## Clyde "Upside-Down" Pangborn



**C**lyde Edward "Upside-Down" Pangborn made crowds gasp when he performed his daring aerial stunts during the Roaring Twenties. He was among the period's finest aerial showmen. As his nickname suggests, he was anything but a conventional pilot, and people loved him for it. But Pangborn was much more than an entertainer. In 1931, he and a fellow aviator set a world record when they became the first people to fly non-stop from Japan to the United States. Pangborn also served as a test pilot in his later years. During his career, Pangborn not only knew the thrill of entertaining crowds and establishing records, but also the painstaking process of thoroughly testing a plane and making it safe for other pilots to fly.

Pangborn was born on October 28, 1894, in Bridgeport, Washington. At age two, he and his family moved to Idaho. After graduating from high school, Pangborn took classes in civil engineering for about two years at the University of Idaho before enlisting in the army.

During World War I, Pangborn served as a flight instructor for the U.S. Army at Ellington Field in Houston. There he taught cadets how to fly the Curtiss JN-4 "Jenny" biplane. Although Pangborn had a relatively uneventful military career, he did acquire a rather unique talent. Pangborn learned to slow-roll his plane onto its back and fly upside down. His fellow pilots subsequently began calling him "Upside-Down Pang," a name that would stick with him for life, although most people would shorten the nickname to either "Upside-Down" or "Pang."

After the war, many military aviators, like Pangborn, wanted to use their new skills as pilots to earn a living. The U.S. military had a surplus of Jenny biplanes, and many of them bought Jennys and set out across the country performing aerial shows. "Barnstorming," as the phenomenon became known, was an extremely popular form of entertainment.

Pangborn became one of these professional barnstormers, thriving as an aerial stuntman and performing all sorts of tricks. One of the first stunts he attempted was an automobile-to-airplane transfer at Coronado Beach, California, in 1920. During the stunt, Pang was supposed to hop off the back of a speeding car onto a rope ladder that was hanging from a cruising airplane, and then climb up into the aircraft. Although Pang got hold of the ladder, he lost his grip and plunged to the ground.

Remarkably, he only sustained three dislocated vertebra and some muscle strains and bruises. This would be the only serious accident of his career.



View of Clyde Pangborn caught mid-air, falling, during his unsuccessful attempt to make an airplaneto-automobile transfer at Coronado Tent City, Coronado Beach, California, on May 16, 1920.

In 1921, Pangborn joined Ivan Gates and formed the Gates Flying Circus. Pang was part owner of the show and the chief pilot and operating manager. The troupe toured internationally and became famous. One of the key stunts Pangborn performed was to change planes while in flight. He held the world record for the feat. In 1924, he also made news when he rescued a stuntwoman in midair whose parachute had gotten tangled in his plane's landing gear. Pangborn flew countless miles during his barnstorming days without sustaining any serious injuries or inflicting any on his passengers.

Like most barnstormers, Pangborn's stunting days were limited because of a series of new federal safety laws. In the late 1920s and early 1930s, barnstormers found it increasingly difficult to meet the new standards and many aerial shows went out of business. The Gates Flying Circus dissolved in 1928. Although Pang would work with other shows, each of them would fold within a few years. In 1931, Pangborn's barnstorming career ended.



Clyde Pangbornïs plane Miss Veedol.

Pang began looking for a new challenge almost immediately and decided to attempt a new aroundthe-world speed record. He believed he could easily better the previous mark of 20 days, 4 hours, established by the German Graf Zeppelin in 1929. Pang chose Hugh Herndon, Jr., a friend and former barnstormer, as his navigator. Herndon, an easterner from a wealthy family, was only an average pilot, but more importantly, he had the money to sponsor the venture. With Herndon's capital, the two men purchased a Bellanca "Skyrocket" monoplane.

Pangborn next attempted to launch the New Standard Aircraft Corporation of Paterson, New Jersey, but the Depression also ended that effort. He then went to work for the Bergen County, New Jersey police department as a pilot. That lasted only a short time, however, and in 1930 he tried barnstorming again.



Having dropped their landing gear at sea to gain speed, Clyde Pangborn and Hugh Herndon, Jr., prepare to land at Wenatchee, Washington. They flew 4,558 miles non-stop in 41 hours.

Everything seemed to be proceeding according to plan, but then Wiley Post and Harold Gatty established a new around-the-world record in June, about a month before Pangborn and Herndon's scheduled take off. Discouraged at first, Pangborn and Herndon still believed they could better Post and Gatty's record of 8 days, 15 hours, and 51 minutes. On July 28, they took off from Roosevelt Field, Long Island, heading northeast.

For a while, Pangborn and Herndon looked as if they might catch up to Post and Gatty's record. When they left Moscow, they were only ten hours behind the previous record setters' time, but then Herndon made a serious mistake. While Pangborn was sleeping, Herndon got lost over Mongolia. Although Pangborn corrected the problem, another major mishap occurred. In Siberia, a driving rainstorm turned a dirt runway into a quagmire, and when the two men could not take off in enough time to better Post and Gatty's mark, they decided to abandon their attempt at the record.

As Pangborn and Herndon were waiting out the bad weather, they came up with another record setting option. At that time, a Japanese newspaper was offering a \$25,000 prize to whomever made the first non-stop flight between Japan and the United States (Post and Gatty had stopped off in Alaska during their flight). Focusing on their new plan, Pangborn and Herndon set out for Japan.

Once again, the former barnstormers ran into trouble. Because of a miscommunication between American and Japanese officials, Pangborn and Herndon did not have permission to fly over Japan. This caused serious problems, especially when coupled with the fact that Herndon had taken some photographs of the Japanese countryside, including, unintentionally, some military installations. When the two men landed, Japanese authorities arrested them on charges of espionage. Although the Japanese government detained them for several weeks, the U.S. Embassy successfully intervened on their behalf, and Pangborn and Herndon stood ready to attempt the record.

A few days before take off, Pangborn, who had grown concerned about the plane's limited fuel supply, developed a plan to reduce the aircraft's weight and thereby increase its range. He rigged a

device so that he could jettison the plane's landing gear shortly after lift off. He calculated that the aircraft would travel approximately 600 miles (966 kilometres) farther without the gear. While many feared that Pangborn would be unable to land safely without wheels, he felt confident that he could "belly land" the plane intact.

On the morning of October 4 (Japanese time), Pangborn and Herndon took off from Samishiro Beach, Japan, in route to Washington state. Like on some of their other flights, the two men ran into trouble quickly. Although Pang jettisoned the landing gear, two of the gear's struts remained behind. Pangborn, realizing that they could not land safely with the struts still attached, performed one of his old barnstorming feats to remedy the situation. Approximately 14,000 feet (7,267 meters) above the Pacific, Pangborn climbed out onto his plane's wing, and in freezing weather and 100-mile per hour (161-kilometer per hour) winds, loosened the remaining struts.

Despite their in-flight challenge, Pangborn and Herndon persevered and brought their plane in for a successful belly landing at Wenatchee, Washington, on October 5, after a journey of some 4,500 miles (7,242 kilometres). They had made their record setting trip in 41 hours, 13 minutes (although some sources cite 15 minutes).

After his trans-Pacific flight, Pangborn took on a variety of challenges but few could compare with his record setting journey. In 1932 Pangborn went to work for Clarence D. Chamberlin in New York City, but in less than a year he had left that venture and was selling Fairchild Aircraft Company airplanes in South America. In 1934, he and Roscoe Turner, a famous air racer and aviation advocate, flew a modified Boeing 247D--a revolutionary, twin-engine, all-metal monoplane than helped bring about the airline revolution of the 1930s--from London to Australia in the MacRobertson Race. They left on October 20, and landed only 92 hours, 55 minutes, and 38 seconds later in Melbourne after flying 11,325 miles (18,226 kilometres). Even so, they finished second in the race, following closely behind the record-setting De Havilland "Comet."

Beginning in 1935, Pangborn became a test pilot and worked for several aircraft companies. Among other ventures, he recruited American fliers for the Royal Air Force (RAF), helping them violate the Neutrality Laws by getting them into Canada where they could legally enlist to fight the Nazis alongside the British. Several members of the RAF's Eagle Squadron, the unit made up of Americans that fought in the Battle of Britain, were recruited by Pangborn. He also joined the RAF Ferry Command and was instrumental in helping organize the effort to ferry aircraft and air weapons across the Atlantic to Britain in 1940 and 1941. During the conflict, he delivered more than 170 airplanes to the Allies and also served with the U.S. military when it entered the war. After the war, Pangborn returned to his life as a test pilot. On March 29, 1958, Pangborn died. He received a burial in Arlington National Cemetery with military honours.

Pangborn amassed an impressive set of aviation credentials and accomplishments during his life. In addition to all of his barnstorming feats, and his trans-Pacific flight, Pangborn was licensed to fly a wide variety of planes, including most single- and multiengine aircraft, and even seaplanes. He also compiled more than 24,000 hours of flight time during his career and never lost a plane or injured a passenger.

Pangborn's career was similar to that of many other second-tier fliers of his generation. He was able to make a life flying but never on the scale of a Charles A. Lindbergh or an Eddie Rickenbacker. He was a capable airman, recognized as such both by the public and his fellow aviators. The record-setting flights he made between 1931 and 1934 were highlights of his career, but his service in 1940 and 1941 on behalf of the British opposing Nazi Germany may have been his greatest contribution.

# **Charles Howard Pixton**



In 1914 the winner of the Schneider Trophy was one **C. Howard Pixton**. An intrepid aviator; his career started in 1910 at Brooklands, the Mecca of experimental flying, where he became A.V.Roe's friend and right hand man.

He started the AVRO School of Flying and was AVRO'S first test pilot. In 1911 he joined Bristol's and in that year he earned more prize money for flying than anyone else in Britain and taught many of the early Army officers to fly.

While with Bristows he became the first serious pilot to demonstrate British planes overseas in Spain, Germany, Romania and Italy.

After his win he was commissioned as a Captain in the R.F.C. and joined the Air Investigation Dept., at Farnborough. In 1914 he joined Tommy Sopwith and won the Schneider Trophy at Monte Carlo



C. Howard Pixton centre, with Thomas Sopwith on right The person on the left is Victor Mahl Sopwith's chief mechanic

The 1914 win was Britain's first international victory with a British plane, which gives Howard Pixton the status of being the man who put Britain in the lead in aviation for the first time.

After the war he rejoined A.V.Roe and among other things he, for the first time, flew newspapers to the I.O.M. and flew the first fare paying passengers from the I.O.M. He retired to the I.O.M in 1932 and became a leading figure on the Manx aviation scene. During the 1939-45 war he rejoined the AID at Farnborough and was 60 when the war ended. He died in 1972 and is buried at Jurby Churchyard.

## The 1914 Schneider Trophy

The following report was first published in a newspaper in 1914, just after Howard Pixton had won the first Schneider Trophy.

On April Fool's Day 1914, an anxious team of British engineers, handlers and aviators tested the new float system on their entry for the second Schneider [Trophy] race. The little biplane was positioned at the end of a high water jetty on the Hamble river as the tide came in. The pilot, C. Howard Pixton climbed into the cockpit and started the engine. The tide was within six inches of the jetty. The team pushed the aircraft over the edge.



The Schneider Trophy

As Pixton started to taxi, the aircraft promptly cart wheeled proving that the main float had been fitted too far aft. Pixton was flung clear. The aircraft, a Sopwith Tabloid, sank, drifting upside-down out into midstream. The disconsolate team eventually got a rope on it, and the next morning dismantled the sodden, buckled machine, now stranded by the tide, balancing on its nose with its tail in the air. Redesigning and rebuilding would have to be fast.

A fortnight later the Sopwith Tabloid was unpacked and reassembled in the team tent at Monaco. It was the smallest and lowest-powered aircraft in the race, and the French, feeling secure in their dominance of world aviation by this time, ridiculed the British team as they laboured over the still rusty engine, refusing to believe the rumours that the little biplane had already achieved 92 miles an hour in tests.



Sopwith Tabloid Seaplane, Schneider Trophy, 1914

Early on Sunday 19 April, the French began to look more thoughtful after watching the Tabloid's test flight. The aircraft had clumsy makeshift floats and a peculiar 'sit' on the water. However, its take-off was smooth and swift compared with the sluggish performance of the French mono-planes. Monday 20 April, was race day.

Under the rules, each competitor had to make two alightings and take-offs during the first lap though these could be in the nature of a land plane's circuits and bumps, without stopping. The two French Nieuports were first away, followed by an FBA flying boat flying for Switzerland. The FBA excited the crowd with a long, porpoising take-off, beginning with a series of hops and finally bounding and ricocheting into the air.



Sopwith Tabloid Seaplane, Schneider Trophy, 1914 Pilot C. Howard Pixton is on the port float

Pixton took off in the Tabloid a quarter of an hour after the two Nieuports. Opening the throttle, he was accelerating rapidly as he crossed the starting line, and his floats actually left the water only 50 or 60ft beyond it. There was a moment when the machine faltered, the floats bounced once on the water, and then the little biplane was climbing strongly away, heading into wind down the long leg of the course towards Cape Martin.

At the sharp turn Pixton banked steeply. Then, with very little reduction in speed, he came down low and his floats kissed the water twice. It was a beautiful piece of flying, and the Tabloid seemed to be slowed by the contact hardly at all.



Sopwith Tabloid Seaplane, Schneider Trophy, 1914

The Sopwith biplane was obviously faster and more manoeuvrable then the monoplanes. At the announcement of its first lap time, the crowd whistled in amazement. Pixton had taken 4 minutes 27 seconds, half the best French time.

## Six agonising laps

By the halfway stage both French Nieuports were having engine trouble from the strain of chasing the Tabloid as the rear banks of their twin-row Gnome engines heated up. Both ended up with seized pistons, leaving the race to Pixton's Tabloid and the Swiss FBA.



Sopwith Tabloid Seaplane, Schneider Trophy, 1914

Some participants, disheartened by the Tabloid's apparent supremacy, had refused to start the race. They began to think again when, on his 15th lap out of the required 28, Pixton began to suffer misfires in one of the nine cylinders of his 100hp Gnome Monosoupape' rotary engine. Pixton's lap times now began to rise a few seconds at a turn.

For six agonising laps the drama went on. One by one Pixton ripped out the drawing pins which were his crude lap counter. Then the Gnome settled down on its eight good cylinders and the lap times improved again. Throughout the final lap Pixton and the Sopwith Tabloid were applauded. With an average speed of 86.78 miles an hour they had beaten Prevost's true average of the previous year by 25 miles an hour.

# Wiley Post

First to Fly Solo Around the World, Lost over Alaska



When Wiley Post and Will Rogers crashed at Point Barrow, Alaska on August 15, 1935, the world mourned the loss of the great flier and the beloved humorist.

Post twice set the record for flying around the world:

- June, 1931 8 days, 16 hours with navigator Harold Gatty
- July, 1933 7 days, 19 hours solo

Also a scientific innovator, Post developed a pressure suit that permitted him to fly the *Winnie Mae* into the stratosphere.

He was a natural flier. No less an authority than Eddie Rickenbacker declared that Post was "a man born with as sensitive a touch as any aviator could develop."

### Youth

Wiley Post was born in Texas on November 22, 1898. Never much of a student, Wiley was interested in mechanical things. His family moved around a bit; when Wiley was 11, they settled in Garvin County, Oklahoma. He saw his first airplane at an air show in nearby Lawton County (coincidentally, the WW2 ace Robert S. Johnson, grew up in Lawton Co.). Post's first job was with the US Army. He switched to work in the oil fields in 1919, but whether times were tough, or Post was just wild, he stole a car in 1921. He was convicted and sentenced to ten years, but was paroled after one year. He lost his left eye in an oil field accident in the mid-1920's, and used the \$1800 settlement to buy his first airplane. In 1925, he first met his fellow Oklahoman, Will Rogers; Rogers needed to get to a rodeo, and Post was pleased to fly the famous humorist there. He became the personal pilot of F.C. Hall, a wealthy Oklahoma oilman, and had use of Hall's personal plane, an open cockpit Travel-Air biplane.

### Winnie Mae



Wiley Post with the Vega

Later Hall bought a Lockheed Vega, largely for Post's use, nicknamed *Winnie Mae* for the oilman's daughter. The Depression intervened, and Hall was sold the plane back to Lockheed. In 1930 Hall bought a later version of the Lockheed Vega, a model 5-C, again nicknamed *Winnie Mae*. This later aircraft is the one most often seen in photographs of Wiley Post.

(When I was a child, my Dad, a lifelong aviation buff, had a model of the Winnie Mae in the house. It's weird aerodymanic 'pants' over the wheels fascinated me, as did its blue-on-white color scheme, its large NR-105-W registration number on the wings, and the list of faraway cities on its world itinerary.) In 1930, the Lockheed Vega was the hottest airplane of its type. Specifications and performance data for the "Wasp" powered Lockheed Vega 5-C:

length 27'8", wing span 41', height 8'6", wing area 275 sq. ft, empty weight 2361 lbs., useful load 1672, payload 1012, gross wt. 4033 lbs., max. speed 170 MPH, cruise 140 MPH, landing 54 MPH, ceiling 20,000 ft., gas capacity 96 gal., oil 10 gal., range 725 miles. price at the factory, July 1928 - \$18,500.

The Lockheed Vega was one of the most famous record-breaking airplanes of the early 1930s. The beautifully streamlined, high-wing, single-engine monoplane was designed by John Northrop and Gerrard Vultee, two aviation pioneers who later established their own aircraft companies. Although the Vega first flew in July, 1927, it was during the early 1930s that the plane established its reputation for rugged reliability and airworthiness. It was designed as a small transport aircraft, carrying six passengers and a crew of two. Lockheed built about 130 of them between 1927 and 1934.

In addition to Wiley Post, two female aviators, Amelia Earhart and Ruth Nichols flew the planes.

Post first achieved national prominence in 1930, when he won the National Air Race Derby, from Los Angeles to Chicago. The side of the *Winnie Mae*'s fuselage was inscribed: "Los Angeles to Chicago 9 hrs. 9 min. 4 sec. Aug. 27, 1930." The *Winnie May* is on display at the Smithsonian National Air & Space Museum (NASM).

# Around the World in Eight Days

In 1931, he flew around the world in the *Winnie Mae* with his navigator, Harold Gatty. (Gatty was a renowned aviator in his own right. An Australian naval cadet, he had accompanied Roscoe Turner on a trans-continental flight in 1929. In 1930, he flew with Harold Bromley on an unsuccessful Trans-Pacific attempt. He devised the ground-speed and drift indicator which formed the basis of the automatic pilot. During the War, he served on McArthur's staff as Director of Air Transport and wrote the Raft Book-a survival manual for downed Allied aircrews. He founded Fiji Airways, now Air Pacific, in 1951.)

On June 23, 1931, Post and Gatty left Roosevelt Field, New York. They made fourteen stops: first at Harbour Grace, Newfoundland; then Chester, England; Hanover and Berlin, Germany; Moscow, Omsk, Novosibirsk, Irkutsk, Blagoveshchensk and Khabarovsk, all in the Soviet Union; Nome, Alaska; and Edmonton, Canada. They then flew to Cleveland, and back to New York on July 1, having travelled 15,474 miles.

Here's their partial itinerary, copied from the program of the July 7 Hotel Astor Banquet.

### LOG OF THE "WINNIE MAE"

(New York Daylight Savings Time)

TUESDAY, JUNE 23 4:56 A.M. - Took off from Roosevelt Field, N.Y. 11:48 A.M. - Landed at Harbour Grace, N.F. 3:28 P.M. - Took off from Harbour Grace

### WEDNESDAY, JUNE 24

7:45 A.M. - Landed at Sealand Airdrome, near Chester, England

9:05 A.M. - Took off from Sealand Airdrome

12:45 P.M. - Landed at Hanover, Germany

1:50 P.M. - Took off from Hanover (Returned

immediately for fuel.)

2:15 P.M. - Again took off from Hanover

3:30 P.M. - Landed at Tempelhof Airdrome, Berlin

### THURSDAY, JUNE 25

2:38 A.M. - Took off from Berlin

11:30 A.M. - Landed at October Airport, Moscow

11:00 P.M. - Took off from Moscow

#### FRIDAY, JUNE 26

7:05 A.M. - Passed over Omsk, Siberia

9:32 A.M. - Landed at Novo-Sibirsk

6:45 P.M. - Took off from Novo-Sibirsk

## SATURDAY, JUNE 27

A.M. - Landed at Irkutsk, Siberia

#### **JUNE 28 - JULY 1**

- Blagovyeschensk, Siberia

- Khabarovsk, Siberia

- Solomon, near Nome, Alaska

- Fairbanks, Alaska
- Edmonton, Canada
- Cleveland, Ohio
- Landed at Roosevelt Field, N.Y.

The flight proceeded smoothly, across the Atlantic and Europe. But two inches of water covered the airfield at Blagovyeschensk (Siberia) and the *Winnie Mae* bogged down in the mud. After wasting fourteen hours grappling with the plane, Post and Gatty were finally rescued by a detachment of American soldiers with a tractor. Dirty, but not damaged, the *Winnie Mae* once again soared through the sky. In Khabarovsk, USSR, the plane was grounded for several hours while mechanics inspected the engine. Luckily, the *Winnie Mae* was in perfect running order, and the around-the-world flight continued. After a 17-hour leg, they landed in Alaska.



Natives of Flat, Alaska, helping right Wiley Post's plane, the Winnie Mae, after Post had nosed over in a cross wind July 20 after being in the air 22 hours and 32 minutes on his flight from Khabarovsk, Siberia. The only damage was a broken propeller, and a new one was brought to Flat by Joe Crosson, pioneer Alaska flier. The new propeller installed, Post continued his flight to Fairbanks.

Their most serious setback occurred on June 30, in Solomon, Alaska, where they bent the *Winnie Mae*'s propeller. In his book, *Around the World in Eight Days*, Post described the takeoff from Solomon:

With 100 gallons of fuel aboard, we started to take off. Taxiing back along the beach, the ship started to sink into the sand. With a quick thrust I banged the throttle open to pull her through it before we were stuck. But all I succeeded in doing was to boost the tail up into the air. With a loud slap the propeller cut a hole in the sand and bent both tips on the blades. I cut the emergency switch just in time to keep 'Winnie Mae' from making an exhibition of herself by standing on her nose. That would have been fatal to our hopes.

I jumped out and surveyed the damage. With a wrench, a broken-handled hammer, and a round stone, I drew out the tips of the blades so they would at least fan the air in the right direction.

But misfortunes never come singly. Harold was swinging the prop for a prime with the switch cut to restart the hot engine. He called 'all clear' to me, and I switched on and whirled the booster. One of the hot charges of gasoline caught on the upstroke of the piston, and with a back fire the Wasp kicked. The propeller flew out of Harold's hands, and the blade opposite smacked his shoulder before he could jump clear of the track. He dropped like a log. It was fortunate, to say the least, that it was

the flat side of the blade which hit him, though it gave him a bad bruise and a wrenched back. If the prop had been going the other way, he might have been sliced in two.

Like a major, Harold climbed in as soon as he had recovered his senses, and we took off for Fairbanks. I was cautious as I had ever been on that run along the shifting sands of Solomon beach. Luck was with me, and we got away without misfortune No. 3. I hope we didn't leave it behind for the next bird who lands there!

The damaged prop was replaced in Fairbanks with a spare obtained from Alaska Airways. They climbed over the 10,000 foot Rockies, to Edmonton, where they landed at Blatchford Field, another water-logged strip. While they had touched down there, they couldn't possibly take off from it. The locals helped them haul the plane over to Portage (now Kingsway) Avenue, which served well enough for the *Winnie Mae* to get airborne.

They landed at New York's Roosevelt Field on July 1. They were welcomed across the country, including lunch at the White House on July 6. The next day, a ticker tape parade in New York City and a banquet given by the Aeronautical Chamber of Commerce of America at the Hotel Astor. Speakers included Post, Gatty, Mayor Jimmy Walker, and Assistant Secretary of Commerce Clarence Young.

After the flight, he acquired the *Winnie Mae* himself. Sources differ as to whether he had a falling-out with F.C. Hall, and bought the plane, or "Hall's admiration for his pilot manifested itself in the gift of the *Winnie Mae*." - as noted on the NASM web site.

Post and Gatty published a ghost-written account of their journey, titling it *Around the World in Eight Days*, a play on the title of Jules Verne's *Around the World in Eighty Days*. Will Rogers contributed an introduction.

### Solo

He spent the next year improving his airplane, installing an auto-pilot made by the Sperry Gyroscope Company and a radio direction-finder which homed in on target radio stations.

In 1933, he repeated his round-the-world flight, but this time did it solo, with the aid of the auto-pilot and radio compass. He took off from New York's Floyd Bennett Field on July 15, bound, non-stop, for Berlin. Despite bad weather over the Atlantic, he made it in 26 hours, setting a record for a New Yorkto-Berlin flight. After a couple false starts, he departed Germany, only to be forced down in Moscow by trouble with his auto-pilot. While more repairs were needed in Novosibirsk and Irkutsk, he reached Khabarovsk ten hours ahead of his previous record.

En route to Alaska, his radio direction-finder malfunctioned, and he got lost. Worried about the 20,000 foot mountains in his way, he touched down at a 700-foot landing strip in a small mining town. He smashed his prop and right landing gear in the process. After repairs, he continued on to Edmonton (July 22), and then flew over 2000 miles non-stop to New York. 50,000 people people greeted him when he landed back at Floyd Bennett Field at 11:50 PM, July 22, 1933. Only making eleven stops, despite some major mishaps, he had knocked 21 hours off his previous record, completing the solo flight in seven days, nineteen hours.

### Into the Stratosphere



Wiley Post's pressure suit allowed him to cruise for long distances at high altitude in the jet stream, and was a precursor to modern pressure and space suits

Always fascinated by the scientific challenges of flight, in 1934 he focused on high-altitude, long distance flight, - funded by Frank Phillips of the Phillips Petroleum Company.

Since the *Winnie Mae*'s cabin could not be pressurized, he developed, with B.F. Goodrich Company, an early pressure suit. The suit was constructed of double-ply rubberised parachute cloth glued to a frame with pigskin gloves, rubber boots and an aluminium & plastic diver's helmet. It had arm and leg joints that permitted easy operation of the flight controls and also enabled walking to and from the aircraft. The helmet had a removable faceplate that Post could seal when he reached a height of 17,000 feet, a liquid oxygen source breathing system, and could accommodate earphones and a throat microphone. The liquid oxygen was contained in double-walled vacuum bottles, and as the super-cold gas boiled off, it could be used for breathing and suit pressurization. In his first flight using the pressure suit, Sept. 5, 1934, above Chicago, he reached 40,000 feet. In the super-charger equipped *Winnie May*, Post set unofficial altitude records (as high as 50,000 ft), discovering the jet stream in the process.

In March 1935, Post flew from Burbank CA to Cleveland OH in the stratosphere using the jet stream. He took his famous five year-old single-engine Lockheed Vega 2,035 miles in 7 hours and 19 minutes with an average ground speed of 279 mph in a 179 MPH aircraft. At times, his ground speed exceeded 340 MPH. He attempted four transcontinental stratospheric flights, all ending in mechanical failure, before retiring his beloved aircraft. Post's pioneering accomplishments were the first major practical advance in pressurized flight.

## **His Last Flight**



This is the Lockheed-Orion Model 9E Special, NC122823, formerly owned by TWA, that was modified by Wiley Post for his trip to Alaska. Among other modifications, Post replaced the engine with a 550 horsepower type, installed a three-bladed variable pitch propeller, swapped out the wing with one that was six feet longer from a Lockheed-Explorer Model 7 Special, NR101W, that had fixed landing gear, and then replaced the landing gear with floats In 1935, Post became interested in surveying a mail-and-passenger air route from the West Coast to Russia. Funded by the airlines, he began to assemble a hybrid plane built from two wrecks. The low-wing monoplane consisted of a Lockheed Orion fuselage and long wings from a Lockheed Explorer. He installed a 550 HP Wasp engine, and oversize 260 gallon gas tanks. He planned to add pontoons, to land in Alaska's and Siberia's many lakes.

His friend Will Rogers visited him frequently at the Lockheed airport in Burbank where the strange beast took shape. Rogers called the red-and-silver plane *Aurora Borealis*, but others called it "Wiley's Orphan" or "Wiley's Bastard." Post insisted that it didn't have or need a name, just a number. When the pontoons he had ordered did not arrive, he had a set installed that were designed for a much larger plane. Altogether it was a dangerously heavy aircraft, which they loaded down further with hunting and fishing equipment.



Wiley Post and Will Rogers during their fateful trip to Alaska. Post never wore a hat

After a test flight in late July, 1935, Post and Rogers left Seattle in the unique plane in early August. Rogers commented on the huge pontoons, but Post dismissed his concerns. Their itinerary: Seattle -Juneau - Dawson, Yukon - Aklavik, NWT - Fairbanks - Matanuska Valley - Point Barrow. While Post piloted the plane, Rogers banged out his newspaper columns on his typewriter.



The last photo taken on August 15, 1935

On the way to Point Barrow, they became lost in bad weather; they landed in a lagoon a few miles from Point Barrow to ask directions. The engine quit when they tried to take off again, and the nose-heavy plane plunged into the lagoon, tearing off the right wing, and killing both men instantly.

An Inuit named Clare Okpeah saw the plane wreck and ran the fifteen miles to Barrow to report it. When he described the two men to Army Sergeant Stanley Morgan, Morgan knew that it must be the two famous travellers. He radioed the War Department, and led a recovery party to the site. The remains of both men began the final journey back to Oklahoma.



The wreckage of Will Rogers' and Wiley Post's Lockheed Orion-Explorer, after it crashed at Point Barrow, Alaska in fog due to engine failure. Both men were killed instantly

Shortly after Post's death his widow sold the famed Winnie Mae to the Smithsonian.

The Will Rogers and Wiley Post Monument, across from the state-owned Wiley Post-Will Rogers Memorial Airport, was dedicated in 1982 to commemorate the 1935 plane crash that killed the humorist and the famous pilot. Two monuments now on the National Register of Historic Places are located at the crash site. Both Will Rogers and Wiley Post are also commemorated in a tower above the Broadmoor hotel complex in Colorado Springs. Well worth a visit.



last farewell

Will Rogers



Will Rogers

Cowboy Humorist Radio Commentator Newspaper Columnist & Author Movie Star Philanthropist

In the 1920's and 30's, Will Rogers, an Oklahoman and part Cherokee Indian, was an American icon. That era was so different from now, that it's difficult to describe his popularity. We have our celebrities today, but are any of them "beloved"? Will Rogers was.

A few of his most famous quotes:

- "I only know what I read in the papers."
- "I never met a man I didn't like."
- "Everybody is ignorant, only on different subjects."

Check out the Will Rogers web site.

## Maurice Prévost



Wealthy French silk merchant Armand Deperdussin founded his aircraft-building company **Societe Pour** les **Appareils Deperdussin** (SPAD) at Betheny near Reims, in 1910. He was fortunate in employing Louis Bechereau who designed a series of monoplanes of increasing capability, developed from an idea by Swedish engineer Ruchonnet and perfecting a monocoque form of fuselage construction that combined a desirable circular cross-section with light weight and strength.



Deperdussin Monocoque Racer - Pilot, Maurice Prévost, October 4, 1913

Typically, the Deperdussins were braced high-wing monoplanes, two king-posts on the forward fuselage carrying a skein of wires to brace the slender wings Lateral control was by wing warping. Landing gear was normally of fixed tailskid type, but seaplane versions had, for their day, a very neat float installation. Power came from two Gnôme rotary engines mounted on a common crankshaft. Bechereau's monoplane was the first to break the 200 kph (124 mph) 'barrier' and was the 'speed phenomenon' of the years before the First World War.



Deperdussin Monocoque Seaplane Racer - Pilot : Maurice Prévost, Monaco, April, 1913

A first major success came on September 9, 1912, when, powered by a 119-kW (160hp) Gnôme and piloted by Jules Vedrines the Deperdussin won the fourth James Gordon Bennett Aviation Cup race at Chicago, Illinois with a speed of 108.1 mph (174.01 kph). Piloted by **Maurice Prévost** the plane won the cup again on September 29, 1913 (October 4? Ed.) in Reims achieving an average of 124.6 mph (200.5 kph). During the race Prévost beat the world speed record three times, with a maximum speed of 126.7 mph (203.85 kph).



Deperdussin Monocoque Seaplane Racer - Pilot : Maurice Prévost, Monaco, April, 1913

A few months earlier, on April 16 (1913), **Prévost** had won another exceptional victory achieving first place in the first race for the Schneider Trophy in Monaco. Flying a float-equipped Deperdussin, (160 h.p. Gnôme), Prévost achieved a speed of 126 mph with an average speed of 45.75 mph (73.63 kph). The low average speed was due to the fact that the judges made **Prévost** repeat his take-off and about six miles (IOkm) of the course because of a supposed violation of the rules. This Deperdussin victory was the only time in the history of the Schneider Trophy (1912-31) that France won a race.

To complete the year's achievements, a Deperdussin piloted by Eugene Gilbert won the Henry Deutsch de la Meurthe air race around Paris on 27 October. Bechereau and Herbemont had created for Deperdussin the world's fastest prewar aeroplane but from this pinnacle of achievement came collapse of the Deperdussin company when it went into liquidation in 1913 after Deperdussin had been arrested for embezzlement. It was taken over by Louis Blériot and renamed **Societe Pour** L'**Aviation** et ses **Derives** (also SPAD), which gained fame for its products during World War I

# Harriet Quimby

"In my opinion there is no reason why the aeroplane should not open up a fruitful occupation for women." – Harriet Quimby, 1912



Harriet Quimby became the first licensed woman aviator in the United States on August 11, 1911.

Harriet Quimby, a journalist by training, was the first major female pilot in the United States, and one of the world's best women aviators. In 1911, she became the first licensed female pilot in the United States, and less than a year later, became the first woman to fly across the English Channel. Although Quimby lived only to age 37, she had a major impact on women's roles in aviation; she was a true pioneer and helped break down stereotypes about women's abilities during the first decade of flight. Quimby was also very beautiful and stylish. At a time when other pilots, most of whom were male, flew in very undistinguished gear, she designed her own trademark flight suit, a purple satin outfit with a hood, which she wore whenever she flew.

Quimby was born to a family of farmers on May 11, 1875, near Coldwater, Michigan. Because none of her early records still exist, scholars have been unable to piece together much about her early life. Her story consequently picks up when her family moved to San Francisco in the early 1900s. At that time, Quimby was an aspiring actress, but despite her beauty and apparent theatrical flair, she chose to become a journalist and drama critic and began writing for the San Francisco Bulletin.



In 1903, Quimby moved to New York City and quickly acquired a job as a regular contributor and photographer for the well-known periodical Leslie's Illustrated Weekly. During her career with Leslie's-which would span nine years--Quimby contributed more than 250 articles. She wrote about housekeeping and also published several drama reviews. But Quimby wanted more exhilarating assignments and she got her wish. In 1906, she told readers what it was like to zip along in an open-air automobile at speeds in excess of 100 miles per hour (161 kilometres per hour). The article revealed her strong interest in machines and speed, some of the qualities that would attract her to aviation.

Quimby became interested in aviation in late October 1910, when she attended the Belmont Park International Aviation Tournament on Long Island. There she met John Moisant, a well-known American aviator, and his sister Matilde. John and his brother Alfred operated a flight school on Long Island. Quimby, who had become enamoured with flight while watching the meet, suddenly wanted to learn to fly and asked Alfred to instruct her and Matilde. Alfred agreed and both women started taking flight lessons at his school.

Quimby had originally intended to keep her flight lessons a secret, but eventually the press discovered that women were learning to fly and she and Matilde became a big story (although it is uncertain whether the press "discovered" the story or whether Harriet led them to it). Whatever the case, Harriet took matters into her own hands and capitalized on the situation by beginning a series of articles for Leslie's about her aviation experiences. On August 1, 1911, Quimby took her pilot's test and became the first U.S. woman to earn a pilot's license. Matilde soon followed Quimby and became the nation's second licensed female pilot.

After obtaining her license, Quimby quickly became the first woman to make a number of memorable flights. In September 1911, she flew over a crowd of approximately 15,000 spectators on Staten Island, New York, during a moonlit night, and became the first woman to make a night time flight. Then, in November, she and Matilde joined the Moisant International Aviators Exhibition Team and toured Mexico. There, Harriet and Matilde became the first women to fly over Mexico.

Quimby sailed for England in March 1912, to pursue her main aviation goal--to become the first woman to fly across the English Channel. Although Louis Bleriot had flown the Channel in July 1909, no woman had ever accomplished the feat. Bleriot, intrigued by Quimby's goal, shipped her one of his Bleriot monoplanes--a 50-horsepower (37-kilowatt), single-seat aircraft--for her flight. Except for Bleriot and a few others, no one knew of Quimby's plan. She wanted to keep it secret because she feared that another woman might try to make the flight before she did. She also feared that people might try to stop her because of the dangers involved, especially the Channel's unpredictable weather.

Gustav Hamel, one of Quimby's friends, was one of the people who tried to stop her. With the best of intentions, Hamel offered to disguise himself in Quimby's purple suit and make the flight for her. He suggested that he could land in a remote spot in France and quickly trade places with her so that she could take credit for the journey, but Quimby refused the offer.

On April 16, 1912, Quimby took off from Dover, England, en route to Calais, France. Flying at altitudes between 1,000 and 2,000 feet (305 and 610 meters), Quimby fought her way through the fog-choked sky and made the flight in 59 minutes, having drifted somewhat off target and landing about 25 miles (40 kilometres) from Calais on a beach in Hardelot, France. She had become the first woman to fly the English Channel. Very few people learned of her accomplishment, though, because of the poor press coverage it received. The Titanic had sunk only two days before and was still the major news of the day. Quimby's story got relegated to the last page, if it was covered at all.

After crossing the Channel, Quimby returned to New York and resumed exhibition flying. But her career ended prematurely in tragedy. On July 1, 1912, flying in the Third Annual Boston Aviation Meet at Squantum, Massachusetts, with William Willard, the event's organizer aboard, her brand-new 70-horsepower (52-kilowatt), two-seat, Bleriot monoplane unexpectedly pitched forward, ejecting both Willard and Quimby. The two plunged to their deaths in the shallow waters of Dorchester Bay in front of some 5,000 horrified spectators. The plane, on the other hand, glided down and lodged itself in the mud.

There has been considerable debate about the cause of the accident. As aviation writers Patricia Browne and Giacinta Bradley Koontz noted, there are several theories about the tragedy. Both the Boston Globe and the well-known aviator Glenn Martin claimed within days of the accident that the tragedy would not have happened if Quimby and Willard had been wearing seat belts. Earle Ovington, one of the meet's officials, argued that some of the plane's cables had gotten tangled in the steering mechanisms, causing Quimby to lose control. Another theory suggests that Willard, a very large man, may have caused the accident by leaning forward to ask Quimby a question, and in the process, threw off the plane's delicate balance. Whatever the cause, the result was still the same. Quimby, one of aviation's early pioneers, had lost her life only 11 months after she had learned to fly.



Harriet Quimby died in a crash in Boston Harbour on July 1, 1912.

Although Quimby was not a suffragette, she did champion many women's issues. During her journalism career, she wrote articles about child welfare and political corruption and vice in New York City. She also pressed for an expanded role for women aviators. As she noted in an exclusive article for Good Housekeeping, which was published posthumously, "There is no reason why the aeroplane [the spelling of the day] should not open up a fruitful occupation for women. I see no reason why they cannot realize handsome incomes by carrying passengers between adjacent towns, why they cannot derive incomes from parcel delivery, from taking photographs from above, or from conducting schools for flying. Any of these things it is now possible to do."

One woman whom Quimby inspired was Amelia Earhart. As Earhart would say about her personal hero: "To cross the Channel in 1912 required more bravery and skill than to cross the Atlantic today...we must remember that, in thinking of America's first great woman flier's accomplishment." For Earhart and other women, Quimby was a pioneer who helped overturn stereotypes about women's roles in society, and who made it possible for them to achieve their dreams.



WHILE THE "Right Stuff" men were still sitting behind conventional engines and looking through the arcs of their propellers, a pilot in Germany was routinely setting records in exotic jet- and rocket-powered aircraft and helping draft the first blueprints for a trip to Mars.

While the Allied air forces were pounding Germany's industrial infrastructure to dust during World War II, Germany turned in desperation to its best test pilot--arguably the most professional and courageous who ever lived--to push aviation technology far beyond anything the Allies ever dreamed of in a last-ditch effort to defeat them.

When a powerful Russian army was only scant yards from Hitler's bunker, a pilot in Germany landed a bullet-riddled plane (with a freshly wounded comrade writhing in the cockpit) on a shell-cratered Berlin street in a futile effort to rescue Hitler from the deadly trap. Shortly after, the pilot successfully took off from the same street through a hailstorm of Russian gunfire, again swerving around the shell craters.

Long after the war, when most would be in retirement, this pilot took off from a field near State College, Pa., to try out a glider that belonged to a friend. When the glider landed--after flying almost 600 miles without power--yet another stunning record had been added to aviation history.

These are but a few of the incredible exploits of Hanna Reitsch.

The ascent of Reitsch's career and WWII German aviation, both began, remarkably enough, with the restrictions imposed against the German air force by the Treaty of Versailles. Few powered planes were permitted in Germany after World War I. A loophole in the restrictions allowed Germany to form dozens of glider clubs that attracted thousands of fresh-faced, eager young pilots. The clever German militarists were developing a large cadre of skilled pilots who would one day trade their harmless little gliders for much more formidable craft marked with the distinct "Balkenkreuzen" of the Luftwaffe.

In 1932, 20-year-old medical student Hanna Reitsch joined a glider club. Soon, she set the first of at least 40 aviation records credited to her and was one of the

first glider pilots to cross the Alps.

Like many of her fellow glider pilots, Reitsch graduated to powered aircraft when an emboldened Germany began rebuilding its air force in earnest.



#### Hanna Reitsch and the Ho III a

Reitsch's talents were soon harnessed to help hone the edge of the Luftwaffe, and she took on unimaginably dangerous jobs. One type of plane she tested was a heavy bomber that had steel blades installed on the leading edges of the wings to cut the heavy steel cables used to tether barrage balloons. During one demonstration for Luftwaffe brass of this hair-brained scheme, Reitsch made a graceful landing and exited the cockpit smiling and waving after deliberately flying into the cables. Only she knew that the wing had almost been ripped from the plane when she hit a cable and she had to fight for her life--second by unnerving second--to get the crippled plane on the runway.

On another hair-raising flight in a stricken plane, instead of bailing out, Reitsch calmly recorded flight data with paper and pencil because she did not think she would live long enough to make the report in person.

Many of the designs that Reitsch tested were novel and innovative, and some were just simply ill-conceived deathtraps. Reitsch was the only civilian and only woman to receive the Knight's Cross with Diamonds. Had Reitsch never lived, a hypothetical screenplay of her adventures would probably be dismissed as being "too far-fetched to be believable."



Hanna Reitsch demonstrating a prototype helicopter

The first operational jet fighter, the twin-engine Me-262 "Swallow," was one of Reitsch's more routine rides. She also tested a cockpit-equipped V-1 rocket and the insanely dangerous rocket-powered Me-163 Komet. The Komet was powered by a binary fuel that--when mixed together--exploded to provide thrust. Sometimes the plane exploded, too, and, if that were not bad enough, the fuel provided only five minutes of flight time, and the pilot had to glide home to a landing. A second landing attempt was not an option.

One of the fuel components dissolves flesh, and sometimes there was nothing to bury following a Komet fuel leak. The payoff was an aircraft that could scream through an Allied bomber formation decimating it with the impunity of a shark attacking a school of baby squid. The Komet is the direct ancestor of many of today's most advanced delta-wing warplanes.

The tragedy of Reitsch's remarkable life was that she chose to serve the Nazis. When in State College, Pa., Reitsch proudly showed the owner of the glider she flew a cyanide suicide capsule that was handed to her by Hitler shortly before he killed himself in his dank bunker. Some historians, blinded by her accomplishments, have tried to depict her as a naïve, apolitical technician, but the fact that her parents committed suicide rather than face life in a defeated Germany did not seem to faze her.

Reitsch was a microcosm of a wartime Germany that was blessed with great scientists and engineers like her colleague, rocket scientist Werner von Braun. If the German fascists proved anything, it is that technological advancement can proceed apace without parallel development in humanitarian principles. It is very sad that Reitsch's remarkable accomplishments will be forever tainted by the twisted cross that adorned the aircraft that she flew so bravely. In the very last days of The Third Reich, she landed an aircraft on a shell-pocked street in Berlin when most of the city had already been occupied by the Russians. She spent two days in the "Fuhrerbunker" before returning to her aircraft and taking off under a hail of heavy gunfire. Although her politics were not popular in post war Europe, to say the least, she did not hesitate to break the "glass ceiling" of women's aviation. In fact, she smashed through it in the fastest and most advanced aircraft of her day. Allied airmen were lucky that she was too valuable as a test pilot to be risked on but a few combat missions

### Cal Rodgers

the First U. S. Transcontinental Flight



A confident-looking Cal Rodgers before his take off from Sheepshead Bay. He was a steady cigarsmoker, even when he flew.

Calbraith Perry ("Cal") Rodgers, an inexperienced 32-year-old pilot, in 1911 made the first transcontinental flight across the United States. He reached Pasadena, California, on November 5, 1911, and Long Beach, California, on December 10, flying between Sheepshead Bay, near New York City, New York, and the West Coast in a Wright EX biplane. He carried the first transcontinental mail pouch and was accompanied on the ground by a support crew that repaired and rebuilt the plane after its numerous rough landings and crashes.

Rodgers was the grandson of the famed Commodore Oliver Perry of the Battle of Lake Erie in the War of 1812. He was an excellent football player, yachtsman, and automobile and motorcycle racer before becoming a pilot, all in spite of deafness that resulted from a childhood bout of scarlet fever. Somewhat of a risk-taker, Rogers had taken only about 90 minutes of flying instruction from Orville Wright in June 1911, at the Wright School in Dayton, Ohio, before attempting a solo flight. He carried out the first aerial photography of industrial plants and in August 1911, won an \$11,000 prize in an international air endurance contest held in Chicago. He also was the first private citizen to purchase a Wright "aeroplane," a long-wing biplane Model B that was modified for his transcontinental flight and designated a Wright Flyer EX (for Experimental).

The \$50,000 prize that renowned publisher William Randolph Hearst offered to the first pilot to fly across the United States within 30 days undoubtedly helped motivate Rodgers to tackle this formidable challenge. Air flight was new to the nation. There were no airports or aircraft mechanics along the way and no air navigation maps, control towers or beacons to warn of hazards or guide the pilot. Rodgers would have to follow railroad tracks, recognize landmarks, and talk with his ground

crew during periods on the ground. Also, the venture would be expensive, and Rodgers needed a sponsor.

J. Ogden Armour, a Chicago meat packer, was willing to sponsor Rodgers in return for advertising his new grape soft drink "Vin Fiz." Rodgers printed Vin Fiz on the rudder and under-wing areas of the plane, and Armour paid him three to five dollars for each mile flown, providing a total of \$23,000. Armour also provided and outfitted a three-car support train, which would prove vital to Rodgers' success. This train was loaded with a crew, including his wife, his mother, a close friend, two mechanics, and two assistants as well as supplies, fuel, repair parts to rebuild the plane, and even spare engines. One car had a much-needed repair shop, and the crew had the capability to rebuild the aircraft at least twice if necessary. All cars advertised the sponsor's product--Vin Fiz.



Cal Rodgers had secured the backing of the Armour Corporation, which was promoting its new grape soda, "Vin Fiz."

The Wright brothers' biplane that Rodgers flew was made with relatively light materials: a spruce airframe that was covered with canvas and linen and a small 35-horsepower (26-kilowatt) engine. The plane had two eight-foot (2.4-meter) push-propellers driven by a chain-drive transmission and could fly at 45 to 60 miles per hour (72 to 97 kilometers per hour). The Vin Fiz had no instruments, other than the reported use of a shoelace to indicate vertical and lateral motion, no heater, and no navigational aids. But with what proved to be considerable foresight, Rodgers had crutches strapped to a wing.



Cal Rodgers took off from Sheepshead Bay Speedway in New York on September 17, 1911, in an attempt to cross the United States by air.

Rogers took off from Sheepshead Bay, New York, at 4:30 p.m. on September 17, 1911. He followed railroad tracks and avoided mountains, storms, and other hazards. Along the way, he landed around 70 times, which included at least 16 crashes some that put him in the hospital. Damage to the Vin Fiz was so extensive that the plane had to be rebuilt at least twice. Only a very few pieces of the original Vin Fiz made it all the way a vertical rudder, a couple of wing struts, and possibly the original engine oil pan.



Cal Rodgers suffered numerous crash, engine malfunctions, and other mishaps on his transcontinental journey in 1911.



Another of Rodgersï many crashes.

Forty-nine days later, on November 5, Rodgers landed in Pasadena, California, He had missed Hearst's deadline by 19 days. So that he could say he had reached the Pacific Ocean, he took off again on November 12, to cover the remaining 20 miles (32 kilometres) to the ocean, only to be forced down twice, once suffering a broken ankle. But on December 10, 1911, he flew on to the beach at Long Beach, California, and taxied the Vin Fiz into the Pacific Ocean. The entire trip of approximately 4,000 miles (6,437 kilometres) (authorities differ on the exact number of miles) had taken 84 days, although only about 82 hours were spent aloft!



Cal Rodgers wets the wheels of the Vin Fiz in the surf at Long Beach, California, after flying more than 4,000 miles in 84 days.

Rodgers' determination and thorough preparation for the flight enabled him to be the first to make his way across the country by air, even though he missed the time deadline for the \$50,000.00 prize.

The public recognized his triumph over life-threatening challenges. The number of onlookers grew from a handful of people wishing him well at his initial takeoff, to newspaper reporters and crowds cheering him on as he crossed the continent, all the way to national celebrity status, with some 20,000 witnessing his November 5 landing in Pasadena.



The final crash of the Vin Fiz into the Pacific Ocean.

But as was the case with so many early pilots, tragedy struck. Almost five months later, on April 3, 1912, while making a test flight in Long Beach, near the site of the end of his record-setting flight, he flew into a flock of birds--a problem still facing aviators today. One bird, probably a seagull, was believed to have stuck in his plane's controls, causing the plane to crash into the surf. When pulled from the wreckage, Cal Rodgers was dead of a broken neck.

# the Hon Charles Stewart Rolls 1877 - 1910



The son of a wealthy British peer, Rolls might have led a carefree life often associated with the young Edwardian aristocracy. Instead, he combined an adventurous spirit with an education and thus made a useful contribution to his nation.

Rolls went to Cambridge University where he earned a BA, and later MA in engineering. His love for speed led him to become a racing cyclist. Later he turned to racing automobiles along with his friend, Moore-Brabazon.

In 1896 Rolls joined with other auto enthusiasts to break a law which forbade automobile travel at over 4mph (6.4km/hr). Their defiance led to a new speed limit which at 12 mph (19.3 km/hr) was 200% faster than had previously been allowed.

In 1901 Rolls, having become an aeronaut, helped found the Aero Club. Two years later he entered an automobile sales venture in London selling expensive French cars. One day a friend introduced him to F. H. Royce who was just beginning to build quality automobiles. Royce, who had worked hard his entire life, had little in common with Rolls yet they still became friends. In 1904 they agreed that Royce would build cars and Rolls would sell them. Rolls-Royce was born.

Rolls continued to fly balloons when he wasn't demonstrating his soon-to-be-famous products. His balloon flying led to aeroplane flying and in 1910 he received certificate number 2 from the Royal Aero Club (Royal as of that year). Later in the same year he became the first man to fly non-stop across the English Channel both ways, but his triumph was short lived. In July 1910 he was killed when his French-built Wright biplane broke up in mid-air. Though he came down from only 20 feet, he cracked his skull. He became Britain's first aircraft fatality.



Charles Stewart Rolls



Charles Rolls makes his his first balloon flight, Sept. 8, 1898

Rolls completed the first double crossing of the Channel - England/France/England on 2 June 1910 in total flying time 95 1/2 minutes and is pictured below.



Rolls completes the first double crossing of the Channel

A French built moving tail plane was fitted 10 July 1910 to his Wright plane. On 12 July in a 20 - 25 mph wind he crashed when tail plane broke at the Bournemouth International Aviation Meeting in celebration of the town's centenary. Rolls was the first Briton to die in an aviation accident. At this time Rolls' exploits had built up such a following in Great Britain that Lord Montague of Beaulieu interrupted his speech in the House of Lords to announce the death. Rolls was buried at St. Cadoc's Church 16 July 1910.



Charles Rolls, Vauxhall, 1908



Flight of the Voyager

Dick Rutan, Jeana Yeager, and the



Dick Rutan and Jeana Yeager embody the very spirit and character of the word "pioneers." In December 1986, they became the first people to circumnavigate the world, non-stop, without refuelling their plane, the Voyager. They also set world flight records in the process. Besides being the first team to travel non-stop around the globe--which was one of aviation's last record barriers--Rutan and Yeager also endured the longest flight to that date, and almost doubled the then current distance flight record. But their contributions did not stop there. They also explored the limits of human endurance and mental fatigue during their journey. To many, Rutan and Yeager's flight represented the triumph of human ingenuity as the two aviators overcame a wide range of aerodynamic, financial, physical, and psychological challenges.





Richard "Dick" Rutan was born in Loma Linda, California, on July 1, 1938. An eager individual, Rutan earned both his pilot's and driver's licenses on his 16th birthday. At the age of 19 he joined the Air Force Aviation Cadet Program and was later commissioned a lieutenant in the Air Force. He flew 325 missions over Southeast Asia during the Vietnam War until September 1968, when his F-100 plane sustained a hit from enemy fire and he had to eject from his aircraft. He evaded capture and was rescued by American forces. Due to his exemplary military record, Rutan received the Silver Star, five Distinguished Flying Crosses, 16 Air Medals, and a Purple Heart.

The second Voyager pilot Jeana Yeager was born in Fort Worth, Texas, on May 18, 1952. By 1978, she had earned her pilot's license. During her early aviation career, Yeager mainly wanted to learn to fly helicopters, but her interests branched off and she turned her attention to high-performance aircraft. Yeager, who is no relation to the famous test pilot Chuck Yeager, first met Dick Rutan, and his brother Burt, at a California air show in 1980. At the time, Burt and Dick ran their own aircraft company. Interestingly, Yeager set four separate speed records in Rutan EZ planes in the early 1980s.

The Rutans originally conceived of the Voyager during a lunch in 1981. They believed that they could design a plane that could break the world distance record of 12,532 miles (20,168 kilometres) set by a B-52 Air Force crew in 1962. Like many great innovators, they quickly sketched their ideas onto a napkin while still at the lunch table. With the help of an eager group of volunteers, they began building the Voyager the next year. Notably, the entire project relied solely on private funds and donations.

The creation of the Voyager posed several design challenges for the Rutans. Burt, the main project engineer, searched for just the right combination of materials to make the aircraft light enough to reach maximum efficiency and yet strong enough to sustain extremely long-distance flight. He also had to devise a way for the aircraft to hold the enormous amount of fuel necessary to power it, non-stop, around the globe. Eventually the Rutans decided to construct the Voyager's main structure/fuselage out of a space age composite material consisting mainly of graphite, Kevlar, and fibreglass. The structural weight of Voyager was only about 939 pounds (426 kilograms), but when its 17 fuel tanks were full, its takeoff weight exceeded 9,700 pounds (4,400 kilograms), or more than 10 times its structural weight. Voyager's wingspan was approximately 110 feet (36 meters). By the time the Voyager made its first test flight on June 22, 1984, the Rutans, Yeager, and scores of volunteers had spent more than 18 months and 22,000 hours working on the aircraft. After more than a year-and-a-half of testing and modifications on Voyager, Dick Rutan and Jeana Yeager were ready to attempt their record-setting flight.

Rutan, Yeager, and Voyager took off from Edwards Air Force Base, California, at 8:01 a.m. on December 14, 1986. The plane needed almost the entire 15,000 feet (4,572 meters) of runway, which was already one of the world's longest airstrips, to become airborne; the aircraft did not lift off until it was approximately 14,200 feet (4,328 meters) down the runway, and then it did so only after sustaining a bit of damage. Due to the large amount of fuel contained in Voyager's wing tanks, the aircraft's wings bobbed up and down while accelerating down the runway, and in the process, about a foot of each wing tip chipped off. Concerned about the condition of their craft, Rutan and Yeager circled the airfield and checked their plane's handling conditions. Fortunately, the plane seemed sound enough to continue the journey.

Yeager and Rutan had to endure severe physical and mental demands during their trip. Because of the time required to make a circumnavigational flight, they became extremely fatigued. To combat the problem, they tried to rotate their duties. One crewmember would fly the aircraft, while the other rested. Initially, they tried to work in two-to-three-hour shifts, but things did not always go according to plan. Furthermore, it was extremely difficult to manoeuvre themselves into a comfortable sleeping position, particularly within the confines of Voyager's small cockpit, which was only the size of a phone booth.

The two aviators faced several dangers during their flight. One of their greatest challenges was bad weather. At several points during their trip, they had to evade menacing storm fronts. Once, they even had to fly around Typhoon Marge, a 600-mile (966-kilometer)-wide storm. While such manoeuvring helped them escape physical harm, it only added to their mental stress. Each time they had to adjust their flight plan by climbing above a storm, or going around one, they burned more fuel, and since

Voyager had started the trip with a very tight fuel allotment, they grew increasingly concerned that they might not have enough to complete their journey. As it turned out, they had enough fuel, but just barely.

Rutan and Yeager completed their journey when they touched down at Edwards Air Force Base at 8:06 a.m. on December 23, 1986. The entire 24,986-mile trip had taken 9 days, 3 minutes, and 44 seconds, or a little more than 216 hours. During their trip, they had averaged around 116 miles per hour (187 kilometres per hour), and when they landed, they only had a few gallons of fuel left.

From a record standpoint, Rutan and Yeager became the first aviators to circumnavigate the globe non-stop, without refueling. They also endured the longest flight up to that time, and essentially doubled the previous flight record for distance. Because of their accomplishment, President Ronald Regan awarded the Rutan brothers and Yeager with the Presidential Citizen Medals of Honour, which had been awarded only 16 times previously. They also received the Collier Trophy, aviation's highest honour, and several other prestigious awards.

In the late 1990s, Dick Rutan attempted to set another around-the-world record, this time in a balloon. Rutan and his team-mate David Melton began preparing for the journey when they learned that the Anheuser-Busch Company was offering \$1 million to the first team of balloonists who could successfully circumnavigated the world, non-stop. In 1998, Rutan and Melton set out on what they believed would be a record-setting journey, but only three hours into their flight, a helium cell ruptured in their balloon and they had to abandon their trip. Another team of balloonists, sponsored by the Breitling watch company, would beat them into the record books in March 1999.

The Voyager now hangs in a place of honor in the "Milestones of Flight" gallery in the Smithsonian's National Air and Space Museum in Washington, D.C. Its 1986 flight revealed just how far aeronautical engineering and design had advanced during more than 80 years of aviation. Rutan and Yeager not only established a couple of world records with the Voyager but also tested the psychological and physiological capabilities of humans under extreme pressure. Rutan and Yeager's flight proved that people really can live up to Rutan's personal motto: "If you can dream it, you can do it."

- Voyager's flight was the first-ever, non-stop, unrefuelled flight around the world. It took place between December 14 and December 23, 1986.
- This milestone flight took 9 days, 3 minutes and 44 seconds.
- The absolute world distance records set during that flight remained unchallenged today.
- The flight was 26,366 statute miles, which more than doubled the previous record set by a B52 Bomber in 1962. (The FAI accredited distance at 40,212 km).
- The structural weight of the Voyager Aircraft was only 939 pounds.
- When the airplane took off full of fuel, pilots and supplies, the gross take off weight was 9,694.5 pounds.
- The average altitude flown was about 11,000 feet.
- The Voyager took off from and landed at Edwards Air Force Base in California.

- There were two crew members on board, Dick Rutan and Jeana Yeager.
- Dick's brother, Burt Rutan, who is a world-renowned airplane designer, designed the airplane.
- The Voyager was built in Mojave, California. It took five years to build and test the airplane before taking off on its remarkable record-setting flight.
- There were 99 ground volunteers that participated in the flight with weather, communications, fabrication, office staff, gift shop staff and more.
- Primarily individual contributions, and a few product equipment sponsors financed the Voyager. The project did not receive any government sponsorship.
- Four days after landing, President Ronald Reagan presented the Voyager crew and it's designer with the Presidential Citizenship Medal, awarded only 16 times previously in history.
- The Voyager Aircraft is on permanent display at the Smithsonian Institution's National Air and Space Museum in Washington, DC.

# Charles Kingsford Smith (1897 - 1935)



A small man with a craggy face, rapid wit and speech, whose party trick was to drink beer standing on his head, his trademark was a famously broad grin around the jutting cigarettes he chain-smoked

His life was lived frenetically and often outrageously. From the horrors of the First World War, in which some of his toes were shot off in aerial combat, he emerged with a contempt for authority and a determination to live life hedonistically and recklessly.

He created for himself a world compulsively ruled by flying, alcohol and women. Yet he was universally loved and worshipped. He remained totally unaffected by fame - quite disarmingly humble and accessible, constantly drawing into his orbit men and women dazzled by his warmth, his enthusiasms and his unique charisma.
But behind the permanent grin he wore and the stream of his repartee, behind his image of flying genius and indestructibility, there lay a more frail human being - increasingly affected by the stresses of his often terrifying flights and the awesome pressures of great fame.



Kingsford Smith beside the Lockheed Altair Lady Southern Cross

When he set out from England in November 1935 on what was to have been his last record bid, an attempt to reach Australia in under two days, he was ill. In his high-speed Lockheed Altair '*Lady Southern Cross*' he and his co-pilot disappeared off the coast of Southern Burma in the early morning dark. All that was ever found was an undercarriage leg with a still inflated tyre - discovered 18 months later on an island in the Andaman Sea.



Sir Charles Kingsford Smith and the plane

The fate of Sir Charles Kingsford Smith remains one of aviation's great unsolved mysteries. At dusk on 7 November 1935 he and his co-pilot mechanic, Tommy Pethybridge, took off from Allahabad in India to fly non-stop through the night to Singapore. They were seen to pass over Calcutta, Akyab and Rangoon - which they over flew at 1.30 am.

Sometime around 2.50 that morning, 8 November, another Australian pilot, Jimmy Melrose who was heading south from Rangoon in a much slower plane, a Percival Gull, was excited to see the Altair overtake him over the Andaman Sea. On arrival in Singapore later that day Melrose was surprised to learn that the Lady Southern Cross had not arrived.

Despite a huge search of the entire Rangoon-Singapore route by squadrons of RAF aircraft no trace of the Altair was found for 18 months. In May 1937 its starboard undercarriage leg was picked up by

Burmese fishermen on the rocky shore of Aye Island off the south coast of Burma about 140 miles south-east of Rangoon.

The theory grew that Smithy had flown into the 460-foot top of the jungle-covered island and the aircraft had plunged into the sea, the wheel breaking off and floating ashore. But an Australian expedition to the island in 1983 searched the seabed without success.

However, if Melrose had genuinely seen the Altair overtake him, and they were the only two aircraft in Burma airspace that night, then Smithy would have crashed at least 100 miles south of Aye - and the wheel drifted north.

## Maud Tait



Maude Tait was born in 1901 in Chicopee, Massachusetts, she was the daughter of James Tait. He was one of the Tait Brothers who operated the Springfield Airport. James was later president of the Springfield Air Racing Association. S.A.R.A. Maude Tait was a pioneer aviatrix during the 1930's. She became a very accomplished pilot and established several flying records.

She posted a new speed record for women on September 6, 1931, when she flew fifty miles at an average speed of 187.5 miles per hour; this beat even Amelia Earhart's previous record by 10 mph, and missed the existing men's record by only 1 mph. In 1929, she set an unofficial altitude record for women by flying at 16,500 feet. She also was the first woman in New England to hold a Transport Pilot license, the highest rating given by The United States Department of Commerce,.Maude Tait's world fame rested on many racing achievements. Over the Labour Day holidays in Cleveland, Ohio, she won many major races.

It was in September of 1931 at the Cleveland National Air Races that she flew her Gee Bee Model "Y" Senior Sportster NR11049 to victory, winning the Aero I Trophy Race, the big Free-For-All race for women. She set a new women's closed-course world speed record of 187.574mph, a feat recognized by the National Aeronautic Association and the Federation Aeronautique Internationale.

The prize for winning back in 1931 was a whopping \$3,750. Also at the 1931 air races while flying the 110 Warner Scarab powered Model E Sportster NC46V, she finished 3rd in both the Women's 510 cu. in. Free-For-All and the Women's 650 cu. in. A.T.C. (Certified Aircraft). Oddly enough, the finishing order in both races was the same. Phobe Omline first and Mary Hazlip second in the Menasco C-4 powered Gee Bee Model "D" Sportster NC11043.

Maude Irving Tait Moriarty, born in 1901 in Chicopee, Massachusetts, was one of the world's greatest flyers of her time. Long before women made history in space, like Sally Ride and Kathryn

Sullivan, Maude Tait was a pioneer aviatrix during the 1930's. Tait became a very accomplished pilot and established several flying records. She posted a new speed record for women on September 6, 1931, when she flew fifty miles at an average speed of 187.5 miles per hour; this beat even Amelia Earhart's previous record by 10 mph, and missed the existing men's record by only 1 mph. In 1929, she set an unofficial altitude record for women by soaring to 16,500 feet. She also was the first woman in New England to hold a Transport Pilot license, the highest rating given by The United States Department of Commerce.

Tait met her challenges flying in one of the famous Gee Bee airplanes. The name comes from the initials of the manufacturers name, letters "G" & "B", which stood for Granville Brothers Aircraft, Inc. Five brothers from New Hampshire started their own aircraft repair business, Granville Air Service, in Boston in 1925. The name was later changed and the Gee Bee trademark was designed. The Granville Brothers' innovative ideas and contributions to aerodynamic design had a tremendous impact on the advancement of aviation technology. Their high performance racing craft, designed and built in their little shop at Springfield Airport in Massachusetts, were the sensation of their time.

Maude Tait, daughter of Springfield's prominent Tait family (which was instrumental in bringing the Granvilles to Springfield, MA), became the country's top woman air racer in her Gee Bee Model Y Super Senior Sportster. White with bright red trim, the new aircraft featured the "Filaloola Bird" painted on its sides, a comic strip character of the day whose claim to fame was its reputation for flying in ever diminishing circles until it flew into its own tail feathers. The Senior Sportster was truly a versatile plane, whether used for racing, aerobatics or high speed cross-country flying. Considered ahead of its time, it was propelled by a powerful Pratt & Whitney engine. Tait's Senior Sportster was a deluxe model, built by the Granville Brothers for her. In addition to standard equipment, it was equipped with a Haywood starter, metal prop, compass, and turn and bank indicator.

In 1929, within a few months of setting up shop in Springfield, the Granville Brothers' Gee Bee planes won national recognition in a series of air races, in which pilots like Tait flew city-to-city over much of the country. This was during the tremendous growth in aviation that followed Lindbergh's flight from New York to Paris in 1927. Maude Tait's exploits in the Gee Bee Racing planes brought the Granville Brothers and the city of Springfield to world pre-eminence in aviation.

Maude Tait's world fame rested on many racing achievements. Over the Labor Day holidays in Cleveland, Ohio, Tait won major contests. It was in September of 1931 at the Cleveland National Air Races that she flew her Sportster to victory, winning the Aerol Trophy Race, the big Free-For-All race for women. She set a new women's closed-course world speed record of 187.6 mph, a feat recognized by the National Aeronautic Association and the Federation Aeronautique Internationale. The prize for winning back in 1931 was a whopping \$3,750. She also piloted one of the little Model E Sportsters to victories.

1931 was the year of great achievement for the Granville Brothers and their planes. Their Gee Bees, piloted by Lowell Bayles, Bob Hall and Maude Tait, swept the championships in the week-long events. With their victories, Springfield became for a time the world's capital city in aviation. When they all returned home to Springfield, a crowd of 10,000 were at Springfield Airport to greet them. Car horns blared, a drum and bugle corps provided martial music and newsreel camera crews and press photographers were everywhere. There followed a parade through downtown Springfield and a formal city reception, dinner and fireworks. The planes were roped off and visited by thousands of spectators.

Maude Tate was educated at Springfield's MacDuffie School for Girls, LaSalle Seminary and Holland House School. She began her professional life as a school teacher in a one-room

schoolhouse in Hampden, MA., later teaching third grade at East Longmeadow's Centre School. She taught school until 1928, when she decided to become a full-time competitive flyer. Her father and his three brothers were all aviation enthusiasts. Together, they backed the Granville Brothers early efforts to produce the sports-type airplanes.

She became one of the nation's first commercial pilots. While doing so, she established a new altitude record for women, reaching 16,500 feet over Connecticut in 1929. On her first commercial express flight, she delivered a radio set for a radio company and a wedding gift for John Coolidge, son of the former U.S President. Maude also flew over opening day of a professional football season to drop the game football. She was a "daredevil" to be sure!

Besides breaking speed and altitude records for women flyers, she had several mishaps, including forced landings due to weather, a fire in her Gee Bee, a flight with fuel running out, and a plunge to earth in a Crane Primary Glider due to a gust of wind. Hospitalized for six months following her crash in the glider, she was forced to wear a back brace for two years.

Maude ended her flying career when she married attorney James Moriarty. Mrs. Maude Tait Moriarty said that during her precarious years of flight she lived only "from day to day" and thought not about longevity. In her later years she made few public appearances, two of them in Springfield in 1978. She met with and signed autographs for her many fans and friends, (this writer included), during observances on the 75th anniversary of the Wright Brothers Flight, and later appeared at the Springfield Science Museum for ceremonies inaugurating the Museum's Hall of Flight.

Mrs. Moriarty lived to be 81 years old. She was quoted as saying, "I always wanted to pilot my own plane, I didn't feel daring, just curious and interested in speed and altitude, and always wanted to explore their possibilities."

The world of flight has greatly changed since the early days of the Gee Bee airplanes, but the same courage and enthusiasm still soars in the hearts of future women aviators.



Louise McPhetridge Thaden (Nov. 12, 1905--Nov. 9, 1979)

One of the most famous American female pilots of the golden age of aviation, Louise McPhetridge Thaden became the first woman to win major flying events and awards as well as setting world performance records. A colleague of Amelia Earhart, Thaden co-founded the Ninety-Nines, an international organization for female pilots which continues to the present day. While history remembered Earhart from the publicity of her over-waterflights and her mysterious death, Thaden was every bit the celebrity ofEarhartduringthe1930s.

She defeated both Earhart and Pancho Barnes to win the first Women's Air Derby, a transcontinental race from Santa Monica, Calif., to the site of the 1929 National Air Races in Cleveland, Ohio. She and co-pilot Blanche Noyes captured the 1936 Bendix Cup race, winning the New York to Los Angeles event in the first year women were eligible to compete. As a result, Thaden received aviation's highest honour, the Harmon Trophy, in 1936. "We had to prove that women were as good pilots," Thaden said. "In an age where some men didn't think a woman should drive a horse and buggy, much less drive an automobile, it was a job to prove that females could

The aviation pioneer was born in Bentonville, Ark., the daughter of Roy and Edna McPhetridge. She was raised in the small northwest Arkansas town, graduating from local Bentonville High, and attending the University of Arkansas in Fayetteville between 1921 and 1925. Majoring first in journalism, then switching to physical education, Thaden left college after her junior year, and in 1927 pursued a job with Travel Air Corporation as a salesperson for the Wichita, Kan., based aircraft manufacturer. She was dispatched to Travel Air's San Francisco sales office.

It was in the Bay Area that she married Herbert Thaden, a former U.S. Army pilot and engineer working on development of the first American allmetal aircraft, on June 19, 1928. She also started flying lessons, soloing in 1927 to earn her pilot's certificate. Signed by Orville Wright, Thaden received certificate No. 74. Within two years, Thaden would become only the fourth woman to hold a transport pilot rating.

The Thadens moved to Philadelphia, where his Thaden T-4 all-metal prototype was purchased by the Pittsburgh Metal Airplane Corp, in which she worked as P/R Director. She also flew the Thaden plane [C502V] in the 1931 NAR Cross-Country Derby, placing fifth. (GMC acquired that company later that year, merged it with Fokker, and moved operations to New Jersey.) Throughout the '30s she continued to set new altitude, endurance, and speed records. Another endurance flight followed and another record fell, that one on Aug 14, 1932—8d:4h:5m in a Curtiss Thrush (with Frances Marsalis) [NR9142].

Her first world record was the women's altitude mark of 20,260 feet set Dec. 1, 1928. She followed it with a women's endurance mark of 22 hours, 3 minutes, 12 seconds on March 17, 1929.



On August 19th, she took off from Santa Monica for the Women's Air Derby, reaching Cleveland on August 27th. Her notable competition met with ignoble outcomes. Earhart damaged her Lockheed Vega aircraft with a ground-loop accident in Yuma, Ariz. Barnes, who first became lost and veered into Mexico, tore the right wing from her Travel Air when she hit a Chevrolet in Pecos, Texas. Noves had an in-flight fire over west Texas, then suffered a ground loop at Pecos. By Fort Worth, Texas, Thaden had control of the race, reaching Ohio after almost 2,500 miles of flying as the national first woman to win а air race.

In 1930, she and Earhart formed the Ninety-Nines, but refused the leadership roll. Insisting Earhart become president, Thaden served as the group's treasurer from 1930-34, then vice-president from 1934-36.



Along with Francis Marsalis, Thaden set a new endurance record by flying a Curtiss Thrush biplane for 196 hours over Long Island, N.Y. During the eight days, Thaden made seventy-eight air-to-air refuelling contacts, and occasionally made live radio broadcasts to a national listening audience. The two pilots received food, water and fresh clothing lowered by rope from another airplane during the record-setting event.

Her win in a standard factory edition Beech Staggerwing C17R with Noyes for the Bendix Cup stunned the aviation world. Thaden's cup victory also set a new east-to-west record of 14 hours, 54 minutes. Thaden retired from full-time competition in 1938 to devote more time to her family.

During the height of her aviation achievements, she had a son, Bill, in 1930 and daughter, Pat, in 1933. In 1935, Thaden worked for the Bureau of Air Commerce promoting marking of airfields and landmarks nationwide. She published her memoirs in 1938 entitled High, Wide and Frightened. Active in the Civil Air Patrol during the Second World War, she reached the rank of lieutenant colonel. The Bentonville airport was renamed Louise Thaden Field in 1951, and a building at the National Staggerwing Museum was named in her honour in 1974. She died of a heart attack in High Point, N.C.

### Bobbi Trout



Evelyn "Bobbi" Trout was born in Greenup, Illinois, on January 7, 1906 and got her name when she had her hair bobbed ala screen star Irene Castle. At the age of twelve she saw her first airplane flying overhead and it was love at first sight. "Some day I'll be up there. Someday I'm going to fly an aeroplane." She took a big step toward that goal on December 27, 1922 when she had her first ride in a Curtiss Jenny at Rogers Field in Los Angeles (coincidentally, it was the same site that Amelia Earhart took her first airplane ride).



"Bobbi" took her first flying lesson on 1 January 1928 and received her Federation Aeronautique

On New Year's Day 1928, Bobbi began her flight training at Burdett Air Lines, Inc., School of Aviation in Los Angeles with Burdett Fuller. She soloed on April 30, 1928, two weeks later completed her training and was issued license number 2613. She was the fifth woman in the USA to obtain her transport license.



Bobbi Trout and Elinor Smith at Van Nuys Airport before their record flight

## Making and Breaking the Records

At 6:25 AM on the morning of January 2, 1929, Bobbi took off from Van Nuys Airport on an endurance flight that would last for twelve hours and eleven minutes and beat Viola Gentry's eight hour endurance record. She had set a new solo endurance record for women. But the record was only to last until January 31, 1929 when Elinor Smith beat her time by an hour. And the race was on!

On February 10, 1929 Bobbi took off at 5:10 PM from Mines Field to beat Elinor Smith's time. She wanted to extend the time by four hours just as she did for the earlier record. She expected to land at 10:30 AM but at 10:05 AM her engine started cutting out from fuel starvation and then died

completely. She glided the Golden Eagle to a perfect landing at 10:16 AM. Her new records now included the first all-night flight by a woman and a new seventeen hours, twenty-four minutes solo endurance record for women. One of the local papers had the headline, *"Tomboy" Stays in Air 17 Hours to Avoid Washing Dishes.* 

Four months later, on June 16, 1929 she climbed into a new ninety horse-powered Golden Eagle Chief, climbed to fifteen thousand two hundred feet and shattered an altitude record for light class aircraft.

# Women's Transcontinental Air Derby

Will Rogers dubbed the race the "Powder Puff Derby" and the name stuck. Any qualified female pilot who had a license and a plane could enter the long and difficult race from Santa Monica to Cleveland. On the morning of August 18, 1929 Bobbi was the fifth racer flagged off to start the race with her 100 horsepower Golden Eagle Chief. The first day of the race went well - it wasn't until day two that disaster struck and Bobbi had to do a dead stick landing in a field about six miles from the Yuma, Arizona Airport, that day's destination. Her airplane suffered some damage upon landing and took several days to repair. Undaunted, she continued with race, catching up with the many of the fliers in Kansas City. Other contestants had problems as well - Claire Fahy, in an OX5 Travel Air was forced down near Calexico with broken wire braces, Amelia Earhart's Lockheed Vega nosed over upon landing and damaged the prop, Thea Rasche was forced down at Holtville, Arizona and Marvel Crosson had a fatal crash in the Gila River Valley, east of Yuma.

Bobbi ran into trouble days later when her engine quit again and she was forced to make another dead-stick landing that ended with the plane ground-looping this time. She was able to make the airplane repairs herself and on August 22, even though she knew she was out of the running in the official race, she took off again. In Columbus, Ohio she found out that it wasn't as bad as she thought when a few of the other racers were just departing for Cleveland. She pushed hard and completed the course.

After the air races, while standing under the bleachers and discussing the events, several of the women pilots came up with the idea of forming a woman's flying organization. Bobbi, Amelia Earhart, Phoebe Omlie, Louise Thaden, Blanche Noyes and several other women decided to create by-laws and get the group started. And that was the start of The Ninety-Nines!

## More Records and Races

During the Powder Puff Derby, plans were made for Bobbi to join forces with Elinor Smith and go for setting another endurance record. This time it would be the woman's endurance record and they planned on being airborne for a month. After many, many hours of preparation and test flights, they were able to stabilize the plane long enough for Bobbi to grab a bag of food, oil and mail hanging from the refuelling plane. This refuelling routine would take place twice a day with the fuel plane being able to transfer one hundred eighty-five gallons of fuel to the receiver aircraft in only four minutes. Bobbi would grab the bag which was tied to a rope and lead the gasoline nozzle into a pipe that lead to the cabin gasoline tanks.

On November 27, 1929, Bobbi and Elinor started the run. They alternated four hour shifts of sleeping and flying with the routine going smoothly for the first two days. In the thirty-ninth hour there was a refuelling mishap and the refuelling plane had to do an emergency landing and while it sustained minor structural damage, the engine had to be overhauled. With the transferred fuel, the women were able to stay flying until 3:47 AM when they were almost totally out of fuel. The official time was forty-

two hours, three and one-half minutes and they had refuelled three and one-half times. They set a world record.

For the next few months, Bobbi won several air races, including the Women's Air Race at the official opening of United Airport, now named Burbank Airport, May 1930. She also agreed to go for another refuelling endurance record with Edna May Cooper.

After one failed attempt on January 1, 1931, Bobbi and Edna May took off from Mines Field again on January 4th, hoping to stay up for at least a month. Once they were aloft long enough to break Bobbi's first record, there was airplanes flying all around them cheering them on. Bobbi celebrated her twenty-fifth birthday two days later by eating a chocolate birthday cake (minus the candles) sent up by a good friend. Day three brought on bad weather and they relocated to Imperial Valley Airport, about two hundred miles away.

Later that day, they returned to Mines Field when the weather cleared. On January 9, with Bobbi at the controls, trouble struck again. The engine started coughing and spewing out oil. With great effort, the plane was kept airborne for several more hours but it was only a matter of time until they would be forced to land. As night came on, they were forced to land but they had set a new women's refuelling record. They had officially been airborne for 122 hours, 50 minutes; covered 7,370 miles at an average speed of sixty miles per hour; taken on 1,138 gallons of fuel and 34 gallons of oil; and received food and supplies during 22 contacts with the refuelling ship.

### Women's Air Reserve and Beyond

Bobbie continued to be very active in aviation. She joined with Pancho Barnes to form the Women's Air Reserve, W.A.R., whose principle purpose was to aid in disasters, where it was impossible to reach people in need of medical attention, except by plane. They had uniforms and trained in first aid, navigation and military manoeuvres. W.A.R. consisted mostly of doctors, nurses, pilots and parachutists who could go directly to the scene of a disaster by air and help.

Bobbi continues to have an active and full life. In 1976 she was awarded the OX5 Pioneer Woman of the Year Award and in 1984 she was inducted into the OX5 Aviation Pioneers Hall of Fame. She is a director of Aviation Archives, a California non-profit corporation, to preserve aviation history. Lt. Col. Eileen Collins took Bobbi's international pilot license (endorsed by Orville Wright) into space when Eileen became the first woman to pilot the shuttle.



## Roscoe Turner



Born Corinth MS, Sept 1895. Died June 23, 1970. Applied for Air Service in World War I, but was rejected because of his lack of a college education, so enlisted as an ambulance driver in May 1917. Then in October he applied for transfer to the Air Service and was that time accepted for flight training in balloons and aircraft, being honourably discharged in 1919 as a 1st Lieutenant. He bought a surplus Standard H-1 and joined the cadre of post-war barnstormers, developing his image of sartorial splendour by designing the special uniform that would become his trademark costume. His flashing smile and easy personality, the eye-catching uniforms, his penchant for self publicity, his sleek aircraft and major sponsors all went toward the creation of a popular image.



However, in the Turner's case, it was not all smoke and mirrors—he lived up to the image. After a few years of movie flying and airline operations—while with Nevada Airlines in 1929 he also became a Colonel in the Nevada National Guard... hence his adopted title#151;Turner began making a mark in the world of air racing that was never equalled by any other flyer in that colourful early era. Among his many accomplishments were numerous transcontinental records, both west-east and east-west, and local dashes.



In 1933 he won the Shell Speed Races and the famous Bendix Trophy. He was also first to cross the finish line in the Closed-Course Thompson Trophy Race, but was technically disqualified for a pylon infraction. In 1934 he won the Thompson, was second in the Shell Race, and finished second in the Speed Division of the MacRobertson International Air Race from London to Melbourne. In 1935 he came in only 23.5 seconds behind the winner in the Bendix Race, and led the Thompson until the last half lap when his engine overheated. In 1938 he placed second in the Golden Gate Trophy Race, and won the Thompson Trophy for the second time.

At the close of the 1939 National Air Races, at which he had won the Thompson Trophy for a third time, he announced his retirement from active competition to found a flying school at Indianapolis IN. During WW2 he was responsible for training 3,300 military pilots. As America's premier speed flyer, Turner was multiple winner of the Harmon and Henderson Trophies, and received a special Distinguished Flying Cross from Congress in 1952 for his contributions to aviation.

The Corinth municipal airport was renamed in his honour in 1961. Beyond his valuable contributions to the sport or racing and advancement of aviation technology, Colonel Roscoe Turner was a legendary personification of a golden era in aviation history.

### Polly Vacher M.B.E. - Aviatrix



Polly Mary Anne Vacher was born in Oxfordshire in 1944. A gifted musician, she qualified as a physiotherapist and worked in the field until 1968. She subsequently worked as a music teacher and became involved in fund raising for the disabled.

Her search for challenges led her to attempt a tandem skydive to raise money at the age of 45. 245 jumps later she was hooked on air sports and obtained her private pilots license in 1994.

She moved with her husband shortly afterwards to Australia. There she promptly flew him around the circumference of Australia, up the middle to Ayres Rock and Alice Springs and back across the Simpson Desert. For a newly qualified pilot this was an extraordinary feat. They landed on dirt strips in the real outback, and on an island in the middle of the crocodile-infested Gulf of Carpenteria.



In 1997 she flew solo in a single engine Piper Dakota across the North Atlantic. Meeting her husband in America, they flew together around the periphery of the United States and Canada. She then flew back across the Atlantic solo, losing the lighting on her primary instruments half way.

In 2001 she flew solo around the World in the same Piper Dakota. This included a sixteen hour crossing from Hawaii to California. Her flights raised money for disabled flying scholarships.

She was awarded the MBE for her efforts.

Polly recently attempted to be the first person to solo circumnavigate the World pole to pole. Flying her Piper Dakota, she almost made it, but was forced back from the South Pole by bad weather. She was again raising money for the charity **'Flying Scholarships for the Disabled'**.

She is married with three grown up sons.



Jules Védrines (1881-1919)



Jules Védrines, Chicago 1912

The People of Limoux, France, couldn't believe it. In March 1912, just one week before they were going to elect a deputy, a new candidate suddenly dropped from the sky: an aviator named Jules Vedrines. A native of Saint-Denis who received his pilot's license in 1910,

1911 was marked by numerous air races, which were organised by newspapers. They were generally long-distance, and as much a test of pilot stamina and navigational skills as of the airworthiness of their aeroplanes. Great numbers of competitors as well as spectators were attracted, and some truly impressive performances were witnessed. French pilots, being the most experienced in Europe, tended to take most of the honours.

The first such event to be organised was the Paris - Madrid Air Race. It's beginning was not auspicious, however.

Among those watching the start at Issy-les- Moulineux on 21 May 1911 was the French Minister of War, M.Berteaux. He stepped in front of an aircraft and was killed. The rest of the competition was put off to the following day.

The only pilot to succeed in completing the course, which included a flight over or around the Pyrennes, was Jules Védrines in his Morane-Borel.

He had decided to run for deputy so that the world of aviation would have a voice in Parliament. In the end, he lost by a few hundred votes to a well-known local industrialist, but Vedrines kept of flying.

In late 1913, three French teams attempted the route from Istanbul-Cairo . They all reached Istanbul within days of each other and were received with great honour. The first was Pierre Daucourt, who

died a few days later when strong winds blew his plane into the mountains in the treacherous Taurus range in eastern Turkey.

Jules Védrines succeeded in conquering the 11,500-foot Taurus peaks, and went on to become the first pilot to land in Palestine, when he touched down in Jaffa on December 27, 1913.



Anxious to advance to the greater prize in Cairo, he rushed off with apologies for not visiting Jerusalem. (Védrines eventually went on to become an ace in the First World War, but died attempting a forced landing on a Paris-Rome flight in 1919.)

On his tail were Marc Bonnier and Joseph Barnier in a Nieuport monoplane. Learning that Védrines had already beat them to Cairo, the pair decided to set their own mark in history by being the first to fly to Jerusalem. They landed on the plateau of what is today the Talpiot promenade.



In 1913, he flew from Paris to Cario in 10 stages. During World War I, he was charged with special missions, and in 1919 he again demonstrated his prowess by landing on the roof of the Galeries Lafayette department store. Three months later, on April 21, 1919, he crashed during a Paris-Rome flight.

# Gabriel Voisin



first flight of Voisin

Gabriel Voisin's real passion was flying. In the First World War Voisin wrote his name into French aviation history with his aeroplanes, and like so many of his contemporary flyers, the aviator from Issy-les-Moulineaux subsequently discovered the pull of the motor car. And even the road machines of Gabriel Voisin displayed a tendency for high flying...



Born in Belleville on the Saone, February 5, 1880, in the Lyons area, Gabriel Voisin was a direct descendent of a line of industrialists. His brother Charles, born in 1882, was to be his best friend.

By the end of the nineteenth century, Gabriel and Charles had already invented a wide range of items, including a rifle, a sailplane, and a car.

In 1900, Gabriel was engaged as draughtsman with the World Fair of Paris, where he met Clément Ader. This reinforceded his passion for aeronautics. Between 1901 and 1902, Gabriel, returned to the Lyons area, and carried out with Charles the study of aeronautics. In 1906, they created the first aviation firm in the world: LES FRÈRES VOISIN. In 1909. he became the youngest person ever to be awarded the Legion d'Honneur.

His brother Charles was killed in a car accident in 1912. He continued developing and building aircraft until the end of the First World War (It was a Voisin aircraft that was the first to shoot down a German.) when he phased himself out of aviation and turned to the design and manufacture of motor cars.



The Voisin Aerodyne

Voisin had a tendency to apply the knowledge of lightweight construction and aerodynamics he had learnt from aviation logically to road vehicles. And as he was a passionate tinkerer, who never considered any product - not even his own - good enough, he was constantly striving to improve it. It is said the he even felt that the French language was in need of improvement, and that gradually he began to evolve his own version which had to be spoken in the factory! Every production series which Voisin started in the 20-year phase of his motor car construction era thus ran for just a short time, in some cases only for a few months. This meant that he was never able to make a profit, quite apart from the high pressure of a rapidly strengthening competitor base in the guise of Peugeot, Renault and Citroen. The writer had the good fortune to own a 1929 Voisin car which was able to hold its own against the 'modern' cars of the mid 1960s.



A stylized bird with erect wings adorned every Voisin radiator grille.

In January 1958, Gabriel Voisin was installed as a "Grand Officier" of the Legion d'Honneur. Only few days later, a painting order was issued in the name of the creditor company SNECMA, to overpaint the facade of the Voisin factory in Issy and thus erase the name of the founder and owner. Gabriel Voisin took this insult with humour, at least as recorded in his memoirs. "In moments of great sadness, the dividing line between sadness and comedy is a very fine one", he wrote. "That was the case on my departure from Issy. For I had scarcely cleared my studio and taken one more look at the charter from the Legion, which had been so ceremoniously handed to me shortly previously, when another government delegation turned up. Another honour...?"

Far from it. The gentlemen handed Monsieur Voisin, who had already moved out, the indictment of the French public prosecutor: during the occupation of France, he had allegedly acted against state

security interests. Voisin did not know whether it was the summons itself, served thirteen years after the end of the war, which should give him reason to laugh, or the fact that the bearers of the indictment gave him a military salute as a Grand Officier of the Legion d'Honneur.

Gabriel Voisin was not convicted, but he had become a lonely man. He had been able to take only one of his thousand motor cars to the modest country property where an old lady friend gave him accommodation. He worked there until the end of his days on new inventions, from kite-like flying machines to banal domestic appliances. "I invented the streamlined car", he once said to an American admirer, to whom he gave one of the last interviews, "but I am still working at perfecting the corkscrew...".

## Jimmie and Walter Wedell



Trophy presentation to James Wedell and Mary Haizlip in New Orleans. L to R: James Doolittle, Mary Haizlip, James Wedell

## **Jimmie and Walter Wedell**

Jimmie Wedell was born in Texas City, Texas, in 1900. His mother died when he was only an infant, and he was raised by his father, who tried to make ends meet as a bartender. This often left Jimmie in charge of both the home and his younger brother, Walter. A resourceful young man, Jimmie demonstrated his mechanical aptitude at an early age. He quit school after the ninth grade and soon transformed four bicycle wheels, a one-cylinder Yale motorcycle engine, and various parts into an automobile. This hobby turned into a means for Jimmie to pursue his greater passion, aviation.

A motorcycle accident that blinded his right eye barely slowed him down. Prior to World War I, he rebuilt two crashed airplanes, an OX Standard and a Thomas Morse Scout, into one flyable craft, although he had never flown in one. Soon thereafter he met a barnstormer who gave him a one-hour lesson. The rest, including how to take off and land, he learned by trial and error. He then engaged in barnstorming for his livelihood.

With this self-taught knowledge of flight, Wedell tried to join the army as an aviator during World War I. Much to his disappointment, he was rejected because of his eye. While Walter began a four-year

hitch in the navy, Jimmie, with his Colt .44 for protection, headed for the Texas-Mexico border where he ran guns and transported rumrunners. After the war, Walter joined Jimmie in this endeavour. As time passed and technology improved, the Wedell brothers' planes proved no match against the newer United States government planes now patrolling the border. Jimmie managed to circumvent this situation temporarily by flying exclusively at night. Eventually, however, the idea to build his own, faster plane dawned on him.

### Wedell-Williams Air Service

In 1929, Jimmie Wedell and Harry Williams formed the Wedell-Williams Air Service. A landing field was cleared on Calumet Plantation, land that had been part of the Williams sugar fields near Patterson. Eventually, the air service expanded until Patterson was home base for a flight school, aerial photography, amphibian service, and aerial transportation. Harry Williams continued to develop the airport through the 1930s, constructing an additional hangar, improving the field's drainage, and installing lights for night operations. At one point, Williams was the owner of the largest privately owned fleet of aircraft in the world, with forty-two planes.

Although remembered as shy and reserved, Jimmie had the flair of a showman. As an early company publicity stunt, he convinced Walter and his fiancée Henrietta to marry in the air in one of their Ryan cabin planes. Flower girls draped the plane with flowers before it left, and a New Orleans radio station broadcast the vows. Jimmie flew the plane and served as the best man.



Walter Wedell with Menefee Airways Plane

Wedell-Williams Air Service began with two routes originating in New Orleans: a weekly flight to St. Louis with stops in Jackson, Mississippi, and Memphis, as well as a daily run from Baton Rouge to Alexandria to Shreveport, and later, to Dallas–Fort Worth. The company also established an aviation school at Menefee Airport in Chalmette, with branches in Alexandria, Baton Rouge, Patterson, and Gulfport, Mississippi. Wedell-Williams was awarded a government contract for airmail service between New Orleans and Houston in 1934.



Wedell-Williams Staff with "44"

At the Patterson facility, a team of engineers and mechanics began to manufacture airplanes for both sport racing and mail use. In later years, Wedell-Williams would be remembered almost exclusively for its racing exploits. In reality, the service also owned many other types of aircraft, including a Ryan monoplane, Lincoln Page, Travel Air, Ryan B-7, Lockheed Sirius, and several Lockheed Vegas.

# The First Wedell-Williams Racers

In late 1929 Wedell-Williams began construction on its initial racing design. The first plane was a racer named the We-Will, derived from the first parts of the pair's last names. Completed in early 1930, the We-Will was powered by a Hisso engine left over from Jimmie's barnstorming days. The second model was basically built to meet mail plane specifications, since Harry Williams planned on bidding on the mail route service from New Orleans to Shreveport and Dallas.

Jimmie Wedell became famous for radically new designs that set speed records time and again. Among the first constructed at the Patterson plant was the We Will Jr., which Jimmie flew in the 1930 American Flying Derby as No. 17. The All-American Derby, a cross-country race featuring eighteen planes, left Detroit, Michigan, on July 21, 1930. From Detroit, the racers traveled a path to Buffalo; Cincinnati; Little Rock, Arkansas; Houston; San Angelo, Texas; Douglas, Arizona; Los Angeles; Ogden, Utah; Lincoln, Nebraska; and finally back to Detroit. The 5,541-mile trek lasted eleven days. After staying in contention for most of the race, Jimmie experienced engine trouble leaving Los Angeles and finished eighth, collecting \$1,600 in prize money.

A fierce competitor, Jimmie was bitterly disappointed by this finish. He returned to Patterson to prepare the racers for the Chicago National Air Races, August 23 to September 1, 1930. He brought three planes from Patterson to Chicago. The first was the We-Will Jr., piloted by Wedell. He managed no better than third in the 350-cubic-inch free-for-all. The second, a We-Will, had engine problems and never competed. The third plane was the We-Winc, piloted by Everett Williams (no relation to Harry), who finished second in the 800-cubic-inch free-for-all and in the 1000-cubic-inch free-for-all. All in all, 1930 was not a promising start for Wedell-Williams racing planes.



We-Will (sideview) at the New Orleans airstrip just outside of one of the hangars. 1930

# 1931 Racing

The airframe of the damaged We-Will was used as the starting point for a new design, which Jimmie hoped would be capable of winning the coveted Thompson Trophy. This was the first racer to bear the famous number "44." At the 1931 National Air Races, few people outside those pilots who had flown with him had heard of Jimmie Wedell. After his arrival in the "44," called the mystery ship of 1931, there was no doubt that Jimmie Wedell was a powerful force. So great was his debut that Roscoe Turner immediately ordered a Wedell-Williams plane. The "44" was designed as a pylon racer and was not yet tested for endurance flying, so Jimmie kept it out of the Bendix. Wedell finished second in the prestigious Thompson Trophy Race, claiming a \$5,850 prize.

Featuring eight to ten planes on the starting line, the Thompson Trophy Race was the grand finale of each year's National Air Races. Its purpose was to honor the fastest airplane that could be built. There were no restrictions. Any power of engine could be used, any number of engines, any number of pilots, and any weight.



Wedell-Williams "44"

Nearly one hundred planes took part in the celebration of the opening of the new \$200,000 Baton Rouge airport in June 1931. The newly outfitted We-Winc was the winner of the open free-for-all race for engines under 800 cubic inches, by an unheard-of margin of two miles. Jimmie won the event's main prize, the Alvin Callender Trophy, for his performance. In November 1931, Jimmie prepared to leave Los Angeles in an attempt to smash James Doolittle's transcontinental speed record. While waiting for bad weather to clear, Wedell heard of Captain Frank Hawks's pending attempt to break the Three Flags (Agua Caliente, Mexico, to Vancouver, Canada) record. Jimmie decided on an informal race with Hawks, just to "kill time." With this spontaneous trip, Jimmie set a new record of six hours, forty minutes, breaking the old one by one hour and eight minutes. The two men flew the same course, with Wedell starting in Mexico and Hawks in Canada. An over flight of Vancouver cost him fifty-five minutes, but Jimmie had not thought it was possible to arrive in less than six hours, so he kept on flying. Only the previous summer, Roscoe Turner had held this same record with a much slower time of nine hours and fourteen minutes. Hawks was overcome in his cockpit by carbon monoxide and unable to complete the trip.

The following week, convinced that he could make the transcontinental trip in less than ten hours and armed with messages of encouragement from such notables as Louisiana Governor Huey P. Long and Orleans Levee Board Chairman Abe Shushan, Jimmie left Los Angeles in an attempt to break Doolittle's record of eleven hours and sixteen minutes. However, the flight was cut short after bad weather, including high headwinds, which slowed the plane to as little as ninety miles per hour, and snow over Colorado, ruined his chance for the record.

#### 1932 New Racers

1932 marked the beginning of the era of Wedell-Williams air-racing dominance. First up was the Three Capitals record, a flight from Ottawa to Mexico City through Washington, D.C. Jimmie left Ottawa on March 23, 1932, and landed in Mexico City eleven hours and fifty-four minutes later, breaking James Doolittle's record by thirty minutes. Wedell claimed that his time would have been considerably better if not for strong headwinds.

Next was the 2,041-mile Bendix, which began the National Air Races and followed a route from Los Angeles to Cleveland. Jimmie flew the 1932 version of the "44," Miss Patterson. Jim Haizlip was contracted to fly the "92," Miss New Orleans, as well as another "44." Roscoe Turner flew his "44," known as the Gilmore or by its race number, 121. On August 29, 1932, Jim Haizlip won the Bendix with a time of eight hours and nineteen minutes and continued to New York to break Jimmy Doolittle's transcontinental record by fifty-seven minutes, with a time of ten hours and nineteen minutes. After leading for a large portion of the race, Jimmie Wedell came in second and Roscoe Turner placed third, a 1-2-3 victory for the Wedell-Williams Air Service. After the long flight, Jim Haizlip remarked, "It's nice to be with people again. It was awful lonesome over the canyons."



Pilots gathered before the start of the 1932 Bendix Race. Second from left, Jimmie Wedell; centre, Roscoe Turner.

Test flights on the newly improved "44" took place during the weeks leading up to the 1932 Thompson Trophy Race. The plane's original 300-horsepower engine was supercharged to produce more than 525 horsepower. One test flight on the ninety-mile flight from Patterson to New Orleans took only seventeen minutes, an average of 324 miles per hour. All three Wedell-Williams racers were also entered in the Thompson Trophy Race. Jimmy Doolittle dominated, flying the Gee-Bee 7-11. He lapped the entire field, except for Wedell. Jimmie took second, Roscoe Turner third, and Jim Haizlip fourth, this time a 2-3-4 Wedell-Williams finish. This was the final air race for Doolittle. After flying the dangerous and highly unstable Gee-Bee, Doolittle decided that he was lucky to be alive and put his racing days behind him.

Upon returning to Patterson after their remarkable showing at the 1932 races, Jimmie Wedell and Jim Haizlip roared down Main Street in Patterson, side by side, at 300 feet and 280 miles per hour. Jimmie proceeded with the "44" to the first annual New England Air Pageant, which dedicated the Rhode Island State Airport. He easily won all three events that he entered.

#### 1933 World Speed Record

Fresh off his successes at the 1932 National Air Races, Jimmie flew Miss Patterson to Florida for some additional competition. After demolishing the other contestants in his first two races, the "44" was ruled too powerful for further races. So much did he enjoy the thrill of the chase that Jimmie borrowed a Warner monocoupe from a friend and proceeded to win three more races without Miss Patterson.

In 1933 Jimmie began testing a new design, the "45." Mechanical difficulties forced him to leave the plane in Patterson for the 1933 New York to Los Angeles National Air Races, so its Pratt and Whitney Wasp 985 engine was mounted on the "44." Jimmie finished second in the Bendix, beaten by Roscoe Turner, who flew his Wedell-Williams with the more powerful Hornet engine. Roscoe and Jimmie were the only two contestants even to finish the race. The "92," flown by famous racer Lee Gelbach,

was forced down with mechanical difficulties near Indianapolis. The Thompson Trophy Race resulted in another 1-2-3 Wedell-Williams victory with Roscoe again in first place. Roscoe was later disqualified for cutting a pylon, and the 1933 Thompson Trophy was awarded to Jimmie Wedell, with Lee Gelbach second in the "92."



Jimmie Wedell standing in the cockpit of the "44" at the Landspeed Race 1933. You can see the other planes lines up down the field.

In addition to the overall world speed record, he broke records flying between New Orleans and several cities while transporting Times-Picayune photographs of Tulane University football games. After the Georgia game in 1931, Jimmie flew from Atlanta to New Orleans in one hour and fifty-seven minutes. After the Georgia Tech game in 1933 he flew through two thunderstorms and still managed to return from Atlanta in 1 hour and 41 minutes, improving his own record. Showing a more serious side, Wedell gained a reputation as a "mercy flier" after he conducted several aerial searches for persons lost in the swamps and on lakes. He made national news when he flew through fog and heavy crosswinds to rush a West Columbia, Texas, baby, Sue Trammel, to Baltimore's Johns Hopkins Hospital for a brain operation.

So impressive and overwhelming was Wedell's success to this point, that other racers actually avoided races in which they knew Jimmie would be flying. At the 1933 National Air Pageant, a charity event held at Roosevelt Field in New York, only one other flier even entered the measured course speed trial event against Jimmie.

## **Death of Jimmie Wedell**

On June 24, 1934, aviation suffered a crushing blow when Jimmie Wedell died in a plane crash. At the time of his death, Wedell was recognized as the speed king of the world, aviation's most successful designer of racing planes, and the holder of more records than any other flyer. Syndicated columnist Will Rogers added, "Who knows but what aviation might not be permanently set back 100 miles an hour through the loss of this fellow, with the knowledge that was buried with him?" History has incorrectly blamed the accident on a student pilot, Frank Seeringer, of Mobile, Alabama, who supposedly froze at the controls of the DeHavilland Gypsy Moth. It appears that Jimmie was at the controls when the crash occurred in Patterson, probably due to structural failure. Jimmie was buried in West Columbia, Texas, following services held in New Orleans.



Plane Crash of Jimmie Wedell



Claude Grahame-White 1879 1959



Claude Grahame-White, c.1912

Claude Grahame-White, born at Southampton on 31 August 1879 and educated at Bedford Grammar School had been a yachtsman, a motoring enthusiast, and a dealer in automobiles before he was converted to aviation at the Reims meeting in 1909.

Forthwith, he had ordered a duplicate of Blériot's ill-fated Model XII; and to become acquainted with its construction he enrolled as a worker in the Blériot establishment at Neuilly-sur-Seine.

He could hardly restrain his impatience. On the morning he was to take delivery at Issy-les-Moulineaux, instructions had not yet arrived. Impulsively he got into the machine and began practicing short hops. He then shipped the plane to Pau, where Leblanc was his instructor; and on 4 January 1910 he received the first French license --- No. 30 --- to be awarded to a Briton. (Under date of 26 April he would be granted British license No. 6 for having qualified as a pilot a Pau.)

The Model XII, however, had only a brief career. A miscalculation on landing one day, with Blériot himself at the controls, resulted in the two-seated monoplane being wrecked; it was the last of its kind. Grahame-White returned to London and began the development of a great flying centre at Hendon, on what was then a vacant, weed-covered lot.

At the same time he entered the Henry Farman school at Chalons, learning to fly the biplane with which he would become famous for a dramatic dash in the dark of the night, racing Louis Paulhan for a 10,000 pound prize offered by the Daily Mail. The course from London to Manchester --- a distance of 183 miles --- had to be covered within 24 hours.

Grahame White was one of the first Britons to exploit aviation commercially after achieving heroic status for narrowly losing the £10,000 prize the Daily Mail offered for the first London to Manchester flight to a Frenchman! He went on to scoop almost all the prizes on a tour of America which included a flight into the White House grounds where he invited President Taft up for a flight. As Taft weighed 21 stone it is probably as well that he declined!

By now White had made a fortune and he invested it wisely in 220 acres of pasture at Hendon, turning it into London's first aerodrome. For 3 years up to the outbreak of WW1 the weekend flying displays there were the greatest attraction in London and the aircraft he designed, which were boxkite affairs not unlike Farmans and Bristol Boxkites, formed the backbone of his Flying School.



CW 'Boxkite' Variant, c.1911



GW XV development, 1913

They were also used for the first demonstration of aerial bombing, strafing and pioneering night flying. On the outbreak of WWI he joined the Royal Naval Air Service and took part in attacks on German held ports before resigning to manage his business, whose staff had increased from 20 to 1000 due to war contracts.

The company built a number of aircraft under licence (Air-Co DH 6, Morane Saulnier G/H) plus a number of aircraft of their own design, including the **Type XV** pilot trainers, as the boxkites were now designated, despite being very different to the original machines of 1912.

The XV trainers were the type used by 48 Reserve Sqn at Waddington from November 1916 to June 1917, as they were established for 18 machines, and A1700 was definitely on their charge. Along with Farman Shorthorns they were the first aircraft based here.

Judging by the lack of information they were not particularly charismatic aircraft but they were made in a variety of forms from 1912 - 17, undergoing a gradual evolution, losing the front elevator and having a cockpit nacelle, aileron balance cables, top wing extensions and dual controls fitted.



GW XV, c.1916

60hp Le Rhone, 70 & 80hp Gnome and 60hp Green engines were among those used to power this machine so there appears to have been a huge variation of types built under the general umbrella name of GW XV! At present we do not know the exact type used at Waddington. It is possible, but unlikely that other GW types were also used here.

We do know that White was out of favour by the end of the war and was forced to go to France looking for contracts. Eventually he became so disillusioned by Britain that he sold Hendon to the Air Ministry and emigrated to California where he was a realtor. In 1959 he died in Nice on his 80th birthday. Hendon is now the main site of the RAF Museum so perhaps it is not surprising that they were the only people able to provide us with some information on his aircraft.



Henri Farman HF.22



## Steve Whittman



## Early Races...

Steve's first air race was in Milwaukee, Wisconsin in 1926. Steve placed second, piloting a Standard J-1. In 1928, Steve piloted a Pheasant H-10 biplane in a cross-country air race from New York to Los Angeles, placing 12th. out of 38 starters. Steve then placed 4th. in a cross-country race from Los Angeles to Cincinnati. Steve flew in numerous other cross country and pylon races in the Pheasant.

Steve's first race plane was constructed in 1931 and made its debut at the National Air Races in Cleveland that year. It was initially powered by an American Cirrus engine. Each winter Steve would rebuild the 'Chief', and over the years the refinements added significantly greater performance.



'Chief Oshkosh' Nicholas Beazley 'Pobjoy Special'

Steve bought this raceplane in 1933 and subsequently modified it, improving its speed. He raced it at various events in 1933-34.

# Bonzo

In 1934, Steve decided to go for the 'big time' and build a race plane capable of winning the Thompson Trophy race [the Indianapolis 500 of air racing]. Engine choice dictated the design configuration - instead of opting for a high-horsepower radial engine, Steve chose an inline Curtiss D-12 motor, the same type engine used in the Curtiss Schneider-Trophy winning race planes of the mid 1920's. Steve's design philosophy emphasised light weight over exotic streamlining, and 'Bonzo' took this approach to its extreme, being dubbed the 'flying barn door' by the press due to its angular appearance. Nonetheless, 'Bonzo's excellent performance made Steve one of the top contenders for the Thompson Trophy. Steve's first race in 'Bonzo' was the 1935 Thompson Trophy race, in which he placed second behind Harold Neumann in 'Mr. Mulligan'.

For 1936, Steve rebuilt 'Bonzo', installing a new landing gear. Since the National Air Races were in Los Angeles that year, he had a long cross-country flight to reach Los Angeles. After landing at Cheyenne, Wyoming, an engine backfire caused 'Bonzo' to catch on fire; luckily the fire was extinguished before 'Bonzo' was completely destroyed. But the damage was too great to be repaired for any further racing that year.



Steve also rebuilt 'Chief Oshkosh', installing a 4-cylinder Menasco engine. At the 1936 National Air Races in Los Angeles, the 'Chief' sheared a prop flange, forcing Steve to an emergency landing. The 'Chief' was damaged but was quickly rebuilt and participated in the Detroit air races later that year.

After the dismal results of the 1936 season, Steve rebuilt both 'Chief Oshkosh' and 'Bonzo'...and 1937 turned out to be Steve's most successful year. Piloting 'Chief Oshkosh', Steve placed 2nd. in the Greve Trophy Race and could possibly have won had the race gone the full number of laps. Steve in 'Bonzo' was the fastest qualifier for the Thompson Trophy race, and he led for the first 18 laps of the 20 lap race, at an average speed of over 275 Mph. With a huge lead and the race seemingly in the bag, suddenly the engine began to run rough, and Steve was forced to throttle back to remain in the race, finishing in 5th. place.

At the Oakland, California races in 1938, Steve blew the engine in 'Chief Oshkosh', and made a forced landing into a marsh, flipping over. This was the end of 'Chief Oshkosh' in its pre-war configuration. He participated with 'Bonzo' in the weekend feature race but dropped out on the sixth lap. At the 1938 National Air Races, Steve placed 3rd. in the Thompson Trophy race in 'Bonzo', and in 1939 (the final pre-WW2 Thompson) Steve placed 5th. after cutting a pylon at the race start. In it's final configuration, 'Bonzo' was capable of a level speed of 325 Mph. on only 475 horsepower, faster than the top-of-the-line US military aircraft then in service. 'Bonzo' is now displayed in the EAA Air Adventure Museum in Oshkosh, Wisconsin.



After World War Two, air racing resumed again, but using modified fighter planes rather than custombuilt race planes. Steve obtained a surplus Bell P-63 fighter and converted it to air racing, clipping the wing tips. Steve placed 8th. in the 1946 Thompson Trophy race with this aircraft.

### Buster

The escalating costs of all-out custom designed race planes in the late 1930's encouraged the development of a 'specification' or limited air racing class. But it wasn't until after World War Two that this class got going...and Steve Wittman played a major role. He took the fuselage of 'Chief Oshkosh', built new wings and installed a Continental C-85 engine, and renamed the craft 'Buster'. The rules for this racing class did not at that time require a minimum pilot weight, so Wittman selected Bill Brennand to fly 'Buster' in the inaugural Goodyear class race at the 1947 National Air Races. Bill Brennand and 'Buster' won. 'Buster' went on to many more Goodyear/Continental Trophy races, and was retired after the 1954 Danville, NY air races. It is now on display at the National Air & Space Museum in Washington, DC.

## "Little" Bonzo

Upon returning home from the 1947 National Air Races, Steve immediately began construction of a new race plane for the Goodyear class, which he named 'Bonzo'. (Steve's reuse of the name has been a source of continued confusion to aviation historians ever since!) The new 'Bonzo' made its debut at the 1948 National Air Races, finishing 3rd. with Steve at the controls. Thereafter, Steve raced 'Bonzo' at many, many Goodyear/Continental/190 cu. in. class/Formula One air races through the 1950's and 1960's, including the first few Reno National Championship air races, before retiring from Formula One competition in 1973.

In 1980, Steve modified 'Bonzo' with smaller wheels and wheel pants to participate in the Lowers-Baker-Falck cross-country air races, winning the first race and placing in several subsequent events. During the 1984 L-B-F race, Steve had a forced landing in a farm field, flipping over. Damage to 'Bonzo' necessitated a rebuild. Steve last flew 'Bonzo' at the 1994 EAA Convention at Oshkosh, and then donated 'Bonzo' to the EAA. It is now displayed next to Steve's pre-war 'Bonzo' in the EAA Air Adventure Museum.

#### Witt's V

In the mid-1960's, a new 'specification' air racing class was proposed, which was later named Formula V. Steve was an early proponent of this class; he designed and built his last race plane "Witt's V' for this class. Due to the scarcity of race planes, Steve flew demonstrations with his Witt's V during the early 1970's while other race planes were being built. In 1977, the first 'official' Formula V race was held, at Sturgis Kentucky. Steve won this race, and was the first National Champion of Formula V. Steve was unbeatable in early Formula V races, winning every one through the 1981 Cincinnati races.

In 1989, at age 85 Steve came out of retirement to race one more time at the Daytona Skyfest Formula V races. Steve won the initial race heat and placed third in the Championship race, his final closed-course pylon race. 'Witt's V' is now displayed at the Wittman Hangar on Pioneer Airfield at the EAA Air Adventure Museum. He died with his wife in an accident when fabric on his Whittman 'Tailwind' detached in flight.

## Sir George Hubert Wilkins



Wilkins as a young cinematographer. For 50 years he would carry a movie camera on his adventures

George Hubert Wilkins was born on 31 October 1888 at Mount Bryan, South Australia, 100 miles north of Adelaide. He was the youngest of 13 children. His upbringing, on the lonely farm at the edge of the Australian outback where he witnessed devastating droughts, was a motivation for his life's work. In 1903 his parents moved to Adelaide and Wilkins enrolled in the University but never completed his courses. He became interested in cinematography and moved to Sydney where he worked in Australia's pioneer film industry. He then left for England to work as a newsreel cinematographer for Gaumont.



Wilkins with his camera aboard the expedition ship Karluk. In the Arctic he developed his revolutionary ideas for polar travel.

After moving to London in 1909 Wilkins worked as a Gaumont cinematographer covering many international events including the Balkans War in 1912. But he still wanted to become a polar explorer. He was offered his first trip to the Arctic as cinematographer with the Canadian Arctic Expedition of 1913 led by Vilhjamur Stefansson. He walked thousands of miles over unexplored territory, learnt to live off the polar ice and developed his revolutionary ideas for polar travel. In 1916 he returned to Point Barrow, Alaska, to learn the world had been at war for two years.



Wilkins in World War One. Unarmed he led troops into battle and became the only official Australian photographer in any war to receive a combat decoration.

When he learnt about the war, Wilkins went to France where he was appointed an official photographer with the Australian War Records Office. From November 1917 until the end of the War Wilkins was responsible for Australia's photographic record of fighting at the Western Front. He constantly risked his life working forward of the front line and refused to carry firearms. He became the only Australian official photographer, in any war, to receive a combat decoration. He was awarded

the Military Cross twice. At the end of the war he travelled to Turkey to make a photographic record of the battlefields of Gallipoli.

When he returned to England from Gallipoli, Wilkins learnt that the Australian government had offered 10,000 pounds for the first All-Australian crew to fly an aeroplane from England to Australia. The Blackburn Aircraft Company, which had developed a long range bomber during the war, had entered one of their planes. Wilkins was appointed navigator



Wilkins replaced the Australian aviator Charles Kingsford Smith in the England Australia Air Race, but the Blackburn Kangaroo plane crashed with mechanical problems in Crete.

With the other members of the crew, the Blackburn Kangaroo left England on 21 November 1919. Problems were experienced with the engines and the plane was forced down over France. Repairs were made and the flight continued, but eventually, still with engine problems, the plane crashed landed in Crete.

After the Air Race Wilkins returned to England determined to continue polar exploration. He joined Dr John Cope on the Imperial Antarctic Expedition. It was Wilkins first trip to the Antarctic, but the expedition lacked funds and achieved little. Next Wilkins was appointed Naturalist on what was to become Sir Ernest Shackleton's last expedition to the Antarctic. This expedition left London on the Quest, a ship that had been hastily prepared and continually gave trouble. As it was being repaired in South America, Wilkins went on ahead to South Georgia Island to photograph the flora and fauna. When the Quest arrived six weeks later Wilkins learned that Sir Ernest Shackleton had died on the voyage.

Wilkins work as Naturalist on the Shackleton expedition so impressed the British Museum of Natural History that they offered him an expedition of his own. The Museum wanted to collect flora and fauna specimens from outback Australia and the islands of Torres Strait. This became the Wilkins Australia and Islands Expedition and for two years Wilkins travelled to remote areas of Queensland, Northern Territory and the Torres Strait filming, photographing and collecting specimens for the Museum. At the end of the two years he wrote to the Museum saying he wanted to continue his work in the polar regions.



Wilkins planned to fly over the unexplored areas north of Alaska. He first purchased two Fokker aircraft but found them too large for landing on ice. He sold one to Charles Kingsford Smith who renamed it the Southern Cross and it became the first plane to fly the Pacific Ocean. Wilkins bought a Lockheed Vega. With pilot Carl Ben Eielson he flew across the Arctic Sea, from Barrow in Alaska to Spitsbergen, Norway. It was the first time such a plane flight had been made and the two men became international celebrities. Wilkins was knighted and chose to be known as Sir Hubert, rather than Sir George.



Wilkins was the first person to fly a plane in Antarctica. Unable to find runways long enough he was beaten in the race to be the first to fly to the South Pole.
With the same Vega they had flown over the top of the world Wilkins and Eielson now travelled south to explore Antarctica. They arrived at Deception Island on the Graham Land Peninsula in November 1928. Their flights exploring the Graham Land Peninsula were the first time anyone had flown a plane in Antarctica. Wilkins had planned, if possible, to fly to the South Pole, but on Deception Island he was unable to find a runway long enough to get the Vega into the air with sufficient fuel to complete the distance. Nevertheless it was the first time in history undiscovered land was mapped from a plane.



Wilkins (left) aboard the Graf Zeppelin when it made the first round the world flight in 1929.

Returning to America after his pioneering flight in Antarctica, Wilkins was invited to be aboard the largest airship of the period, the Graf Zeppelin, as it attempted the first around the world flight. Wilkins agreed and joined the flight to make a film record. The Graf Zeppelin flew from Lakehurst, New York, across the Atlantic to Germany. From Germany it made the longest non-stop flight up until that time - from Germany, across Russia to Japan. From Japan it crossed the Pacific and America to return to New York. Six years later Wilkins would be aboard the airship Hindenburg as it made its maiden voyage from Germany to America.



Wilkins' Nautilus submarine in the Arctic in 1931. His pioneering submarine expedition under the Arctic ice was 25 years ahead of its time.

After a second season flying his Lockheed Vega in Antarctica Wilkins planned his most ambitious expedition. To take a submarine under the Arctic ice to the North Pole. Constant delays prevented the submarine getting away on time to reach the polar ice cap before winter and the submarine constantly broke down. Still determined to prove that submarine travel under the ice was possible, Wilkins continued north to the edge of the ice pack to discover his submarine had malfunctioned

again. Nevertheless, with his partly disabled submarine he was still able to sail under the ice to prove it could be achieved.

After his Arctic submarine expedition, which many people considered a failure because he did not reach the North Pole, Wilkins organised three expeditions to the Antarctic to assist American millionaire explorer, Lincoln Ellsworth become the first person to fly across the Antarctic continent. When Russian aviators went missing while flying from Russia to America via the North Pole, Wilkins was called in to head the search.



Wilkins Catalina Flying Boat during his search for missing Russian aviators in 1937

In 1938 he returned to Antarctic with Lincoln Ellsworth, again assisting in the discovery of new land. At the outbreak of World War Two Wilkins immediately offered his services to the Australian Government, but it had no need for a polar explorer, now aged over 50.

Wilkins next offered his service to the U.S. Army which retained him to teach Arctic survival skill to U.S. soldiers. After the war he remained as a consultant to the U.S. Army. The United States Navy were developing nuclear submarines for sub ice travel in the Arctic and consulted Wilkins on his pioneering 1931 expedition. Wilkins died on 30 November 1958 in a hotel room in Massachusetts. As a mark of respect the U.S. Navy took his ashes to the North Pole in the nuclear submarine Skate. On 17 March 1959 the Skate became the first submarine to surface at the Pole, where it held a memorial service and scattered the ashes of Sir Hubert Wilkins.

## Wright Brothers



Wilbur and Orville Wright were photographed by the French aviator Leon Bollée in May 1909. Their triumphs and travails were as much consequences of their approach to life as of their approach to the problems of flight.

By the first decade of the twentieth century, interest and work in the field of flight had reached a fever pitch. As highly publicized efforts by engineers and scientists to develop an airplane capable of carrying a person were underway in Europe and America, two brothers from Dayton, Ohio, were quietly, doggedly, and methodically teaching themselves everything there was to know about flying, and inventing all the rest as the need arose. What exactly drove the Wright brothers to embark on the odyssey that led them to Kitty Hawk is not at all clear, and even definitive biographies like Tom Crouch's The Bishop's Boys have trouble penetrating those two inscrutable minds. And that's just the way they would have wanted it.



This 1900 glider, in a wind from the left, was moored by a wire below and raised or lowered by a wire (not visible in the photo) that pulled the forward elevator up or down.

Wilbur was born in 1867, and Orville four years later the third and sixth of seven children born to Milton and Susan Koerner Wright. Milton was a minister in the United Brethren Church, an evangelical Protestant denomination, and the family moved frequently until Milton was named a bishop in the church and the family settled in Dayton, Ohio. In childhood and throughout their lives, Orville and Wilbur were constant companions (in 'Wilbur's words, the brothers "lived together, played together; worked together, and, in fact, thought together") and displayed many of the Yankee characteristics of their parents and forebears: an inner-directed Spartan strength and a clear-eyed, determined outlook on the world and on life. Neither brother finished high school. though they were both insatiable readers and tinkerers. The Wright brothers tried their hand at several enterprises, including publishing newspapers and running a printing shop, hut without success.



Wilbur's drawings of the 1899 Kite, the Wright brothers' first aeronautical experiment

In 1892, America was in the midst of a bicycle craze and the brothers established a bicycle shop in Dayton that proved financially successful. They manufactured some bicycles under their own brand name, including one they called the Flyer. During 1896, the Wrights read about the death of Otto Lilienthal and they became intensely interested in the question of flight. They collected all existing information on flight, writing to Octave Chanute and Samuel Langley at the Smithsonian, beginning an active correspondence with these men that was to last for years. Chanute (who regarded himself as a kind of international clearinghouse of information about flight) was particularly generous.

The Wrights designed a glider, strongly influenced by Chanute's design, and decided that their aircraft would not be as difficult to fly as Lilienthal's glider, but neither were they going to be passive passengers on a an inherently stable aircraft. They devised a method to control an aircraft in flight that involved twisting a Chanute design in a technique called "wing warping."



With a pilot (in this case, Oiville) warping the wing, the glider banked as expected, but would "slip" to the side and invariably crash sideways into the sand.

There are many stories about how the Wrights came upon wing warping, but the fact is that the technique was not new, and at least one American experimenter, E. F. Gallaudet, made use of it in kite tests near New Haven, Connecticut, in 1898. With their customary thoroughness, the Wrights also wrote to the U.S. Weather Bureau to find out the best place to test aircraft. On the basis of that information, they selected the Kill Devil Hills sand dunes outside Kitty Hawk, North Carolina, a fishing village on the Outer Banks, a thin peninsula that jutted out into the Atlantic and enjoyed strong and relatively constant winds.

In 1899, they tested a scale model of a glider in Dayton, and by the late summer of 1901 they were ready to test-fly their first full-size glider at Kitty Hawk. The trips to Kitty Hawk were arduous; a great deal of material had to be brought along, some in pieces that would be reassembled on site. The conditions were difficult and the pair's resolve and fortitude were tested to the limit by heat, mosquitoes, storms, cold gale-force winds, and isolation.



The solution was to place a double rudder in the rear so the glider would "bite" the wind when it banked into a turn, as it does here as Wilbur banks the glider in the 1902 tests. The pilot is still lying down in order to cut down wind resistance ("drag").

The locals liked the Wrights and the Wrights liked them, but the brothers' natural reticence caused some people to regard them as secretive—some believed that was why Kitty Hawk was chosen as a test site in the first place. But at this stage, the Wrights were not at all hesitant to share their findings with fellow researchers. In fact, in the midst of their experiments, Wilbur accepted an invitation from Chanute to report on his and his brother's experiments at a meeting of the Western Society of Engineers in Chicago, and many of the people Chanute kept bringing to Kitty Hawk to assist them were, the Wrights well knew, doing research of their own. The craft "flew" (it actually glided) well enough, but with thirty percent less lift than the Wrights had calculated.

They returned to Dayton and built a larger craft with a front horizontal rudder (called a "canard"), and returned to Kitty Hawk in July 1901 to test it. The performance was improved and the control bugs were worked out, but the Wrights were perplexed about why their calculations were still off. Their response to this was unique and would he reason enough to regard the Wrights as the first to fly. They constructed a wind tunnel in the rear of their bicycle shop and conducted precise tests of different wing sections. The tunnel was only six feet long by sixteen inches square, with a glass window in the top panel to allow observation. A steady fan driven by a small gas engine blew air through the box at a steady twenty-seven miles per hour ), and inside, balance and spring scales measured lift and pressure on a variety of airfoils. In these experiments, the Wrights raised aviation experimentation to the level of serious engineering (and were thus more firmly in the tradition of Cayley and Langley than anyone else had been for over a century).

These tests were made in November and December 1 901; they collectively represent one of the most important phases in the early history of flight. The Wrights discovered that much of the published data on airfoils was incorrect or had ignored important elements of an airfoil in flight. They arrived at a clear idea of how the centre of pressure moves about an airfoil in relation to the angle of attack and as a function of the camber. And they knew what the control surfaces would need to be able to do if the flight was to be controlled by the pilot. After testing two hundred different wing surfaces, the brothers used their newly gained information to design Glider Number 3. It was equipped with a forward elevator wing and a rear fixed double fin that was later made adjustable, with its controls connected to the wing-warping controls for the main biplane wing section.

They returned to Kitty Hawk in September and tested their new machine in more than one thousand glides. It not only performed well, it performed as predicted. It was only now that the Wrights felt they were on the verge of succeeding in creating a powered airplane. They filed for a patent in March 1903, and turned their attention to the last hurdle: turning their glider into a flier.

The decade from the December 1903 flight of the Flyer at Kitty Hawk to the outbreak of World War 1 in August 1914 was an extraordinarily busy one in the development of aviation. Looking at the aircraft being built in 1913 and comparing them to those built in 1904, it is difficult to believe that only a decade had passed. Airplanes like Louis Bechereau's Deperdussin Racer and Geoffrey de Havilland's B.S.1, both produced in 1913, were built with enclosed, metal fuselages that used "monocoque" design: instead of just the frame, the entire fuselage supported the plane's load. These planes are recognizable early versions of planes produced thirty and forty years later, while the spindly frames of the Wrights' airplanes and the early flying machines were by that time only relics.

The Wright brothers had clearly uncorked a torrent of industry and creativity that had simply been waiting for some indication that the prospect of flight was not hopeless. But if the Wrights were the spark that ignited the enterprise, there were other forces at work that drove it to a fever pitch. One was the giddy optimism that characterized the opening of the new century. True, the twentieth century's ambivalence about technology was born in its very first decade, but in the face of the many

advances from 1900 to 1914, it really began to look as if technology could and would make just about anything possible.

The Wrights played a large part in the forming of this attitude: the remoteness of their experiments gave fuel to the claims made by such prestigious publications as The New York Times and Scientific American that their flights were a hoax. One can imagine these publications being much more careful afterward in their scepticism about any scientific and technological claims.

Yet, there was the equally powerful sense that a war was coming, and that one result of the industrialization of Europe would be an improved ability to conduct armed conflict. What role aviation would play in the theatre of war was not clear even to the most visionary planner but there was no doubt that aircraft (both heavier and lighter than air) would be exploited by combatants to the fullest and that command of the sky could possibly be a decisive factor in any war. Military strategists who prepared for possible invasions across natural barriers such as the English Channel or the Alpine mountains had to rethink their defences in the light of aerial warfare of unknown effectiveness.

Behind all the hoopla of the races, the feats, the records, the stunts, the glamour and derring-do—all the romance of early aviation—were calculating minds fully aware (or aware enough to take anxious notice) of the military potential of flight. In the decade between Kitty Hawk and the outbreak of World War I, one can summarize the history of aviation very simply: while the Wrights and Curtiss were slugging each other senseless in court, the Europeans slowly took the lead in aviation. The Wrights won many of their court battles, but lost the war for supremacy in the air.

They enjoyed two crowning moments in the decade following Kitty Hawk: their exhibition in France and their test for the Army at Ft. Myer. But they allowed many opportunities to slip by: while Curtiss was winning prizes for aviation feats he was performing years after the Wrights had passed that level of technology, the brothers were too proud or secretive to claim any prize; while Curtiss was winning races that the Wrights could have won handily, the brothers would not consent to enter any contests; while Curtiss was gaining fame participating in aerial exhibitions and air shows, the Wrights regarded them as circuses unworthy of their talents; while Curtiss was forming productive and useful alliances with a wide range of people—from Bell and the Smithsonian to August Herring, Octave Chanute's old assistant to Henry Ford and his high-priced patent lawyers—the Wrights steadfastly rebuffed any offer of collegiality (including from Curtiss) and preferred to go it alone; while Curtiss developed new technology as quickly as it became available—he abandoned wing warping when it became clear ailerons were a superior means of lateral control; he developed wheeled undercarriages when they were shown to be preferable to skids; and he experimented with different engines and configurations



Wright wind tunnel

The Wrights never strayed far from the basic design configuration they inherited from Chanute; and while Curtiss developed the entire field of naval aviation, developing seaplanes that could consider attempting to cross the Atlantic Ocean, the Wrights entered the field belatedly and half-heartedly.

But for a moment, the Wrights were alone at the pinnacle of the mountain, and their country and the world paid them homage. Wilbur died of typhoid fever in 1912, but Orville lived until 1947. Orville was honoured late in his life for the contribution he and his brother had made to flight, but he certainly must have wondered what might have been had Wilbur lived. Publicly he blamed Curtiss and the Smithsonian for everything (even Wilbur's death), but Curtiss retired from active involvement in aviation in 1921 and turned to real estate speculation in Florida until his death after an appendectomy in 1930. So it was hardly the case that it was all Curtiss' fault. Typically, Orville never voiced any regrets for letting the dominion of flight slip through his fingers. Still, one wonders.

## Kill Devil Hill, December 17, 1903

After the Wright brothers' successful glides in the summer of 1902, it was time to add an engine and propellers to the machine. Typically, however, the Wrights did not simply add a power plant to their glider; they redesigned the entire machine and integrated the propulsion system in a technically well-designed machine. The added weight of an engine meant they could increase the camber (which would result in the centre of pressure behaving about the same as it did for the glider), and enlarge the wing to a forty-foot wingspan and a surface area of 510 square feet for the two wings combined.

The machine—which they called the Flyer I (only later was its name changed to the Kitty Hawk) retained the glider's front canard-design elevator and the movable rear rudder. The plan was to place the engine on the lower wing, next to the pilot who would, as was the case with the gliders, lie prone on the lower wing. The propellers would be "pusher" (meaning, pushing the machine from behind the wing, as opposed to "tractor," which means pulling the machine in front of the wing) and would turn in counter-directions. As they had done with the wings, the Wrights had tested and perfected the propellers in their wind tunnel and greatly improved their efficiency. Unlike the gliders, the Flyer could not be launched by leaping from a dune or by running down a hill; it would then be only a powered glide and not a real flight. They designed a launch mechanism that consisted of a single track on which ran a simple flat car that the aircraft was placed upon.

The car would be propelled by the aircraft's propellers, and when take-off speed was attained, the airplane would simply lift off. The Wrights calculated that they would need sixty feet of track (and that is what they brought). The Wrights had put off the question of the engine, hoping that the strides being made in the automotive industry would produce a light and powerful engine they could use. But no such engine was forthcoming and finally they attacked the problem head-on and designed their own engine with the help of their machinist, Charles Taylor. The engine just barely met their specifications, but they decided not to postpone testing it. They did not arrive at Kitty Hawk that year until September 26 and were not ready to test their machine until winter was already setting in.

It was too cold even for Chanute, who had waited patiently as long as he could. After many delays and repairs, on December 14 the Flyer seemed ready. The brothers, aware that they were about to make history, tossed a coin to see who would have the honour of the first flight. Wilbur won. On the first attempt, however, the elevator was set low and the craft ploughed into the sand at the end of the track, damaging the aircraft. After three days of frantic repairs and threatening weather, the Wrights were ready for a second try. They raised a flag signalling the crew of the lifesaving station that they were ready, and when a small group arrived, Orville took his turn on the lower wing. At 10:35 A.M. on December 17, before several witnesses from the weather station, the Flyer took off into a twenty-one-mile-per-hour (34kph) wind. Wilbur ran alongside the aircraft, keeping the right wing from dragging in the sand but being careful not to assist the plane down the track; they wanted this to be an unassisted take-off.

Sensing that they would be successful on this day, they had set up their cumbersome glass-plate camera and aimed it at the end of the track. They instructed one of the witnesses, John T. Daniels, to snap the shutter as the plane left the end of the track. Daniels took one of the most famous photographs in the history of aviation, possibly in the history of all of technology. It shows the Flyer lifting off with Orville aboard, and Wilbur off to the side having just run down the track alongside. The Flyer flew for twelve seconds and landed in the sand 120 feet away.



Wilbur is seen here aboard the Flyer (now outfitted with motor and propellers) as it dips and runs aground on takeoff during its first

test on December 14, 1903. The damaged elevator required three days to repair.



The brothers quickly placed the Flyer on the launching car for another flight. This time Wilbur piloted the craft and it flew almost two hundred feet before landing gently in the sand. In all, they conducted four flights, alternating as pilots, with the best flight the fourth: 852 feet in fifty-nine seconds. After the fourth flight, a gust of wind overturned the aircraft and damaged it beyond quick repair. The brothers knew they would be returning to Dayton. They ate a leisurely lunch, then went into Kitty Hawk, called a few friends to report on their success, and sent a telegram to their father: "Success four flights Thursday morning all against twenty one mile wind started from Level with engine power alone average speed through air thirty one miles longest 57 seconds inform Press home Christmas. (signed) Orville."

Contrary to legend, the reaction of the press to the historic flight was not a deafening silence. The Dayton Evening Herald reported the flight the next day on the front page, and the Virginian-Pilot was careful to point out in a sub-headline that no balloon had been attached to the aircraft. Garbled accounts appeared on the front page of the New York Herald, but there was little follow-up and many of the sporadic reports that appeared during the first two years after Kitty Hawk ridiculed the Wrights' claim by adding facetious exaggerations to the account. The first full, serious, and accurate account of the Wrights in flight appeared in the January 1, 1905, issue of Gleanings in Bee Culture, an apiary journal, written by the publisher, Amos I. Root. But the Wrights were not people to waste time. On their return to Dayton, they immediately set to work on the Flyer 2. incorporating all that they had learned in the Carolina dunes. It looked like the first machine, but had a smaller wing surface and a gentler camber. Most importantly, it had a more powerful engine.

The brothers rented a ninety-acre (36ha) farm outside of Dayton that became known as "Huffman Prairie" (after the owner) and tested their new machine there. On September 20, 1904, Wilbur flew the Flyer 2 in a complete circle and returned to his starting point and landed. This was the flight Root witnessed and described, and in the minds of some aviation historians, this flight and the others conducted at Huffman (and not the four Kitty Hawk flights) deserve to be considered the beginning of the age of flight. (Others point out, however, that these take-offs were not unassisted: to compensate for the lighter winds, the Wrights launched their aircraft at Huffman with a weight-and-derrick launcher.) The best flight of the season, four circles of the field, lasted over five minutes.

In the summer of 1905, the Wrights tested an even more improved machine, Flyer 3, as always, in full view of onlookers and inviting the press to important tests, which they rarely attended. The aircraft had an even smaller wing surface but the same camber as the 1903 machine. This time the machine flew beautifully, and many of the more than forty flights conducted were limited only by the amount of fuel the aircraft could carry. The plane could take off and land with minimal adjustment, and the elevator and rear rudder, pushed out farther from the wings, gave the pilot almost complete control of the aircraft in flight. The longest flight of that summer was over a half hour, and the aircraft could

circle and fly figure eights easily. This aircraft, the Flyer 3, is often referred to as the first practical aircraft in history.

In 1905, the brothers sensed trouble when their patent application of two years earlier was delayed. The U.S. War Department was unenthusiastic about their proposal to build airplanes for the Signal Corps, and they kept hearing rumours that competitors were copying their designs. The patent (for wing warping) was granted eventually in 1906, and the U.S. government eventually came around, but the challenge from rivals—one in particular: Glenn Curtiss—proved to be one hurdle too many.

## Chuck Yeager



Lt Chuck Yeager after his first kill - march '44

For many people, Chuck Yeager is a true hero in the strictest definition of the word. Throughout his career, Yeager displayed distinguished courage and performed several extraordinarily brave deeds, although he only considered such acts as following his duty. Many people recognize Yeager as the first person to officially break the sound barrier, but that feat is only one of his many important achievements. Without a doubt, Yeager is the world's most famous test pilot not only because of the records he set, but also because of his determination, his ability to remain calm in difficult situations, and his ability to quickly analyze problems and find a solution. He is one of the "toughest" pilots, both mentally and physically, in aviation history, and few have ever matched his piloting skills.

Charles "Chuck" E. Yeager was born on February 13, 1923, in Myra, West Virginia. The son of a gas driller, Chuck grew up working with a wide variety of mechanical devices. He could readily take apart an engine and put it back together without difficulty. A few months after his high school graduation, Yeager joined the U.S. Army Air Forces.

Yeager had no real interest in learning to fly when he first joined the Air Forces. He simply wanted to be a mechanic. The main reason he enlisted in the Army was because the Army recruiter was more persuasive than the Navy spokesperson. Furthermore, unlike many famous aviators, Chuck's first encounter with an airplane had left him unimpressed. When Yeager was a teenager, a plane made an emergency landing near his house. Although Chuck dashed over to look at the aircraft, he was unmoved by the experience.

When Yeager entered the Army Air Forces, he seemed unlikely to become one of history's legendary pilots. But, in the summer of 1942, he began showing an interest in becoming an aviator, thanks to the Air Forces "Flying Sergeant Program," which trained enlisted men to fly. Yeager enrolled in the program because he wanted a change of pace, not to mention a promotion and a pay raise.



Chuck Yeager, fighter pilot.

Yeager earned his wings in early 1943. After a brief assignment stateside, he transferred to England and began working with the 363rd Fighter Squadron. In early 1944, on his seventh mission, Yeager shot down his first enemy plane. However, his next sortie did not go as well.

On March 5, 1944, his eighth mission, Yeager had to bail out over occupied France after his plane took an enemy hit. Despite being wounded, Yeager still evaded the Germans, with the help of the French Resistance, and made it into neutral Spain. Soon after, he returned to England. Although military rules prohibited him from returning to his unit, he appealed his case all the way up to General Dwight D. Eisenhower, who allowed him to return to his squadron.

If Eisenhower had any doubts about his decision, Yeager quickly put them to rest. After returning to his unit, Yeager shot down five enemy planes in a single day and became an "ace-in-a-day." Later, he even downed a German Messerschmitt Me-262 jet while flying his propeller-driven P-51 Mustang. Throughout his 64 World War II missions, Yeager scored a total of 11-1/2 victories. (Pilots were credited with a "half" victory if pilots from two planes both hit an enemy aircraft.)

In July 1945, Yeager entered a new phase of his aviation career when he became a maintenance officer at Wright Field, Ohio, a job that entailed flight-testing all of the field's different planes. Due to his growing experience with a wide variety of aircraft, and his outstanding piloting skills, Yeager caught the attention of Colonel Albert Boyd, the man in charge of the Air Force's aircraft testing program. Boyd invited Yeager to become a test pilot, and the West Virginian accepted the offer.

In August 1947, Yeager transferred to Muroc Air Base, California (which would later become Edwards Air Force Base), the premier proving ground for the day's most technologically advanced aircraft. Soon after arriving at Muroc, Yeager received orders to test the X-1, an experimental aircraft that some believed might exceed Mach One. On October 14, Yeager flew the X-1, which he had renamed the Glamorous Glennis in honour of his wife, faster than the speed of sound. With that flight, he travelled faster than any human being ever had, a remarkable feat considering the fact that he had broken several ribs during a horseback riding accident only a few days before. Revealing his characteristic sense of humour, Yeager radioed to one of colleagues: "I'm still wearing my ears and nothing else fell off, neither."



Chuck Yeager and the X-1 research plane that broke the sound barrier. It can be seen today at the Smithsonian Air Space Museum in Washington, DC.

Yeager's next noteworthy flight occurred in 1953 while he was checking out the X1-A, a longer and more powerful version of the X-1. On December 12, Yeager piloted the X1-A to Mach 2.4, another record, although a short-lived one. Even though most of the flight went according to plan, near the end, the aircraft unexpectedly started spinning out of control and began rotating on all three axes. In the process, Yeager smashed his head on the cockpit's canopy. After spinning for more than 50 seconds, Yeager finally regained control of the aircraft and landed it safely, a fine example of his outstanding piloting skills.

In 1954, Yeager left Edwards and accepted a series of command positions. His first stop was West Germany where he headed the 417th Fighter Squadron. Three years later, he returned to California as the commander of the 1st Fighter Squadron. After graduating from the Air War College in June 1961, he received a promotion to full colonel. The following summer he returned to Edwards to head the new Aerospace Research Pilot School, an institution that trained several of the Apollo and Space Shuttle astronauts. And notably, during this period, Yeager continued to help Jackie Cochran, the well known female flyer, learn the intricacies of various jets and support her quest to better several speed records, a mission he had begun in the early 1950s.

Despite his workload as the commander of the Aerospace Research Pilot School, Yeager continued to test most of the experimental planes that came through Edwards. Although many of his flights went according to plan, one mission quite literally blew up in his face. In December 1963, Yeager was testing a Lockheed Starfighter F-104 when it unexpectedly spun out of control at well over 100,000 feet (30,480 meters). Although Yeager fought to regain control, he could not and had to eject at about 8,500 feet (2,591 meters). While ejecting, his pilot's seat smashed into his helmet, tore open his visor,

and the flame from his seat's ejector rocket severely burned him. Although Yeager parachuted to safety, he required several skin grafts. The incident undoubtedly helped bolster his tough and determined reputation.

Yeager returned to military combat in July 1966 when he assumed command of the 405th Fighter Wing at Clark Air Base in the Philippines, which fought in the Vietnam War. During the conflict, Yeager flew a total of 127 combat missions.

In February 1968, Yeager entered the final phase of his military career when he began commanding the 4th Tactical Fighter Wing. The following year, he received a promotion to brigadier general and became the vice commander of the 17th Air Force. Yeager had become one of only a handful of men who had started as an enlisted man and risen all the way to the rank of an Air Force general.

Yeager formally retired from the Air Force in March 1975. During the 1970s and 1980s, he received a string of honours. In 1976, he received the Congressional Medal of Honour for his first supersonic flight. Then, in 1985, President Ronald Reagan awarded him the Presidential Medal of Freedom. These two medals are the highest honours an individual can receive for outstanding service and achievement. Yeager also obtained several other prestigious awards during his career, including the 1948 Collier Trophy, and the 1958 Harmon International Trophy, as well as numerous military citations.

On October 14, 1997, the 50th anniversary of Yeager's first Mach One flight, Yeager broke the sound barrier once again, this time in an F-15. That flight was his last official flight in an Air Force plane.



Chuck Yeager, still flying high in the 1990s.

Yeager travelled a long and challenging path from his West Virginia beginnings to becoming one of the world's most famous aviators. For many people, he exemplifies the true meaning of the word "hero," not only as a record setter and pioneering test pilot, but also as a military aviator.

## Dick Rutan, Jeana Yeager, and the Flight of the Voyager



Dick Rutan and Jeana Yeager embody the very spirit and character of the word "pioneers." In December 1986, they became the first people to circumnavigate the world, non-stop, without refuelling their plane, the Voyager. They also set world flight records in the process. Besides being the first team to travel non-stop around the globe--which was one of aviation's last record barriers--Rutan and Yeager also endured the longest flight to that date, and almost doubled the then current distance flight record. But their contributions did not stop there. They also explored the limits of human endurance and mental fatigue during their journey. To many, Rutan and Yeager's flight represented the triumph of human ingenuity as the two aviators overcame a wide range of aerodynamic, financial, physical, and psychological challenges.





Richard "Dick" Rutan was born in Loma Linda, California, on July 1, 1938. An eager individual, Rutan earned both his pilot's and driver's licenses on his 16th birthday. At the age of 19 he joined the Air Force Aviation Cadet Program and was later commissioned a lieutenant in the Air Force. He flew 325 missions over Southeast Asia during the Vietnam War until September 1968, when his F-100 plane sustained a hit from enemy fire and he had to eject from his aircraft. He evaded capture and was rescued by American forces. Due to his exemplary military record, Rutan received the Silver Star, five Distinguished Flying Crosses, 16 Air Medals, and a Purple Heart.

The second Voyager pilot Jeana Yeager was born in Fort Worth, Texas, on May 18, 1952. By 1978, she had earned her pilot's license. During her early aviation career, Yeager mainly wanted to learn to fly helicopters, but her interests branched off and she turned her attention to high-performance aircraft. Yeager, who is no relation to the famous test pilot Chuck Yeager, first met Dick Rutan, and his brother Burt, at a California air show in 1980. At the time, Burt and Dick ran their own aircraft company. Interestingly, Yeager set four separate speed records in Rutan EZ planes in the early 1980s.

The Rutans originally conceived of the Voyager during a lunch in 1981. They believed that they could design a plane that could break the world distance record of 12,532 miles (20,168 kilometres) set by a B-52 Air Force crew in 1962. Like many great innovators, they quickly sketched their ideas onto a napkin while still at the lunch table. With the help of an eager group of volunteers, they began building the Voyager the next year. Notably, the entire project relied solely on private funds and donations.

The creation of the Voyager posed several design challenges for the Rutans. Burt, the main project engineer, searched for just the right combination of materials to make the aircraft light enough to reach maximum efficiency and yet strong enough to sustain extremely long-distance flight. He also had to devise a way for the aircraft to hold the enormous amount of fuel necessary to power it, non-stop, around the globe. Eventually the Rutans decided to construct the Voyager's main structure/fuselage out of a space age composite material consisting mainly of graphite, Kevlar, and fibreglass. The structural weight of Voyager was only about 939 pounds (426 kilograms), but when its 17 fuel tanks were full, its takeoff weight exceeded 9,700 pounds (4,400 kilograms), or more than 10 times its structural weight. Voyager's wingspan was approximately 110 feet (36 meters). By the time the Voyager made its first test flight on June 22, 1984, the Rutans, Yeager, and scores of volunteers had spent more than 18 months and 22,000 hours working on the aircraft. After more than a year-and-a-half of testing and modifications on Voyager, Dick Rutan and Jeana Yeager were ready to attempt their record-setting flight.

Rutan, Yeager, and Voyager took off from Edwards Air Force Base, California, at 8:01 a.m. on December 14, 1986. The plane needed almost the entire 15,000 feet (4,572 meters) of runway, which was already one of the world's longest airstrips, to become airborne; the aircraft did not lift off until it was approximately 14,200 feet (4,328 meters) down the runway, and then it did so only after sustaining a bit of damage. Due to the large amount of fuel contained in Voyager's wing tanks, the aircraft's wings bobbed up and down while accelerating down the runway, and in the process, about a foot of each wing tip chipped off. Concerned about the condition of their craft, Rutan and Yeager circled the airfield and checked their plane's handling conditions. Fortunately, the plane seemed sound enough to continue the journey.

Yeager and Rutan had to endure severe physical and mental demands during their trip. Because of the time required to make a circumnavigational flight, they became extremely fatigued. To combat the problem, they tried to rotate their duties. One crewmember would fly the aircraft, while the other rested. Initially, they tried to work in two-to-three-hour shifts, but things did not always go according to plan. Furthermore, it was extremely difficult to manoeuvre themselves into a comfortable sleeping position, particularly within the confines of Voyager's small cockpit, which was only the size of a phone booth.

The two aviators faced several dangers during their flight. One of their greatest challenges was bad weather. At several points during their trip, they had to evade menacing storm fronts. Once, they even had to fly around Typhoon Marge, a 600-mile (966-kilometer)-wide storm. While such manoeuvring helped them escape physical harm, it only added to their mental stress. Each time they had to adjust their flight plan by climbing above a storm, or going around one, they burned more fuel, and since

Voyager had started the trip with a very tight fuel allotment, they grew increasingly concerned that they might not have enough to complete their journey. As it turned out, they had enough fuel, but just barely.

Rutan and Yeager completed their journey when they touched down at Edwards Air Force Base at 8:06 a.m. on December 23, 1986. The entire 24,986-mile trip had taken 9 days, 3 minutes, and 44 seconds, or a little more than 216 hours. During their trip, they had averaged around 116 miles per hour (187 kilometres per hour), and when they landed, they only had a few gallons of fuel left.

From a record standpoint, Rutan and Yeager became the first aviators to circumnavigate the globe non-stop, without refueling. They also endured the longest flight up to that time, and essentially doubled the previous flight record for distance. Because of their accomplishment, President Ronald Regan awarded the Rutan brothers and Yeager with the Presidential Citizen Medals of Honour, which had been awarded only 16 times previously. They also received the Collier Trophy, aviation's highest honour, and several other prestigious awards.

In the late 1990s, Dick Rutan attempted to set another around-the-world record, this time in a balloon. Rutan and his team-mate David Melton began preparing for the journey when they learned that the Anheuser-Busch Company was offering \$1 million to the first team of balloonists who could successfully circumnavigated the world, non-stop. In 1998, Rutan and Melton set out on what they believed would be a record-setting journey, but only three hours into their flight, a helium cell ruptured in their balloon and they had to abandon their trip. Another team of balloonists, sponsored by the Breitling watch company, would beat them into the record books in March 1999.

The Voyager now hangs in a place of honor in the "Milestones of Flight" gallery in the Smithsonian's National Air and Space Museum in Washington, D.C. Its 1986 flight revealed just how far aeronautical engineering and design had advanced during more than 80 years of aviation. Rutan and Yeager not only established a couple of world records with the Voyager but also tested the psychological and physiological capabilities of humans under extreme pressure. Rutan and Yeager's flight proved that people really can live up to Rutan's personal motto: "If you can dream it, you can do it."

- Voyager's flight was the first-ever, non-stop, unrefuelled flight around the world. It took place between December 14 and December 23, 1986.
- This milestone flight took 9 days, 3 minutes and 44 seconds.
- The absolute world distance records set during that flight remained unchallenged today.
- The flight was 26,366 statute miles, which more than doubled the previous record set by a B52 Bomber in 1962. (The FAI accredited distance at 40,212 km).
- The structural weight of the Voyager Aircraft was only 939 pounds.
- When the airplane took off full of fuel, pilots and supplies, the gross take off weight was 9,694.5 pounds.
- The average altitude flown was about 11,000 feet.
- The Voyager took off from and landed at Edwards Air Force Base in California.

- There were two crew members on board, Dick Rutan and Jeana Yeager.
- Dick's brother, Burt Rutan, who is a world-renowned airplane designer, designed the airplane.
- The Voyager was built in Mojave, California. It took five years to build and test the airplane before taking off on its remarkable record-setting flight.
- There were 99 ground volunteers that participated in the flight with weather, communications, fabrication, office staff, gift shop staff and more.
- Primarily individual contributions, and a few product equipment sponsors financed the Voyager. The project did not receive any government sponsorship.
- Four days after landing, President Ronald Reagan presented the Voyager crew and it's designer with the Presidential Citizenship Medal, awarded only 16 times previously in history.
- The Voyager Aircraft is on permanent display at the Smithsonian Institution's National Air and Space Museum in Washington, DC.