

The Sky's the Limit Volume III: A Place in the Sky

by Monica Sorensen
Illustrated by Paula Gustafson
Cover artwork by Jerry Sivertson
Edited by Ruth Berman

This text is distributed for use by individuals.
Teachers may use this text to assist in classroom education.
Any sale or commercial reproduction of the materials contained in this book is prohibited.
Endorsed by the Minnesota Department of Children, Families and Learning



Minnesota Department of Transportation • Office of Aeronautics • Aviation Education Section
222 E. Plato Boulevard, St. Paul, MN 55107-1618 • www.mnaero.com/aved • 651-297-1600

Introduction

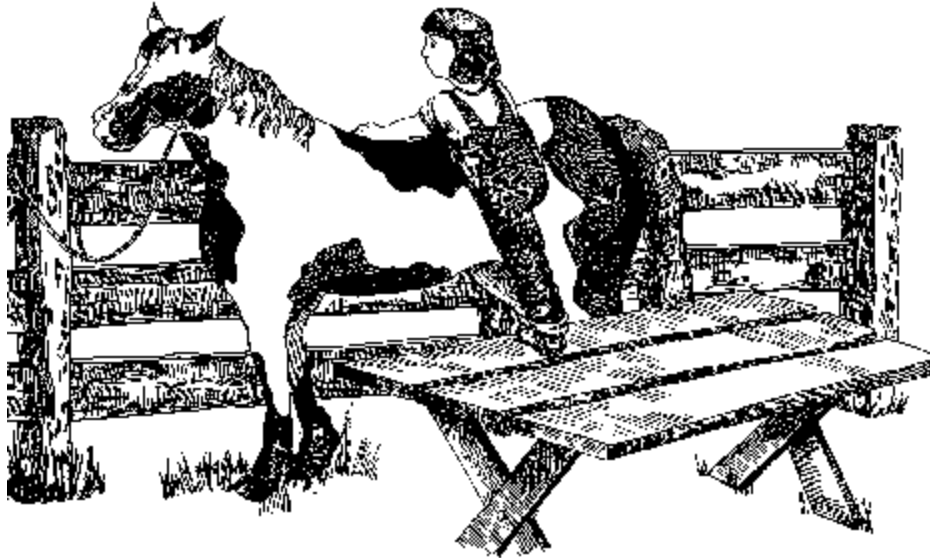
The Sky's the Limit is a series of books featuring people who have made contributions to the field of aviation. A variety of backgrounds and perspectives are represented as the reader learns about such people as Anne Morrow Lindbergh, an aviation writer and pilot, Angelo De Ponti, an aviation businessman, and Franklin Chang-Diaz, an astronaut and rocket scientist. Each book includes activities related to aviation and the principles of flight. The activities range from making a compass to completing a word-find exercise.

The series begins with the early days of flight in the United States and continues through the space program. The books are not intended to be a complete history of aviation. Rather, they draw from a variety of disciplines to inspire young readers in the areas of math, science, reading, writing, art, and engineering.

Contents

Jeana Yeager	3
<i>Aviation adventurer and co-pilot of the Voyager</i>	
Make a Paper Helicopter	6
<i>A helicopter activity</i>	
Randy Penner	7
<i>Aviation artist</i>	
Make a Copy of a Picture You Like	9
<i>Activity making a copy of a picture</i>	
Anne Morrow Lindbergh	10
<i>Aviation writer and pilot</i>	
An Unusual Paper Airplane	12
<i>Activity making an unusual airplane</i>	
Mark Hurd	13
<i>Aerial photographer and inventor</i>	
Make a Camera	15
<i>Making a paper camera</i>	
Find and Circle the Words Listed	16
<i>Seek and find activity</i>	

Jeana Yeager

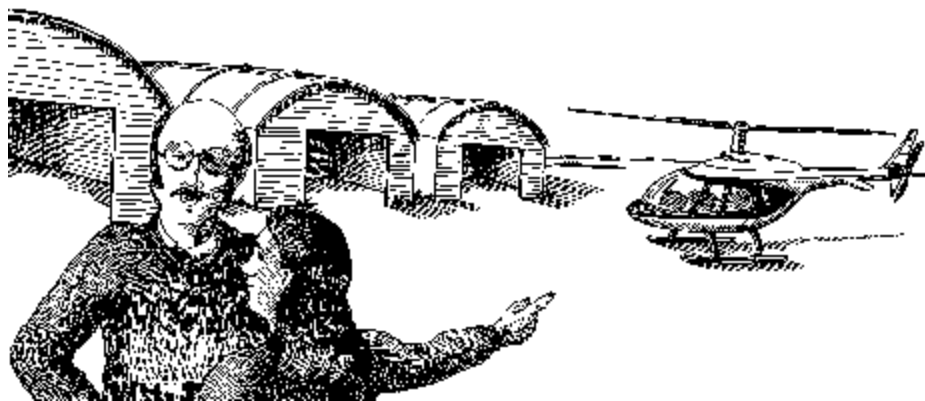


Jeana Yeager was born on May 18, 1952, in Fort Worth, Texas. As a child, she liked being outdoors climbing trees, hunting tadpoles, and stream fishing. She was a very curious child and especially liked exploring new places while traveling with her family.

When she was very little, she learned how to ride a horse. Horses have been an important part of her life ever since. Growing up, Jeana learned that if she was willing to work hard enough, she could do anything she set her mind to.

In school, she was active on the track team. To be a good runner she had to develop discipline and stamina. Participating in track taught her that trying to do your best is what is important, not whether you win or lose.

As a young adult, Jeana was fascinated by helicopters. She liked the way they flew through the air and hovered like the dragonflies she tried to catch when she was a child. Could she learn to fly a helicopter she wondered. She went to the airport to find out. The first step was to learn how to fly an airplane.



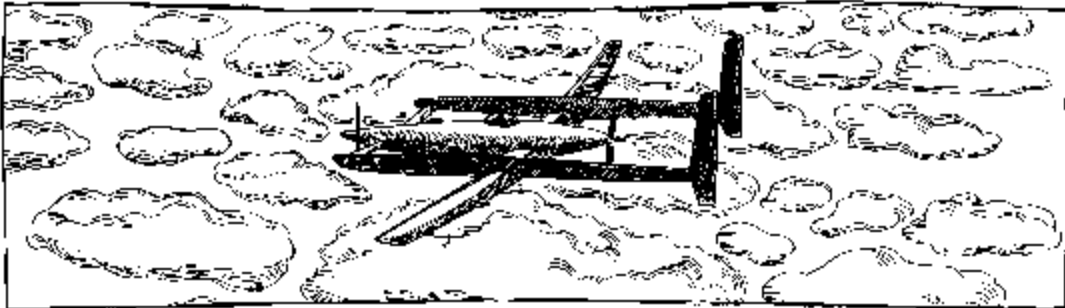
While Jeana was taking flying lessons, a friend told her about a man who was building a rocket to carry a person into space. Jeana wanted to meet this man and learn more about his project. The man was Bob Truax, a famous rocket scientist. His rocket was located in a large five-car garage. Bob was happy to show Jeana around and answer her many questions.

The two became friends, and later when Bob asked Jeana to come to work for him, she said, "Yes." From Bob, Jeana learned about rocket systems and what it takes to launch a rocket. There were many new tasks to learn at this job. Jeana learned to do the work the same way she had learned to train her horses, she would try one way and then another until she found the way that worked best.

After completing the rocket project with Bob, Jeana and a friend Dick Rutan teamed up to build and test a new type of airplane that would fly around the world nonstop and non-refueled. This was an amazing task! No one had ever done this before. Was it really possible? Jeana and Dick discussed the details of the project, and Jeana drew up the early plans. "Let's name the plane Voyager" Jeana suggested.

Gradually, Voyager took shape in the hanger in Mojave, California. It took six years to build and test Voyager. Many people volunteered their time to help. Some people donated money, some donated equipment. People from all over the world joined the Voyager Club to help out in whatever way they could.

Finally, everything was ready for the around-the-world flight. On the morning of December 14, 1986, Jeana and Dick took off in Voyager from Edwards Air Force Base, California. According to their calculations, they would be flying for nine days.

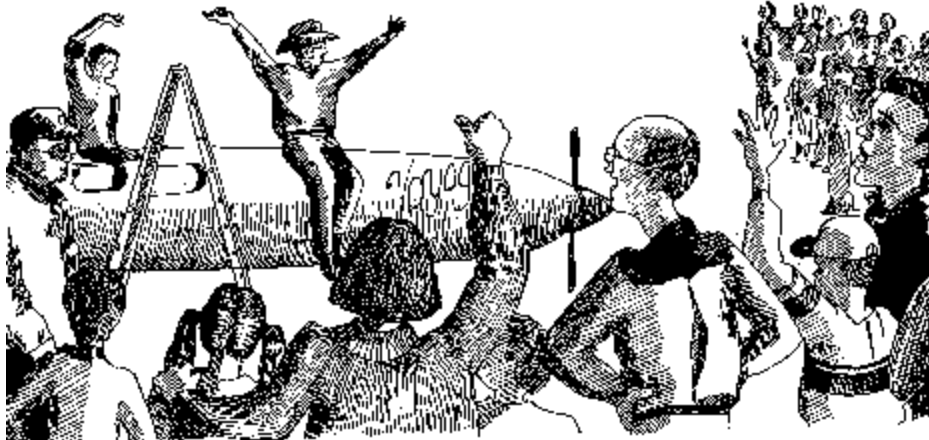


There was plenty to do besides flying the plane. Navigation and monitoring the plane's many systems took up most of their time. Difficult weather conditions demanded their full attention, leaving little time for sleeping.

During one storm, the plane was turned on it's side. Very carefully, Jeana and Dick brought the plane right side up and hoped that nothing was badly damaged.

There were many "close calls," and times when they thought they would have to make emergency landings. But they managed to keep going. After nine long days and about 28,000 miles, they were nearing the end of their flight. They could see Edwards Air Force Base in the distance, and thousands of people waiting and cheering them on.

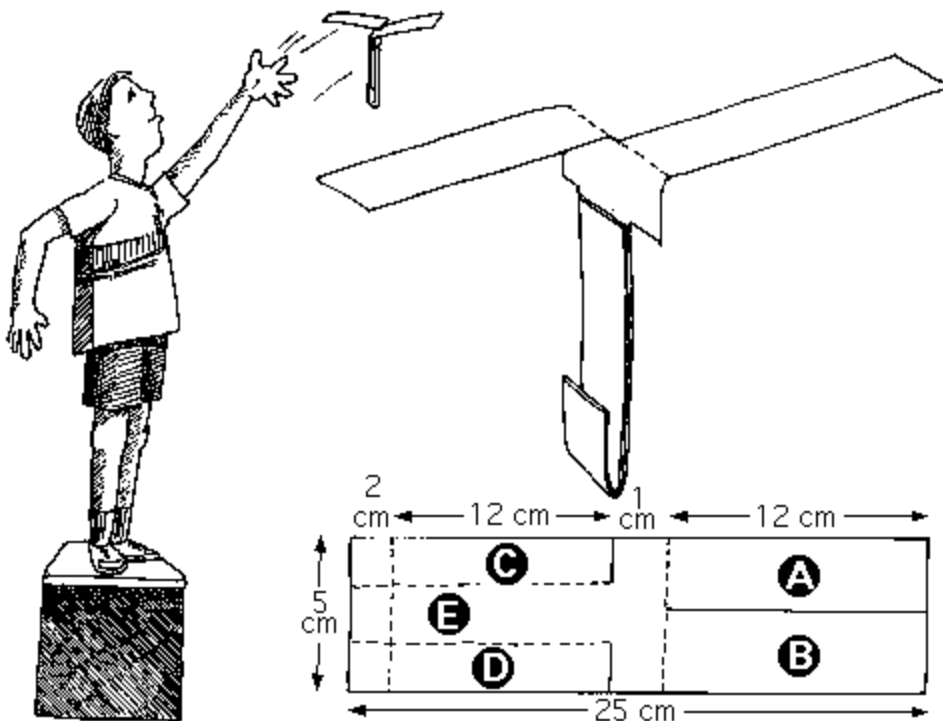
On December 23, Voyager landed. Jeana and Dick were greeted by family and friends and fans from all over the world. Jeana's high school, in Commerce, Texas, sent yellow roses,



which Jeana's father delivered. The whole world had followed the progress of Voyager for nine days with hope and fear for the two brave pilots. Jeana and Dick were glad to be back home and were ready to get some rest.

For their magnificent aviation achievement, Jeana and Dick were awarded the Presidential Citizen's Medal. Their flight was a big accomplishment in aviation, and they were proud to see Voyager installed in its new home at the Smithsonian National Air and Space Museum in Washington, D.C., alongside such great planes as those of Charles Lindbergh, Amelia Earhart, and Orville and Wilbur Wright. To find out more about their amazing flight, you may want to read the book titled *Voyager*, written by Jeana Yeager and Dick Rutan.

Make A Paper Helicopter



You will need:

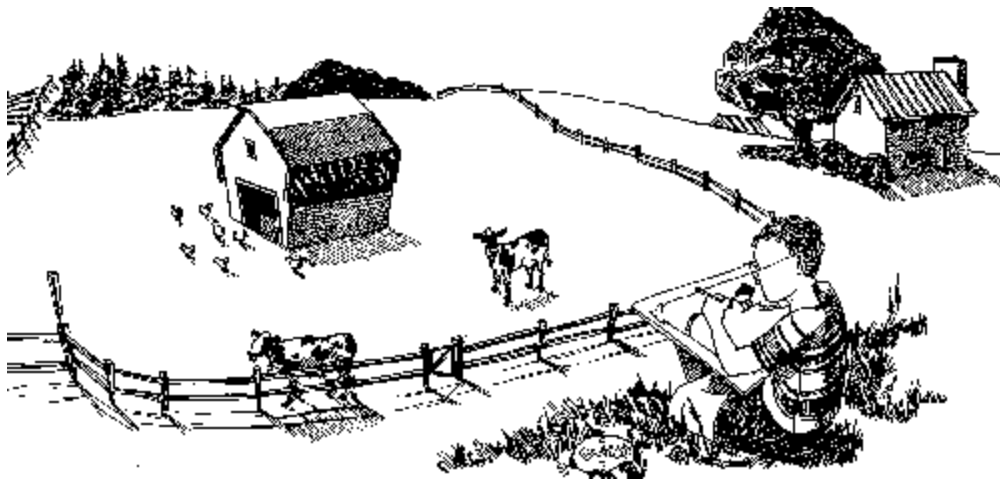
- 1 piece of paper that is 25 cm long and 5 cm wide
- 1 paper clip
- a ruler

To make the helicopter, use a ruler to draw the dashed lines and solid lines onto your piece of paper as shown in the pattern. The dashed lines are fold lines, and the solid lines are cutting lines. First, cut along the solid lines on your piece of paper. Then, complete the following folding steps.

1. Fold **A** and **B** away from you.
2. Fold **C** toward **E**, on the dashed line.
3. Fold **D** so it overlaps **C**.
4. Fold **E** in toward the center of your paper.

Place the paper clip over the fold at **E**. Now you are ready to make a test flight. Hold your paper helicopter so that **E** is toward the ground. Start by holding the helicopter above your head and letting it drop. Then try it from higher places. Make some test flights with the paper clip off. Does this have any effect?

Randy Penner



Randy Penner was born on February 27, 1921, in Hillsboro, Kansas. As a child, his favorite activity was drawing pictures. He enjoyed living on a farm and found that the cows and chickens and horses were very good subjects for his drawings. But Randy's favorite thing to draw was airplanes.

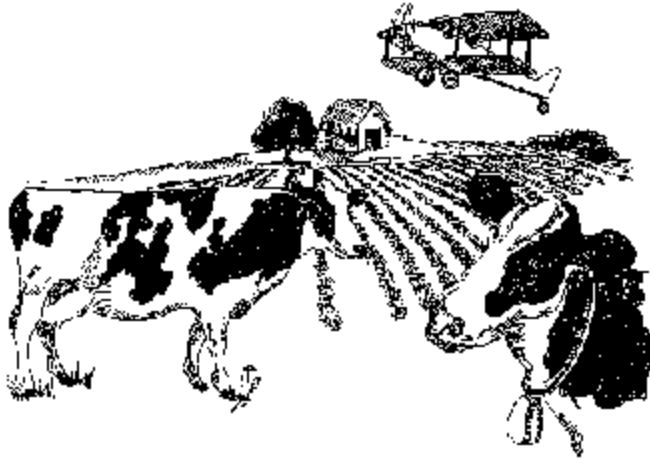
His parent's farm was located near the city of Wichita, where a new invention was being manufactured - airplanes. Young Randy would listen for the sound of an approaching plane, then wait excitedly until he had it in sight. He saw many different types of airplanes as they flew overhead, on their way to and from Wichita.



Randy's friends and family admired his drawings and encouraged him to do more. At school, his teacher asked him to draw pictures of airplanes on the chalkboard for the whole class to enjoy. One day, a friend at school said, "Hey Randy, I'll trade you part of my lunch for one of your airplane drawings."

Being a growing boy, Randy was always hungry, so he gladly made the trade. When other kids heard about this, they wanted a drawing too. Well, that was the beginning of a very good business.

The high school Randy attended did not offer any art classes. So Randy drew during study hall. The teacher didn't mind because it was obvious that Randy was a very talented artist and was not simply goofing off. In science class, Randy's detailed drawings of frogs and earthworms brought him praise and good marks from the teacher.



Randy had his first ride in an airplane when he was a teenager. What a fabulous time he had going up in the little Piper Cub. In those days, airplanes landed in pastures because there weren't many airports yet. Pilots learned quickly that if they landed their planes in cow pastures, they should never leave them unattended. Why? Because the cows would eat them! Airplanes were made of wood and treated fabric at that time, and the cows liked the taste of the fabric.

After high school Randy went to college to study art. He graduated with a degree in art, and got his first job as a commercial artist drawing trucks and buildings. A few years later, he decided to open his own business as an artist.

Since airplanes were still Randy's favorite subject to draw and paint, he decided to make aviation art his specialty. His paintings of airplanes were a great success.

One day he was asked if he would paint pictures of airplanes to be featured in a popular magazine. Randy was thrilled! This was a great honor. He was now becoming well known for his airplane paintings.

Randy's paintings of airplanes have been sold to people all around the world. His artwork appears in magazines, books, and museums. A museum in Minden, Nebraska, has a display of Randy's paintings, showing the airplanes of the past landing in cow pastures. Randy's paintings record the history of airplanes, and can be enjoyed by generations to come.

People often tell Randy, "We saw one of your paintings and we enjoyed it so much." Randy says it's a good feeling to know he has given something to the world that will be enjoyed for many years to come.

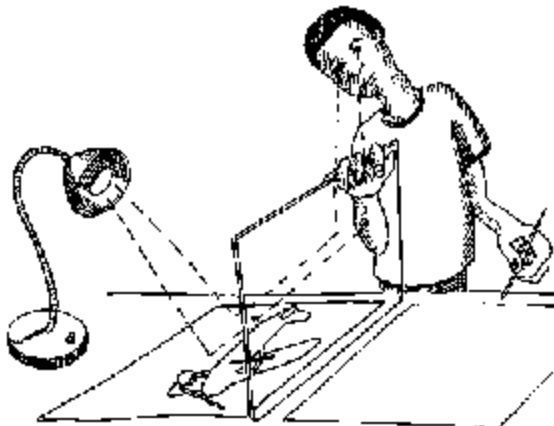


Make a Copy of a Picture You Like

Here's an easy way to make a copy of a picture. You can even make it smaller or larger than the original.

To make your copy machine you will need:

- a picture to copy
- a piece of glass approximately 20 cm by 25 cm
- a piece of paper
- a pen or pencil
- a desk lamp



First, place the picture and the piece of paper side by side on a table.

Next, place the lamp next to the picture and adjust the lamp so it shines directly on the picture.

Now, place the glass in an upright position between the picture and the paper.

Look through the glass at the blank piece of paper. You will what appears to be see a reflection of the picture on the piece of paper. You may have to move your head around, trying different viewing angles until you get the best reflection of the picture. Moving your head will also make the reflection appear larger or smaller.

Once you have a good reflection of the picture on your paper, hold the glass and your head still, and begin tracing the reflection on the paper.

Anne Morrow Lindbergh



Anne Morrow Lindbergh was born on June 22, 1906, in Englewood, New Jersey. Anne's father, an executive at a large bank, often took the whole family with him on business trips to Europe. These trips to London, Paris, and Milan were a great learning experience because Anne's father described the exciting history of the cities they visited.

Anne's mother, a teacher and writer, encouraged Anne and her sisters and brother to write stories and poems about their adventures.

When Anne was 10 years old, she began writing her thoughts in a diary. Her favorite place to write was a window seat overlooking the garden. She could curl up and enjoy the view of flowers and trees while she wrote. Anne hoped that someday she would write something that would be meaningful to others.

In school, Anne was shy. She liked reading and writing, but she didn't like playing sports. When she went to college, she studied English and worked hard writing and rewriting her assignments. She was very happy when one of her poems was published in a well-known magazine.

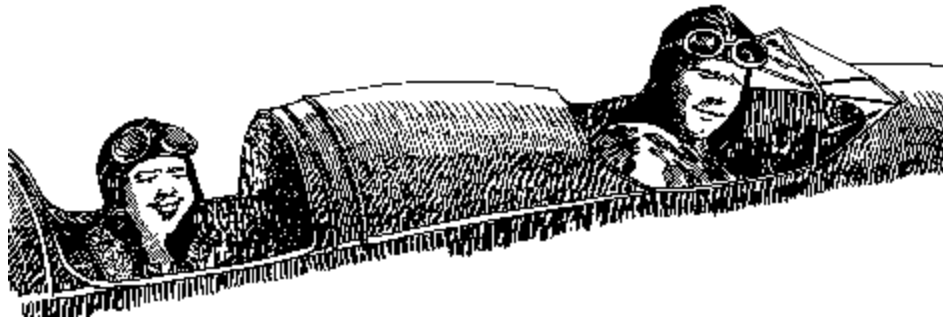
While Anne was in college, her father invited Charles Lindbergh, the famous pilot, and his mother to join the Morrow family for the Christmas holidays. During this visit, Charles took Anne and her sisters up for their first airplane ride. Anne was thrilled with the flight. When she returned to college after Christmas, she began learning all about flying. It wasn't long before Anne and Charles became friends and started flying together.

When Anne graduated from college, she received two prizes for her writing. She felt very honored and pleased that her work was valued by her teachers. Later that year, Anne and Charles were married. Together they went on many flying adventures.

Anne loved her new world of flying and soon was learning all about airplane navigation and how to operate the communications radio. With practice and patience, Anne became extraordinary at both of these skills. Anne also became the first woman in the United States to receive a license to fly a glider airplane.



As a team, Anne and Charles flew to many faraway places looking for the best routes for airlines to use. They recorded information about weather patterns and landing conditions, and had many exciting adventures along the way. Between trips, Anne wrote her first book, "North to the Orient". This book is about the trip she and Charles took to China, looking for a route for airlines to use. On this trip, they flew over the frozen arctic region, where no people live. They wore electric flight suits to keep warm, and saw huge icebergs as they flew over the ocean.



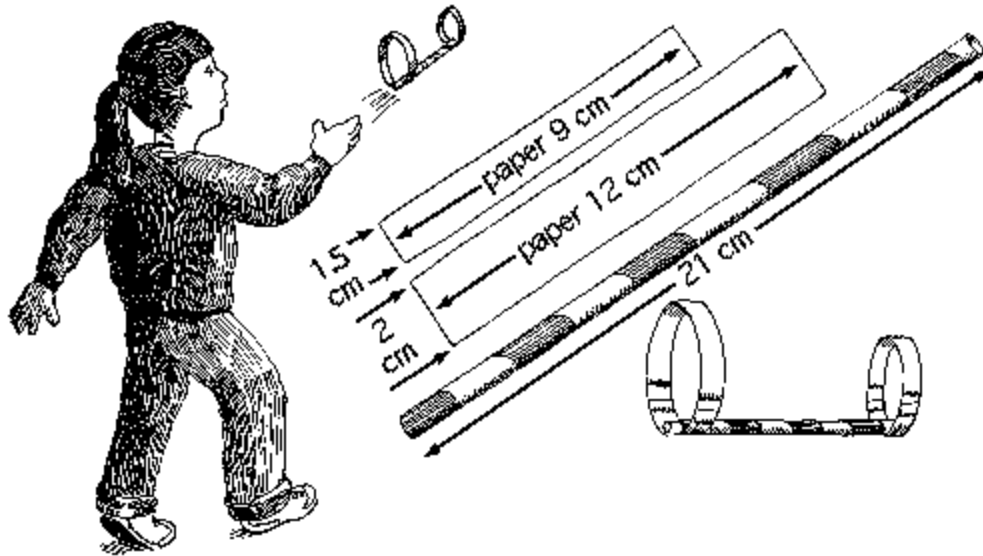
Anne's second book, "Listen! the Wind", describes a thrilling adventure flying through tropical storms and blizzards while searching for the best route to Europe. Anne's contributions as copilot and radio operator on this trip were tremendous. For this achievement, she was awarded the National Geographic Society's Hubbard Gold Medal for distinction in exploration, research, and discovery. Anne was the first woman ever to receive this medal.

Traveling by plane gave Anne a good view of our environment. She began to notice changes taking place in the land and forests and lakes. These changes were not positive. Anne became very concerned about pollution and its effects on the environment. To help protect and preserve our beautiful land, she wrote a book called Earth Shine.

Anne continued to fly and to write many more books. Her writing helped to inspire and teach many people about the beauty of flying. The hope she had as a child of writing something meaningful had come true.



An Unusual Paper Airplane



Have you ever seen a paper airplane like this one?
You can make it if you have these supplies.

You will need:

1. 1 drinking straw
2. tape
3. 2 strips of paper cut to these sizes: 1.5 cm wide and 9 cm long
2 cm wide and 12 cm long

To make the plane, take one of the strips of paper and make a loop by overlapping the ends. The ends should overlap enough to form a pocket to slip the straw into. Tape each end of the paper in place. Repeat this step with the other strip of paper.

Next, slide the straw into the pocket of one of the paper loops. Slide the other end of the straw into the pocket of the other paper loop.

Now you are ready to fly your plane. Experiment with your plane to see how its flight is affected by sliding the loops along the straw into different positions or by flying the plane upside-down, and backwards.

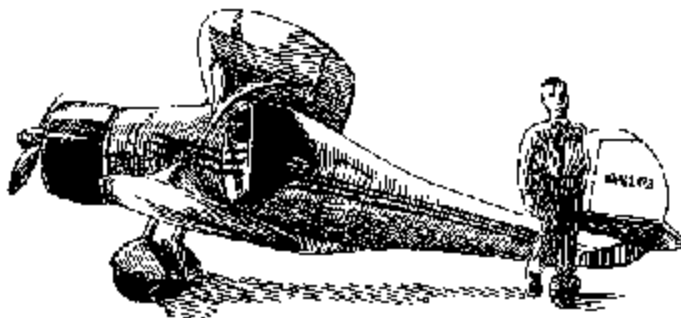
Mark Hurd



Mark Hurd was born on May 11, 1892, in Minneapolis, Minnesota. Growing up in Minnesota, Mark enjoyed both city life and country life. During the school year, Mark lived with his family in Minneapolis. Each summer, Mark and his brother Cecil went with their father to northern Minnesota to work at their family's logging business.

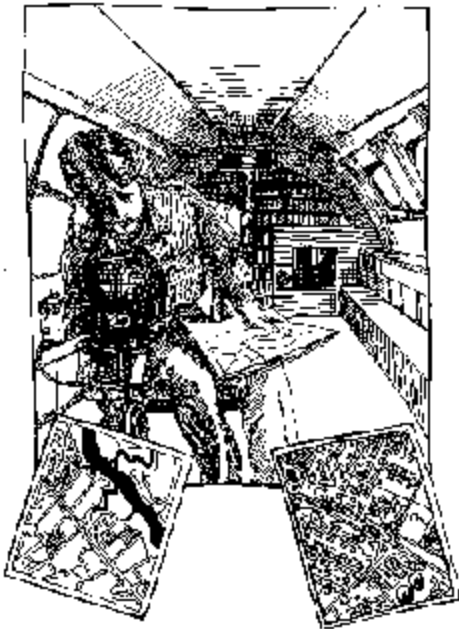
The wilderness of northern Minnesota was a paradise to Mark. He explored the rivers and lakes in a canoe, retracing the routes that the first explorers and trappers used. He became so knowledgeable of the area that he was asked to serve as a guide for travelers.

After graduating from high school, Mark went to college and earned a degree in engineering. When World War I began, Mark joined the military to help do his part. The military sent Mark to France, and put him to work as an aerial photographer and observer. It was Mark's job to take photographs from an airplane and gather important information about troops and the area. This was Mark's first introduction to airplanes. He could see that aerial photography could have many practical uses.



When the war was over, Mark opened his own aerial photography business. His company started out small - just Mark, a camera, and a cameraman.

Mark believed that photographs taken from an airplane could be very helpful for making maps. He was right.



As Mark's business grew, he expanded his services to include anything that involved airplanes. He built, sold, and fixed airplanes, and started one of the first airline passenger companies.

When World War II began, Mark found himself in the military again. This time he was assigned to General Patton's office and put in charge of aerial reconnaissance. Mark had many ideas for improving the methods of taking pictures from an airplane. His ideas were a big help to General Patton.

When the war ended, Mark returned to Minnesota and opened a new business taking aerial photographs and making maps.

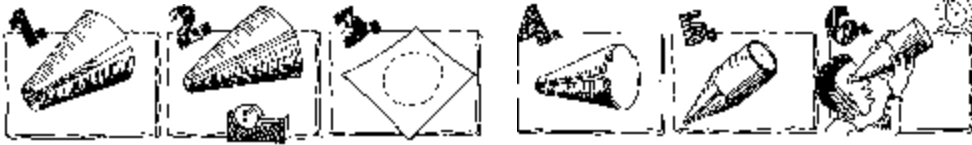
Mark's company was responsible for photographing three-fourths of the United States. These photos were used for planning new roads, figuring out the sizes of forests, and making maps of the area. People began to realize that aerial photography could help them in many ways. One businessman who owned a lumber company hired Mark's company to photograph the logs being transported on the river. From these photographs, the logs could be counted and the businessman could then estimate how much lumber he would be able to make from the logs.

One of the many interesting jobs done by Mark's company involved photographing all of Liberia, Africa. The government in Liberia wanted to figure out how many trees there were for making lumber to build houses with. It is easy to calculate the number of trees from an aerial photograph. But imagine how difficult it would be to count trees one by one from the ground.



Mark was constantly finding new ways to improve the equipment and methods used for taking aerial photographs. The camera that is used today by most aerial photographers was designed and patented by Mark Hurd.

Make a Camera



The first photograph was made in 1826 by Nicephore Niepce, a French physicist. You can make a simple camera with easy-to-find materials.

- One piece of black paper, approximately 20 x 28 cm
- wax paper or tracing paper
- One empty frozen juice can
- tape
- One pen or pencil
- One pin

First, roll the black paper into a cone shape so that the wide end will fit snugly into the juice can. Use tape to hold the paper cone together. Trim the ends if necessary so that the edges are even.

Place the wide end of the cone on the wax or tracing paper and trace its shape. Cut out the shape from the wax paper and tape it onto the wide end of the cone. Now, ask an adult for help. Using a pin (and maybe a hammer) make a pin hole through the bottom of the juice can.

Slide the wide end of the paper cone into the juice can about 1/4 of an inch.

Now, aim the pinhole at an object that is well lit and look through the small end of the cone. The image you see in your camera will be upside down. Try sliding the cone farther into the can. Does the image change size? What happens if you make more pinholes in the bottom of the can?

You have just made a simple pin-hole camera. The first cameras used were this type. To learn more about pin-hole cameras you may want to read one of the following books: "The Hole Thing", or "My First Photography Book".

Find and Circle the Words Listed

P H O T O C B A P H V G H
E H E L I C O P T E R N E
N A V I V O Y A G E R G L
N R W R I T E R R T I S T
F D Y M O J A V N P H I C
B P H O T O G R A P H Y Q
O E Y J A G E R V E U E P
Y N E A G E R P I N R A I
E N A V I G A T O R D G F
N E G E N N E R A N E F R
A R T I S T E R T R L B A
I N L I N D B E R G H Y P
V O Y A C F R I T E S T H

**VOYAGER
PENNER
HURD
HELICOPTER
ARTIST
PHOTOGRAPHY**

**YEAGER
LINDBERGH
MOJAVE
NAVIGATOR
WRITER**