

LESSON 2

Developing Aircraft

Quick Write



Both the Wright brothers and Glenn Curtiss were heavily involved with bicycles before taking up flight. What similarities do you see between bicycles, early motorcycles, and early airplanes?

Learn About...



- the key individuals involved in early aircraft development
- the names and anatomy of period aircraft
- the significance of other American pioneers in aviation following the Wright brothers

Glenn Curtiss, born in Hammondsport, New York, in 1878, sped onto the aviation scene in the early 1900s. But he was riding a motorcycle, not an airplane. At Ormond Beach, Florida, in 1907, he set a world speed record for motorcycles: 136.3 miles per hour (mph). People called him the “fastest man on Earth.” This was the same year the Wright brothers received their bid request for a military airplane from the Army Signal Corps chief, Brig Gen James Allen.

Much was happening all at once in the world of transportation. And any advance in one field sparked progress in another.

Curtiss’s passion for speed began with bicycles. As a teenager, he raced at county fairs and often won. This experience led to his love of fast motorcycles. Curtiss liked to fiddle with the mechanical side of bicycles, motorcycles, and engines as well. Actually, he did more than tinker with them. He built gasoline engines for motorcycles. Barely out of his teens, he started his own motorcycle business, the G. H. Curtiss Manufacturing Company.

His work with motorcycle engines eventually caught the eye of people in the field of flight. Once they introduced Curtiss to aircraft, he was hooked for good.

Key Individuals Involved in Early Aircraft Development

In the first decade of the 1900s, when the Wright brothers were making aviation history, other people were also becoming aviation pioneers. Each person made developments in aircraft that earned him or her a place in aviation history.

Glenn Curtiss

Glenn Curtiss pushed aviation forward in several ways. Even before his record-setting motorcycle ride in 1907, Curtiss was dipping his toes into aviation. He'd begun racing with his bike motors in Florida in 1904. It was there that Thomas Baldwin discovered Curtiss.

Baldwin, an American balloonist, owned a dirigible. As you read in the lesson "The Early Days of Flight," a dirigible is a lighter-than-air craft filled with helium. By the early 1900s aviators in France and Germany were using engines to maneuver such aircraft in the sky. But balloonists in the United States hadn't yet taken that step. Baldwin was looking for a lightweight engine for his aircraft when he spotted Curtiss racing in Florida. He saw how well Curtiss's engine performed. He asked if he could buy one. The young mechanic agreed. He tweaked one of his engines for use in an aircraft.

Baldwin's aircraft, equipped with a Curtiss engine, was the first powered dirigible in America. Before long, other balloonists wanted Curtiss motors, too. And in 1908 the US government purchased one of Curtiss's engines for the US Army's first dirigible, SC-1. Later, the military would purchase Curtiss planes and engines for use in World War I. The Army used the Jenny airplane—or JN-4—for training pilots. Curtiss's Wasp engine broke records for speed and rate of climb.

Vocabulary



- aileron
- fuselage
- multiengine plane
- cockpit
- tandem
- porthole
- radial
- crankshaft
- rotors
- torque
- boom
- solo
- pylons
- jumpsuit



GLENN CURTISS

Courtesy of Underwood & Underwood/Corbis

The Aerial Experiment Association

Glenn Curtiss was a busy man in 1907. In addition to working on some of the devices already mentioned, he joined the Aerial Experiment Association. Alexander Graham Bell, best known as the inventor of the telephone, formed this group. The inventors who belonged made some important design breakthroughs.

First, they built the first American plane equipped with ailerons. An **aileron** is a small flap on the wing for controlling turns. Ailerons replaced the Wright brothers' wing-warping technique, which used cables to pull on the ends of the wings. The aileron was a more effective means to move an aircraft left or right. It also provided lateral balance. This was critical whenever airplanes had rigid metal rings.

Although association members get credit for introducing this idea to America, none of them dreamed it up. The aileron was patented in Great Britain in 1868. In 1904 a Frenchman who was flying a glider used ailerons for the first time.

Second, members of the group built and flew the country's first seaplane. Curtiss would later win the first government contract with the US Navy for seaplanes.

Curtiss's Fame Grows

Curtiss continued to enter contests. In 1908, piloting an association plane called the *June Bug*, he won the Scientific American trophy. The award was for making the first public flight of more than one kilometer (0.6 miles). At the Rheims Air Meet in France in 1909, Curtiss picked up a prize for speed. He flew the fastest two laps over a triangular, 6.21-mile course. For this feat he took home the Gordon Bennett trophy. Curtiss won the trophy in his *Golden Flyer*. His average speed? An amazing 47 mph.



THE AERIAL EXPERIMENT ASSOCIATION

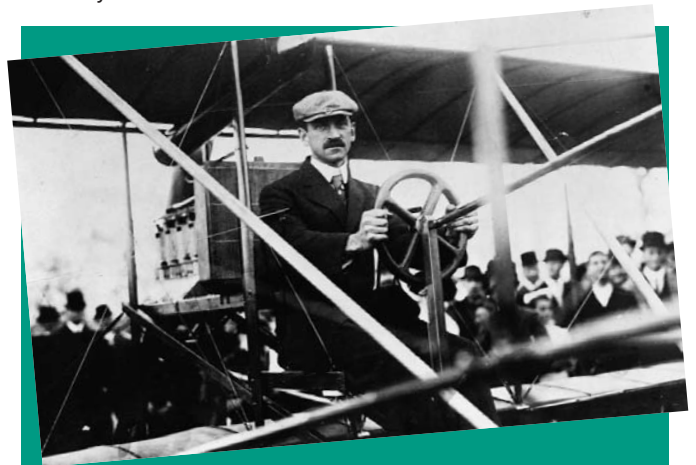
Members include Glenn Curtiss (left) and Alexander Graham Bell (center)

Courtesy of the Library of Congress



THE JUNE BUG

Courtesy of Bettmann/Corbis



THE GOLDEN FLYER

Two of Glenn Curtiss's award-winning planes: the June Bug and the Golden Flyer

Courtesy of Corbis Images

Never one to rest, Curtiss opened a flight school in 1910, the same year the Wright brothers opened their school. Also in 1910, a pilot named Eugene Ely flew a Curtiss biplane from the deck of a ship off Hampton Roads, Virginia. Later, Ely landed the plane on a wooden platform built on the armored cruiser USS *Pennsylvania*.

Curtiss's effect on aviation can still be felt today. To begin with, motorcycle engines were light and powerful. Aircraft also need light, powerful engines that won't weigh them down. Less weight puts less strain on the aircraft during takeoff, landing, and flight.

Louis Blériot

Across the Atlantic Ocean, the French pilot Louis Blériot was also pushing the limits of flight. He was the first man to cross the English Channel in a heavier-than-air craft. And what an adventure it turned out to be.

He took off from near Calais, in northern France, without a compass. Within 10 minutes, he was lost. He could see nothing but water and sky. He had no coastline in sight to guide him. Blériot piloted his aircraft as best he could toward England. He knew the journey was about 25 miles.

Finally he caught sight of the English cliffs of Dover. But then he encountered another hitch. His engine was overheating, and he was still above water and could not land. Then he spotted a small rainstorm. He veered toward it. The rain cooled his engine, and he landed safely. The flight took 37 minutes.

This flight took place in a powered monoplane that Blériot built. A *monoplane*, as you read in Chapter 1, is an airplane with one set of wings. The Wright brothers' aircraft were biplanes, or aircraft with two sets of wings. Louis Blériot was the first man to build a powered monoplane. He named the aircraft that brought him across the English Channel the *Blériot XI* because he'd built 10 others before it. He'd crashed nearly 50 times during test flights of those aircraft. The 11th plane brought him safely to England's shores.

Blériot achieved other accomplishments. Like Curtiss, he entered the first international air meet in Rheims in August 1909. While Curtiss won the two-lap contest for speed, Blériot snapped up a trophy for a one-lap contest by flying at 47.8 mph. Also like Curtiss, Blériot built planes for the war effort during World War I. But Blériot built aircraft for his own country, France.

LOUIS BLÉRIOT AND HIS MONOPLANE

Courtesy of the Library of Congress



The Names and Anatomy of Period Aircraft

During the years between the Wright brothers' famous flight of 1903 and the start of World War I in 1914, aircraft continued to grow more sophisticated. The first man to use ailerons, Frenchman Robert Esnault-Pelterie, was also the first to fully enclose the fuselage. A **fuselage** is the body of an airplane containing the crew and passengers (or cargo). Enclosed cabins protected pilots and passengers from the wind and rain.

Multiengine Planes

While Louis Blériot was experimenting with monoplanes, brothers Eustace, Howard, and Oswald Short of England were adding engines to their aircraft. A **multiengine plane**—a plane with more than one engine—had greater power, reliability, and safety than a single-engine plane. Just as two heads are supposedly better than one, two (or more) engines upped an aircraft's power. Safety increased, too. If one engine died during flight, the second could provide enough power to get the plane back to earth.

The Short brothers built the *Triple Twin*, a two-engine, three-propeller aircraft in 1911. They placed one engine in front of the **cockpit**—a space inside the fuselage where the crew sits. They mounted the second engine behind the cockpit. The forward engine ran the two propellers on the wings; the rear engine drove the third propeller.



IGOR SIKORSKY

Courtesy of Corbis Images

Meanwhile a Russian pilot named Igor Sikorsky was designing a four-engine aircraft called *Le Grand*. He flew it on 13 May 1913. He used four 100-horsepower engines to lift the 92-foot-wingspan airplane. He mounted the four engines in two pairs in **tandem**—two objects with one placed directly behind the other—on the lower wings. The front engines powered the forward propellers, and the back engines drove the pusher propellers. Because the plane was so big, the landing gear had 16 wheels. The aircraft also had an enclosed cockpit. Each passenger could peer through a **porthole**—a small, circular window.

Passenger-friendly inventions such as portholes and enclosed cabins contributed greatly to the development of today's commercial airliners. Flying in a protected body and having viewing windows made air travel more attractive to paying passengers.



LE GRAND

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. 85-18305)

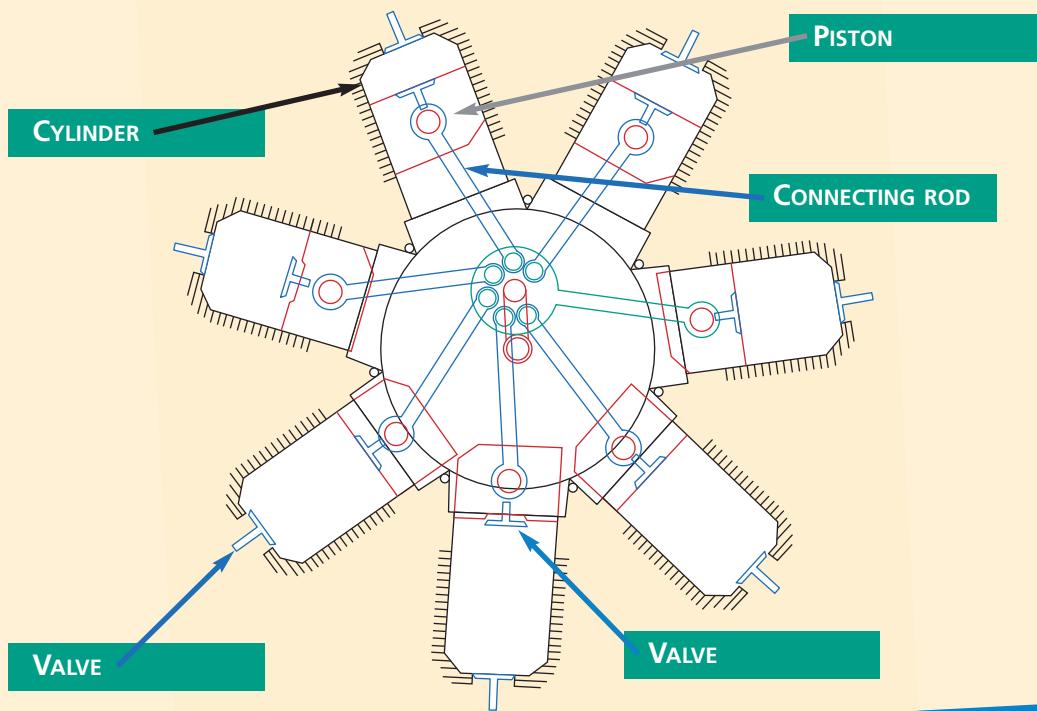


FIGURE 2.1 THE GNOME ROTARY ENGINE

Rotary Engines

Strong engines were essential for sustained flight. But the earliest engines were relatively heavy. The engine and propellers on the 1903 *Wright Flyer* weighed about 200 pounds. One reason for this heft was that these early engines used water as a coolant. They also weren't efficient: in 1907 every 10 pounds of engine generated just one horsepower.

Another set of brothers, Laurent and Gustav Seguin of France, set out to reduce the motor weight. Their solution? Rotary engines. Rotary engines used circulating air, rather than water, as a coolant. The Seguins placed the engine's cylinders in a **radial**, or round, pattern. They fitted each cylinder with a fin to draw out the heat as the plane flew.

With these changes, engines became more efficient. The number of pounds of engine weight needed to generate one horsepower dropped from 10 to three. The Seguins named their engine the Gnome.

But the Gnome was still a work in progress. The brothers needed to find a way to prevent the engine from overheating when the aircraft was revving up before takeoff. The brothers decided that the **crankshaft**—a *shaft that turns or is turned by a crank*—should no longer rotate the propeller and engine. Instead, the propeller and engine ought to rotate around the crankshaft. The Seguins bolted the crankshaft to the plane's frame. So even when the plane was at a standstill, air would circulate around the engine and keep it cool.

Helicopters

One of the last aircraft invented during the pre-World War I period is one you can still see almost every day. You've seen these aircraft in action movies or caught a glimpse of them on your local television news station's traffic report. They are helicopters.

Helicopters are different from the aircraft you've been studying in two important ways. First, they don't have fixed wings. They have rotating wings. Second, they take off and land vertically.

All aircraft need lift to remain in the air. Biplanes and monoplanes rely on their wings and forward motion to maintain lift. But what's to keep an aircraft in the air when it rises straight up like a helicopter does? The wings of helicopters, like those of other aircraft, must be in constant motion. Helicopters have **rotors**—*another name for propellers*. Rotors are made up of blades, each of which acts as a wing. As the blades rotate, they lift the helicopter. Helicopters are also known as rotary-wing aircraft.

Inventors as far back as Leonardo da Vinci tried to design a helicopter. Some models made it into the air. But it wasn't until 1842 that a man named W. H. Phillips got a model helicopter with a steam engine into the air.

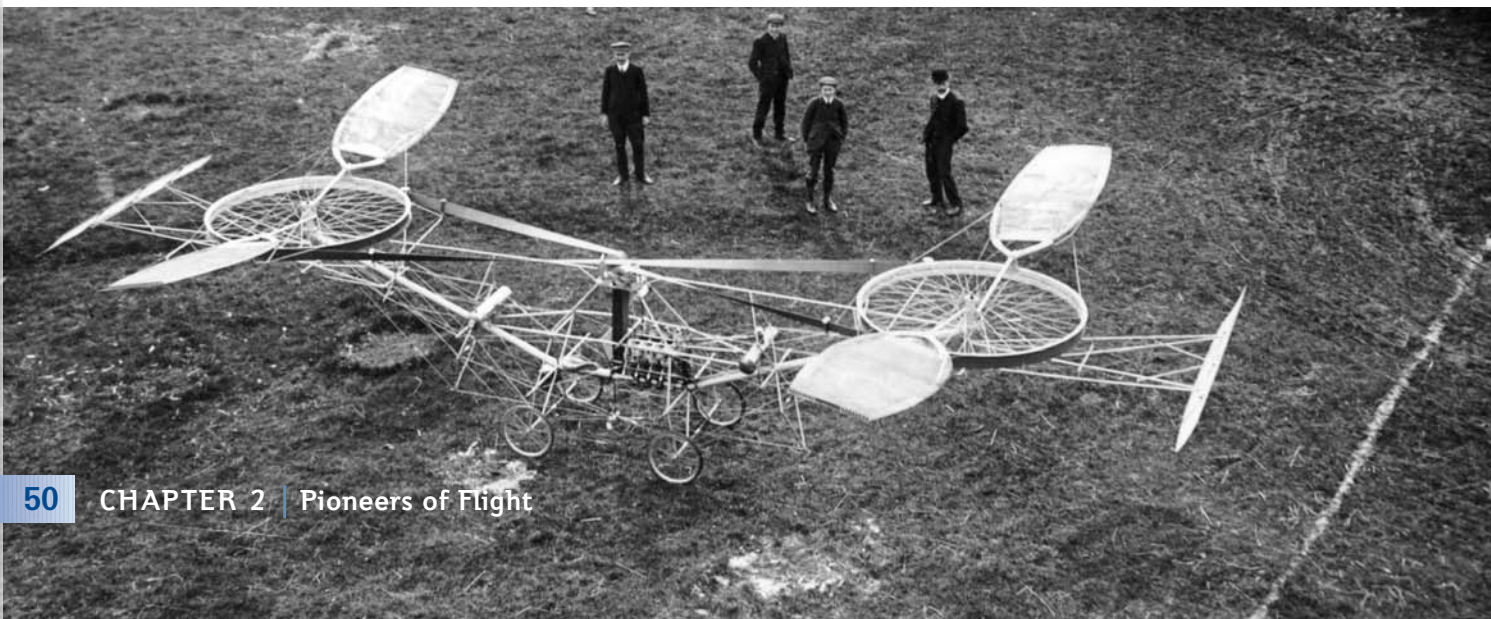
The first two manned attempts at helicopter flight were in 1907. Frenchman Louis Bréguet flew one with the help of four assistants who had to hold it steady. His countryman Paul Cornu also got a helicopter to lift. In 1909 an American father-son pair, Emile and Henry Berliner, also built and piloted a helicopter.

All these men faced one common problem: helicopters are difficult to balance. Bréguet needed four assistants to steady the aircraft. They needed to do this because rotating blades create **torque**, *which is a twisting force*. Because of torque, while the blades are turning in one direction, the body of the aircraft spins in the other.

No one would find a solution for 30 years. But when they did, they came up with two possibilities. The first was to use two rotors and to make them spin in opposite directions. The second solution was to place a small rotor at the end of a long tail boom. A **boom** *is the section of the helicopter that connects the tail with the main body*. The tail rotor spins in a direction opposite that of the main rotor.

PAUL CORNU'S HELICOPTER

Courtesy of Branger/Getty Images



Other American Pioneers in Aviation Following the Wright Brothers

While some aircraft pioneers were achieving fame as inventors, others were breaking barriers as pilots. Those barriers ranged from distance to altitude to gender and race. Calbraith Perry Rodgers made the first cross-country flight in the United States. American Bessie Coleman was the first black woman in the world to get a pilot's license. Blanche Stuart Scott was the first woman to fly solo. The early 20th century was a time when all kinds of records could be broken.

Other American Aviation Pioneers

All these aviation pioneers needed great courage. They were flying in an age when planes were, frankly, quite flimsy. They also had to be very curious. They were exploring a new frontier. And like Glenn Curtiss, they shared a passion for flight and speed—for soaring into the sky. Each one faced challenges—crashes were many, and all pilots knew the possible consequences. But they dared to continue flying.

The Vin Fiz Flyer

Could Calbraith Perry Rodgers fly across the United States in 30 days? That was his goal in 1911. Newspaper publisher William Randolph Hearst was offering a \$50,000 prize to the first pilot who made the journey in that timeframe. Rodgers wanted to give it a try. But he had no money. Like today's NASCAR drivers, he needed a sponsor.

Rodgers asked soft drink manufacturer Vin Fiz if it would provide financial support for his flight in exchange for nationwide publicity. The company agreed. It bought him a Wright airplane (the *Vin Fiz Flyer*) and made sure he had all the spare parts he'd need. Rodgers hired mechanic Charles Taylor away from the Wright brothers to help him out on his adventure.

Rodgers took off on 17 September 1911 from Sheepshead Bay, on New York's Long Island. Vin Fiz, with publicity in mind, mapped his route. The flight plan called for stops in major cities such as New York City, Chicago, Kansas City, San Antonio, El Paso, and Yuma. The destination was Pasadena, California.



THE VIN FIZ FLYER

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. 2006-25765-640)



A VIN FIZ ADVERTISEMENT

Showing the route of Calbraith Perry Rodgers' cross-country flight

Taken from Aerofiles.com

Rodgers's biggest worry was getting over the Rocky Mountains with a 40-horsepower engine. Head winds and weather would slow him down. As the flight progressed, his shortest laps were around 40 miles, and his longest was 133 miles. He averaged around 52 mph. He made 68 landings. The plane needed countless repairs along the way. In fact, by the time it got to Pasadena, the *Vin Fiz Flyer* had only two original parts—the rudder and one strut.

The trip turned out to be 4,251 miles long, rather than the anticipated 3,390. It took 49 days. Rodgers didn't win the award because the flight took too long. But he'd earned a place in aviation history—he made the first airplane crossing of the United States from coast to coast.

The First Enlisted Pilot Gets His Wings

Private First Class (PFC) Vernon Burge was the first enlisted man to become a pilot. The US Army Signal Corps' Aeronautical Division, created in 1907 to take charge of ballooning and air machines, had a general rule that only officers could be pilots. Enlisted men trained as mechanics. And as late as 1908, the bulk of the "flying" done in the Aeronautical Division was done in balloons. The mechanics had to know how to work with balloon fabric, to control the aircraft, and to prepare the gases for the balloons.

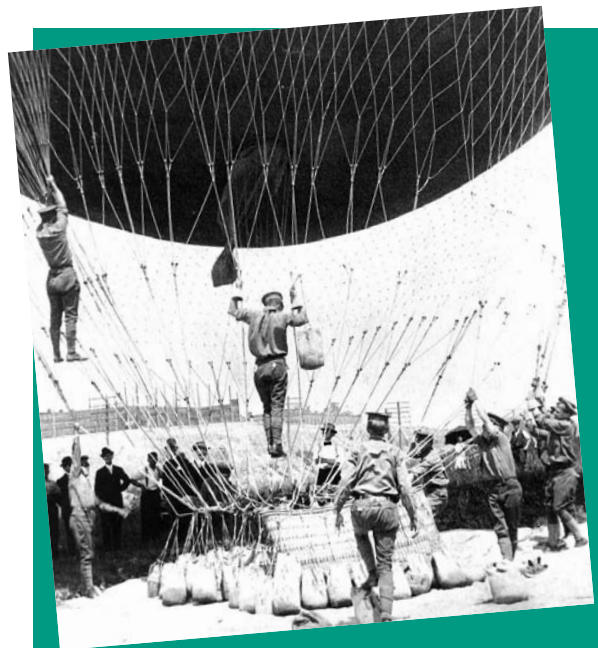
Burge was one of eight enlisted men who joined the division in 1907. In 1909 he and nine other enlisted men joined 1st Lt Benjamin Foulois and a civilian mechanic at Fort Sam Houston in San Antonio, Texas. This was when Foulois was teaching himself how to fly. Burge and another private, Glenn Madole, assisted by the civilian mechanic, built a landing system for Foulois' airplane. During this time, Burge learned as much as he could about repairing and flying airplanes.



COL VERNON BURGE

Col Vernon Burge on the eve of his retirement, right before his final flight

Courtesy of the Airmen Memorial Museum



ENLISTED MEN LEARNING THE BALLOON TRADE

Courtesy of the Airmen Memorial Museum

By the time Burge became a pilot in 1912, the Army had 11 aircraft, 14 officer pilots, and 39 enlisted men. But it wasn't until 18 July 1914 that the US House of Representatives passed a bill that authorized enlisted men to fly. The bill limited the number of enlisted pilots to 12. That bill was also important because it gave official status to the Army's aviation arm—it created the Aviation Section of the Army Signal Corps, which replaced the corps' Aeronautical Division.

Flight Paths

A Private's Persistence

PFC Vernon Burge knew he wanted to be a pilot from the moment he laid eyes on an airplane. When he volunteered for balloon duty in August 1907, he began a five-year journey as ground crewman, balloon handler, and airplane mechanic. He and his fellow mechanics spent a good deal of those five years at air shows around the country, helping prepare aircraft and keep them fit for flight. Burge absorbed all he could about balloons and airplanes.

In early 1912 Burge, by now a corporal, shipped with a *Wright B* airplane to the Philippines. Brig Gen James Allen had ordered that an air station be established at Fort McKinley. Burge reported to 1st Lt Frank P. Lahm, who was setting up a flight school at the station. Aware of the shortage of officers, Burge took the plunge. He asked Lt Lahm whether he could train to be a pilot.

Lahm agreed, and Burge began his instruction 8 April 1912. He already knew a good deal about flying. As a mechanic, he'd taxied a good many airplanes along runways to make sure the engines were running right and repairs were correctly done. He passed his flight test 14 June 1912.

Burge's hard work, love of flying, and persistence eventually earned him a place in the Army as an officer. He retired 31 January 1942 at the rank of colonel. He'd spent 35 years in military aviation and had served as a pilot for 30 of those years. He'd logged 4,667 hours and 55 minutes in the air—quite a career.



SGT VERNON BURGE IN UNIFORM

Courtesy of the Airmen Memorial Museum

CAPSULES

Europe Versus America

Although the Wright brothers invented the airplane in America, Europe had more pilots than the United States did in those early days. France was the leader; by 1911 it boasted 353 pilots. Great Britain had 57, Germany 46, Italy 32, and Belgium 27. The United States had 26, giving it a sixth-place ranking in the world.

Tearing Down the Barriers

Bessie Coleman faced two obstacles to becoming a pilot—her race and her gender. She overcame both. In 1921 Coleman became the first black woman to get a pilot's license. She had to go to France for training because no flight school in the United States would accept her. She died in an airplane crash only four years after getting her license. You'll read more about Coleman in Chapter 3.

Opportunities for Women in Aviation

Before Bessie Coleman got her license in 1921, other women found it difficult to realize their dream of joining men in the skies. Even the most successful female pilots felt the strain.

Blanche Stuart Scott, the first American woman to solo in a plane, said, "There seemed to be no place for a woman engineer, mechanic, or flier. Too often people paid money to see me risk my neck, more as a freak, a woman freak pilot, than as a skilled flier." Because of this public pressure and a few severe accidents in the air, Scott retired from flight in 1916 when she was only 27 years old.

Despite the obstacles, many women thrived on the thrill of lifting and looping and diving through the air. They broke records and paved the way for women in the future to enter careers in commercial and military aviation.



BESSIE COLEMAN AND HER PILOT'S LICENSE

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. SI-99-15416)

BLANCHE STUART SCOTT

Blanche Stuart Scott was used to setting records. She became the first woman to drive a car across America in 1910. And she didn't do it on a highway, or even on a state route. At that time, there were fewer than 300 miles of paved roads in the entire United States.

When men started setting records in aviation, Scott wanted to be part of the action. She was Glenn Curtiss's only female student in 1910. In fact, she was Curtiss's first student ever, and he never took on another. In addition, Scott was the only female student pilot in the United States at that time. Curtiss worried about this. If Scott crashed, he feared he'd be blamed for putting a woman in harm's way. What's more, she'd be using a single-engine plane that Curtiss designed, and some people might think the plane was faulty. For these reasons, he did what he could to keep Scott from being able to take off.

Scott would taxi back and forth across the runway in Curtiss's plane. But she could never get into the air. Frustrated, on 2 September 1910, she got out of the plane and took a close look at the engine. She was, after all, a curious person. She noticed a small piece of wood lodged under the throttle lever. She deduced this hindered the lever's motion. And she also concluded that Curtiss had placed the wood there to make sure the aircraft wouldn't be able to get off the ground when she sat at the controls.

Scott removed the wood, climbed back into the cockpit, and asked a mechanic to crank the propeller. The plane lifted off the runway. Scott was airborne.

Scott had become the first American woman to solo in a fixed-wing airplane. To **solo** is to fly with no one else on board. She flew with exhibition groups for six years, although she never got her pilot's license. She was known for two stunts. In one, she flew under bridges upside-down. Her other stunt was the "death dive." She would climb to 4,000 feet, and then plunge the plane toward earth, leveling off only when she reached 200 feet.

Scott was adventurous, but even daring people get their fill. After a number of accidents, she retired in 1916 at the age of 27. She died in 1970 at the age of 81. She'd lived to see the first man land on the moon.



BLANCHE STUART SCOTT

Courtesy of the National Air and Space Museum,
Smithsonian Institution (SI Neg. No. SI-72-4803-A)

BESSICA MEDLAR RAICHE



BESSICA MEDLAR RAICHE

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. SI-2007-5475)

Some aviation historians think Bessica Medlar Raiche was really the first woman to go solo. She made that flight on 13 October 1910. They contend Scott got into the air purely by accident. But Raiche herself gave Scott credit for the event.

“Blanche deserved the recognition,” Raiche said, “but I got more attention because of my lifestyle. I drove an automobile, was active in sports like shooting and swimming, and I even wore riding pants and knickers. People who didn’t know me or understand me looked down on this behavior. I was an accomplished musician, painter, and linguist. I enjoyed life, and just wanted to be myself.”

Raiche never got a license. But flying excited her. She and her husband, François, formed a lightweight airplane company called the French-American Aeroplane Company. They did two important things to make their planes better than other lightweight aircraft. They took off some pounds by exchanging heavier fabrics, such as muslin, for silk. They also used piano wires instead of iron wires.

Raiche eventually left flying. She entered medical school and became a doctor.

HARRIET QUIMBY



HARRIET QUIMBY

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. SI-2002-23705)

Quimby was the first American woman to earn her pilot’s license. A journalist, she wrote for a popular magazine called *Leslie’s Weekly*. But she wanted to make more money to support herself, her parents, and her ambition to become a creative writer.

In 1910 she watched aviator John Moisant fly around the Statue of Liberty in New York harbor. The sight thrilled her. She signed up for flying lessons. She got her license on 1 August 1911, after completing a two-part test. The first part of the test required her to make five left and right turns around **pylons**—*tall, thin towers*. She also had to fly five figure eights. Quimby passed this part with ease. For part two, she had to land within 100 feet of her takeoff point. Quimby failed this part first time around.

She took the test again the next day. This time she succeeded. She landed within 7 feet, 9 inches, of her takeoff point. What was so remarkable was that in those days, planes did not have brakes. Quimby set a record with her mark.

Quimby set other records: She was the first woman to fly at night (1911) and the first woman to cross the English Channel in the pilot's seat (1912).

She broke a fashion barrier, too. The long dresses that women wore at that time weren't practical for a pilot. Most of the planes were open to the elements, and long pieces of fabric might get caught in a propeller or other mechanism. Quimby designed an outfit for female pilots. Her tailor sewed a one-piece uniform made of purple satin. Quimby had invented the **jumpsuit**, a *one-piece outfit*.

Despite the progress, flight was still a dangerous business. Quimby entered the Boston Air Meet on 1 July 1912 in a Blériot monoplane. She and her passenger, William P. Willard, took off over Boston Harbor in hopes of making a record 58 mph flight over a body of water. At 5,000 feet, the plane flipped and nosed downward. As horrified spectators watched, Quimby and Willard fell from the plane and plunged into the waters. Both perished. Amazingly, the monoplane—now with no pilot or passenger—righted itself and landed in the harbor with a light crash.

In 1991, the US Post Office created a stamp in Quimby's honor.

HARRIET QUIMBY IN A PURPLE JUMPSUIT OF HER CREATION

Courtesy of the Library of Congress

CAPSULES

Dressed for Success

Harriet Quimby was a good friend of Matilde Moisant, John's sister. The two women decided to sign up for flight training together. When they did, both dressed as men. Why? Women were discouraged from learning how to fly, so they figured they'd need a disguise. Somehow, newspapers found out. They'd uncovered a fascinating story about two determined women.





MATILDE MOISANT

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. SI-73-3564)

Fortunately, the thickness of her clothing and her leather helmet protected her. Matilde Moisant died in 1964 at the age of 77.

MATILDE MOISANT

Matilde Moisant didn't buy into the superstition that the number 13 is unlucky. Her achievements proved how wise she was to ignore such beliefs. To begin with, she was born Friday, 13 September 1887. That was a good day for her and her parents.

Nearly 24 years later, on 13 April 1911, Moisant became the second woman in America to get a pilot's license. She won the Rodman Wanamaker Trophy for flying at an attitude of 2,500 feet. This was amazing in a day when planes weren't as stable as they are now. She also got a court to acknowledge it was legal to fly on Sundays. This happened after a sheriff in Long Island, New York, tried to arrest her for flying on a Sunday. Moisant's response was to hop in her plane and fly to another field.

One tragedy did strike: her brother, John Moisant, also a pilot, died in a crash in 1910. Matilde crashed a number of times herself, but she continued flying. Her brother's death deeply affected her, and on 13 April 1912, she said she'd make her last flight the next day. It turned out to be a very dangerous flight. The fuel tank sprang a leak, and by the time Moisant landed, her clothes were on fire.

European Women in Aviation

Women in Europe also turned their eyes to the sky during the early days of flight. Thérèse Peltier was the first European woman to fly as a passenger in a powered airplane in July 1908. The first European woman to pilot a plane was French baroness Raymonde de la Roche. The date was 22 October 1909. Soon after, she attained another first. On 8 March 1910 she became the first woman to earn a pilot's license.

RAYMONDE DE LA ROCHE

Courtesy of the National Air and Space Museum, Smithsonian Institution (SI Neg. No. SI-81-3423)



JULIA CLARK

On 19 May 1912, Julia Clark was the third American woman to gain her pilot's license. Sadly, she achieved an unfortunate other first: she was the first woman pilot to die in a crash.

Clark had a fascinating life. She emigrated to the United States from London and became an American citizen. She learned to fly at the Curtiss Flying School at North Island in San Diego. After soloing in a Curtiss plane, she joined an exhibition group. On the evening of 17 June 1912, she decided to take a test flight. It was dark, and she couldn't see that one of her plane's wings was about to hit a tree limb. The aircraft crashed. She died only about two weeks before Harriet Quimby.

KATHERINE AND MARJORIE STINSON

Flying was a family affair for the Stinsons. Katherine, her two brothers, and her sister all became pilots.

Katherine earned her pilot's license on 24 July 1912. She was the fourth American woman to do so. And at age 16, she was also the youngest. She would eventually become one of the most successful women in aviation.

For example, Katherine was the first pilot of either gender to take part in a parade. She covered her plane with roses for the 1913 New Year's Day Tournament of Roses Parade in California and flew over the parade route. Later, she set a distance record for both genders in a nonstop cross-country flight.

Her younger brothers, Eddie and Jack, became pilots. Jack was a test pilot. Her younger sister, Marjorie, graduated from the Wright Flying School in August 1914 (Wilbur Wright had her mother sign a waiver because of Marjorie's age). At 17, Marjorie became the first woman authorized to fly the experimental airmail service.



KATHERINE STINSON

Courtesy of the National Air and Space Museum,
Smithsonian Institution (SI Neg. No. SI-2007-5474)

All four siblings had the support of their mother, Emma. She even went so far as to move the family to San Antonio, Texas, so her daughters could open a flying school. When World War I began, the sisters tried to enlist as pilots in the Army, but they were rejected. So the sisters opened a school to train Americans and Canadians as pilots for the war. A supporter, New York Congressman Murray Hulbert, tried unsuccessfully to get Congress to pass a bill allowing women to join the Flying Corps. But women were allowed to do little more than serve as nurses during the war. Katherine went to France to work as an ambulance driver because, in her own words, “I didn’t feel I was doing enough for the war effort.”

That war would lead to revolutionary developments in aviation.



MARJORIE STINSON

Courtesy of Corbis Images

CHECKPOINTS

Lesson 2 Review

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

1. Who was the famous founding member of the Aerial Experiment Association?
2. Which of Glenn Curtiss's effects on aviation are felt today?
3. What did Louis Blériot do when his engine overheated as he was crossing the English Channel?
4. What type of "wing" does a helicopter have that gives it lift?
5. When did the first enlisted man become a pilot? What was his name?
6. Who was the first black woman to get a pilot's license? What two obstacles did she have to overcome?
7. What did Blanche Stuart Scott remove from her plane's engine to get it to fly?
8. Why was it remarkable that Harriet Quimby landed her plane 7 feet, 9 inches from her takeoff point?

Applying Your Learning

9. What are the advantages of multiengine planes?