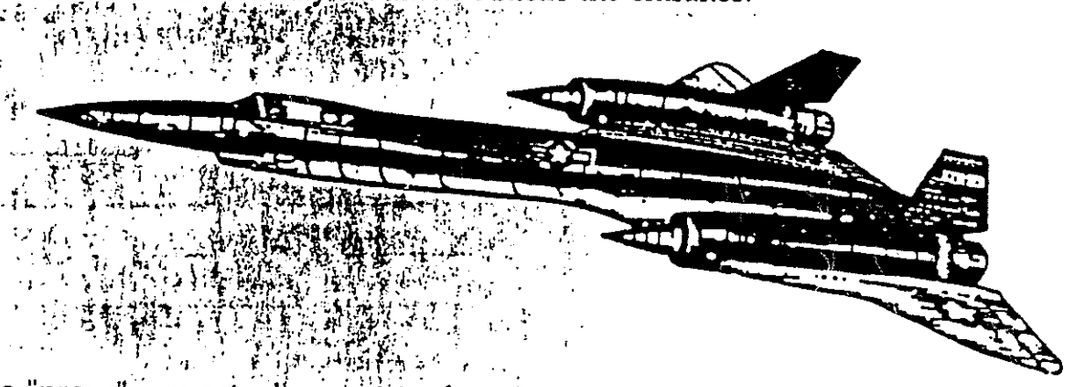
ENGBERG RESOURCE 1994-5
PHYSICAL SCIENCE/HISTORY

NAME_____
PERIOD____ ROW # _____

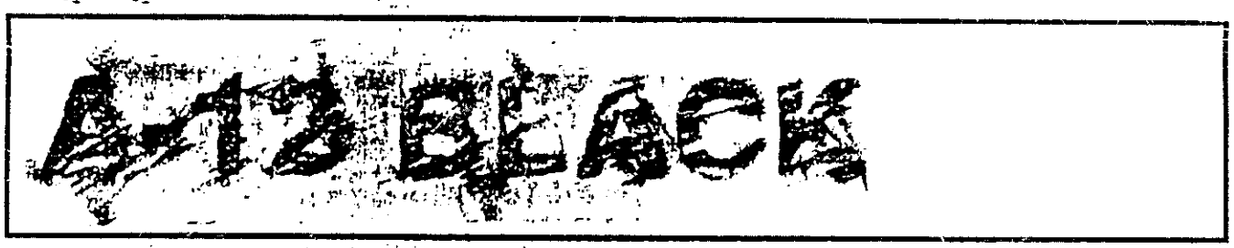
San Diego
AEROSPACE MUSEUM

The San Diego Aerospace Museum is located at the south end of Balboa Park near the Starlight Bowl. It is one of the finest Aerospace Museums in world, having several hundreds of aircraft in its collection and thousands of historical air and space related artifacts. This wonderful collection is very dynamic and is constantly enlarging and changing. Due to this fact be aware that some of the items mentioned in this "adventure" may have changed since this paper was printed. If you can't find something mentioned here just state so on the paper and continue to learn from and enjoy your San Diego Aerospace Museum.

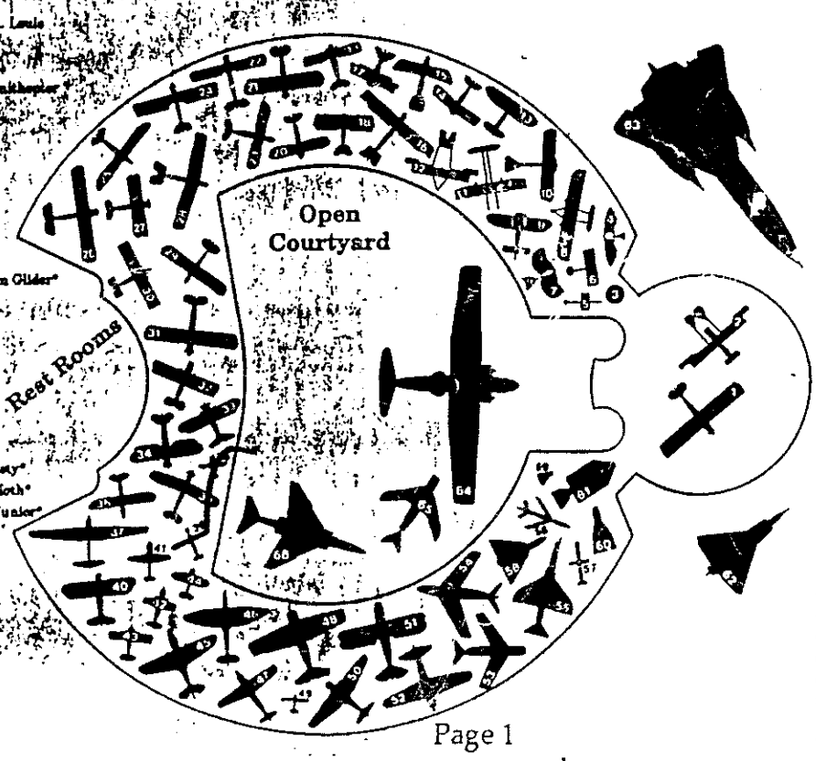
No doubt the first thing you'll notice as you approach the museum is the Lockheed A-12 BLACKBIRD dramatically mounted outside the entrance.



To "prove" you actually went to the museum you must make a "rubbing" of a part of the plaque found under the A-12 which tells about this historic craft. Use a soft pencil or crayon to make a rubbing to finish the inscription seen below. Rub in the word "BIRD" in the space provided.



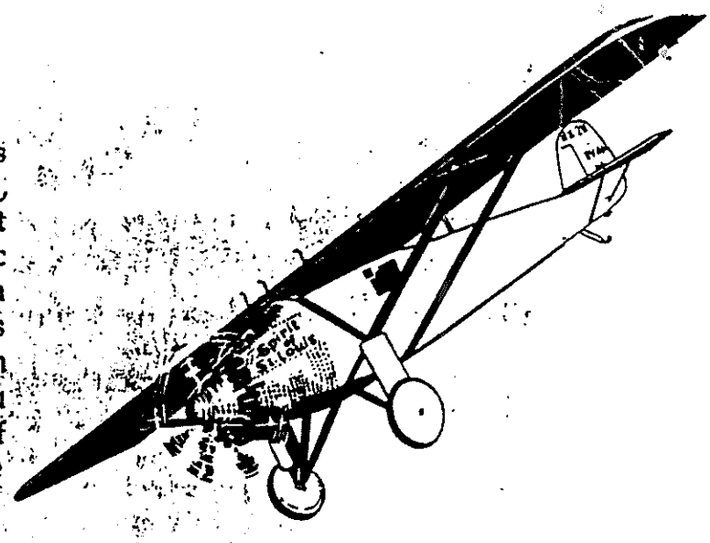
As you enter the building you will instantly recognize that this "adventure" will cover only a miniscule amount of the collection. It is hoped that you will take your time and not only find the few items mentioned here but search out and find the many aspects of aero-space history that are of special interest to you. Refer to the map below to find the general area of the items mentioned inthe following 3 pages.



1. Ryan NYP Spirit of St. Louis
2. Curtiss A-1 Triad
3. Montgolfiere Balloon
4. Leonardo Da Vinci Ornithopter
5. Cayley Glider
6. Chanute Glider
7. Lilienthal Glider
8. Wright 1903 Flyer
9. Bleriot XI*
10. Deperdussin C*
11. Wright Ex Vin Fiz
12. Curtiss Little Looper
13. Montgomery Evergreen Glider*
14. Nieuport XI
15. Albatros D.Va
16. Curtiss JN-4D*
17. Fokker Dr-1 Triplane
18. Thomas-Morse S-4C*
19. Spad 7.c.1*
20. Nieuport 28
21. Ryan M-1
22. Consolidated PT-1 Trusty*
23. De Havilland 60-GM Moth*
24. Curtiss-Wright CW-1 Junior*
25. Aeronca C-3 Duplex*
26. Curtiss B-1 Robin*
27. Fleet 2*
28. Standard J-1*
29. Piper J-3 Cub*
30. Pietenpol Air Camper*
31. Ryan B-5 Brougham*
32. Swallow TP*
33. Boeing FaB-4

34. Waco YKS-7*
35. Link Trainer*
36. Ryan S-T*
37. Bowlus SP-1 Albatross
38. Ryan PT-22 Recruit*
39. Wee Bee
40. Stearman N2S-3 Kaydet*
41. Mercury Air Shoestring*
42. Jungster VI*
43. Sundancer*
44. Pitts S-1-S Special*
45. Curtiss P-40E Warhawk*
46. Supermarine Spitfire Mk. XVI*
47. Messerschmitt Bf-109G-14
48. Grumman F8F-3 Hellcat*
49. Radioplane OQ-1 Drone*
50. Douglas SBD-5 Dauntless
51. Grumman J2F-6 Duck*
52. Mitsubishi A6M7 Zero*
53. MiG-15*
54. North American F-86 Sabre*
55. Douglas A-4B Skyhawk*
56. Ryan X-13 Vertijet*
57. General Dynamics Tomahawk
58. Ryan Firebee II*
59. Mercury Spacecraft
60. Gemini Spacecraft
61. Apollo Spacecraft
62. Convair YPZY-1 Seadart*
63. Lockheed A-12 Blackbird*
64. Consolidated PBY-5A Catalina*
65. MiG-17*
66. McDonnell F-4S Phantom II*

*Indicates



Much of the display in the foyer is dedicated to Charles _____, who, in the year _____, was the first person to fly solo across the Atlantic ocean. He landed in Paris France after a flight of _____ hours. A replica of his plane, *"The Spirit of Saint Louis"*, is on display here (#1 on the map). Do you think he could see the Eiffel Tower out of his front windshield as he approached the Paris Le Bourget Airport? Sure/ No Way.

PAY YOUR ENTRANCE FEE (It's FREE every 4th Tuesday), TAKE YOUR TOKEN AND ENTER THE MAIN MUSEUM AREA.



LOOK UP OVER YOUR HEAD.
Find the Hot-Air balloon of the *Montgolfier* brothers. Why is it on display here? What is it's historic significance? _____

_____

_____

_____.

FIND THE "MOON-ROCK"
This rock was picked up by the crew of Apollo 17. It has been dated to be _____ years old. In this same area you'll see the space suit of Bill Anders. He is a graduate of which GHS District High? _____

THERE ARE SO MANY BIOGRAPHICAL ARTIFACTS HERE THAT YOU MAY WANT TO SPEND SOME TIME JUST WALKING AROUND TAKING THEM IN. EVENTUALLY FIND YOUR WAY TO THE **"WRIGHT FLYER."(#8 on the map)**

Discuss the importance of the **WRIGHT FLYER** and tell some of it's and the Wright brother's history. (date, length of flight, engine, etc.) _____

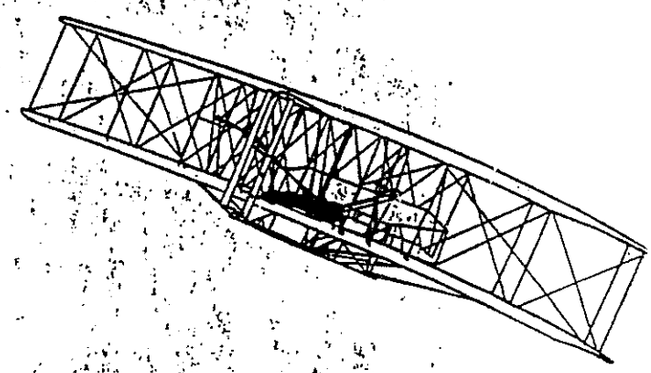
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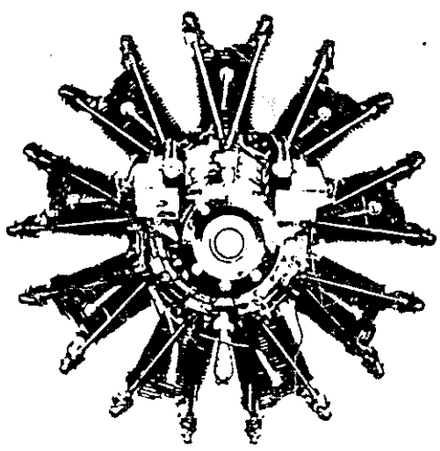
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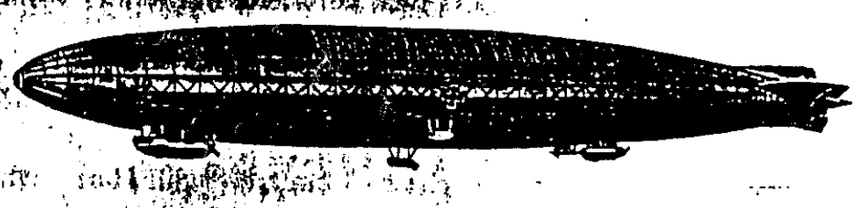
_____.





There are three basic piston engine types used in aircraft (new and old). They are the: HORIZONTAL OPPOSED, THE RADIAL, AND THE INLINE ENGINES. Of these which type did the **Wright Flyer** use? _____.
What type did the **Fokker Dr 1 Triplane** use? _____. And the **Nieuport 28**? _____. What type of engine is shown to the left? _____. Find and name a plane with a horizontally opposed engine. _____.

KEEP WANDERING, OBSERVING, AND ENJOYING. Have you played some of the TV demonstration movies? Don't pass them up.



Why did the **Zepplins** show a "lack of success" during World War I?_____.

Does that mean that we should be worried about the GOODYEAR blimp? YES/NO. Why or why not? _____.

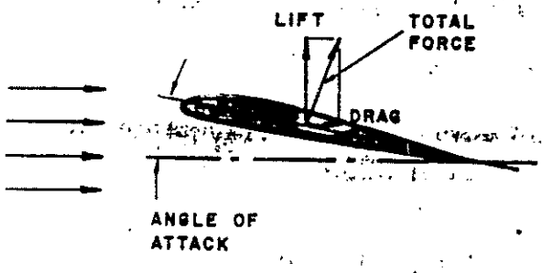
YOU SHOULD BE ABOUT HALF WAY THROUGH THE BUILDING. FIND THE DISPLAY "AERODYNAMICS: WHY PLANES FLY" (Near the Piper J-3 Cub #29 on the Map)

Use the space to the right to draw and label an airplane to help describe and define the terms: "PITCH, YAW, and ROLL".

What causes "DRAG?" _____

_____

According to the *Bernoulli* effect low pressure is ABOVE/BELOW the wing.



Sketch Showing What is Meant by Pitch, Yaw and Roll

HERE'S A PUZZLE: How much did Gasoline cost in 1933? _____ per gallon.

CONTINUE YOUR MEANDERINGS UNTIL YOU'RE IN THE AREA OF THE **Ryan S-T** (#36 on your Map). ENTER THE EXHIBIT CALLED "WOMEN IN AVIATION"

Can you find the photo of Isabelle Hale ? She was the school nurse at Mount Miguel High school for many years. She once won the "All Women Transcontintal Air Race". The photo of her shows her standing next to the wife of which US president? _____.

IF YOU LIKE YOU CAN GO OUT TO THE OPEN COURTYARD AND LOOK AT THE PBY-5A AND THE AIRCRAFT ON DISPLAY THERE.

CONTINUE ON AROUND TO THE PLANES OF WW II AND KOREAN ERA. IF YOU HAVE A QUARTER YOU CAN TRY OUT THE "Army Air Corps Aerial Gunnery Trainer, MK. I.

FIND THE **GRUMMAN F6F-3 HELLCAT (#48)**
You may be a good shot but can you land your plane? The **LANDING SIGNAL OFFICER (LSO)** is waving his signal panels as shown to the right. What's going to happen when you come in and why? _____

_____

_____

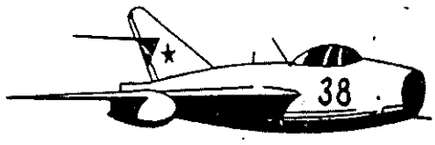


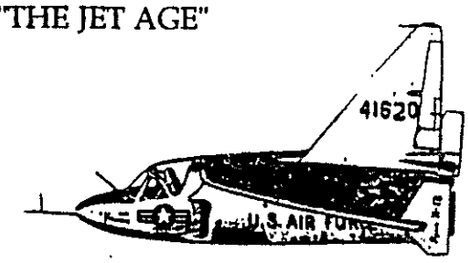
FIND YOUR WAY TO THE PILOT'S READY ROOM (The room is dimly lit with red lights. There's a reason for using red lights in the Ready Room. Why?_____ _____ It doesn't say why but maybe you can figure it out or perhaps one of the retired pilots who volunteer in the museum can tell you).

Watch the film shown in the Ready Room which tells about a modern nuclear aircraft carrier. How many planes (_____) and how many people are on board?(_____).

This room also honors naval officers such as Commander Bill Harris who commanded the VF 146 SQUADRON aboard the USS _____.

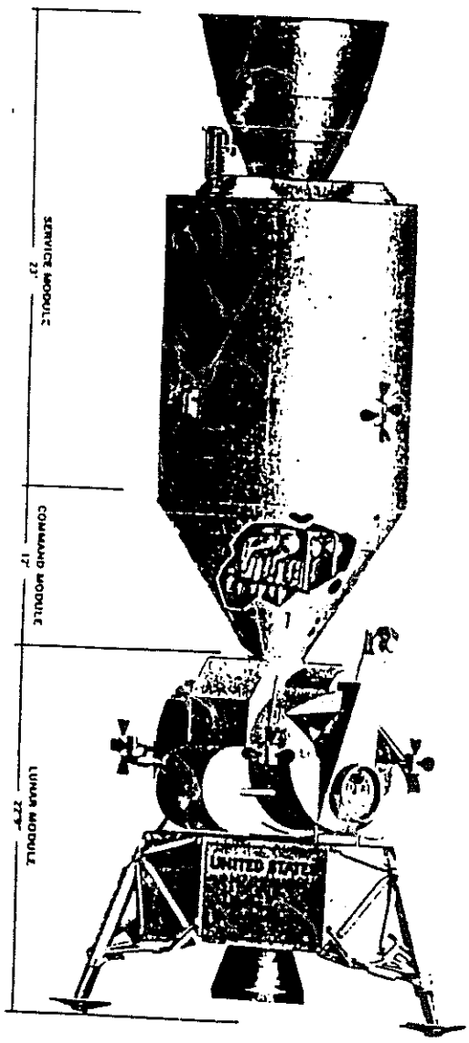
LEAVE THE READY ROOM YOU'RE WELCOMED TO "THE JET AGE"
Can you find and identify the two planes shown here?





Mikoyan-Gurevich -_____ and the Ryan _____

FIND THE TV/MEDIA SHOW "APOLLO MISSION PROFILE"
Watch the film and answer the following questions:



1. What is the name of the Rocket that sent the Apollo Mission to the moon? _____.

2. How many miles to the moon? _____.

3. How many days did it take for the Apollo to get to the moon? _____.

4. Finish this sentence (the first words from man on the moon). **"Tranquility Base here. _____ has landed"**

FIND THE EXHIBIT "FOOTPRINTS ON THE MOON"
What does the plaque attached to the Lunar Landing Vehicle say?

Here _____ _____ _____ _____ mankind

As you're leaving look up at the 33 foot long space vehicle over your head... What is that thing?

_____

YOU'VE ONLY HAD A CHANCE TO SEE A FEW OF THE HISTORIC AIR AND SPACE CRAFT HERE AT THE SAN DIEGO AEROSPACE MUSEUM. WE HOPE YOUR INTEREST HAS BE STIMULATED AND YOU'LL COME BACK AGAIN.