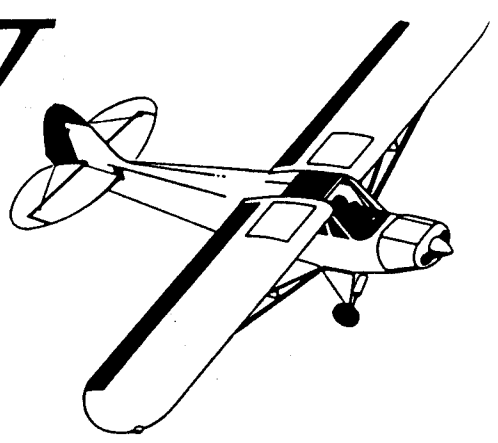


TO FLY



Know the freedom that pilots experience as they travel the limitless sky, near the stars, clouds, and winds that circle the earth!

FLYING IS FUN!

When a plane passes over, do you wish you could be flying high above the ground, soaring like a bird? You can be. You can know the freedom that pilots experience as they travel the limitless sky, near the stars, clouds, and winds that encircle the earth.

If you think that piloting a plane is only for those who joined the military or became commercial airline pilots, think again. You can be a part of general aviation.

The term general aviation refers to all aviation activity that is not military or commercial. Each year more than 100,000 people in the United States take flying lessons to learn how to fly general aviation aircraft. When asked why they want to learn to fly, most say, "because flying is fun."

Some of the people who learn to fly are salespeople who want to expand their business territories or doctors who need to reach patients in remote areas. Others fly for recreation, like going on vacation. Some people who learn to fly are teenagers getting a head start on a piloting career.

And not only is flying fun, but it's also efficient. Many trips that normally take a whole day by car can be made in half the time, or less, in an airplane.

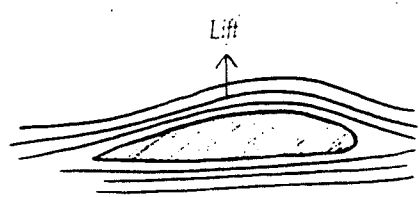
WHY DOES AN AIRPLANE FLY?

Although nothing is mind-boggling or mysterious about flying, there is much to learn—just as there is in learning to drive a car. As you learn to fly step by step, you'll find your training enjoyable and challenging.

Although airplanes have been a part of our society for more than 85 years, most people have only a vague idea of the basic principles of flight. Flight may seem complicated, but in fact it's based on some simple laws of nature.

The principle of lift

When you examine a cross-section of an airplane's wing, or airfoil, you'll notice that the top part is curved and the bottom part is relatively flat. This special shape creates lift, which makes the airplane fly.



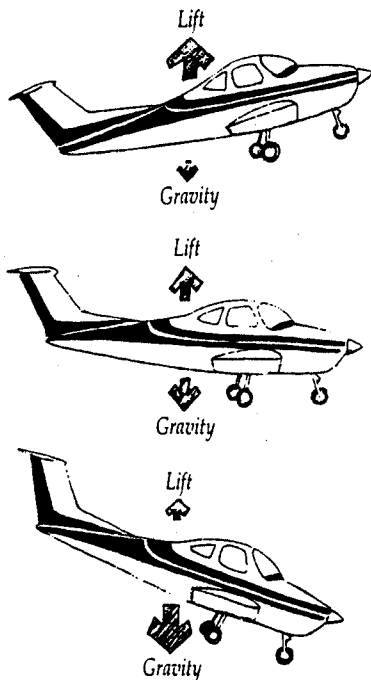
As the wing moves forward, the air flowing over the top travels faster than the air flowing beneath, resulting in a lower pressure area above the wing. The relative pressure differential provides the upward force called lift. Lift is basic to flying.

WHAT ARE THE BASICS OF FLIGHT?

Lift and gravity

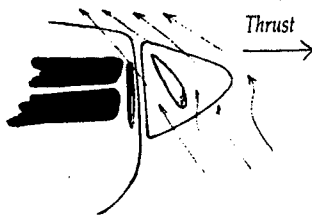
In order for an airplane to climb, lift must be greater than gravity, the force that holds objects on the earth.

For an airplane to maintain level flight at a particular altitude, lift and gravity must be the same, or in equilibrium. When gravity is greater than lift, the airplane will descend.

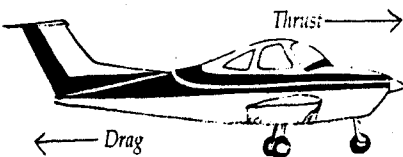


Thrust and drag

As an airplane moves forward, the wing produces lift. The force of forward movement is called thrust, and it's created by the engine-driven propeller or a jet engine.



Like the wing, the propeller is also an airfoil. As it rotates, it creates "lift" in a forward direction that is called thrust. Thrust overcomes drag (resistance of an object toward movement).



When thrust is greater than drag, during takeoff, for instance, the airplane's speed increases. When thrust and drag are equal, the airplane maintains the same speed. Whenever drag is greater than thrust, the plane slows down.

Lift, gravity, thrust, and drag are the four forces acting upon the airplane. You'll learn to understand them thoroughly as you advance in your study of flight.

Control

As the pilot, you control the airplane, and you determine how it flies. The different movements of your controls will cause corresponding movements in the airplane. Here are some basic airplane movements.

Pulling the control wheel toward you raises the elevator, which in turn forces the tail down and the nose up. This serves to create more lift than gravity and the airplane will climb. To help produce the extra lift needed in the climb, you usually need additional power from the engine, which you achieve by using the throttle control. Pushing the control wheel away from you lowers the elevator, forcing the tail up and the nose down. This reduces the lift, and gravity makes you descend.

The rudder pedals control the movement of the plane from right to left in much the same way as the rudder of a boat. Pushing the right rudder pedal forces the nose of the airplane to the right, and the left rudder pedal produces the same movement to the left.

Turning the control wheel moves the ailerons in opposite directions, enabling you to raise or lower either the right or left wing, which enables the airplane to turn faster than using only the rudder.

To change the attitude of the airplane, its relationship to the horizon, you simply use the control surfaces and the power of the airplane. It's an exercise in coordination, much like riding a bicycle. Your flight instructor will discuss with you how these simple movements can be combined to maneuver the airplane.

The parts of an airplane

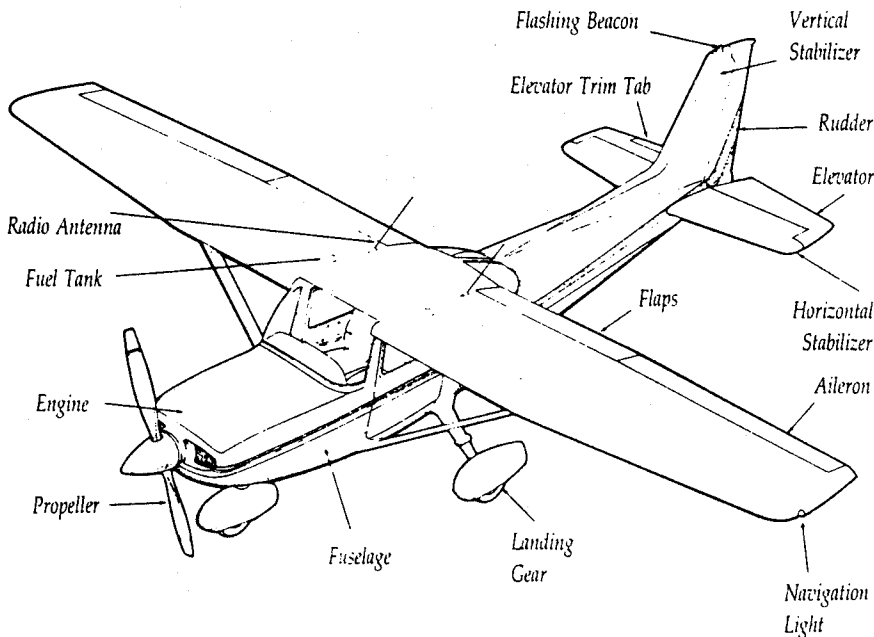
An airplane, of course, is more than a wing, a propeller, and an engine.

The body of the airplane, which holds the pilot, passengers, and baggage, is called the fuselage.

The tail of the airplane is called the empennage, and it consists of the horizontal and vertical surfaces called stabilizers. They create the stability necessary to use the lift and thrust created by the wing and the engine-driven propeller.

Parts of the wing, horizontal stabilizer, and vertical stabilizer are moveable to provide the pilot with the means to control the airplane. These control surfaces are called ailerons on the wings, elevators on the horizontal stabilizer, and rudder on the vertical stabilizer.

You'll become as familiar with the workings of these different parts as you are with the operation of a car.



The basic flight instruments

Although the instrument panel of an airplane may confuse you at first, you'll soon be familiar with the dials and switches and the valuable information they provide. The basic flight instruments are as follows:

A Airspeed indicator—It shows the speed of the airplane through the air.

B Attitude indicator—This instrument is like the horizon you see looking out from the pilot's seat. It tells you whether the nose of the airplane is pointed above or below the horizon and whether the airplane is turning (banking) to the left or right (left wing down or right wing down).

C Altimeter—This instrument shows the airplane's altitude in feet above sea level.

D Turn coordinator—When you're turning the airplane, this instrument shows the rate and the direction of the turn. In this way you can adjust to a slower or faster rate of turn.

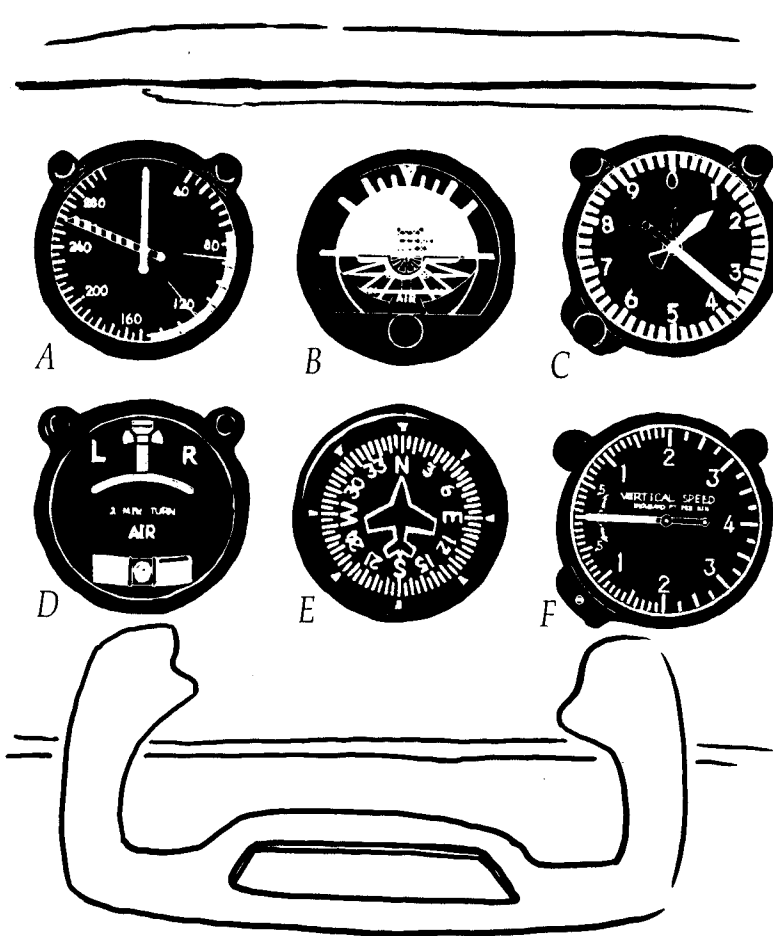
After your first few flights, you'll be thoroughly familiar with these instruments and how they work together with the airplane's control surfaces.

E Heading indicator (directional gyro)—This instrument is another compass. It shows the direction that the airplane is flying. It's usually bigger and easier to read than the magnetic compass, but it requires some source of power to work.

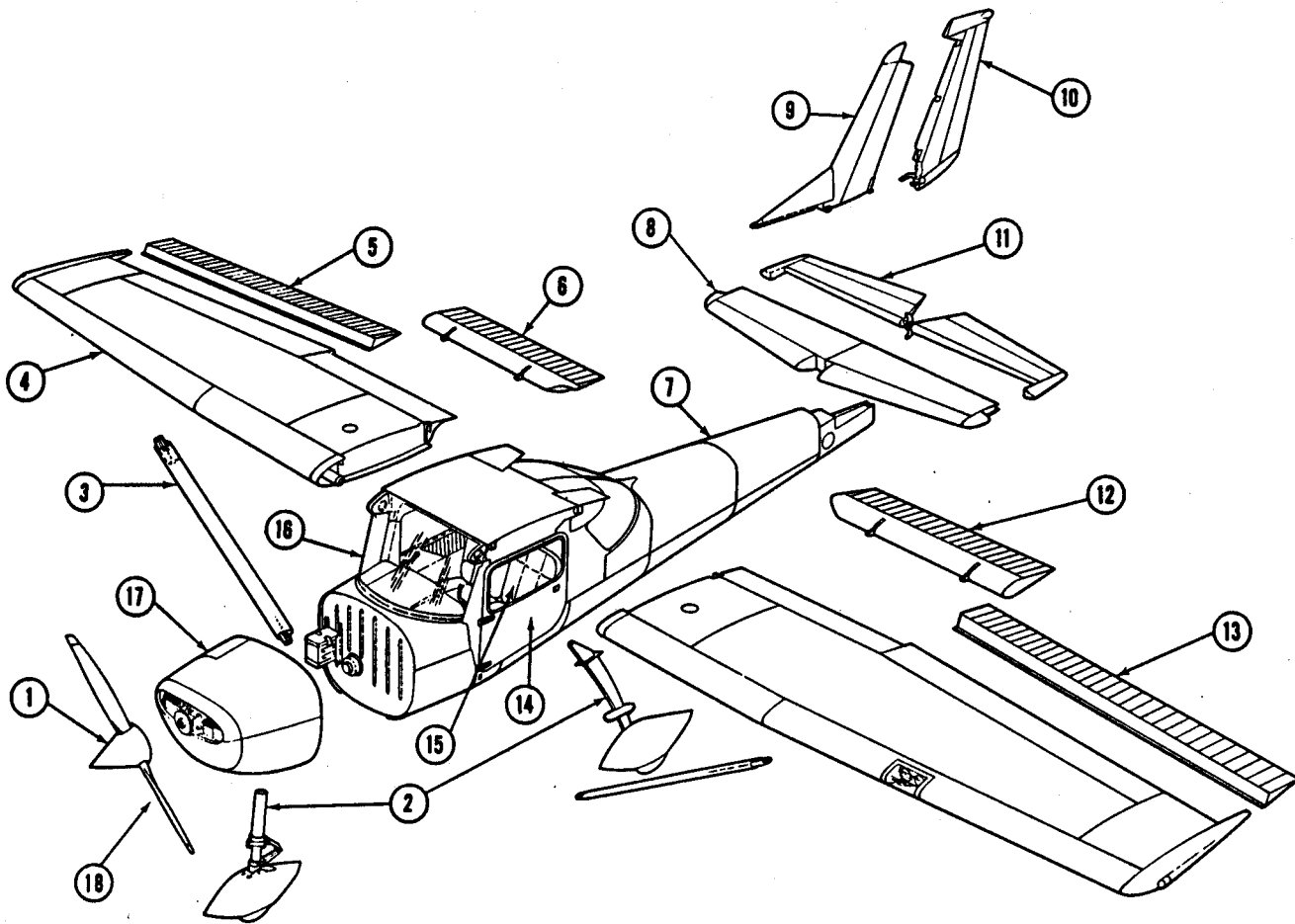
F Vertical speed indicator—This instrument tells you how quickly you're climbing or descending in feet per minute. When you're in level flight, it reads "0".



Magnetic compass—Like the compass you have seen in a car or boat, it tells you the airplane's heading—the direction it's flying. It requires no power source.



- AIRPLANE** - An airplane is a vehicle heavier than air, powered by an engine, which travels through the air by the reaction of air passing over its wings.
- FUSELAGE** - The fuselage is the central body portion of an airplane designed to accommodate the crew and the passengers or cargo.
- COCKPIT** - In general aviation airplanes the cockpit is usually the space in the fuselage for the pilot and passengers; in some aircraft it is just the pilot's compartment.
- LANDING GEAR** - A landing gear is underneath the airplane and supports it while on the ground.
- PROPELLER** - A propeller is a rotating blade on the front of the airplane. The engine turns the propeller which pulls the airplane through the air.
- WINGS** - Wings are parts of airplanes which provide lift and support the entire weight of the aircraft and its contents while in flight.
- FLAPS** - Flaps are movable sections of an airplane wing closest to the fuselage. They both move in the same direction (down) and enable the airplane to fly more slowly.
- AILERONS** - Ailerons are outward movable sections of an airplane wing which move in opposite directions. They are used in making turns.
- RUDDER** - The rudder is the movable vertical section of the tail which controls lateral movement.
- HORIZONTAL STABILIZER** - The horizontal stabilizer is the horizontal surface of the aft part of the fuselage used to balance the airplane.
- ELEVATOR** - The elevator is the movable horizontal section of the tail which causes the plane to move up and down.
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The Main Parts of an Airplane

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|--------------------------|-----------------------|
| 1. Spinner | 10. Rudder |
| 2. Landing Gear | 11. Elevator |
| 3. Wing Strut | 12. Left Wing Flap |
| 4. Wing | 13. Left Wing Aileron |
| 5. Right Wing Aileron | 14. Door |
| 6. Right Wing Flap | 15. Seat |
| 7. Fuselage | 16. Windshield |
| 8. Horizontal Stabilizer | 17. Engine Cowl |
| 9. Fin and Dorsal | 18. Propeller |