

THE AIRPLANE

An airplane is defined by the Canadian Air Regulations as being a "power driven, heavier-than-air aircraft, deriving its lift in flight from aerodynamic reactions on surfaces that remain fixed under given conditions of flight".

Airplanes may be classified according to:

- Position and number of wings in relation to the fuselage,
- The number of engines, and
- The undercarriage configuration.

The essential components of an aircraft are:

- Fuselage,
- Wings or lifting surfaces
- Tail section or empennage,
- Propulsion system, and
- Landing gear or undercarriage.

THE FUSELAGE

The part that makes up the central body of the airplane, designed to accommodate the crew, passengers and cargo. Almost all other parts of the aircraft are attached to the fuselage.

Classification of fuselage: The fuselage is classified into two types:

Truss type

- Consist of tubes (wood or metal) that are usually welded or bolted together. The longerons are the principle member of the truss that run lengthwise. They are braced, or held together, by the vertical or diagonal members to form the frame

Monocoque

- A series of rounded formers/bulkheads held together by stringers. The formers and bulkheads carry most of the load of the structure. The skin that that covers the fuselage is capable of carrying some of the load.

EMPENNAGE

Attached on the rear of the fuselage is the tail group called the empennage.

Components of the Empennage:

Horizontal Stabilizer

- A fixed, non-movable horizontal section of the tail plane.

Elevator

- A moveable section of the tail group, hinged to the trailing edge of the horizontal stabilizer.

Fin

- A fixed vertical section of the tail group placed in the center of the horizontal stabilizer and elevator.

Rudder

- A moveable vertical section of the tail group hinged to the rear of the fin.

Canard

- Some modern aircraft have replaced the tail section with a canard - a horizontal stabilizer assembly is located at the front of the airplane.

Stabilator

- A single airfoil section that replaces the combination of stabilizer and elevator. It is
- attached to the fuselage at a point around which it pivots.