



Smithsonian Institution

# BESSIE COLEMAN

## FIRST FEMALE AFRICAN-AMERICAN PILOT

1892 - 1926

### OBJECTIVES

- Describe Bessie Coleman's early life.
- Describe one of her early flying accomplishments, which was a first.
- Discuss her profession in the early 1920s.
- Describe the circumstances of her death.
- Build the Curtiss JN-4 "Jenny" biplane.

### STANDARDS

#### (NGSS)

##### Science

- MS-ETS1-1      ■ MS-ETS1-4
- MS-ETS1-3      ■ MS-PS3-1

##### ELA/Literacy

- RST.6-8.3      ■ WHST.6-8.7
- RST.6-8.7      ■ WHST.6-8.8
- RST.6-8.9

##### Mathematics

- 7.EE.B.3

#### (NCSS)

- IV.f.
- V.d.

One of thirteen children born to poor sharecropper parents, stunt pilot Bessie Coleman had to fight more than just the gender barrier to pursue an aviation career in the early 1900s. She faced racial and economic barriers as well.

When Coleman was in her early 20s in 1916, she heard stories about aviation from returning World War I aviators. This sparked an interest, which became a passion to become a pilot. At this time American flight training schools admitted neither women nor blacks. Frustrated with doors being closed on her for being both black and female, she looked abroad. In France, pilot training schools were open to all races and women. Coleman learned to speak French and, in 1920, went to France to learn to fly.

In September 1921, she sailed for New York and became a media sensation when she returned to the United States hoping to perform exhibition flights. But she was rejected when she attempted to purchase a plane.

In 1922, she returned to Europe. She met Anthony Fokker, a famous airplane designer who had his own flight school and expert instructors. Coleman was further trained by one of Fokker's top pilots to a high level of competency.

She came back to New York later in 1922. At this time in America, "barnstormers" across the country usually flew war surplus Curtiss JN-4 "Jenny" biplanes. She quickly realized that in order to make a living as a civilian aviator, she would need to become a "barnstorming" stunt flier and perform for paying audiences. She made her first exhibition flight in an American air show on September 3, 1922. This air show was billed as an event honoring veterans of the all-black 369th Infantry Regiment of World War I. Bessie Coleman had made herself a childhood vow to one day "amount to something." When she flew at this air show she knew she had accomplished her goal. She quickly gained a reputation as a skilled and daring pilot who would stop at nothing to complete a difficult stunt. She was tragically killed in an airplane crash in 1926 during an air show.

"Queen Bess," as she was known, made such an impact in the world that many national and international honors were bestowed on her. The first African-American female astronaut in space, Mae Jemison, carried a picture of Bessie Coleman with on her first mission.

# HER STORY

Bessie Coleman was born on January 26, 1892, in Atlanta, Texas, and grew up in rural east Texas. Her large family struggled with poverty, and she walked miles to a one-room schoolhouse without the benefit of even the basic school supplies. In spite of these social and economic challenges, she excelled in school and completed all eight grades.

She moved to Chicago in 1916 and was inspired to pursue an aviation career as a skilled stunt pilot. Her civilian air career would span less than four years.

While exhibiting at an airshow in Jacksonville, Florida, on April 30, 1926, Coleman was killed while she was test flying a new Curtiss biplane. A mechanical error caused by a wrench left in the engine caused the plane to spin downward. Coleman had

been looking over the side of the plane in search of a suitable parachute landing location and had unfastened her seat belt, although she was only too well aware of the accident that Harriet Quimby had had years earlier. As with Quimby, Bessie Coleman was thrown out of her airplane at over 300 feet and fell to her death. Her mechanic, William Wills, crashed and died.

William Powell, a lieutenant who served in an all-black unit in World War I, penned in his 1934 book, *Black Wings*, “Because of Bessie Coleman, we have overcome that which was much worse than a racial barrier. We have overcome the barriers within ourselves and dared to dream.”

Bessie Coleman broke down barrier after barrier, paving a way for all Americans of future generations to



US Air Force

one day pursue the possibility of flight. She dreamed of a flying school for blacks, and the possibility that women could be admitted to flying schools. She had made a large difference in aviation for generations to come.



blackamazing.com

## Achievements include

- First person of African American/ Native American descent to earn a pilot's license and an aviation pilot's license from the Fédération Aéronautique Internationale (1921)
- The USPS issued a Bessie Coleman stamp in 1995 commemorating “her singular accomplishment as becoming the world's first African American pilot and there by becoming by definition an American legend”
- Enshrined in National Aviation Hall of Fame (2006)

# BUILD A CURTISS JN-4 "JENNY"

Students and cadets will build a highly detailed paper model of an important aircraft used by student pilots and barnstormers from 1915 until well into the 1930s. Stunt pilot Bessie Coleman flew the Jenny at airshows.

*Permission to reprint, Chip Fyn, Fiddler's Green Company*

## BACKGROUND

The Curtiss JN-4 "Jenny" in 1915 was one of a series of "JN" biplanes built by the Curtiss Aeroplane Company of Hammondsport, New York, later the Curtiss Aeroplane and Motor Company. Although the Curtiss JN series was originally produced as a training aircraft for the U.S. Army, the "Jenny" (the common nickname derived from "JN-4," with an open-topped four appearing as a Y) continued after World War I as a civil aircraft. It became the "backbone of American postwar (civil) aviation."

Between 1917 and 1919, the JN-4 type accounted for several significant aviation "firsts" while in service with the U.S. Army Signal Corps Aviation Section and the United States Marine Corps (USMC) including flying the first U.S. air mail in May 1918.

In a series of tests conducted at the U.S. Army's Langley Field in Hampton, Virginia, in July and August 1917, the world's first "plane-to-plane" and "ground-to-plane, and vice versa" communications by radiotelephony (as opposed to radiotelegraphy which had been developed earlier) were made to and from modified U.S. Army JN-4s.

In early 1919, a USMC JN-4 was also credited with what is believed to be the first successful "dive bombing" attack during the United States occupation of Haiti.

The Curtiss JN-4 is possibly North America's most famous World War I aircraft. It was widely used during World War I to train beginning pilots, with an estimated



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95% of all trainees having flown a JN-4.

After World War I, thousands were sold on the civilian market, including one sold to Charles Lindbergh in May 1923, in which he then soloed. Surplus U.S. Army aircraft were sold, some still in their unopened packing crates, for as little as \$50, essentially "flooding" the market. With private and commercial flying in North America unhampered by regulations concerning their use, pilots found the Jenny's slow speed and stability made it ideal for stunt flying and aerobatic displays in the barnstorming era between the world wars, with the nearly identical Standard J-1 aircraft often used alongside it. Some were still flying into the 1930s.

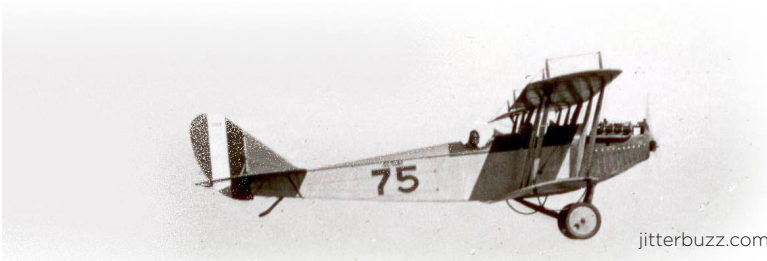
## ABOUT THE PLANE

### GENERAL CHARACTERISTICS

- **Crew:** 2
- **Length:** 25 ft. 4 in (8.33 m)
- **Wingspan:** 43 ft. 7 in (10.97 m)
- **Height:** 9 f. 10½ in (3.01 m)
- **Wing area:** 352 ft.<sup>2</sup> (32.7 m<sup>2</sup>)
- **Empty weight:** 1,390 lb. (630 kg)
- **Max takeoff weight:** 1,920 lb. (871 kg)
- **Powerplant:** 1 × Curtiss OX-5 V-8 piston, 213 hp (67 kw)

### PERFORMANCE

- **Maximum speed:** 75 mph (121 km/h)
- **Cruise Speed:** 60 mph (97 km/h)
- **Range:** 150 miles (or 2-hours)
- **Service ceiling:** 6,500 ft. (2,000 m)



jitterbuzz.com

# MATERIALS

- 1.. Flat, level, stable, and easily cleaned surface to work on
2. Sharp-pointed (“X-acto”-type) hobby knife. ALWAYS cap it when not in use
3. Sharp, precision sewing-type scissors.
4. A ruler or any other (truly) straight edge
5. Toothpicks, round (and flat, if available)
6. “Elmer’s” glue, super glue, plastic model cement or Aleen’s FAST GRAB TACKY GLUE
7. Eyebrow-type tweezers, having a straight edge of comfortable angle
8. Stylus of some kind, to make indented lines for folds
9. A trash can nearby to be neat
10. 67 lb. paper to make the copies of the plans

**fyi:**

## Things to keep in mind

1. Any card model consists of a number of flat parts which have to be folded in certain directions to form a three-dimensional shape.
2. There must be a clear indication where to fold and in what direction.
3. Most of the established publishers (in Europe) have a traditional format for indicating folds and scoring, to maintain continuity in their model designs.
4. The contracted designer is forced to follow this “tradition.”
5. First score and then cut!
6. Most things to score and fold are TABS.
7. Curved folding edges are not possible.
8. Plan much “wait time” between steps, as noted in procedures.

## PROCEDURE — Building the Jenny

1. Print the Curtiss JN-4 Jenny plans found on the following pages.



5. Cut and fold the tabs carefully. Bend tabs with a straight edge ruler.

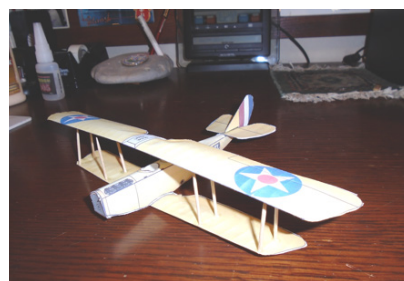


2. Set up your work area with materials and tools.
3. Read all the instructions on the plan. Fiddlers Green tells you where to glue, cut and fold/bend.

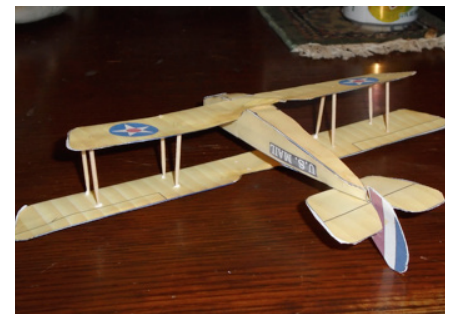


4. Cut out the parts, slowly and carefully.

6. Use round toothpicks for the airplanes struts. Make small holes in the wings where the struts go. Apply white glue or Tacky Glue to the struts and glue them in place on the bottom wing only. Wait 30 minutes before you flip the JN-4 over to attach the top wing on to the struts. This takes patience. Below, the top wing is just sitting on top to see what it will look like.



7. The top wing is glued to the struts, and the white dots are the Tacky Glue that will dry clear. When you get to this place, square everything you can and leave it alone to dry.



8. Landing gear, small struts on fuselage, the tail skid, and propeller are added several hours later after the glue has thoroughly dried.



# CURTISS JN-4 JENNY

Of the JN series the JN-4 was the first to be affectionately called Jenny, a phonetic blending of the JN.



The Curtiss "Jenny" America's most famous World War I airplane, was developed by combining the best features of the Curtiss "J" and "N" models. A 1915 version, the JN-3, was used in 1916 during Pershing's Punitive Expedition into Mexico. Its poor performance, however, made it unsuited for field operations.

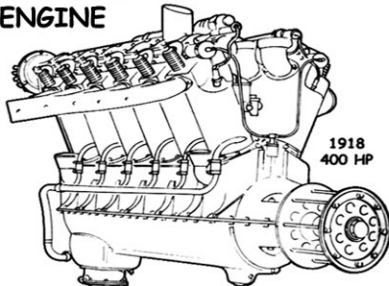
The JN-3 was modified in 1916 to improve performance and redesignated the JN-4. With the U.S. entry into World War I on April 6, 1917, the Signal Corps began ordering large quantities of JN-4s, and by the time production was terminated after the Armistice, more than 6,000 had been delivered, the majority of them JN-4D.

The Jenny was generally used for primary flight training, but some were equipped with machine guns and bomb racks for advanced training. After World War I, hundreds were sold on the civilian market. The airplane soon became the mainstay of the "Barnstormer" of the 1920s, and some Jennies were still being flown in the 1930s.

The Liberty 400-horsepower (298-kilowatt) V-12, air-cooled engine, on the other hand was one of the war's most powerful engines and one of the workhorses of the war.

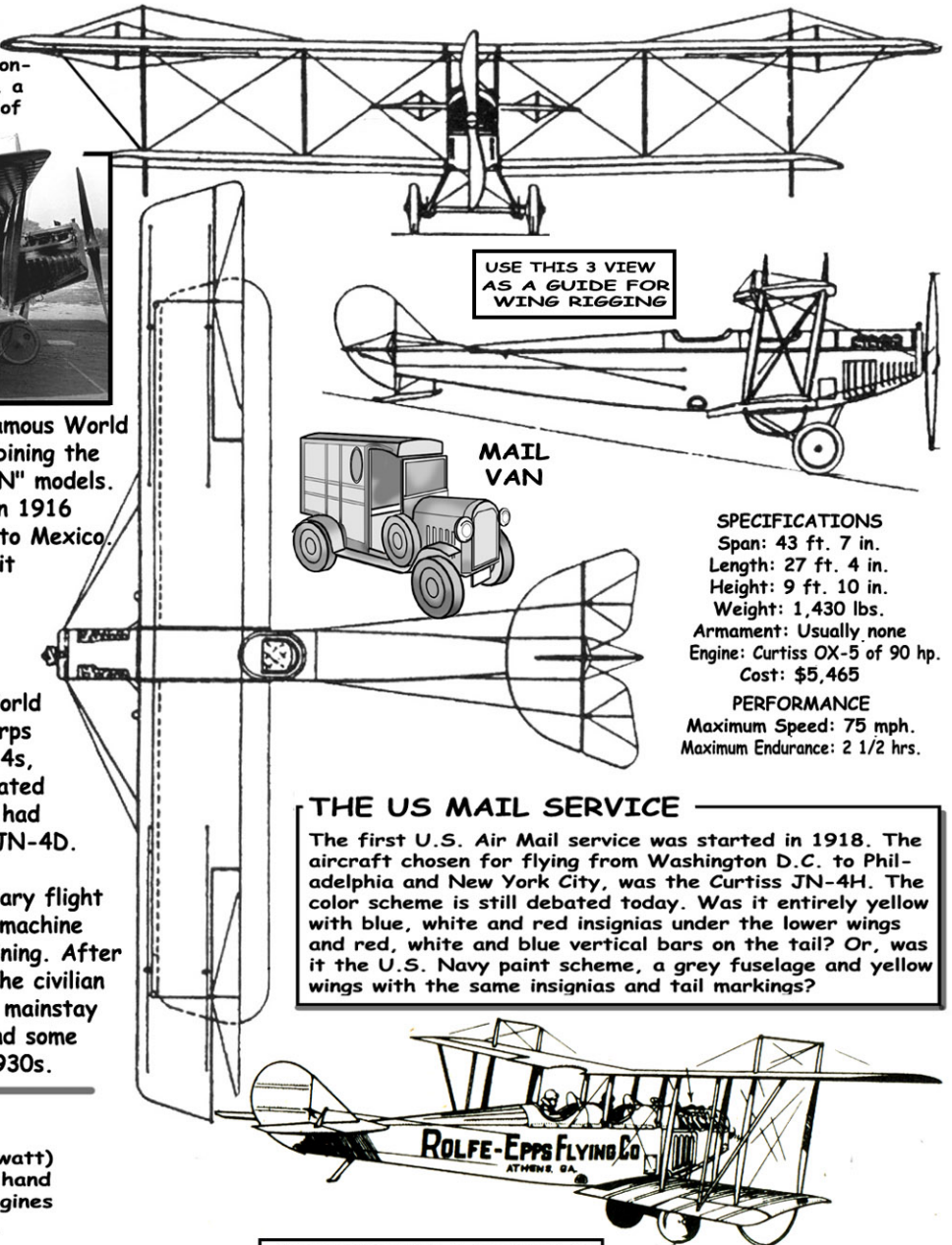
Designed to be mass-produced with interchangeable parts, the Liberty became the standard wartime aircraft engine, produced by Packard, Lincoln, Ford, General Motors (Cadillac and Buick), Nordyke, and Marmon. It was used most often on the DH-4, the only U.S.-made airplane to go into combat on the Western Front. More than 13,000 engines came off the assembly line before the Armistice, and more than 20,000 were built by the time wartime production ended early in 1919.

## THE LIBERTY ENGINE



1918  
400 HP

©fiddlersgreen.net/2004



USE THIS 3 VIEW  
AS A GUIDE FOR  
WING RIGGING

MAIL  
VAN

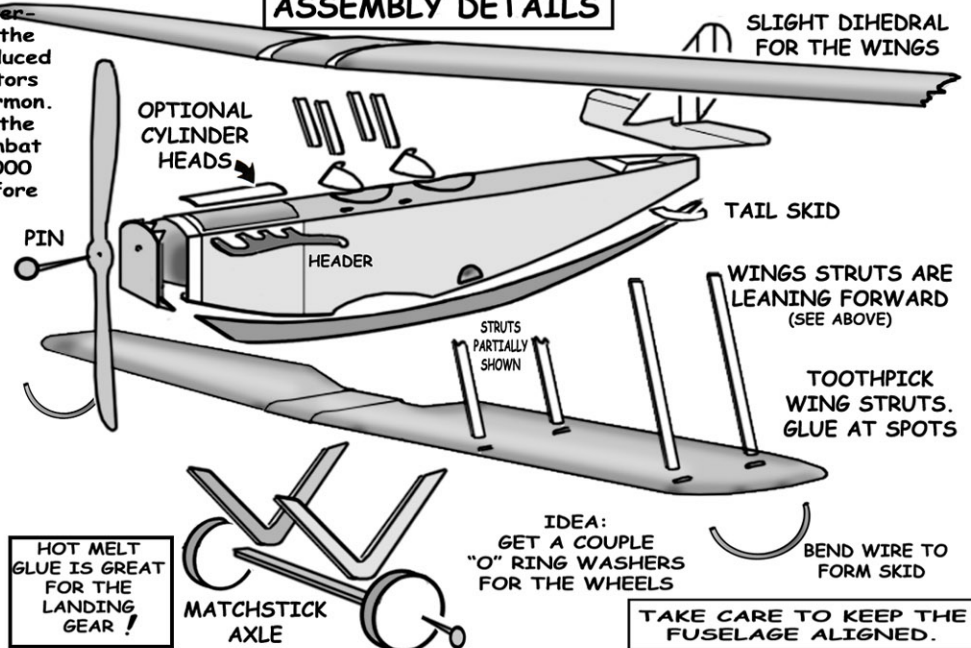
**SPECIFICATIONS**  
Span: 43 ft. 7 in.  
Length: 27 ft. 4 in.  
Height: 9 ft. 10 in.  
Weight: 1,430 lbs.  
Armament: Usually none  
Engine: Curtiss OX-5 of 90 hp.  
Cost: \$5,465

**PERFORMANCE**  
Maximum Speed: 75 mph.  
Maximum Endurance: 2 1/2 hrs.

## THE US MAIL SERVICE

The first U.S. Air Mail service was started in 1918. The aircraft chosen for flying from Washington D.C. to Philadelphia and New York City, was the Curtiss JN-4H. The color scheme is still debated today. Was it entirely yellow with blue, white and red insignias under the lower wings and red, white and blue vertical bars on the tail? Or, was it the U.S. Navy paint scheme, a grey fuselage and yellow wings with the same insignias and tail markings?

## ASSEMBLY DETAILS



SLIGHT DIHEDRAL  
FOR THE WINGS

WINGS STRUTS ARE  
LEANING FORWARD  
(SEE ABOVE)

TOOTHPICK  
WING STRUTS.  
GLUE AT SPOTS

IDEA:  
GET A COUPLE  
"O" RING WASHERS  
FOR THE WHEELS

BEND WIRE TO  
FORM SKID

TAKE CARE TO KEEP THE  
FUSELAGE ALIGNED.



THE FABLED CURTISS JN-4D "JENNY," AMERICA'S PRINCIPAL CIVILIAN AIRCRAFT OF THE EARLY 1920S, WAS MORE A PRODUCT OF SYSTEMATIC TRIAL AND ERROR THAN OF INSPIRED DESIGN.

**"If you can fly a Jenny, you can fly anything"**

THE FABLED CURTISS JN-4D "JENNY," AMERICA'S PRINCIPAL CIVILIAN AIRCRAFT OF THE EARLY 1920S, WAS MORE A PRODUCT OF SYSTEMATIC TRIAL AND ERROR THAN OF INSPIRED DESIGN.

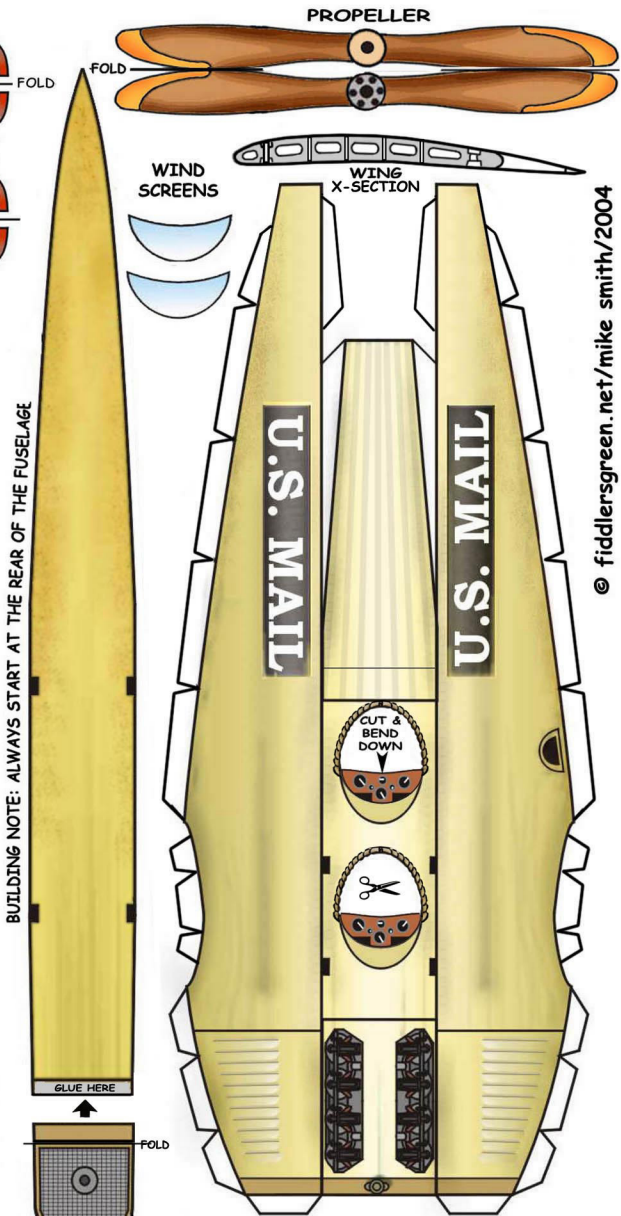
KEEPING ITS TEMPERAMENTAL OX-5 ENGINE ADEQUATELY COOL, FOR EXAMPLE, REQUIRE CUTTING AWAY MUCH OF ITS LEATHER-STRAPPED COWLING. ITS SHORT EXHAUST PIPES SPAT FUMES AND OIL IN THE PILOT'S FACE AND ON SOME OCCASIONS EVEN IGNITED THE EXPLOSIVE NITRATE DOPE ON THE PLANE'S FABRIC COVERING.

THE JENNY'S THIN WINGS WERE BRACED BY WOODEN STRUTS AND METICULOUSLY RIGGED WITH A MAZE OF TURNBUCKLED WIRES. AS IN MANY AIRCRAFT OF THE DAY, SEMICIRCULAR WING SKIDS WERE ADDED AFTER WOBBLY LANDINGS ON THE NARROW LANDING GEAR FREQUENTLY ENDED WITH ONE WING DUG INTO THE GROUND. FOR ALL ITS FLAWS, THE JENNY WAS AN IMPORTANT EVOLUTIONARY STEP IN AIRCRAFT DESIGN, EVEN THOUGH IT WAS SOMETIMES DESCRIBED AS "A BUNCH OF PARTS FLYING IN FORMATIONS."

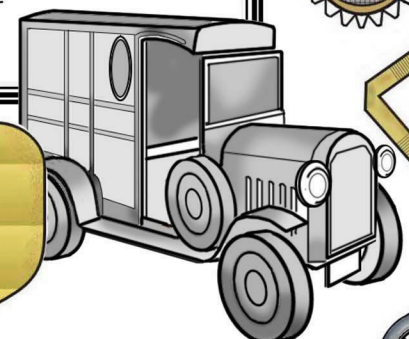
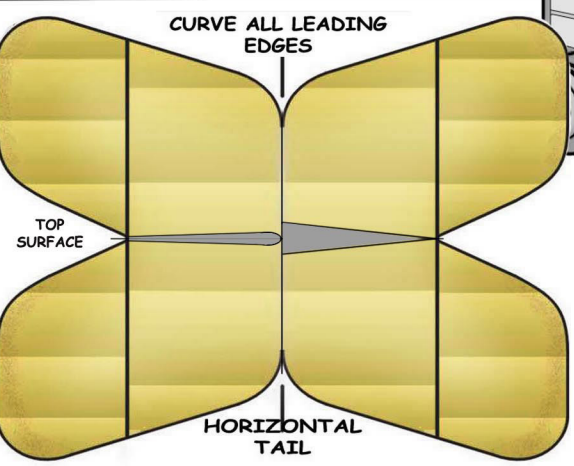
THE UNITED STATES GOVERNMENT WAS QUICK TO UTILIZE THE HIGH POWERED AIRPLANE DEVELOPED FOR WAR SERVICE IN SPEEDING UP MAIL SERVICE BETWEEN PRINCIPAL CITIES. THE FIRST AIR-MAIL ROUTE WAS OPENED BETWEEN NEW YORK, PHILADELPHIA AND WASHINGTON, D.C., MAY 15, 1918.



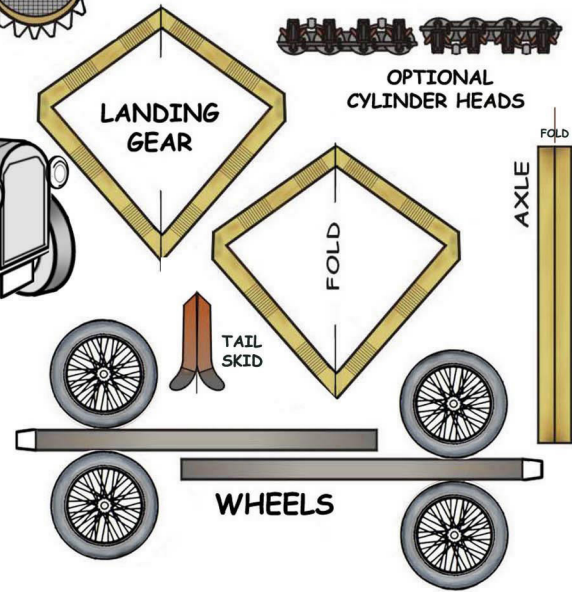
THE JENNY HAD HER SHORTCOMINGS BUT WOULD GIVE NOVICE PILOTS MORE THAN AN EVEN BREAK. SHE WAS DESIGNED TO TEACH PEOPLE TO FLY AND NOTHING MORE WAS EVER EXPECTED OF HER. HOWEVER CLEAR CUT THE JENNY'S WARTIME PURPOSE MAY HAVE BEEN, HER GREATEST FAME ACTUALLY CAME IN THE POST WAR YEARS OF THE 1920S. BY SHEER NUMBERS SHE INVADDED AND TOOK OVER THE INITIAL PHASES OF AMERICAN AVIATION AND BECAME THE FIRST READILY AVAILABLE AMERICAN PRIVATE AIRPLANE. INCLUDED WITH THIS MODEL IS A LITTLE MAIL TRUCK THAT'S ON EXHIBIT AT THE EVERGREEN AIR MUSEUM, McMINNVILLE, OREGON



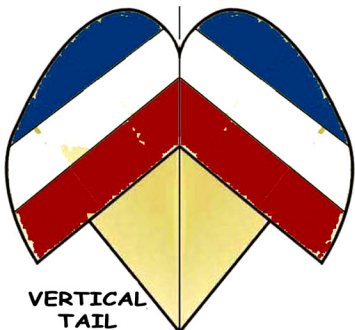
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**FORD MODEL T MAIL TRUCK**



SHEET TWO



VERTICAL TAIL

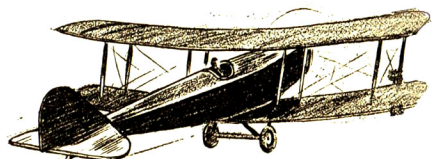


UPPER MID-WING SECTION



LOWER MID-SECTION

WINGS FOR THE U.S. MAIL



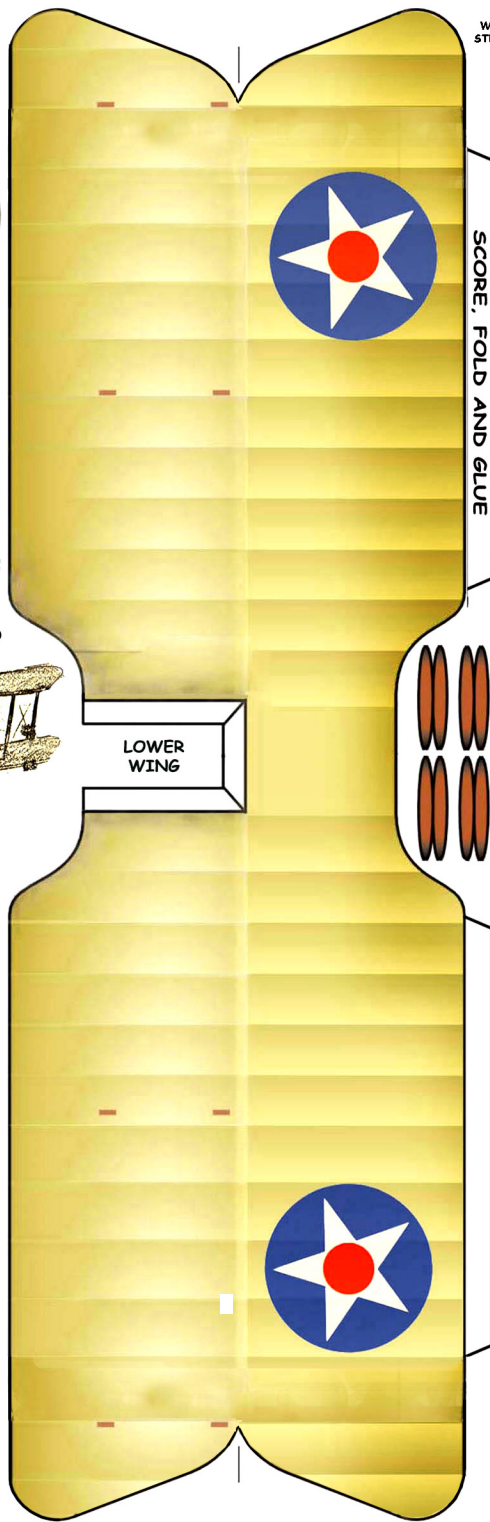
LOWER WING

UPPER WING

MAJOR R.H.FLEET PILOTED THE FIRST MAIL PLANE. HE COVERED THE DISTANCE FROM NEW YORK TO THE NATION'S CAPITAL IN 3 HOURS TWENTY MINUTES-ABOUT HALF THE TIME REQUIRED TO MAKE THE TRIP BY RAIL. LT GEO BOYLE MADE THE RETURN TRIP, LEAVING BOLLING FIELD BEFORE OFFICIALS, INCLUDING PRESIDENT WILSON. SIMILAR SERVICES WERE OPENED THE SAME YEAR FROM NY TO BOSTON ON JUNE 6, & FROM NEW YORK TO CLEVELAND AND CHICAGO, SEPTEMBER 5. THESE PIONEER AIR-MAIL LINES WERE THE FOUNDATIONS FOR A MAIL CARRIER SYSTEM THAT WAS TO BECOME A NETWORK OVER THE ENTIRE COUNTRY.

THE FOLLOWING YEAR THE COUNTRY'S FIRST REGULAR PASSENGER AIR SERVICE USING CURTISS SEAPLANES, WAS INAUGURATED BETWEEN NEW YORK AND ATLANTIC CITY, NEW JERSEY.

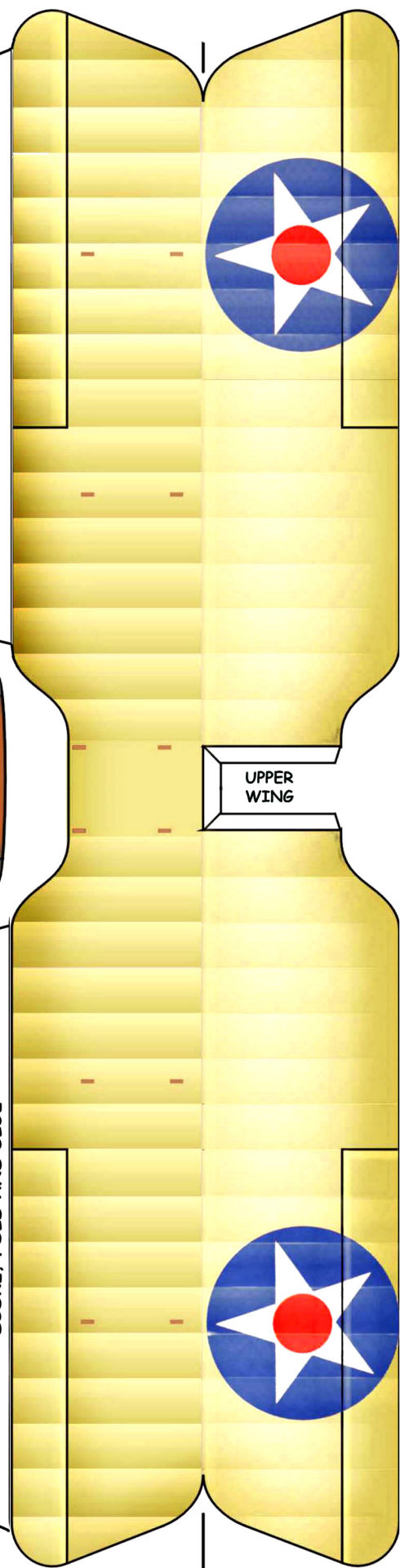
LATER, THE SAME YEAR, AN AIR LINE WAS ESTABLISHED BETWEEN NEW YORK MIAMI, FLORIDA AND HAVANA, CUBA.



WING STRUTS

SCORE, FOLD AND GLUE

SCORE, FOLD AND GLUE



# EXTENSION



Delta Airlines

## MAKING HISTORY IN 2017

As recently as February 2017, Delta Airlines pilots Dawn Cook and Stephanie Johnson (pictured) made history for that airline by being the first African American women to make up the cockpit crew. The first all African American female crew of any airline had been broken a few years earlier.

- Research other racial and gender barriers that still have not been broken.
- Brainstorm solutions to bringing down those barriers.

## REFERENCES

1. Bessie Coleman: Woman who “dared to dream” made aviation history. (2012, January 31). Air Force News Service. Retrieved from <http://www.af.mil/News/Article-Display/Article/111769/bessie-coleman-woman-who-dared-to-dream-made-aviation-history/>
2. 51 Heroes of Aviation. (2013, July 24). Flying Magazine. Retrieved from <https://www.flyingmag.com/photo-gallery/photos/51-heroes-aviation>
3. Rich, Doris (1993). Queen Bess: Daredevil aviator. Washington: Smithsonian Institution Press.
4. Rudd, Thelma. (n.d.). Bessie Coleman. Retrieved from <http://www.bessiecoleman.org/bio-bessie-coleman.php>
5. Toth, Maria Lynn. (2001, February 19). Daredevil of the sky: The Bessie Coleman story. Los Angeles Times.



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## NOTES