FLIGHT PLAN

Your guide to learning

OFFICIAL PROGRAM 2016

LONDON HOUSTON TOKYO

Welcome!

We are glad you are here! This program is for kids, teens, and their parents. It explains some of the things you can see in this museum. At the end of the program, you will receive an official Aviator badge.

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On the computer

You can use the computer to visit a virtual museum park. It has planes that are in real museums in England and Japan.

With the virtual reality glasses

You can use the virtual reality glasses to explore the planes and more.

This book

This book is yours to keep. Use it during your visit to the virtual museum. Or, use it by itself.

If you need help, just ask!

PRE-FLIGHT CHECKLIST

The 1940 Air Terminal museum

Find out what makes this museum neat, and learn what it takes to be an aviation enthusiast.

Our planes

Check out our planes and how they work.

Solved problems

Learn some of the secret language of aviators.

More!

Make plans to visit other places in Texas and online.

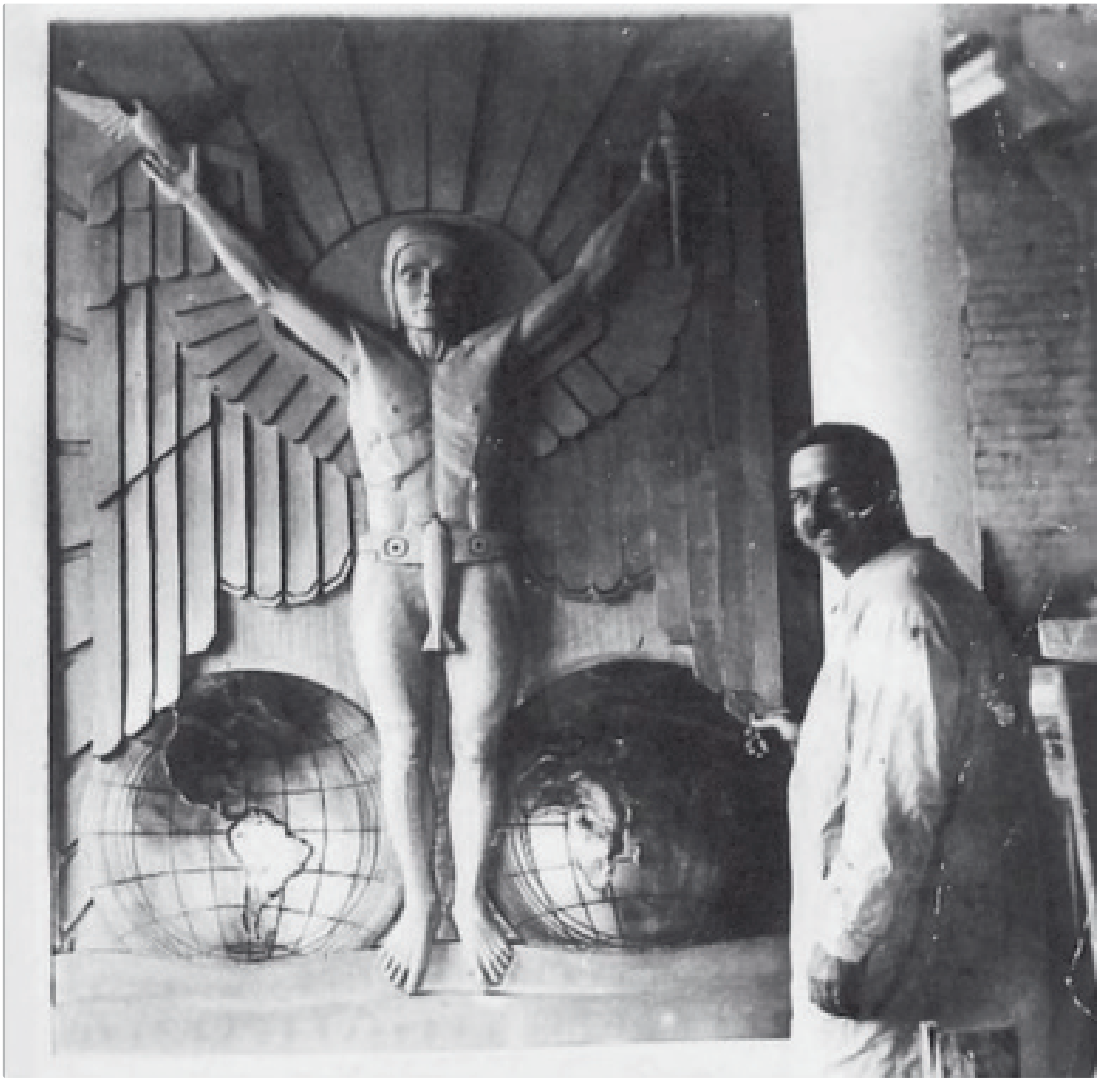
Museum History

This building was the original airport. It is more than 75 years old!

The building was designed by a man who grew up in Austria and then moved here. The design is called *art deco.* Art deco first became popular in Paris, and it used designs from Native Americans.

The same man designed the Houston City Hall building, too.

The sculptures that decorate the outside walls were made by a Texan named Dwight Holmes. In this picture, he is standing next to the one that was put up over the doors. It is named *Winged Mercury.*



Notice that Mercury has a dove of peace on his left, and a torch of knowledge on his right. He is wearing an aviator's helmet, and two different sides of the globe are shown on each side of him.

And yes, a propeller plane serves as a fig leaf for modesty!

What do you think the artist was trying to say with this sculpture?

_____

_____

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_____

Planespotting

Some people like to look for different planes in the sky and keep track of the ones they see. This hobby is called *planespotting* and the people are called *plane spotters*.

Are plane spotters outside today?

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What kind of planes do you think they see?

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Would you like to be a plane spotter?

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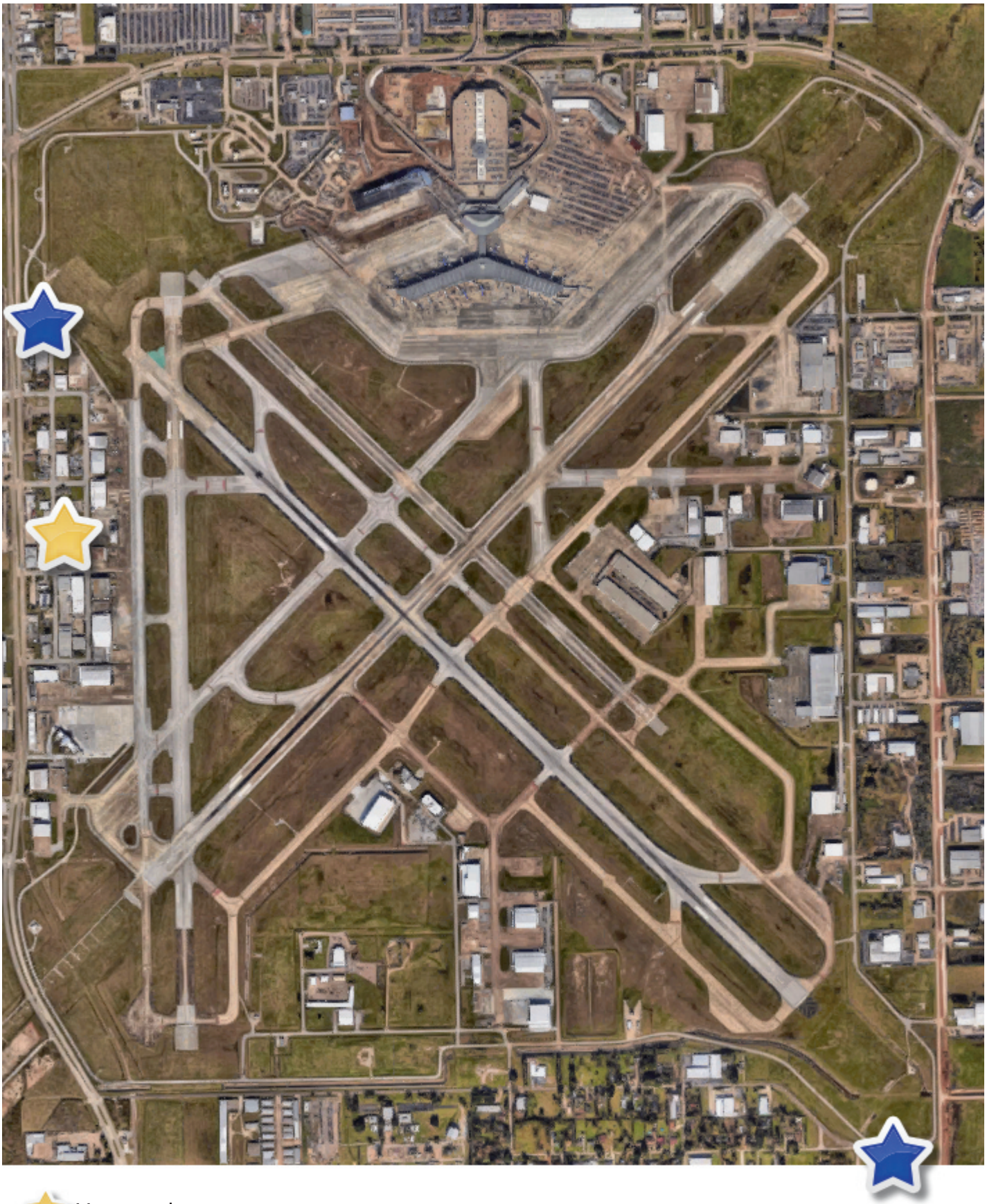

You are here.

These are observation lots for planespotting!

N31G: A 1942 Lockheed Lodestar

Even in the 1920s, Houston businesses used planes to travel to oilfields and to other cities. A company named Lockheed made this plane and others like it to take people to far-away places. It is a *passenger transport* aircraft.

This model was popular because it had two more rows of seats than earlier ones. Does it look like a big plane to you?

Did you know?

Every plane has a unique name, called the *aircraft registration number.* In the United States, aviators call it the "N number" because our planes always start with the letter N. The N number is always printed on the plane. Do you see where it is printed in this photo?

How it works

Flying is a balance of four forces: weight, lift, drag, and thrust.

If you drop any object, it falls to the ground because of weight. Weight is caused by gravity.

Lift happens when air flows over an object.

A plane's wings help it achieve lift. If you have flown a kite, you have experienced lift.

Drag happens when a plane is thrusted through the air.

If you put your hand out the car window, your hand is pushed back. That's drag.

To get enough air for lift, you must have thrust. The planes' engines thrust (or push) the plane forward.

A fan at your house thrusts air toward you to keep you cool.

Are any of these forces important for cars?

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_____

N887: A 1958 Sikorsky Helicopter

This helicopter was made by Sikorsky. He grew up in Russia and then came to the United States as an adult. He invented many of the features of the modern helicopter. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vestibulum velit ex, suscipit nec tristique vitae, condimentum vitae erat. In ac sapien gravida, tristique velit quis, luctus erat. Curabitur vel velit sit amet odio suscipit cursus. Sed ut velit enim.

This helicopter was used by the the St. Louis Helicopter company. They used it to lift really heavy equipment during construction jobs.

Rotary Wings

The first plane we looked at had *fixed wings*. That is, its wings do not move. A helicopter is different. It is a *rotary wing* aircraft. It has rotor blades that spin very fast to lift the helicopter.

Helicopters like this one can lift a lot of weight, and they can go directly up and down without a runway. They can go in reverse, too! And, helicopters can hover, which means staying in the same place in the air.

When you have seen helicopters, what jobs were they doing?

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Lorem ipsum

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N841TA: A 1956 Douglas DC-6

We are restoring this plane. To fix it, we had to cut it in half! What you see is the *nose* and *front fuselage.* The nose is the tip of the plane and where the pilots sit. The fuselage is the body of the plane.

N841TA was a *passenger liner*, which people took when they wanted to visit people far away. It is not the type of plane that usually moves equipment.

Compare this plane with N31G. How are they different?

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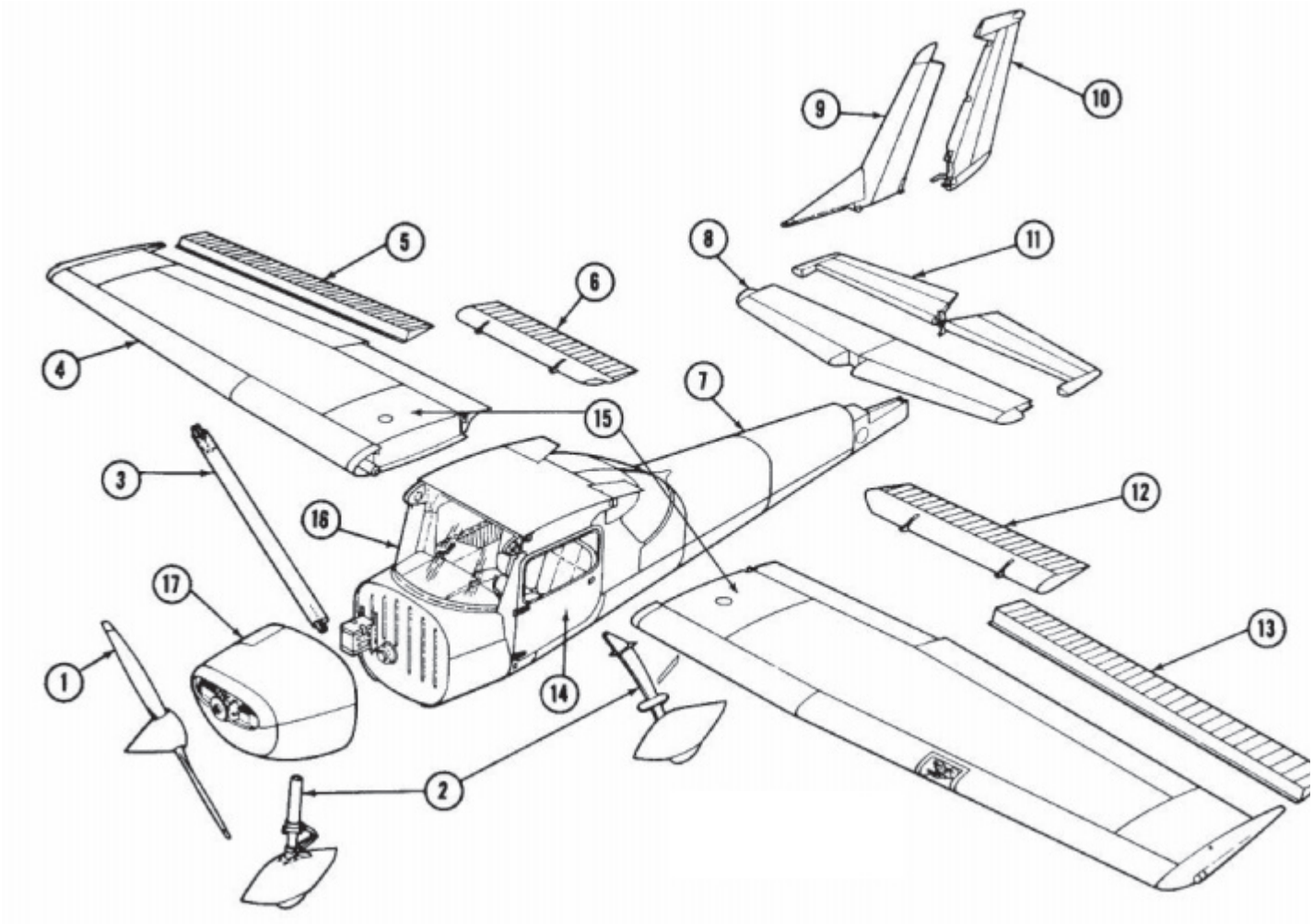
Parts of the plane



1. Propeller

2. Landing gear

3. Right wing strut

4. Wing

5. Right wing aileron

6. Right wing flap

7. Fuselage

8. Horizontal stabilizer

9. Vertical stabilizer

10. Rudder

11. Elevator

12. Left wing flap

13. Left wing aileron

14. Door

15. Fuel tanks

16. Windshield

17. Engine cowling

N400PR: A 1969 Hawker Siddeley Jet

This plane was made in 1969 but is similar to the planes used today. Companies sometimes send their employees on business trips to visit oilfields and other cities in this type of plane. It is a *business jet.*

Jets do not have propellers. Instead, they have jet engines. This plane has **two** engines. Why would two engines be better than one?

_____

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Taking the controls!

The pilot's area of the plane is called the cockpit. It has everything he needs to go forward, up, and down. Like a car's dashboard, the cockpit shows helpful information.

Attitude indicator

The ground is brown and the sky is blue. Your wings are the red line in the middle. What do you think it would look like if the plane were tilted to the right?

Heading indicator

This dial shows the direction you are flying in. If it looked like this, are you flying north, south, east, or west?

Vertical speed indicator

This dial shows how fast you are going up or down. Do you think this picture shows you going up, or down?

Is it time for a break?

You've been working hard, and you've learned a lot. It's time for a break! Please enjoy these good jokes...

After having a good laugh, go to the next pages. You will learn a little of the secret language of aviators, and then you will get your official Aviator badge!

Daniel: Why does a hummingbird hum?

Nancy: It doesn't know the words!

M

Tali: What kind of plane hops before it takes off?

F

Gabe: A "hare-plane"!

Joseph: What kind of aircraft do you not want to fly in?

Jon: A "fell-i-copter"!

Q

Pilot: Does this cockpit always leak like this?

Mechanic: Only when it rains!

E

Ramon: What is the hardest thing about flying a plane?

Sara: The ground!

E

Camila: What does a flying plane and a pile of clothes have in common?

T

Carlos: They both don't need hangars!

Karim: My arms are killing me!

Robbie: Why?

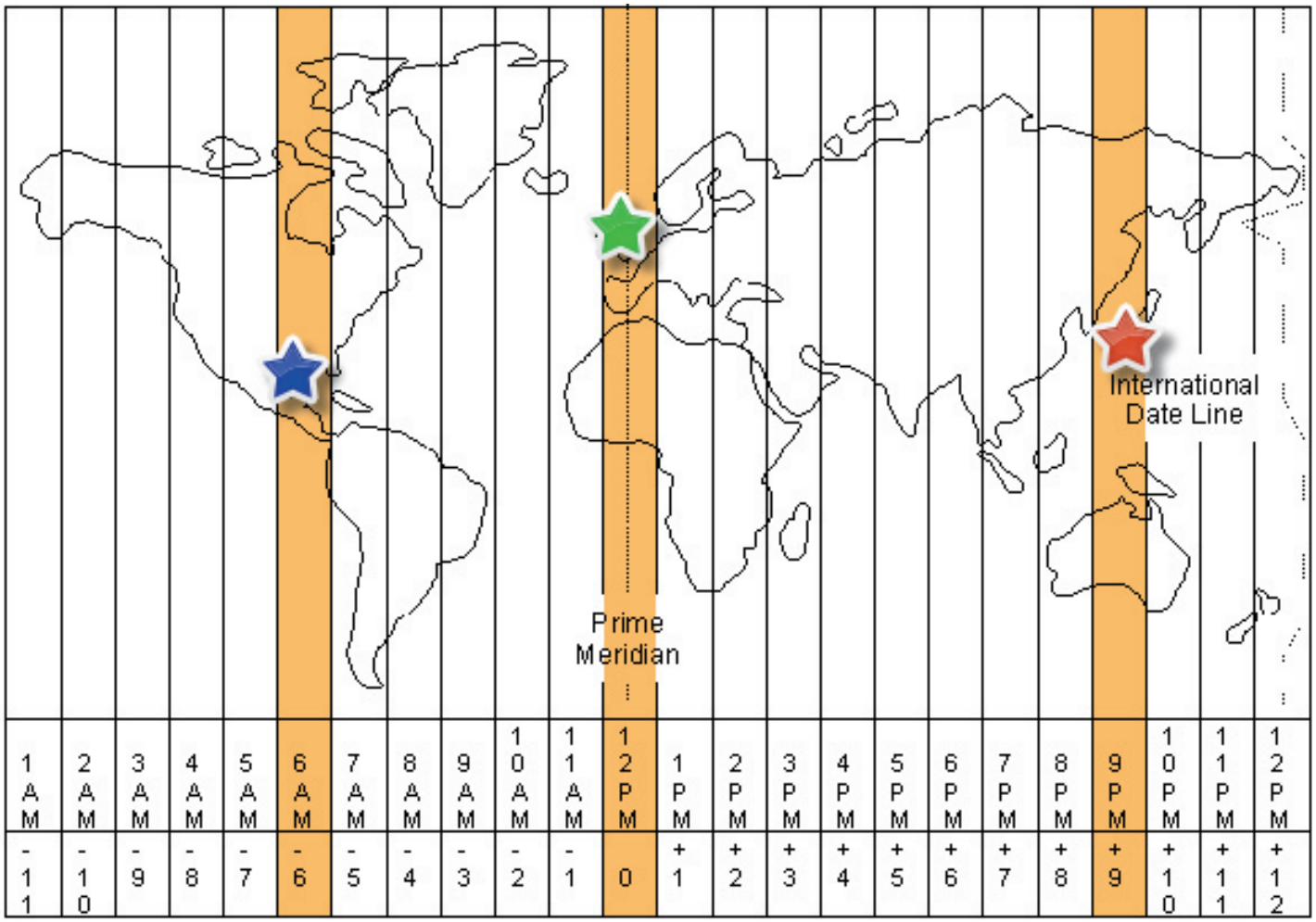
Karim: I just flew in from New York!

W

It's About Time

Have you noticed that on TV, they sometimes say that a show will start at "8 PM, 7 Central?" They are only broadcasting the show once. At that time, in Houston our clocks show it is 7:00 PM (because we are in the Central time zone). At the very same time, the clocks in New York show that it is 8:00 PM (because they are in the Eastern time zone).

There are 24 time zones around the world, which you can see on this chart:



Texas has a blue star; England has a green one; Japan has a red star. Notice the times at the bottom of the map. When it is 6:00 in the morning in Houston, it is noon in England, and 9:00 at night in Japan.

If you were to fly a plane from Houston to Japan, how may time zones would you cross?

_____

If you wanted to meet a friend in Japan for lunch, and you were flying your plane from Houston, how would you talk to your Japanese friend about what time you are leaving Houston?

_____

_____

Zulu time

On TV, they only have to talk about a few time zones for their shows, but aviators have to talk about all the time zones! This was before planes, when people used ships to cross the oceans. The aviation field learned from the shipping (boating) field. They decided that when they would talk about time, they would only use one time zone, no matter where they were. They call that *Zulu time.* Zulu time happens to be the same as the time on the Prime Meridian.

Look at the map. Which country has the Prime Meridian going through it?

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Spelling the Aviator Way

Say these letters out loud: B, D, G, P, T, V, Z. They rhyme, don't they? What about the letters M and N? Because letters sound alike, and because sometimes unfamiliar accents also make it difficult to understand letters, civil aviators around the world came together to create a new way to say letters.

Today's aviators use the *phonetic* alphabet. With the phoentic alphabet you say a word instead of just a letter. For example, you say "alfa" instead of "A."

When you use the chart, you might see a few surprising things. "Oscar" and "Victor" are pronounced like British people would say it—without the R at the end. "Papa" is pronounced like the Spanish word for father, with the accent on the second syllable. The number 3 is pronounced like the leafy plant!

Give it a try

Do you remember what you learned about the N-number? That's the unique name assigned to each plane. When aviators talk to each other, they first spell the name of the plane whose pilot they are talking to, then they spell their own name. For example, if you want to talk to the pilot in the first plane we looked at, and if your name is Pat, then you would say, "November tree one golf, this is papa alfa tango."

Use the chart to announce yourself to pilots in the other planes we looked at. Remember, it is in this order: "*[spelling of plane number]* this is *[spelling of your name]*."

Hint: The planes are "N31G," "N887," "N8471TA," and "N400PR."

 **Alfa** (AL-fah)	 **Bravo** (BRAH-voh)	 **Charlie** (CHAR-lee)	 **Delta** (DEL-tah)	 **Echo** (ECK-oh)	 **Foxtrot** (FOKS-trot)
 **Golf** (Golf)	 **Hotel** (Hoh-TEL)	**India** (IN-dee-ah)	 **Juliet** (JEW-lee-et)	 **Kilo** (KEE-loh)	 **Lima** (LEE-mah)
 **Mike** (Mike)	 **November** (Noh-VEM-ber)	 **Oscar** (OS-cah)	 **Papa** (pah-PAH)	 **Quebec** (Keh-BEK)	 **Romeo** (ROW-mee-oh)
 **Sierra** (See-AIR-ah)	 **Tango** (TANG-oh)	 **Uniform** (YOU-nee-form)	 **Victor** (VIK-tah)	 **Whiskey** (WISS-key)	 **X-ray** (EKS-ray)
 **Yankee** (YAN-kee)	 **Zulu** (ZOO-loo)	 **Zero** (ZEE-ro)	 **One** (Wun)	**Two** (Too)	 **Tree** (Tree)
 **Four** (FOW-er)	 **Five** (Fife)	 **Six** (Siks)	 **Seven** (SEV-en)	 **Eight** (Ait)	 **Niner** (NIN-er)

You are cleared for lift-off!

You have learned a lot, and we hope you had fun, too! Your hard work has earned you an official Aviator badge from this museum. If you are in Girl Scouts, what you did today can count toward a badge, too!

The museum's Aviator badge

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The Girl Scout badge

Did you know that Juliette Gordon Low established an aviation badge for Girls Scouts to earn in ***1916***? Some of the activities you did today may go toward a badge. Check with your Scout Leader!

January Business Aviation Day	**February** Chopper Day	**March** Piper Day	**April** HobbyFest
May Learn to Fly Day	# Calendar Of Events		**June** Movie Night
July Raffle Day & Our Birthday			**August** Grumman Day
September Air Show	**October** Wings Over Houston	**November** Air Race Day	**December** Houston Spotters Appreciation Day

My dates to remember:

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FLIGHT MUSEUM

More fun places

In Houston

Space Center Houston is inside the NASA Johnson Space Center. See how we took aviation to space!

A spacecenter.org

In Fredericksburg, Texas

The National Museum of the Pacific War is inside the Admiral Nimitz State Historic Park. This museum has planes used over the Pacific ocean during World War II.

A www.pacificwarmuseum.org

In Corpus Christi, Texas

The USS Lexington is a World War II aircraft carrier and museum. An aircraft carrier is a really big ship that is used as an airbase. Planes can land on these types of ships!

A www.usslexington.com

In Dallas, Texas

The Frontiers of Flight museum is a very big museum wiht many planes. They also show plane exhibits from the Smithsonian.

A www.flightmuseum.com

Online

The Smithsonian is a group of our nation's museums. They have *everything*, and anyone can visit for free! But, the Smithsonian Air and Space musuem is in Washington, D.C., so it is easier to visit them online.

A airandspace.si.edu