died in the fighting. In the siege of Leningrad (now St. Petersburg) alone, 900,000 people starved.

After the German invasion, the Soviet Union joined the Allies. With the United States and Britain, they helped defeat the Nazis.

CAPSULES

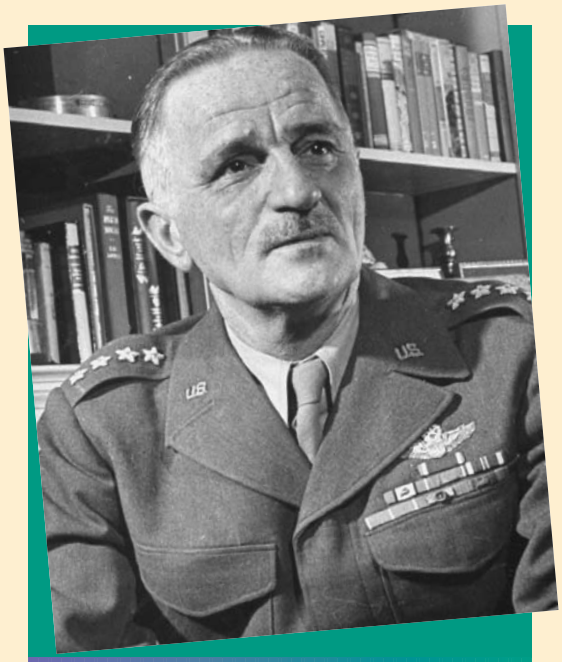
Estimated Military and Civilians Killed in World War II, by Country

Allied Powers	
Australia	30,000
Belgium	112,000
Britain	460,000
Canada	42,000
China	10,300,000
Denmark	3,000
France	270,000
Greece	490,000
India	36,000
Netherlands	264,000
New Zealand	10,000
Norway	16,000
Poland	2,630,000
South Africa	9,000
United States	300,000
U.S.S.R. (Russia)	28,000,000
Yugoslavia	305,000
Axis Powers	
Bulgaria	60,000
Finland	104,000
Germany	5,500,000
Hungary	320,000
Italy	400,000
Japan	2,100,000
Romania	900,000
TOTAL	**54,226,000**

Compiled by Professor Joseph V. O'Brien, Department of History, John Jay College of Criminal Justice, New York, NY

Gen Carl A. Spaatz: First Chief of Staff, US Air Force

Gen Carl A. ("Tooey") Spaatz (1891–1974) flew in World War I. He was also commander of air forces in several regions during World War II. He remained in the military between the wars. During the Battle of Britain, he spent time in Britain, where he observed German tactics.



GEN CARL A. "TOOEY" SPAATZ

Courtesy of Getty Images

The West Point graduate served in every theater—*a large geographic area in which military operations are coordinated*—during World War II. He headed the Eighth Air Force in England. While the British conducted nighttime bombing raids over Germany, Spaatz had his pilots fly during the day. He was also responsible for the 12th Air Force in North Africa.

After the Allies defeated the Germans in Africa, Spaatz led the 12th and 15th Air Forces as well as the Royal Air Force in Italy. In 1944 he was put in charge of the US Strategic Air Forces in Europe. He oversaw air power there until Germany's collapse. In July 1945 he was sent to the Pacific. His pilots delivered the atomic bombs on Japan. Although he did not agree with using atomic weapons, he carried out his orders.

After the war, Spaatz served for about a year as the first chief of staff of the new US Air Force. He retired in 1948. He earned many awards, including the Distinguished Service Cross. Spaatz was one of the foremost military leaders of World War II.

The Strategic Role Air Power Played in World War II

Many decisive battles of World War II were fought in the air. After Germany surrendered in 1945, all its military commanders and civilian leaders who'd been held prisoner conceded that air power had won the war for the Allies.

Air power played a strategic role in determining the outcome of World War II at several points. As you read in the lesson on World War I, *strategic* means designed to strike at the sources of an enemy's military, economic, or political power.

Germany began World War II using its Luftwaffe—*the German air force*—in combination with ground troops. The Germans broke through Poland's borders on 1 September 1939. In less than a month, they crushed Poland's army, which was the fifth largest in Europe. Poland surrendered in just 20 days. Germany then rolled over a number of other countries in short order. They included Norway, the Netherlands, France, and Belgium. All these countries faced German occupation—*invasion, conquest, and control of a nation or territory by foreign armed forces*.

But Germany's good luck changed when it struck Britain. Britain's air power put a stop to German air power. This clash, which began in August 1940, was called the *Battle of Britain*.

Britain was in a fight for its life. For a year, it stood alone against the Axis onslaught. But it had a few advantages over Germany. First, its Royal Navy was superior to Germany's navy. Second, German aircraft weren't equipped to fly the long distances needed to cross the English Channel and conduct missions in Britain. Even so, Germany continued to strike Britain from the air through much of the war. But its strategy and air power were never able bring the British to their knees. The British kept the Germans from grabbing their island nation.

On 20 June 1941, Hitler invaded the Soviet Union. The Japanese air strike on Pearl Harbor brought America into the war six months later. Pearl Harbor is a second example of the importance of air power in World War II. Following the attack, America declared war on Japan and on the other two Axis Powers, Germany and Italy.

Now Britain had two powerful new allies. Had Japan not attacked Pearl Harbor, it's difficult to say how much longer the United States would have maintained its isolationist stance. An isolationist country *is a nation that does not enter alliances with other countries*.

The D-Day invasion on 6 June 1944 was a third punch delivered through air power. It prepared the Normandy beaches for the infantry—*soldiers armed and trained to fight on foot*. It helped drive the Germans back to their own country. While all the armed forces contributed to the D-Day mission, air power was an essential element in that battle.

Finally, the atomic bombs dropped on Japan in August 1945 ended the war in the Pacific. Those bombs, delivered by American aircraft, broke the will of the Japanese government and people.

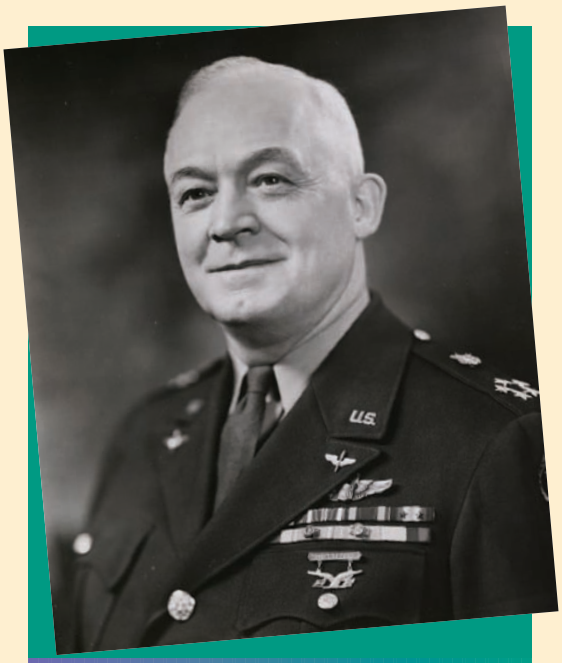
The Role of Air Power in World War II Versus World War I

Air power had a much larger role in World War II than it did in World War I. During World War I, air power was still a novel concept. This was especially true in that war's earliest years. All-metal planes were still new. Bombs were so light that pilots could carry them on their laps and drop them by hand. The pilots' work was mainly to observe enemy locations and support ground troops.

But by the end of World War I, things were changing. All-metal planes were becoming the norm. Bombs weighed as much as 2,000 pounds. Pilots engaged in dogfights. Some 1,500 planes fought in the Battle of Saint Mihiel in France in 1918.

Even so, much of World War I took place in the trenches. Infantrymen died in huge numbers. No country wanted its Soldiers to suffer such losses ever again. That's one reason the use of air power morphed so quickly between 1914 and 1918. It's also why air power was used so heavily in World War II. During this second war, fought between 1939 and 1945, long-range bombers saw lots of action. These aircraft could fly over trenches and enter enemy territory. Not only could fighters protect bombers and transports, they could also drop bombs.

Flight Paths



GEN HENRY "HAP" ARNOLD

Gen Henry "Hap" Arnold was the first five-star general in the US Army Air Forces.

Courtesy of Underwood & Underwood/Corbis Images

The Foresight of Gen Henry Arnold

Gen Henry ("Hap") Arnold (1886–1950) served in both world wars. He learned how to fly from Orville Wright. Arnold was a West Point graduate. He first served in the infantry. In 1911 he transferred to the Aeronautical Division of the US Army Signal Corps.

Arnold thought air power was essential to the future of the military. When troubles began brewing in Europe in 1938, he asked Congress for more funding for the Army Air Corps. He was especially interested in developing aerospace technology to give the United States an edge in achieving air superiority. He fostered the development of jet aircraft, rockets, rocket-assisted takeoff, and supersonic flight.

During the war, Arnold had a couple of jobs. He was commanding general of the US Army Air Forces. He also was the air representative on the US Joint Chiefs of Staff. In 1944 the Army made Arnold a five-star general. He is the only air commander to achieve that rank.

The Allies and Axis Powers used their aircraft to destroy airfields, supply lines, and military posts. They also used aircraft to try to break the will of the people. In fact, during World War II, civilians were often targets. This strategy had been used throughout history. But in World War II it greatly widened the scope of destruction. German bombs killed more than 40,000 civilians in and around London, for instance. The United States firebombed Tokyo and dropped atomic weapons on Hiroshima and Nagasaki, Japan, killing hundreds of thousands.

Victory in World War II relied on contributions from all forces—land, sea, and air. Each was indispensable. But for the first time in history, air power was the key to victory.

How Air Power Was Developed During World War II

Now that air power was more reliable, military leaders began to think ever more seriously about its prospects. Even in Brig Gen Billy Mitchell's day, visionaries knew aircraft would some day serve in more than a supporting role. With World War II, that day arrived. Both the Allies and the Axis Powers soon developed new strategies for waging war in the air.

The Development of Strategic Air Warfare

When World War I ended, both sides signed a peace treaty. It was named the Treaty of Versailles. Among other points, this treaty stated that Germany could not build a military air force. It was free, however, to develop commercial aircraft.

Germany used the progress it made in commercial planes as a cover for the advances it was secretly making in military aircraft. It was also quietly training pilots in South America. By 1932 Germany's military air force had three bomber squadrons, four fighter squadrons, eight observation squadrons, 1,500 trained pilots, and 3,000 pilots in training. A squadron *is an air force unit consisting of two or more flights*. A flight *is a unit that has two or more elements*.

In 1933 Adolf Hitler became chancellor of Germany. In 1935 Germany unveiled its Luftwaffe. In 1939 the German Army and Air Force invaded Poland. Germany was once again a power to be contended with.

Wanting to avoid getting bogged down in trench warfare as it had in World War I, Germany perfected a new strategy to invade and control Poland. The Germans called it *Blitzkrieg*, which in English means "lightning war." A blitzkrieg *is a war conducted with great speed and force*. In a blitzkrieg, the offense attempts to overwhelm its enemy. Because the fighting is quick, it supposedly results in fewer deaths and less damage to the invaded country. A blitzkrieg uses combined arms, *the coordinated efforts of different military branches, such as air and ground*.

EUROPE BETWEEN THE WARS

Courtesy of Maps.com

In a World War II blitzkrieg, the Luftwaffe would strike first. Its pilots would fly behind enemy lines to take out an enemy air force, often before it could even get in the air. Then the German Army, using tanks to get its infantry safely across trench lines, would blow up railroads and strike at enemy troops. Combined arms were used a bit at the end of World War I, when the tank was developed. But they came into their own during World War II.

Tactical Operations: The Three-Point Plan

German and Italian forces were also in North Africa. From this base, they attacked British positions in the Mediterranean and along the Suez Canal. The Axis Powers needed Middle Eastern oil. To get it, they had to gain control of the canal, through which oil was shipped. The fight between the Allies and the Axis Powers in North Africa began in 1941, when the Germans targeted the British on Malta, an island in the Mediterranean.

In Africa, the United States and Britain used the same air policy at first. When the Luftwaffe attacked an Allied air base, only the aircraft at that base would respond. Each base commander was in charge of his planes. He did not coordinate with any other base commander. As a result, very few Allied planes were going up. They were always outnumbered by German aircraft. It became clear that if the Allies didn't change tactics, their huge losses would continue.

So Britain's Royal Air Force (RAF) and then the US Army brought all their planes under centralized control. This way, if a base were attacked, all Allied bases could defend it or retaliate together.

It worked. By 1942 the German Afrika Korps under Field Marshal Erwin Rommel was crumbling. The Germans' supplies were cut off. By 1943 the Allies controlled the skies. That meant the infantry could now control the ground. The Allies had won the battle of Africa. The US Air Force still uses this strategy of centralized control.

A new plan for tactical operations also grew out of the experience in Africa. Something that is tactical *involves military operations that are smaller, closer to base, and of less long-term significance than strategic operations*. The theory had three points:

1. Air superiority, achieved by destroying opposing airfields, aircraft, fuel tanks, and manufacturers of aircraft and spare parts
2. Interdiction, or *the act of cutting or destroying an enemy's advance through firepower*. As part of interdiction, aircraft hit supply routes, railroads, bridges, highways, warehouses, troops, and means of communication
3. Close ground support. Aircraft bombed and strafed within enemy territory and provided an aerial shield for Allied infantry

LT GEN PETE QUESADA

Courtesy of the US Air Force

Lt Gen Pete Quesada: An Advocate of Close Air Support

Lt Gen Pete Quesada (1904–1993) realized as early as the 1930s that "future war will require all sorts of arrangements between the air and the ground, and the two will have to work closer than a lot of people think or want." As commander of the First Air Defense Wing in North Africa, he put close air support into practice. He refined his idea as commander of the 12th Fighter Command, also in North Africa, in 1943.

Close air support has three major features:

1. Making ground and air commanders equal
2. Using centralized control
3. Establishing air superiority before committing ground troops

Another name for close air support is "tactical operations."

Quesada later commanded the Ninth Fighter Command, which saw action on D-Day in 1944. It provided close air support. Later, he was the first commander of the Tactical Air Command. He retired from the Air Force in 1951. In 1958 President Dwight Eisenhower named him the first director of the Federal Aviation Agency.

Strategic Operations: Long-Range Bombing

One of the Allies' air-warfare strategies was long-range bombing. The Allies used this strategy a great deal since they had more long-range bombers than Germany did. Germany's manufacturers produced mostly short- and medium-range bombers. Hitler had figured most of his battles would be in continental Europe, and therefore close to Germany.

Long-range bombing was an Allied air *strategy*; the approach used in North Africa involved Allied air *tactics*. Tactical operations apply to a specific fight. Strategic operations encompass the entire philosophy of a military's plan to win the war. The Allies relied heavily on long-range bombers to hit deep inside Germany and Japan and to destroy their ability to wage war.

Between the German blitzkrieg and Allied tactical and strategic plans, air power was taking shape. Both sides fine-tuned operations throughout the war. And that fine-tuning continues today.

The Tuskegee Airmen and President Harry Truman

Neither the Army Air Corps nor the Civilian Pilot Training Program (CPTP) accepted African-Americans at first. It was Senator Harry S. Truman, a future US president, who got Congress to admit blacks into the CPTP. The Tuskegee Airmen were born. They flew fighters.

The men, all African-Americans, got basic flight training at the Tuskegee Institute in Alabama. Those who passed went on for combat flight training at Tuskegee Army Air Field. Tuskegee pilots formed the 99th Fighter Squadron, which saw action in North Africa. Pilots also joined the 332nd Fighter Group. The 332nd and the 99th fought side by side in Italy later in the war.

By the end of the war, the Tuskegee program produced 992 black pilots. Of those, 150 lost their lives in training or combat.

When Truman became president, he vowed to push for more rights for blacks in all branches of the military. His overall goal was to end racial segregation in the armed forces. In July 1948 he signed Executive Order 9981. It said: "It is hereby declared to be the policy of the President that there shall be equality of treatment and opportunity for all persons in the armed services without regard to race, color, religion, or national origin."

The Tuskegee Airmen's service during World War II helped make this new order possible.

THE TUSKEGEE AIRMEN

Members of the Tuskegee Airmen during World War II

Courtesy of the US Air Force

Lt Col Benjamin O. Davis Jr.

Lt Col Benjamin Davis Jr., commander of the 99th Fighter Squadron, prepares to lead a bomber escort mission during World War II.

Courtesy of the US Air Force

Gen Benjamin O. Davis Jr.: All in the Family

The military was in Benjamin Davis Jr.'s blood. His father was an Army general. The younger Davis (1912–2002) would become the first African-American brigadier general in the US Air Force.

Davis trained in the Tuskegee program. In 1941 he led the all-black 99th Pursuit Squadron. He saw action in 1943 in North Africa. He also commanded the all-black 332nd Fighter Group. This group fought in 15,000 air battles in Europe during World War II. It destroyed 260 enemy planes.

Davis flew 60 combat missions and logged 224 combat hours. He earned the Distinguished Flying Cross, the Silver Star, the Croix de Guerre, the Star of Africa, and more. In 1998, Davis became a four-star general.

1st Lt Charles B. Hall

1st Lt Charles B. Hall was a fighter pilot with the 99th Fighter Squadron. He was the first African-American pilot to score a kill.

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. 99-15449)

Charles Hall: A First for the 99th Fighter Squadron

1st Lt Charles Hall was a fighter pilot with the all-black 99th Fighter Squadron. On 21 July 1943, he was flying a P-40 over Italy as part of the escort for a B-25 bomber. He saw two German Focke-Wulf 190s coming his way. He zipped this way and that, intent on stopping the enemy aircraft. Hall let off a spray of bullets. One of the German fighters went down. Hall was the first African-American to score a kill during the war. He had two more by war's end. The US government awarded Hall the Distinguished Flying Cross.

The Combat Box Formation and Formation Pattern Bombing

It was 1943. Brig Gen Curtis LeMay's bombers were coming under heavy fire. US losses were staggering. During the US Eighth Air Force's first flight into Germany in July, the enemy shot down 92 American bombers. A month later it destroyed 60 more. In October antiaircraft fire and German fighters downed another 148 US bombers. Such losses could not continue.

Part of the problem was that the US bombers were flying into Germany unaccompanied. They had no protection. Normally fighters accompany bombers. But Allied fighters didn't yet have the range that Allied bombers had. By the end of the war, at least one fighter, the P-51 Mustang, would be developed to escort bombers. In the meantime, bombers' only defense was gunners all around the aircraft. But gunners weren't as helpful as a protective flank of fighters.

Furthermore, US pilots were conducting their precision-bombing missions during daylight hours. The RAF had lost many planes trying this. So they switched to night bombing. Americans were responsible for daytime runs. They had the Norden bombsight, which helps them hit targets during the day.

LeMay knew he had to do something to cut losses. He came up with two tactics: the combat box formation and formation pattern bombing.

LeMay instructed his bombers to fly close together. He called it the combat box formation. By sticking together, the gunners on the aircraft could more effectively protect against enemy fighters. This tactic helped somewhat until long-range escort fighters became available later in the war.

Formation pattern bombing is what results when bombers fly in a combat box formation. Bombs dropped from aircraft flying close together will land closer together and can have a big impact in a small area.

THE P-40 WARHAWK

Courtesy of the EAA/Jim Koepnick

The Development of Bombers, Fighters, and Transports

Between the end of World War I and the start of the second world war, both the United States and Britain cut defense spending drastically. The Axis Powers were doing just the opposite. So when Germany invaded Poland in 1939, the Axis nations were well prepared for war. The Allies were not.

In 1939 the US had 1,500 airplanes. At the time of the Pearl Harbor attack, it had 2,900 aircraft. Many weren't fit for combat duty. Furthermore, in 1939 US manufacturers could build no more than 2,100 aircraft per year. By 1940 they increased that to 570 a month. And by 1941 they could build 1,900 airplanes a month. Requests from Britain and France, as well as the US military, spurred the factories to ramp up production.

Pilots flew three key kinds of aircraft in World War II: the bomber, the fighter, and the transport.

Flight Paths

Gen Curtis E. LeMay and His Bombers

Gen Curtis E. LeMay (1906–1990) rose from flying cadet to many leadership positions. He worked with fighter planes. He moved to bombers in 1937. He charted routes to Africa and England before World War II.

In 1942 LeMay was in charge of the 305th Bombardment Group in the European theater. These pilots flew B-17s. It was with this group that he developed the combat box formation and formation pattern bombing. Later, when placed in charge of B-29s in the Pacific, he adapted those bombing theories to the new theater.

LeMay was a tough commander, but he was also tough on himself. He had a theory about war: "If you are going to use military force, then you ought to use overwhelming military force. Use too much and deliberately use too much. . . . You'll save lives, not only your own, but the enemy's, too." He applied this philosophy when his B-29s firebombed Tokyo in the most destructive air raid in history.

GEN CURTIS LEMAY

Courtesy of the US Air Force

After the war, LeMay had a number of leadership roles. Among them was command of the US Air Force in Europe during the Berlin airlift, an operation in Germany that followed World War II. Back in the United States, he commanded the Strategic Air Command, which oversaw atomic-bomb operations.

In 1961 LeMay became the fifth chief of staff of the Air Force.

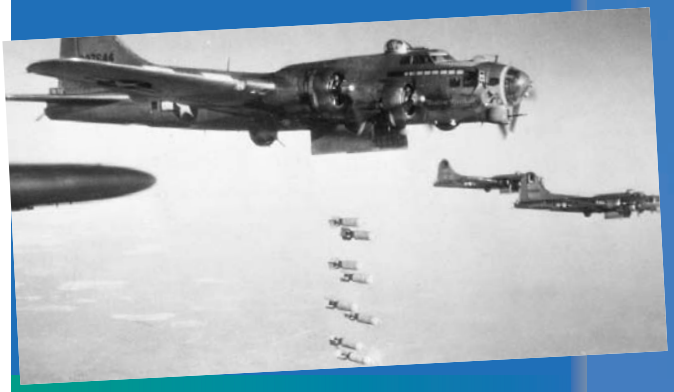
Bombers

America had the long-range B-17 Flying Fortress bomber as early as 1935. This, along with the B-24, saw a lot of action in Europe. The B-24 Liberator was developed by 1938 and was in production by 1941. It had a 2,850-mile range and could fly 303 miles per hour (mph). Some 18,000 were built during the war. An Army Air Force report from 1944 nicely expresses the reasons for designing the B-24:

> The Liberator was the result of the Army Air Forces' desire for a long-range running mate for the Flying Fortress. In football language, we sought a good ball carrier who was just as good at long end runs as he was at off-tackle smashes. We thought of the B-24 in terms of patrol and transport as well as bombardment, and it has performed all three functions splendidly.

The B-29 Superfortress was the long-range bomber of the Pacific theater. It was bigger than the B-17 and the B-24. It could also fly greater distances—5,830 miles, with a top speed of 365 mph. It was designed for bombing runs over Japan.

Medium-range bombers included the B-25 Mitchell (1938) and the B-26 Marauder (1939). Both were in mass-production by February 1941. Lt Col Jimmy Doolittle used the B-25 in the 1942 Tokyo raid. This attack showed Japan that Allied planes could reach the home islands. The B-25 had a range of 1,200 miles and flew 275 mph. The B-26 Marauder flew mostly in England and the Mediterranean. It could fly 1,100 miles at a top speed of 285 mph. This bomber claimed the distinction of having the fewest of its numbers shot down of any Allied aircraft.



B-17 Flying Fortress

Courtesy of Betttman/Corbis

B-24 Liberator

Courtesy of the US Air Force

B-29 Superfortress

Courtesy of the EAA/Ken Lichtenberg

B-26 Marauder

Courtesy of the US Air Force

P-38 Lockheed Lightning

Courtesy of the US Air Force

P-51 Mustang

Courtesy of the EAA/Jim Koepnick

F-4F Wildcat

Courtesy of the EAA/Jim Koepnick

F-4U Corsair

Courtesy of the EAA/Jim Koepnick

Fighters

Among the American fighters that saw action in World War II were the Lockheed P-38 Lightning, Bell P-39 Airacobra, Curtiss P-40 Warhawk, and Republic P-47 Thunderbolt. Perhaps the most famous fighter was the North American P-51 Mustang.

Both the P-51 Mustang and the P-38 Lightning escorted long-range bombers. These fighters protected the bombers on missions deep into Germany. The P-38 gained a reputation among the German Luftwaffe in North Africa. They called it the "fork-tailed devil."

P-39 pilots went on many strafing runs. And the P-40 was a tough, sturdy plane. It saw action from the very start, going up against Japanese fighters at Pearl Harbor. The ranges on these fighters reached from 650 miles (the P-39) to 1,100 miles (the P-38). The P-51 had a top speed of 437 mph while the P-40's fastest pace was 362 mph.

The Navy, meanwhile, enjoyed success in the Pacific with the P-38, as well as with the carrier-launched Grumman F-4F Wildcat, the Grumman F-6F Hellcat, and the Chance-Vought F-4U Corsair.

F-6F Hellcat on the USS *Yorktown*

Courtesy of the National Archives and Records Administration

Developing any new aircraft was costly. The P-38, for instance, cost $852,000 to design. It would be considerably more in today's dollars. Unlike other countries at the time, the United States held design competitions for its military aircraft. The Army Air Forces believed this resulted in better aircraft. The designers came up with unique features that furthered advances in air combat capabilities.

Other fighters of note included the British Supermarine Spitfire (range 395 miles; maximum speed 355 mph), the Hawker Hurricane (700 miles; 325 mph), and the twin-engine De Havilland Mosquito (1,400 miles; 378 mph). Germany's main fighters were the famed Messerschmitt 109 (405 miles; 292 mph), the Messerschmitt 110 (1,305 miles; 342 mph), and the Focke-Wulf 190 (560 miles; 408 mph). Significantly, Germany also launched the world's first operational jet fighters at the end of the war, the Messerschmitt 262 Schwalbe (650 miles; 540 mph) and the Heinkel 162 Volksjaeger (606 miles; 562 mph). Fortunately for the Allies, these jets appeared too late in the war to affect the outcome. Japan's premier fighter was the Mitsubishi Zero (1,930 miles; 331.5 mph), which completely dominated its American counterparts at the beginning of the war.

Supermarine Spitfire

Courtesy of the EAA/Phil High

Messerschmitt 109

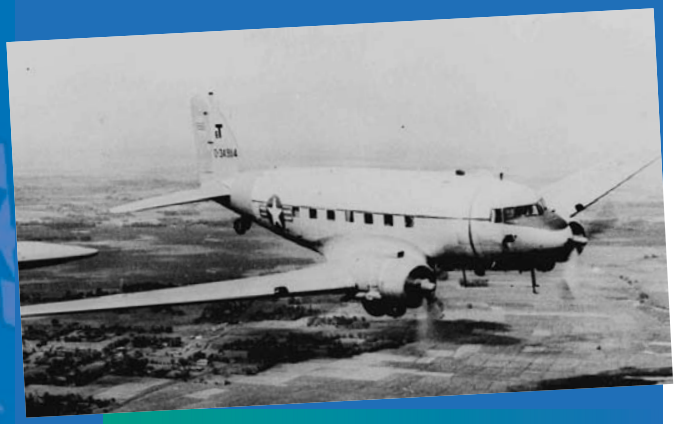
Courtesy of the EAA/Jim Koepnick

Messerschmitt 262

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. 79-4620)

Mitsubishi Zero

Courtesy of the Museum of Flight/Corbis



C-47 Skytrain transport

Courtesy of AP Photo

Transports

Transports were built to move people and cargo. They were less comfortable than commercial aircraft. As applied to all branches of the military, a transport *is a vehicle—aircraft, ship, or other—that carries people, supplies, tanks, and artillery*. The best-known air transport was the C-47 Skytrain. It was based on the Douglas Aircraft DC-3. It could fly 1,513 miles. It could reach 232 mph but generally cruised around 175 mph. Besides ferrying ground troops and equipment, it moved paratroopers and towed gliders. Some 9,348 C-47s were built by the end of the war.

CAPSULES

Enlisted Pilots

Before World War II, the United States had more pilots than planes. But once the United States entered the war and the war-manufacturing industry heated up, there were more planes than pilots. This meant that more enlistees would get a chance to fly. Congress passed a bill on 3 June 1941 to encourage enlistee pilots.

There were 3,000 enlisted pilots from 1912 to 1942. Cpl Vernon Burge, whom you read about in a previous chapter, was the first. The main differences between noncommissioned and commissioned pilots were age and education. Enlisted pilots were between 18 and 22 years old. They had to graduate in the top half of their high school classes. They didn't have to attend college. Commissioned pilots were 20 to 27 years old. They had college degrees. Most enlistees who became pilots eventually did receive commissions.

Army command intended to use enlisted pilots for transport duties, not for combat. But the needs of war often meant that the enlistee pilots saw action. These pilots fought most of the air battles over North Africa, for instance. In the Mediterranean, officers who had started out in the military as enlisted men were in charge of all the troop carrier groups in the region. Troop carrier groups flew Soldiers in transports. Enlisted pilots contributed mightily to Allied victory.

The Significance of the Allied Air Campaigns

Germany resumed hostilities in Europe in 1938 to take lands it felt belonged to it: Austria, Czechoslovakia, and later, Poland. Most of Europe caved quickly before German aggression. Britain was an exception. This small island nation was about all that stood between Germany and total conquest.

Before the United States joined Britain in its campaign to free Europe, the military and civilian leaders of the two countries met many times. They talked strategy. The United States was already supplying Britain with ships, planes, and parts. The Allies considered the chance Japan would one day attack the United States. They asked themselves how this would affect the Allied strategy.

The United States and England came to some important conclusions. They decided that even if Japan struck the United States, the first objective of the Allies would still be to defeat Germany. Germany was in Britain's backyard. Its factories churned out excellent planes and tanks. It had been hammering Britain for two years. As of 1941 the combined forces of the US and England would have been hard pressed to fight all-out war on two fronts. But by 1944 that was no longer true. Helped by the Soviets' battle with the Germans on the Eastern Front, they could take on Germany and Japan full force.

Once the United States entered the war, air power had a big part in the European and Pacific theaters. It played both its old support role and its new offensive role of strategic bombing.

Significant Allied Air Campaigns in the European Theater

All Allied air actions in Europe had a single goal: to shut down the German offensive. The first great clash was the Battle of Britain.

The Battle of Britain

The Battle of Britain was one of the most important of the war. This was a defensive battle for the British. The British were the first to stop the Nazi war machine.

The battle began in August 1940. The Germans did small-scale raids to test British strength. England relied on its fighters for defense. Both British resolve and poor German planning helped Britain hold out. As you read above, the Germans had only short- and medium-range bombers. They needed long-range bombers to hit Britain effectively.

Germany made another big mistake. It didn't count on British radar. Radar let the British spot German squadrons heading toward them across the English Channel. Because of radar, the RAF didn't have to waste fuel patrolling in the air. And it didn't have to waste manpower or put unnecessary wear and tear on its planes. Having radar was a bit like being able to see into the future. It allowed the RAF to send its fighter pilots where and when they were needed.

Even so, German bombers did manage to get through to bomb London and the surrounding areas. They inflicted serious death and damage. But German efforts grew weak by 1941. The Luftwaffe had lost too many planes and crews to British fighters. British air power had saved Britain.

The Allies Versus the Axis Powers in Europe

When the United States declared war on Germany and Italy, a new phase of the air campaign began. Britain now had active allies in the United States and the Soviet Union. Before America's entry, Britain had been on the defensive. With America by its side, Britain mounted an offensive campaign.

Between 1942 and 1945, the Western Allies went hard after Germany. The US Eighth Air Force went on its first strategic bombing run over Germany on 17 August 1942. It used B-17 bombers with Norden bombsights for daytime precision strikes. The RAF hit Germany at night. The Allies' strategy was threefold:

1. Protect Allied supply routes between the United States and Britain to stop the Germans from blowing up Allied ships carrying materiel—*the equipment and supplies of a military force*
2. Bomb the German war industry (factories and warehouses)
3. Destroy German roads, bridges, and communication lines.

THE RAF HAWKER HURRICANE FIGHTER

The RAF Hawker Hurricane fighter played a huge role in the Battle of Britain.

Courtesy of the EAA/Phil High

THE GERMAN STUKA DIVE-BOMBER

A German Stuka dive-bomber used during the early years of World War II

Courtesy of ullstein bild/The Granger Collection

The Allied plan had one big hitch. Until 1944 most bombers flew without fighter escorts. The fighters weren't equipped to make the long flight to Germany. The Allies suffered huge losses, especially in 1943 over Germany. Not until March 1944 would bombers reach Berlin. Fighters eventually accompanied the bombers. In the meantime, the Allies also focused on German positions in France from 1942 to 1943. The hop across the English Channel was just more than 20 miles.

In mid-1943 the Ninth and Twelfth Air Forces of the US Army became free for European theater duty. They'd been fighting in North Africa. Now the Ninth and Twelfth provided support in Italy. The Allies invaded the island of Sicily in July 1943 and Italy in September 1943. Upon Italy's surrender soon after, the Ninth and Twelfth turned their attention to support actions against Germany, including the D-Day invasion.

Flight Paths

Maj Glenn Miller: Morale Booster

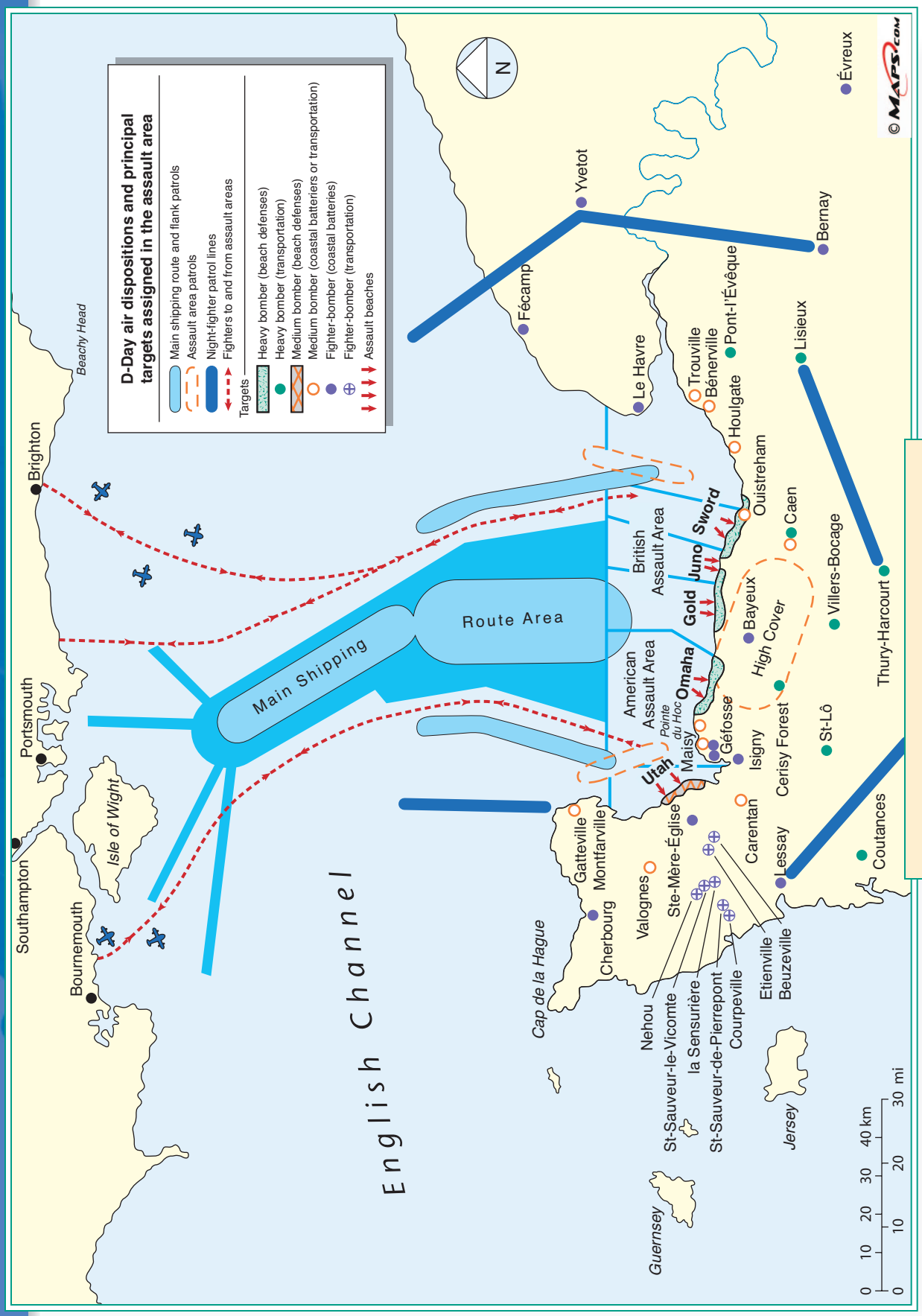
Back in the states, Glenn Miller was a successful bandleader. At 38, he was too old to be drafted into the war. So he volunteered. He started as a captain in the Army Air Corps. Miller felt that his swing music could cheer up Allied troops overseas.

Miller put together the 418th Army Air Forces Band in 1943. Fifty Airmen—almost all enlisted—played for it. Many thought that this wartime band was even better than Miller's civilian band. The band played all over Europe. It made weekly radio broadcasts and often gave live shows every night. The musicians also did everyday military duties, such as playing Reveille and Taps.

On 15 December 1944 Maj Miller took off from England for Paris. The aircraft never made it. No one ever found the wreckage. However, even without its leader, the 418th Army Air Forces Band continued to lift the troops' spirits throughout the remainder of the war. Miller's goal of helping his countrymen lived on. The band evolved into today's USAF premier jazz band, "The Airmen of Note."

CAPT GLENN MILLER

Courtesy of Hulton Archive/Getty Images



THE D-DAY INVASION

Courtesy of Maps.com

D-Day

The Western Allies delivered a backbreaking blow to Germany in 1944. They called it Operation Overlord. The purpose of this invasion, which would take place on "D-Day," was to retake Western Europe once and for all.

The D-Day invasion began on 6 June 1944 at Normandy, on the northern coast of France. But preparations had begun much earlier. For two months, bombers and fighters of the Army Air Forces and RAF had been striking at German positions in and around Normandy. They wanted to soften the German defenses. They hit airfields, railroads, and coastal barriers. They downed Luftwaffe planes. They wiped out as much as they could within a 130-mile radius of the Normandy beaches where American, British, and Canadian Soldiers would land.

The night before the invasion, the Allies hit German forces extra hard. Hundreds of bombers, which normally flew at an altitude of 20,000 feet, raced through the air just 100 feet to 1,000 feet above ground. After dropping their bombs, the aircraft strafed targets on the ground.

On D-Day, fighters played a critical role. They, too, conducted bombing missions. The P-38 Lightning could carry two 1,000-pound bombs. One group of fighters flattened a German command center. In addition, fighters strafed German infantry. They protected ships crossing the English Channel en route to the Normandy shoreline. They were also used to escort, *or accompany*, bombers and air transports.

The first wave of transports that crossed the channel on D-Day was breathtaking. It was nine aircraft wide in a line extending for 230 miles. Many of the Soldiers arriving on the beach by air transport were paratroopers. A paratrooper *is an infantry Soldier who is trained to parachute, often behind enemy lines*. Transports also towed gliders carrying men and materiel. Most of these gliders were made of wood and fabric, just as the earliest planes were. The maneuver was huge. On the evening of 6 June one glider took off from England for France every 15 seconds.

A B-17 CREW PRAYING BEFORE TAKEOFF FOR D-DAY

Courtesy of the 91st Bomb Group Memorial Association

The D-Day invasion and the Battle of Normandy cost 57,000 Allied Soldiers and Airmen their lives. But it was a major turning point in the war. It gave the Allies a foothold in Europe. More than 1 million men landed along 60 miles of beaches within seven weeks of D-Day. But there was still more to be done to achieve final victory in Europe.

Flight Paths

Paul W. Airey: From POW to the First Chief Master Sergeant of the Air Force

In July 1944 Paul W. Airey was flying his 28th combat mission in the European theater. He was a technical sergeant and radio operator. He was flying on a B-24 over oil refineries around Vienna, Austria. Antiaircraft fire severely damaged the bomber. The pilot ordered everyone to jump. Airey parachuted from 18,000 feet into a field. Austrian farmers beat him and held him until German forces arrived. Airy became a prisoner of war (POW).

CMSgt Paul W. Airey in the 1990s

Courtesy of the US Air Force

The Germans sent him to a POW camp called Stalag Luft IV. Later, when Allied forces approached the region, the Germans made all the prisoners march 400 miles to a camp in Berlin. British forces arrived in Berlin in May 1945 and freed the POWs.

Despite his experience as a prisoner, Airey loved the Air Force. On 3 April 1967, Paul Wesley Airey became the first Chief Master Sergeant of the Air Force (CMSAF). Now he was in the highest NCO position and the enlisted advisor to the secretary of the Air Force and Air Force Chief of Staff.

CMSAF Airey helped produce the Weighted Airman Promotion System. This system included clear, weighted criteria for promotion, including test scores and time-in-grade, and is still in use today. He noted that "WAPS is the most equitable promotion system for enlisted personnel in any of the US armed services." Airey considered this his most important contribution as the CMSAF. He retired on 1 August 1970.

The Women's Airforce Service Pilots

Shortly after Europe went to war in 1939, two Americans tried to find a way for more women to get into the air. The result of their efforts was the Women's Airforce Service Pilots program (WASP).

This program didn't come about overnight. Jacqueline Cochran contacted First Lady Eleanor Roosevelt about setting up a training program for women pilots in September 1939, the month Germany invaded Poland. Nancy Harkness Love got in touch with Lt Col Robert Olds about forming an all-women's ferrying squadron in 1940. These women's job would be to fly military aircraft from factories to bases.

It took a while to grant either request. First, America hadn't even entered the war as of 1939. Second, the country at that time had more pilots than planes.

But eventually the women got their wishes. Once the United States entered the war, the Army Air Forces needed to free men for combat duty. Cochran was in charge of training women through the Women's Flying Training Detachment (WFTD). Some 1,879 female pilots passed through her program. Love became director of the Women's Auxiliary Ferry Squadron (WAFS). In 1943 the Army Air Forces merged the two units into WASP. While Cochran was in charge of WASP, Love headed its ferrying-operations arm. WASP pilots were not members of the military but civil-service employees. By the time WASP was broken up in December 1944, its female pilots had flown 60 million miles and ferried 77 kinds of aircraft.

Women's Airforce Service Pilots

Pilots in the Women's Auxiliary Ferrying Squadron fly aircraft from factories to bases. Behind them is a B-17E.

Courtesy of the US Air Force

Jacqueline Cochran: From Foster Care to the Air

Jacqueline Cochran (1906–1980) had grit. She was in foster care as a child. Cochran said she didn't get her first pair of shoes until she was 8 years old. She trained to be a beautician. She liked to make people happy through her work. But along the way, she caught the flying bug.

It started in 1932, when she met millionaire Floyd Bostwick Odlum in New York City. She told him she'd like to start a cosmetics company. Odlum said that in that case, she'd need to find a way to fly her goods to many markets. Cochran saved up money for flying lessons. Rather than cosmetics, flying became her career.

JACQUELINE COCHRAN

Courtesy of the US Air Force

In 1938 Cochran broke a record with a nonstop flight from Los Angeles to Cleveland in eight hours, 10 minutes, 31 seconds in a P-35 fighter. This won the cross-country Bendix Race. Around this time, she reached an altitude of 33,000 feet—a new women's record. She performed other feats as well. Cochran liked to say: "I might have been born in a hovel, but I was determined to travel with the wind and the stars."

As early as 1939 she tried to get the US government to let her train women pilots to help with the war effort. The women couldn't take on roles in fighting, but they could fill support roles and allow more men to enter combat, she figured. The government turned her down.

But later President Franklin D. Roosevelt asked her to study ways to use female pilots in the Army Air Corps. Things went better this time. Cochran, with 25 other women, went to London and served in the British Air Transport Auxiliary in 1942. At Maj Gen Hap Arnold's request, Cochran later established the Women's Flying Training Detachment within the Army Air Forces.

After the war, Cochran kept on flying. In 1953 she became the first woman to break the sound barrier.

Flight Paths

Nancy Harkness Love's Early Love of Flight

Nancy Harkness (1914–1976) came from a wealthy Philadelphia family. She attended excellent schools: the Milton Academy in Massachusetts and Vassar College in New York. Early on, she fell in love with flying. She once buzzed her college campus and was suspended from her classes for two weeks.

As a young woman, Nancy fell in love with another pilot, Robert Love. He was an Air Corps Reserve officer. The two married in 1936. They founded an aviation business in Boston. Nancy Love got more flight time in other ways. Through the Bureau of Air Commerce, she was a test pilot for new landing gear with three wheels.

Nancy Love is best known for getting the Women's Auxiliary Ferrying Squadron set up. Maj Gen Hap Arnold turned down her first proposal in 1940. Then in 1942 Robert Love talked to Col William Tunner, who was in charge of the stateside division of the Army Air Forces Ferry Command. Robert Love told Tunner about Nancy Love's piloting skills. Tunner desperately needed more pilots.

Nancy Love got her Women's Auxiliary Ferry Squadron. It had 25 female pilots. She was its director. After the war, she was awarded an Air Medal.

NANCY HARKNESS LOVE

Courtesy of the US Air Force

The Ninety-Nines

Female pilots faced all sorts of barriers at the start of the 20th century. For example, they weren't allowed to compete in air races with men. Nor were they allowed to work as commercial pilots.

In 1929 there were only 117 licensed, American female pilots. A few of them decided to form an all-women pilots' club. They sent letters to all the licensed women pilots. Ninety-nine of the women replied. So Amelia Earhart proposed the group be named The Ninety-Nines. Earhart was the first president.

At first, the women mostly discussed air races. But they gradually took on a more important role. They began to lobby for rights for women pilots. During World War II, members joined the Women's Airforce Service Pilots. Those with nursing training became flight nurses and treated Soldiers wounded in battle. And before the war, they worked on the National Air Marking Program to create a navigation guide visible to the naked eye for pilots without instrument panels or radios.

The Ninety-Nines organization still exists. It has more than 5,500 members. And it continues the air-marking program to this day.

The Final Push

Despite these gains, the Allies had not yet won the war in Europe. From the beaches in Normandy, the Western Allies pushed through the rest of France, then Belgium, and Luxembourg. Meanwhile, on the Eastern Front, the Soviets pushed the Germans out of the Soviet Union and through Eastern Europe. In September the first US patrols entered Germany.

At the end of December 1944, the Germans made a desperate surprise counterattack in Belgium. They wanted to divide the Allied armies and force a negotiated peace. The epic battle in the Ardennes Forest is known as the Battle of the Bulge. Allied air power provided crucial help to the brave ground troops in beating back this attack. Luftwaffe planes attempted to support German forces by attacking US troops on the ground. But in most cases Allied fighters stopped them short of their targets. Although poor weather limited flying on several days, Allied bombers seriously hampered German efforts. They bombed roads, railroads, and bridges behind the lines. This made it more difficult for the Germans to move up supplies and troops.

German defeat in the Battle of the Bulge not only sealed the Nazis' fate on the ground, it also destroyed German air power. The commander of the Luftwaffe fighter arm, Lt Gen Adolf Galland, wrote, "The Luftwaffe received its death blow at the Ardennes offensive."

The strategic bombing of Germany went on. The Allied bombers and escorts hit airplane factories, oil refineries, and roads. Allied manufacturers poured out thousands of airplanes and other supplies. The intensity of air battles grew. By 1945 most bombing runs over Germany involved between 1,000 to 1,500 bombers. The Eighth and Fifteenth Air Forces conducted these missions.

The Army Air Forces and RAF ran out of targets by 15 April 1945. They had unloaded 2.5 million tons of bombs on the Axis Powers in Europe. The United States and Britain lost 8,000 bombers and 7,000 fighters. But the Luftwaffe, despite its initial advantage, lost 33,000 airplanes. On 7 May 1945 the Germans surrendered. The European chapter of the war was closed.

Significant Allied Air Campaigns in the Pacific Theater

Having defeated Germany, the Allies could turn their full attention to Japan. In 1931 Japan reached beyond its borders for more and more resources like oil. It invaded Manchuria and China. In 1940, after France fell to Germany, Japan snatched French Indochina. (French Indochina is today the three countries of Vietnam, Cambodia, and Laos.)

The United States and Britain wanted to put an end to these land grabs. They imposed a trade embargo on Japan. An embargo *is a legal ban on commerce*.

In response, Japan went after its biggest naval threat in the region: the US Pacific fleet at Pearl Harbor in Hawaii. If Japan could defeat this fleet, it could place bases on islands in the Pacific to protect its imports.

As it entered war with America, Japan knew it must maintain its navy. And even though the navy wasn't especially strong in the beginning, it was successful. It surprised the Americans at Pearl Harbor. It drove the Allies all the way to Australia by mid-1942.

The US and Britain were up to their elbows with the war in Europe in 1942. Yet they began a Pacific offensive. It started with two important battles.

MAJ ARTHUR CHIN IN 1944

Courtesy of the American Airpower Heritage Museum

Maj Arthur T. Chin: Early Ace of World War II

Maj Arthur T. Chin (1913–1997) was born in Portland, Oregon. He was a Chinese-American. He took flying lessons as a teenager. Chin started the Portland Chinese Aero Club when still a teen with some of his friends. When Japan invaded China in 1931, they all wanted to go help China fight the Japanese.

When Japan again invaded China in 1937, Chin headed overseas to join the Chinese Air Force. The Chinese thought he was such a good pilot that they sent him to Germany for extra training. When Chin returned to the Chinese Air Force, he flew the Gloster Gladiator and the Curtiss P-40 Warhawk. He made 5 kills and got half credit for another. This made him an ace. He was one of the first American aces of World War II.

In 1939 Chin was shot down and badly burned. As he fell from his airplane, with his hands on fire, he managed to pull the ripcord to his parachute. Nearby Chinese peasants rescued him. He spent several years in recovery. In 1944 he flew again, now as a member of the US military. He delivered supplies over the Himalayan Mountains to Chinese troops. This was necessary because Japan had cut off land and sea routes to China. Chin remained in China until 1949, when the Communists took over the country. At that time he returned to Portland.

The Battle of the Coral Sea and the Battle of Midway

The Battle of the Coral Sea and the Battle of Midway put the brakes on the Japanese advance through the Pacific. These were air battles fought at sea. Air power didn't play a supporting role; the US Navy's ships did. During these battles the aircraft carrier became the principal ship in the navy.

The Battle of the Coral Sea took place from 7 May to 8 May 1942. This was the first naval battle in history in which the opposing ships never saw each other. It was fought entirely by aircraft. US and Japanese planes dive-bombed each other's aircraft carriers off the east coast of Australia. Japan lost two carriers, three heavy cruisers, one light cruiser, two destroyers, and 100 airplanes. The United States lost the aircraft carrier USS *Lexington*, one destroyer, one tanker, and 50 airplanes.

The two sides fought the Battle of Midway from 3 to 6 June 1942. Both sides launched planes from their carriers. The US knew where the Japanese ships were because it had broken the Japanese Navy's secret code. The Japanese suffered greater losses in this clash. They lost four aircraft carriers, one heavy cruiser, three destroyers, and 275 airplanes. In addition the Japanese Navy left the battle site with many damaged vessels, including three battleships, three heavy cruisers, one light cruiser, and a handful of destroyers. By contrast, the United States lost only one aircraft carrier (the USS *Yorktown*), one destroyer, and 150 airplanes. With this battle, the tide of the Pacific war turned in favor of the United States. The Japanese never recovered from their losses at Midway.

The Battle for the Pacific Islands

Less than a month before the Battle of the Coral Sea, America had delivered its first blow to Japan, with the famed Doolittle raid. Lt Col Jimmy Doolittle led 16 B-25 bombers over Japan on 18 April 1942.

Until that day, Japan had promised its people their island nation was safe. Doolittle's raid proved otherwise. The bombers took off from the US Navy aircraft carrier *Hornet*. They hit Tokyo, Kobe, and other cities. Japan didn't shoot down a single B-25. There wasn't enough fuel to return to the *Hornet*, so most of the crews landed in China. One outcome of this raid was that Japan brought some of its air forces home for defense.

Two years later the United States made more strategic bombing attacks over Japan. On 15 June 1944 American B-29s took off from China. Later that year they took off from the Mariana Islands. Many Japanese civilians died in these raids. One reason was that the Japanese placed their factories in the middle of residential neighborhoods. Furthermore, in February 1945 the bombers switched from explosive bombs to incendiary bombs—*bombs designed to start fires*. The incendiary bombs created huge firestorms on the ground. Americans dropped such bombs on the cities of Tokyo and Kobe. An estimated 100,000 civilians died.

Many US bombers also met their end in these raids because they had to fly unescorted from the Marianas, some 1,500 miles away. To reduce their losses, the US forces fought long and hard for the island of Iwo Jima in 1945. Once they captured it, their new air base was only 750 miles from Japan.

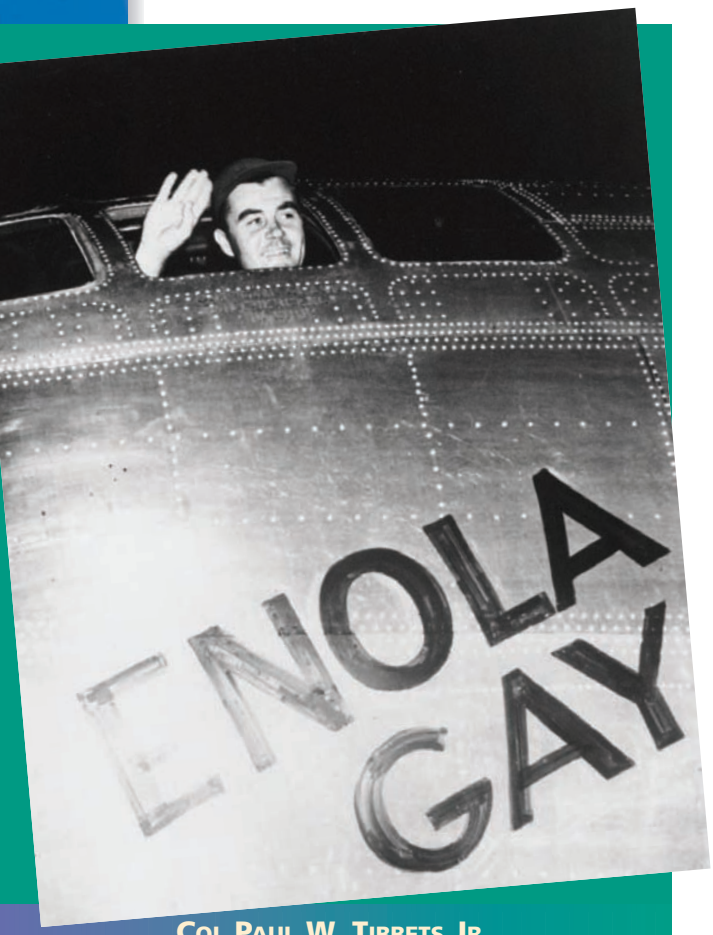
A B-25 BOMBER

A B-25 bomber like the one Lt Col Jimmy Doolittle flew during the Tokyo raid

Courtesy of the EAA/Jim Koepnick

The Atomic Bomb

By mid-1945 Germany had surrendered. A few weeks earlier, Harry S. Truman became president of the United States when Franklin D. Roosevelt died. The firebombing of Tokyo and Kobe was weakening Japanese resolve. But more was needed to break the Japanese military government's will. President Truman didn't want to risk hundreds of thousands of US casualties—and the lives of millions of Japanese—on an invasion of Japan.



Col Paul W. Tibbets Jr.

Enola Gay pilot Col Paul W. Tibbets Jr. shortly before takeoff with the atomic bomb that was dropped on Hiroshima, Japan.

Courtesy of the National Archieves/Getty Images

So Truman asked the military to use its newest weapon, the atomic bomb. The United States had two of them. Col Paul W Tibbets Jr. piloted the *Enola Gay* B-29 bomber. It took off from Tinian Island in the Pacific with the first of the atomic bombs. The crew dropped it on the city of Hiroshima on 6 August 1945. The US dropped the second bomb on Nagasaki, another major Japanese city, on 9 August. Tens of thousands died in the blasts. Tens of thousands more would die of radiation poisoning. Japan surrendered on 14 August 1945.

World War II ended with the utter defeat of Germany, Italy, and Japan. But developments during the war set the stage for much of the next 40 years. The nuclear arms race, jet airplanes, and humanity's first steps in space all happened because of developments during the war. The war also ended in a new rivalry between the Western democracies and the Soviet Union.

At the same time, however, the US economy and the recovering economies of Europe would grow rapidly after the war. And advances in commercial aviation were at the forefront of that growth.

CHECKPOINTS

Lesson 2 Review

Using complete sentences, answer the following questions on a sheet of paper.

1. What is the date of the Japanese attack on Pearl Harbor?
2. Who were the leaders of Italy and Germany?
3. What was the name of the German Air Force?
4. Define the word *blitzkrieg*.
5. What are the three major features of close air support?
6. In what year did President Harry Truman desegregate the armed forces?
7. Who was the first African-American brigadier general of the US Air Force?
8. What is the name of the general who thought up the combat box formation?
9. Name three long-range bombers used by the Allies during World War II.
10. On what day did the D-Day invasion begin?
11. What was the name of the battle that first put a stop to the German advance across Europe?
12. Name two important battles in the Pacific theater during World War II.
13. What was the name of the US bomber that delivered the atomic bomb on Hiroshima?

Applying Your Learning

14. Why was the long-range bomber so important to the United States and Britain in winning World War II?