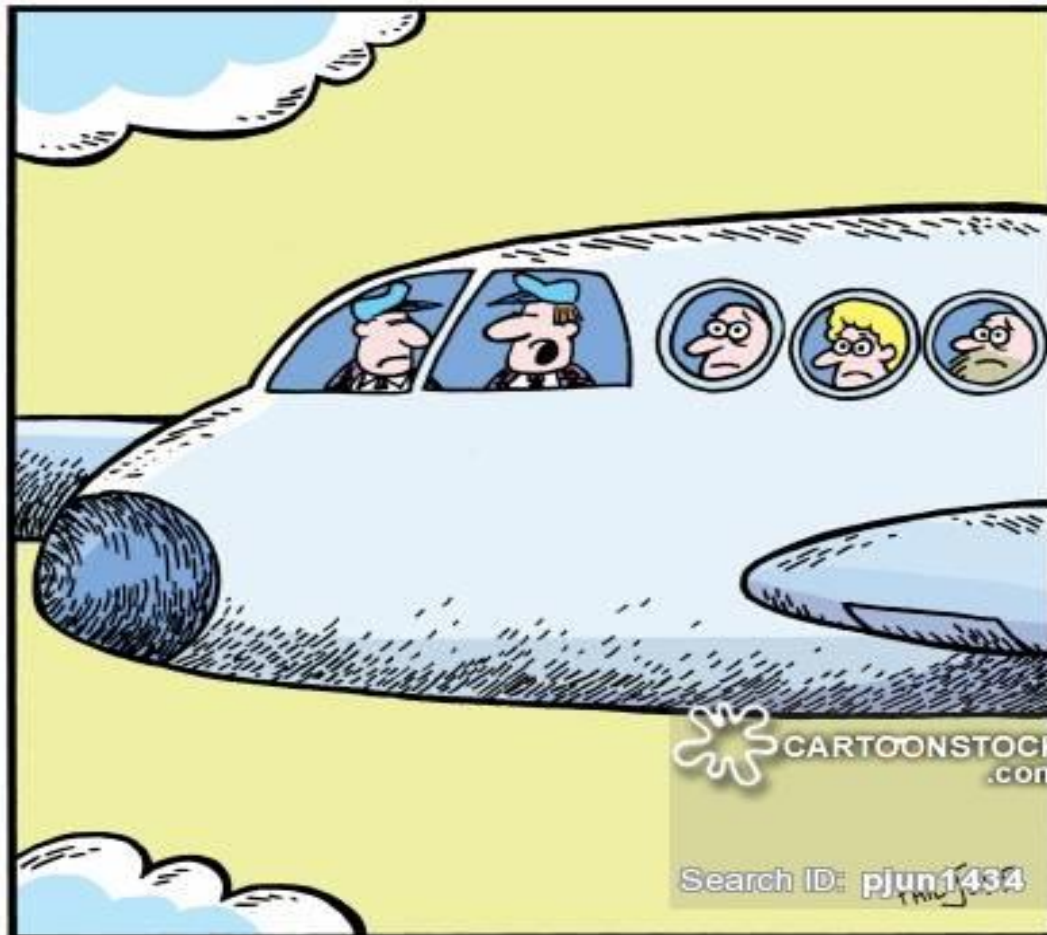




UNIT 3 *Aviation Industry* today

**LET'S PRACTICE
ENGLISH CONVERSATION**





"Oh No! I forgot my driving glasses! What!
You too? Now what are we going to do?"



CHARACTERISTICS OF THE INDUSTRY

- Prior 1950, product line was entirely aeronautical – aircraft, engines, propellers, avionic components, and accessories
- Early 1950, transformation began, new type of engines, different air-frame, different on-board equipment, new tooling and facilities
- R & D , with increasing scientists, engineers, highly skilled technicians, make managerial more sophisticated



MODE OF TRANSPORTATION FEATURES

All modes of transportation have common features. They require an infrastructure, terminals, vehicles as means of transportation and operations to control the transportation systems



In the Airline Industry

- the 'transport networks' → 'Airways'
- the 'terminal' → 'Airports.'
- The 'vehicles' → 'different types of airplanes.'
- 'Air Traffic Control (ATC)' → a service offered by the appropriate authority to promote the safe, orderly flow of air traffic.



AIRLINE INDUSTRY IS...

- System of Transportation . Focus on moving people and goods from place to place by using airways
- Mode of Transportation
 - : Passengers → automobile, busses, air and railways (by convenience)
 - : Freight → sea, road, railways, and air (by speed)



FREEDOM OF THE AIR

Source: *Manual on the Regulation of International Air Transport* (Doc 9626, Part 4)



FREEDOM OF THE AIR

- ***First Freedom of the Air*** - the right or privilege, in respect of scheduled international air services, granted by one State to another State or States to fly across its territory without landing (also known as a ***First Freedom Right***).
- ***Second Freedom of the Air*** - the right or privilege, in respect of scheduled international air services, granted by one State to another State or States to land in its territory for non-traffic purposes (also known as a ***Second Freedom Right***).



FREEDOM OF THE AIR

- ***Third Freedom of The Air*** - the right or privilege, in respect of scheduled international air services, granted by one State to another State to put down, in the territory of the first State, traffic coming from the home State of the carrier (also known as a ***Third Freedom Right***).
- ***Fourth Freedom of The Air*** - the right or privilege, in respect of scheduled international air services, granted by one State to another State to take on, in the territory of the first State, traffic destined for the home State of the carrier (also known as a ***Fourth Freedom Right***).



FREEDOM OF THE AIR

- ***Fifth Freedom of The Air*** - the right or privilege, in respect of scheduled international air services, granted by one State to another State to put down and to take on, in the territory of the first State, traffic coming from or destined to a third State (also known as a ***Fifth Freedom Right***).
-
- ICAO characterizes all "freedoms" beyond the Fifth as "so-called" because only the first five "freedoms" have been officially recognized as such by international treaty.
-
- ***Sixth Freedom of The Air*** - the right or privilege, in respect of scheduled international air services, of transporting, via the home State of the carrier, traffic moving between two other States (also known as a ***Sixth Freedom Right***). The so-called Sixth Freedom of the Air, unlike the first five freedoms, is not incorporated as such into any widely recognized air service agreements such as the "Five Freedoms Agreement".



FREEDOM OF THE AIR

- ***Seventh Freedom of The Air*** - the right or privilege, in respect of scheduled international air services, granted by one State to another State, of transporting traffic between the territory of the granting State and any third State with no requirement to include on such operation any point in the territory of the recipient State, i.e the service need not connect to or be an extension of any service to/from the home State of the carrier.
-
- ***Eighth Freedom of The Air*** - the right or privilege, in respect of scheduled international air services, of transporting cabotage traffic between two points in the territory of the granting State on a service which originates or terminates in the home country of the foreign carrier or (in connection with the so-called Seventh Freedom of the Air) outside the territory of the granting State (also known as a ***Eighth Freedom Right*** or "**consecutive cabotage**").



FREEDOM OF THE AIR

- ***Ninth Freedom of The Air*** - the right or privilege of transporting cabotage traffic of the granting State on a service performed entirely within the territory of the granting State (also known as a ***Ninth Freedom Right*** or "***stand alone***" cabotage).





Break 10 minutes

AVIATION INDUSTRY

Airline Industry is a part of aviation industry, which scope of activities provided by:

- 1. Aircraft Manufacturers**
- 2. Airport Operations**
- 3. Aviation Support Industries**
- 4. Service Provider**



1. AIRCRAFT MANUFACTURERS

Produce

- Commercial planes with 2, 3, 4 engines
- Small planes called 'General aviation planes' with 1,2 jet engines or propeller .Small planes or light planes use for flight instruction, spraying field crops, serve small communities to larger airports called 'Commuter plane'
- Military planes, which include bombers, fighters

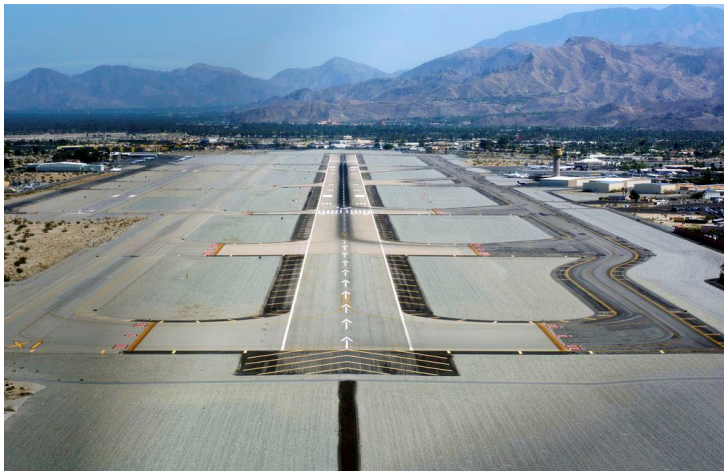


AIRCRAFT MANUFACTURERS



2. AIRPORT OPERATIONS

- Ground Facilities such as reservation, check in, gate, etc.
- Including Runway and Navigation Aids
- Air Traffic Control (ATC)



AIRPORT OPERATIONS



3. AVIATION SUPPORT INDUSTRIES

Provide services and supplies to airlines or airports

- **Company supply fuel for airplanes**
- **Furnish Maintenance, or Repair services**
- **Food suppliers**
- **Airport support involve ground transportation**
- **Freight forwarder**
- **Specialized professional ie. flight insurance, weather information**



AVIATION SUPPORT INDUSTRIES



AVIATION SUPPORT INDUSTRIES



4. SERVICE PROVIDERS OR TRAVEL AGENTS

- Important contributor
- Authorized to sell and issue tickets in and affordable price
- Supporting hospitality service such as hotel, car rental, tourism agent, or cruise operator
- Things needed when arrive at destination



TYPES OF AIRLINE SERVICE

- **Scheduled Flights**
- **Non-scheduled Flights**



SCHEDULED FLIGHTS

- **Predetermined routes according to timetable which refers to regular, published schedules**
- **Use 'Wide' or 'Narrow' body aircraft**
- **The airlines that provide scheduled flight service
Major Airlines, Low Cost Carriers, or Regional Airlines.**



- Major Airlines is large airlines that connect to major cities of the world. These airlines have the capability to handle international destination
- Low Cost Carriers, known as ‘no-frills’ airlines, offer low fares The term originated within the airline industry referring to airlines with a low – or lower – operating cost structure than their competitors



- Regional Airlines known as **'feeder airlines'**. The role of feeder airlines is to bring passengers to the major airports, to connect for longer distance flights on larger aircraft.
- Sometimes offer transportation service between small, isolated communities unable to support larger aircraft. they are referred to as **'commuter airlines'**.



SCHEDULED FLIGHTS



NON-SCHEDULED FLIGHTS

- Not operate under a planned timetable
- Chartered for commercial use by tour operators or other hiring arrangements with customers
- Markets for these services include athletic teams, corporations and government agencies
- A growing part of Airline industry



NON-SCHEDULED FLIGHTS



PASSENGER TRAVEL

- ***The business market*** : main goal is to meet with customers and attend conferences or meetings .
- Fast growing markets and world trade in the Asia market are the main driving factors contributing to business travel.
- This travel market is the most profitable segment of passenger travel.



- ***The leisure market*** consists of passengers travelling for a more extended period of time for the purposes of recreation or other personal reasons. ; holiday



Q & A



REFERENCES

- http://www.thehindubusinessline.com/multimedia/dynamic/01047/bl09_blswe_b_lter_t_1047704f.jpg
- <http://www.aspireaviation.com/wp-content/uploads/2012/12/K65105-02.jpg>
- <http://www.supremeaviation.com/images/references/logo.jpg>
- <http://www.akfen.com.tr/wp-content/uploads/2012/11/IST-1.jpg>
- http://cdn2-b.examiner.com/sites/default/files/styles/image_content_width/hash/49/db/49db577b2e20847551e9e5909d2a9c5a.jpg?itok=JvOcbqT1
- [http://upload.wikimedia.org/wikipedia/commons/e/e7/Airbus_A321-231_-_British_Airways_-_G-EUXH_-_EHAM_\(5\).jpg](http://upload.wikimedia.org/wikipedia/commons/e/e7/Airbus_A321-231_-_British_Airways_-_G-EUXH_-_EHAM_(5).jpg)
- http://content.emirates.com/newsimages/Flavour-2_tcm133-395365.jpg
- <http://www.hometravelagentsite.com/wp-content/uploads/2014/07/travelagent3.jpg>
- <http://www.vosizneias.com/wp-content/uploads/2014/05/F140508ZEL03-725x482>
- <http://elaingroup.com/wp-content/uploads/2013/02/15.jpg>
- <http://www.rentittoday.com/rental-blog/wp-content/uploads/2010/12/stratos-jets.jpg>



DAY BREAK
60 MINUTES

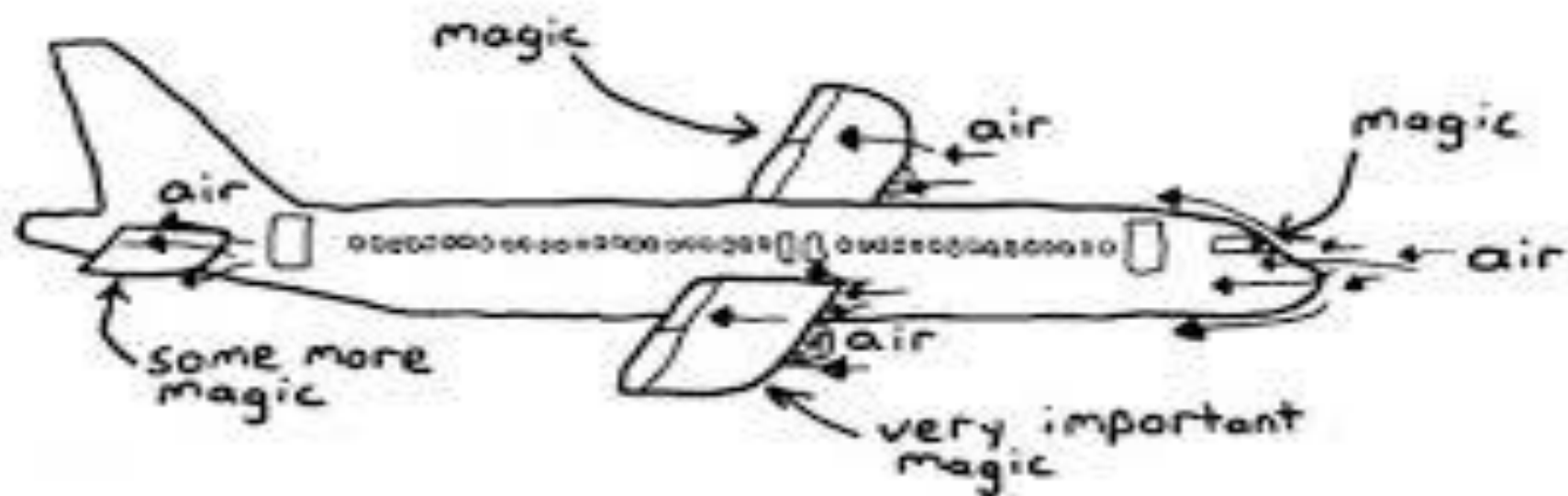




Introduction to Aviation Industry

Unit 4 The airplane and flight

how planes fly



What is the 'Airplane'?

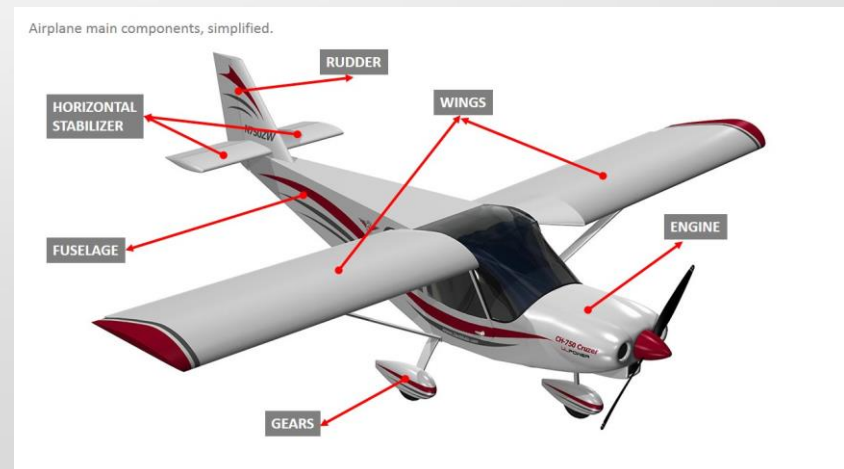
- Airplane is a Powered, fixed-wing aircraft which propelled forward by thrust from a jet engine or propeller



<https://youtu.be/Vqg2uDYOyTA>

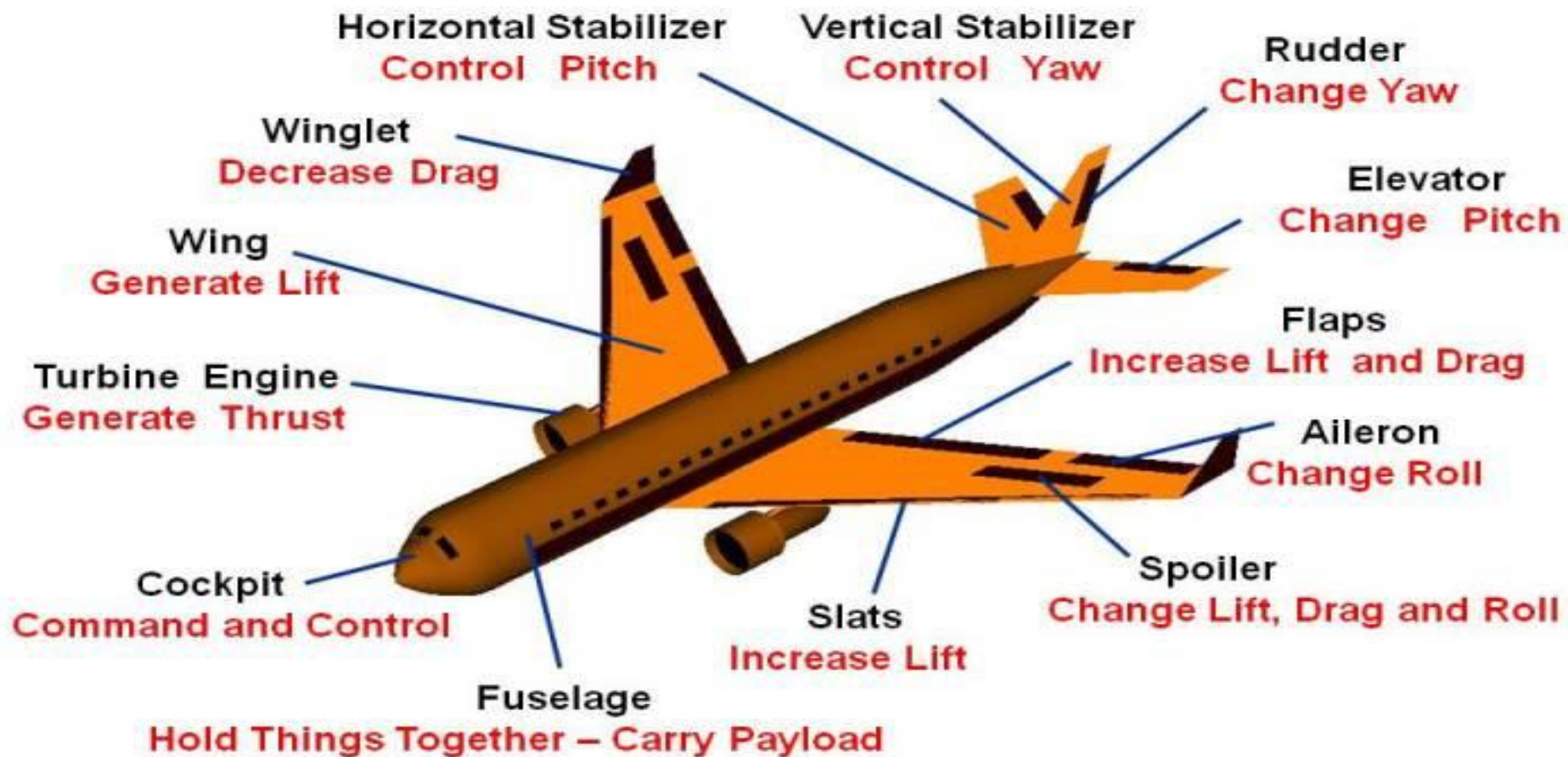
Basic Parts of Airplane

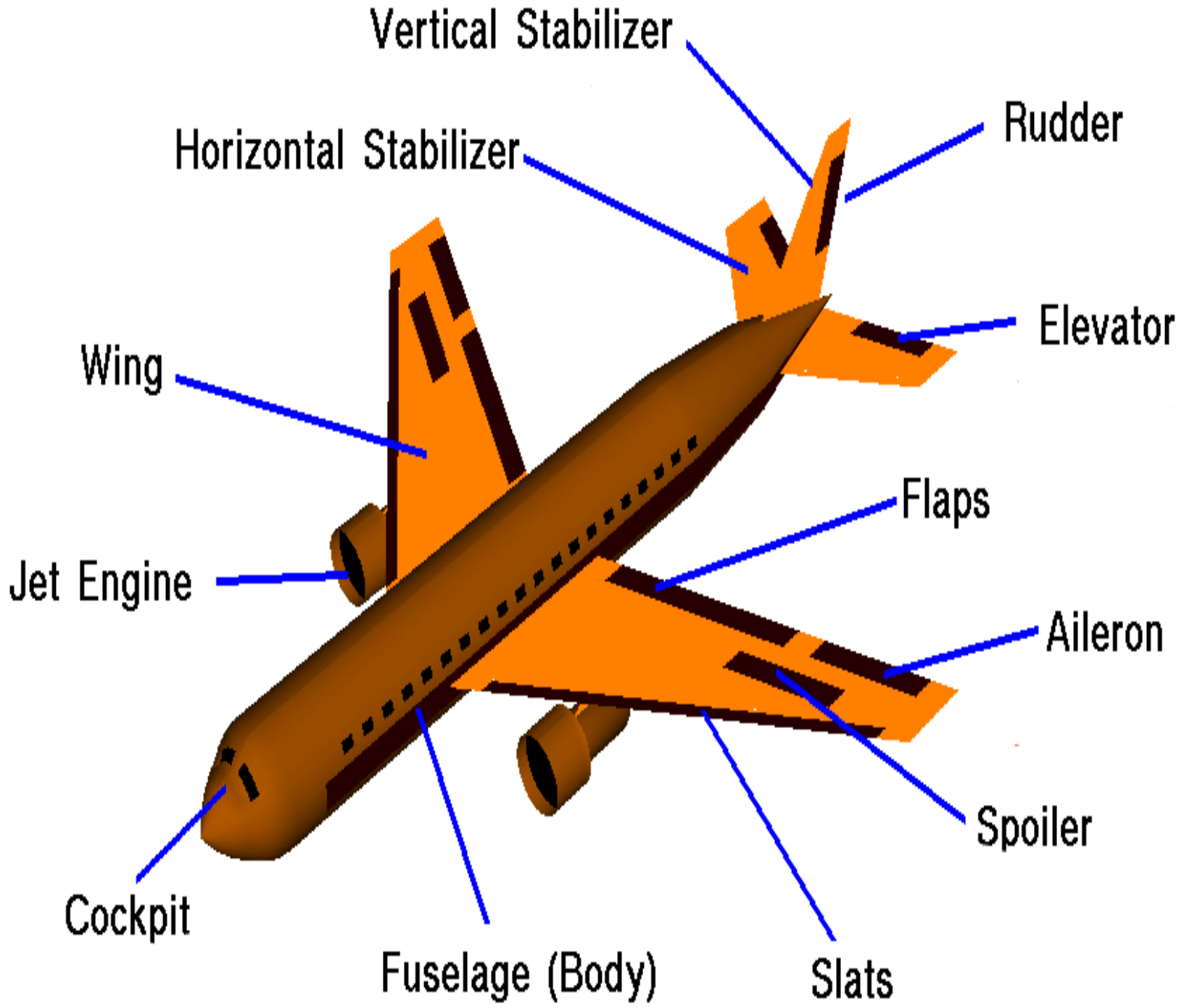
- Wings
- Fuselage or Body
- Empennage or Tail assembly
- Landing Gear
- Engines





Airplane Parts *and* Function





Wings

- **The extended part from the fuselage**
- **A wing has a curved top and a nearly flat bottom.**
- **This shape helps create the lift that raises an airplane off the ground and keeps it in the air.**

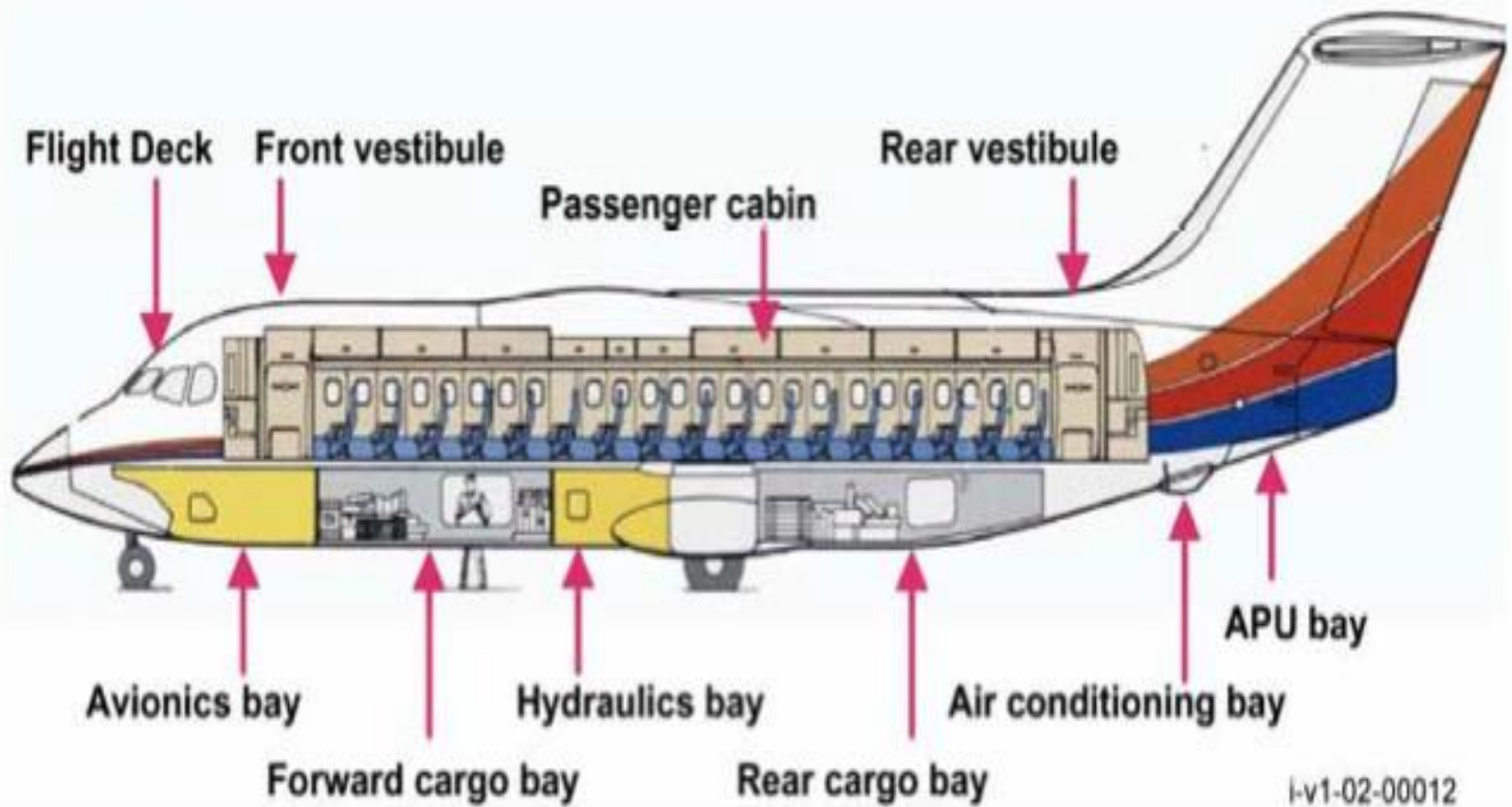


- **Flaps** are deployed downward on takeoff and landing to increase the amount of lift produced by the wing.
- **Slats** are another type of lift producing surface, installed on the leading edge, which are also used at takeoff and landing.
- The **spoilers**, located on top of the wing, are used to reduce the amount of lift created by the wing once the aircraft has landed.

Fuselage or Body

- Extends from the nose to the tail and have a tube shape and are covered with a lightweight skin consisting of aluminum or a composite material on newer aircraft.
- Has flight deck, passenger cabin, and cargo compartment
- The fuel carried in the wings also fuselage

Figure 1.12 - Passenger Cabin and Lower bays

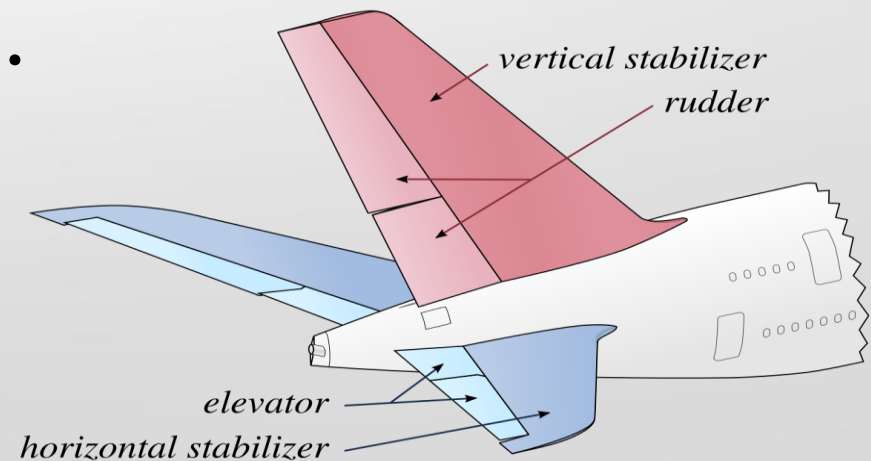


I-v1-02-00012

Tail

- The tail assembly, or empennage, is the rear part of the airplane
- Control surfaces on the empennage help to control and manoeuver the aircraft
- The tail has a fixed horizontal and vertical stabilizer.
- The stabilizers provide stability for the aircraft, to keep it flying straight.

- The vertical stabilizer keeps the nose of the plane from swinging side to side
- horizontal stabilizer prevents an up-and-down motion of the nose.
- At the rear, the hinged part of the vertical stabilizer is called the rudder used to deflect the tail to the left and right .
- The hinged part of the horizontal stabilizer is called the elevator and is used to deflect the tail up and down.



Landing Gear

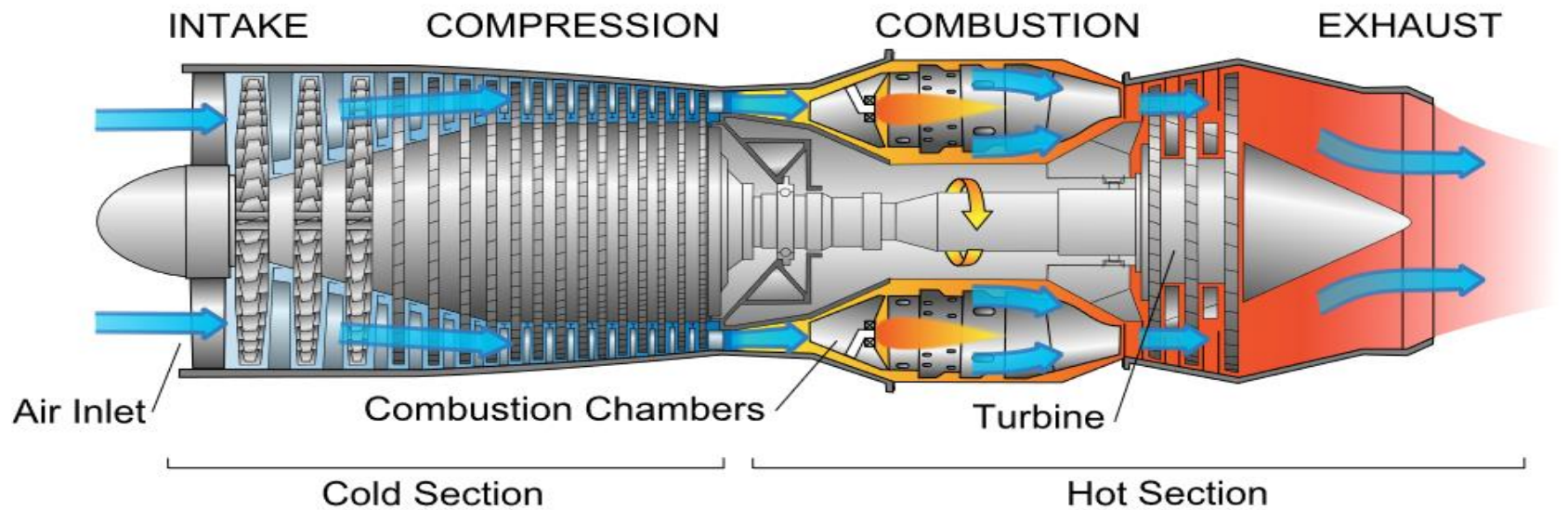
- Or undercarriage, consists of the wheels and supports the weight of the plane on the ground.
- Landing gear maybe fixed or retractable. A fixed landing gear create drag, which can slow down the speed of the plane, so most high-speed planes are designed with retractable landing gear



Engine (s)

- Produce the power that makes the plane fly.
- Jet engines enable large airplanes to fly long distances at high speeds
- Air is compressed, then burned with jet fuel in a combustion chamber, forming high velocity exhaust
- Turbine spinning run different parts of engine

Engine (s)

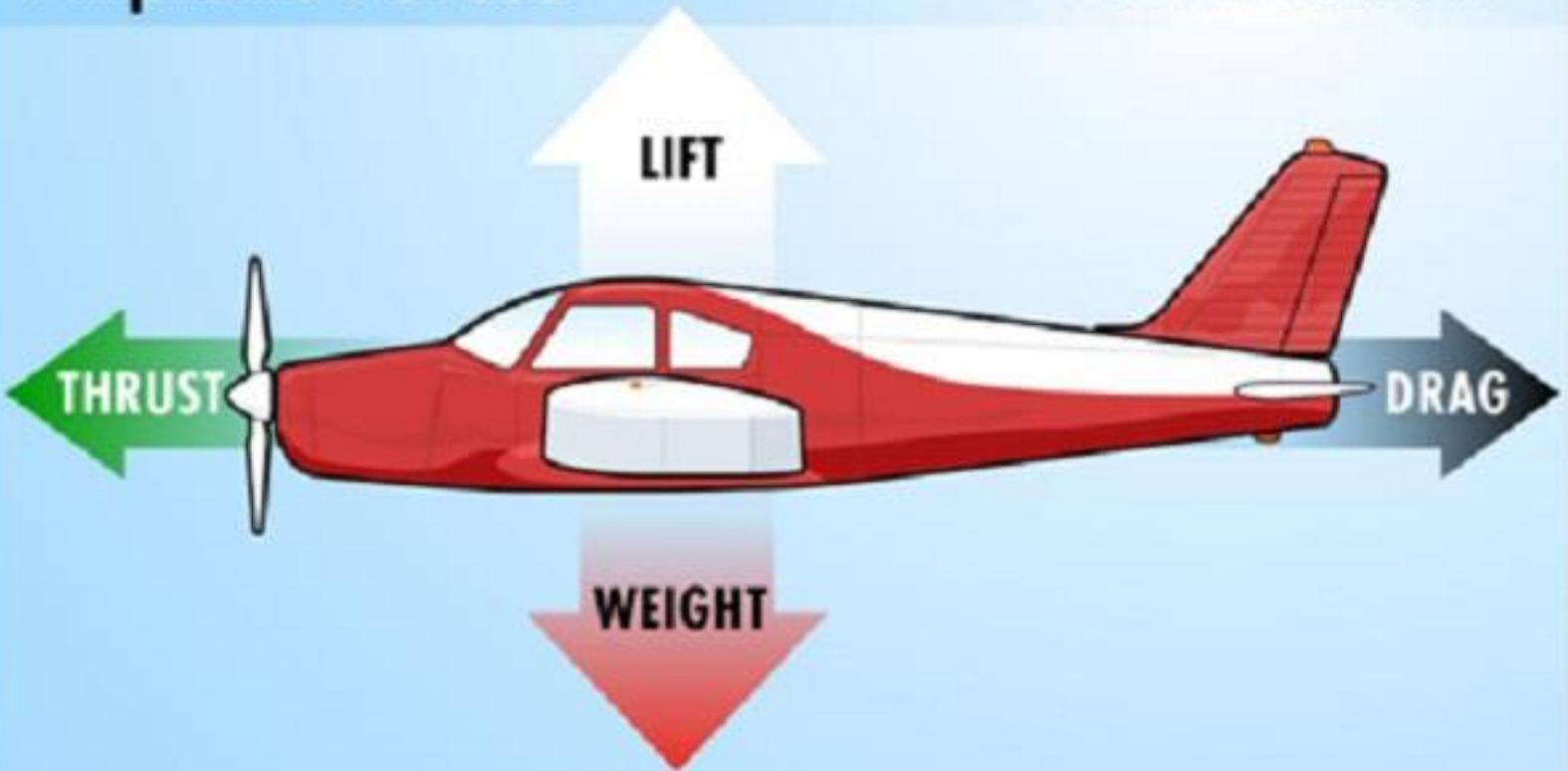




Break 10 minutes

Airplane Forces

©2010 HowStuffWorks



4 Forces to Fly

- **Gravity** :the natural force that pull an airplane to the earth when in flight.
- **Lift**; is the mechanical force that pushes a plane upward, against the gravitational pull. The movement of a plane's wing through the air creates lift.
- **Drag** ; is the force of air opposing the forward movement of the airplane.
- **Thrust**; is the force that opposes drag and moves the plane forward. The plane's engines or propeller create this thrust.

Gravity and Lift

- **Lift is created by the difference air pressure on the top and the bottom of the wing as the plane moves along the ground or through the air.**
- **Pressure on the top is lower than that on the bottom of the wing, this difference pressure creates the lifting force.**
- **Flaps extended on takeoff and landing to help create more wider wings**

Drag and Thrust

- The engine provides the thrust to push the airplane forward through the air. The air resists the motion in the form of aerodynamic drag.
- Increased thrust will move a plane forward faster.
- Speed increases, Drag increases as well

Changing Altitude and Direction

- **Climbing** : From Take off to Cruise level. Increase amount of Lift and increase the power for Thrust
- **Cruising** : Steady level of flying. All four forces are equal
- **Descending** : From Cruise level to Landing. Decrease the power, reducing the Thrust and Lift, increasing Drag and Weight

Airplane Manufacturer

- Or **Airframe Manufacturer** because they provide the mechanical structure or frame of the airplane to the airline.
- Some of the most famous of commercial airplanes, **Boeing and Airbus**
- some manufacturers who have chosen to specialize in the smaller regional jets, or turboprops, such as **Bombardier and Embraer.**

Airbus Industries (AI) France

- **Partnership of different European aerospace companies; Airbus France, Airbus Deutschland and Airbus Espana and BAE Systems of the UK.**
- **In 2001, Airbus became a single fully integrated company incorporated under French law.**
- **Manufacturing, production and sub-assembly of parts for Airbus aircraft are distributed around 16 sites in Europe, with final assembly in Toulouse, France, and Hamburg, Germany.**

- The advanced of the Airbus product line is they were designed to incorporate a high degree of **commonality** between airplane family group members.
- The benefits of **commonality** in such areas as cockpit design and aircraft systems , the practical use of modern technology, savings in aircraft and engine spares holdings, maintenance and training, as well as in operational flexibility.
- A380 ,2005, is the world's largest passenger jetliner (550pax). It is designed for long range travel with two complete passenger decks

- 
- **A350 made of carbon-fibre-reinforced polymers (2011 onward)**

A380: WHERE THE KEY PARTS ARE MADE



GERMANY

Aft and forward fuselage
Vertical tail plane

FRANCE



Centre wing box
Centre fuselage
Nose section
Radome

SPAIN

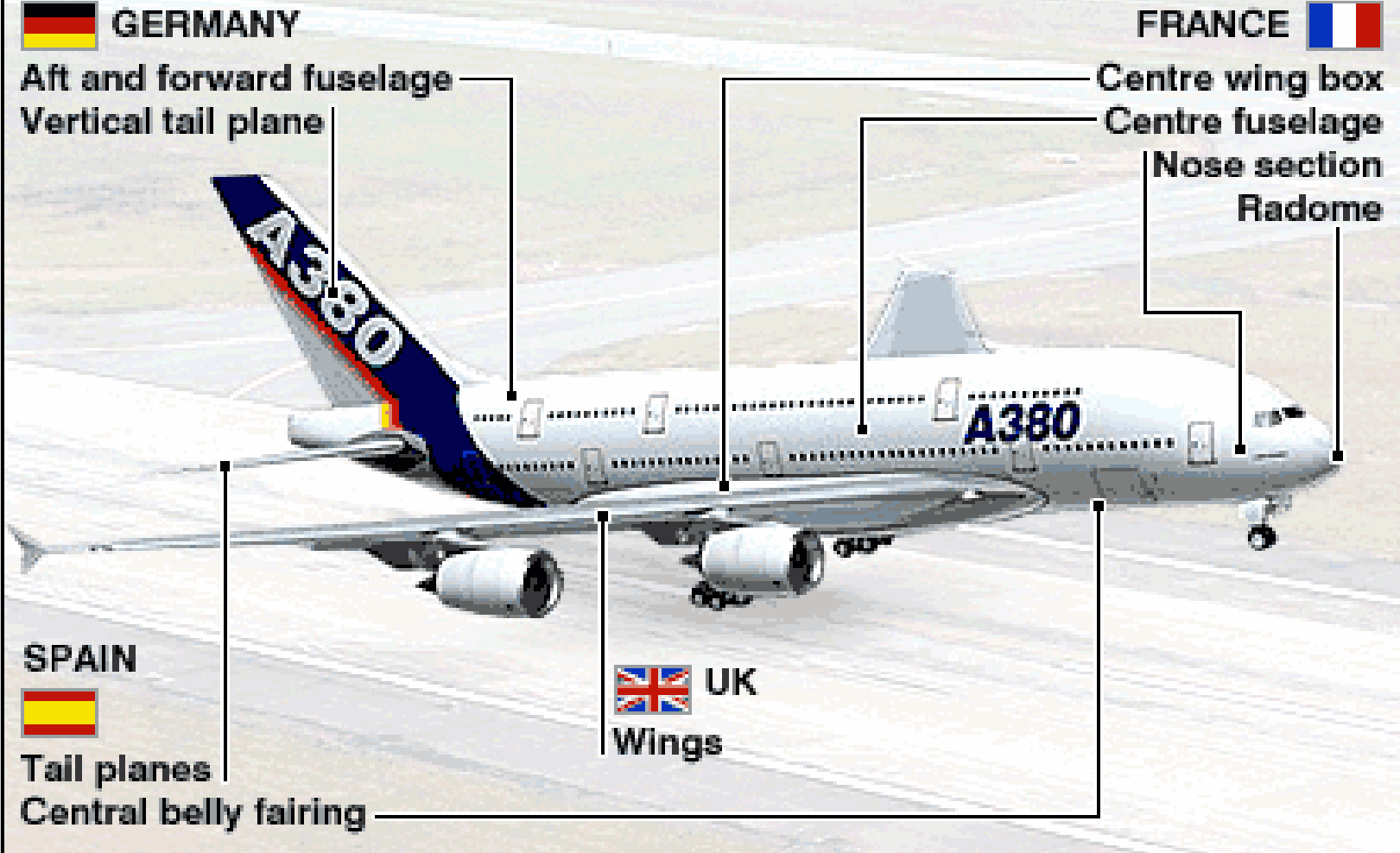


Tail planes
Central belly fairing



UK

Wings



Airbus Industries (AI) France

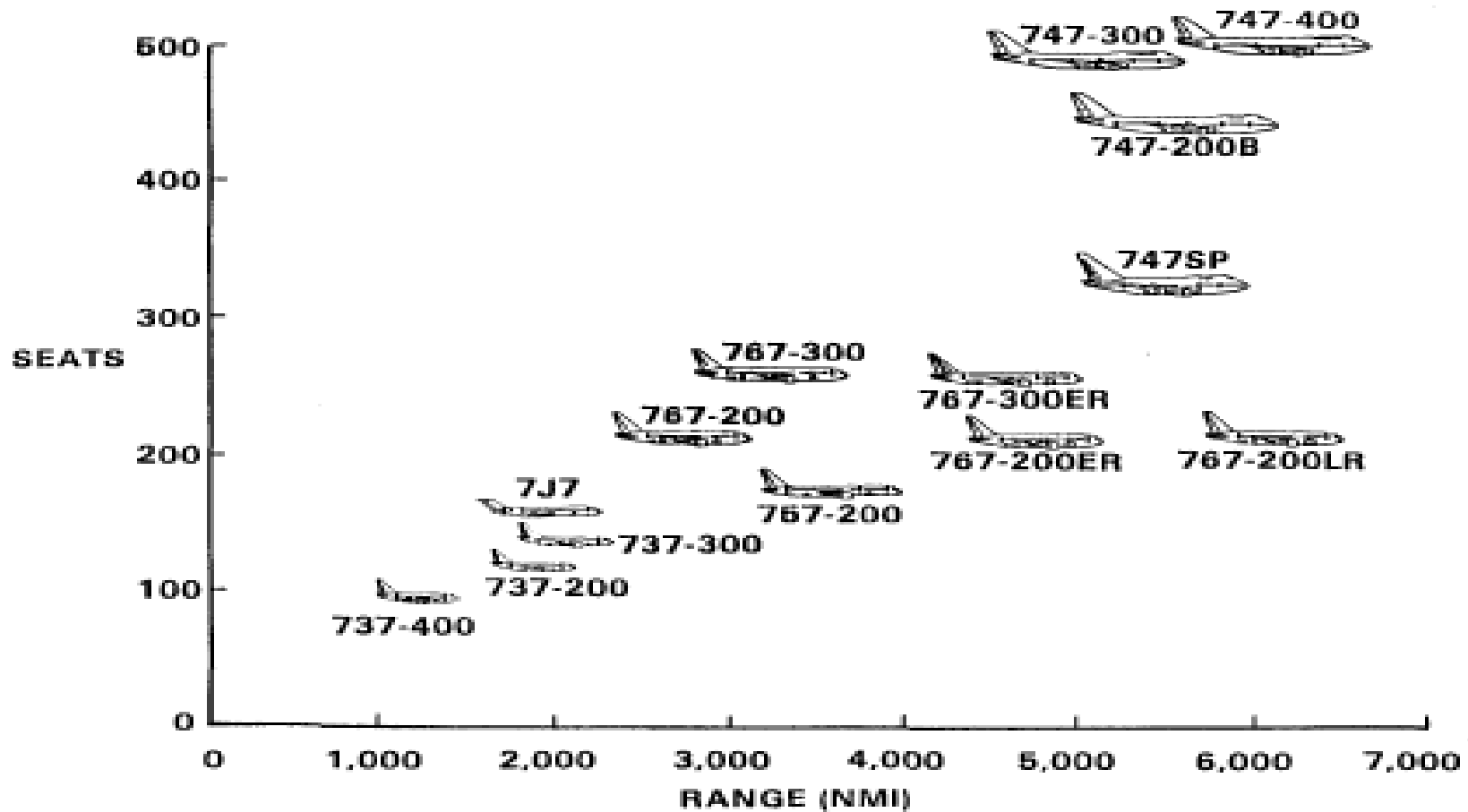




The Boeing Company, USA

- Created by an aviation pioneer, William E. Boeing in 1916
- 1928, introduced America First Airliner – model 80A
- B737 initially designed as a smaller, short range, twin engine
- B747 was successful when airport congestion
- 1997, merged with McDonnell Douglas
- B787-8 , B787-9 Dreamliner
- B777 GE9X engine, with the folding wingtips

BOEING NEW AIRPLANE FAMILY



Bombardier Aerospace Group, Canada

- Founded 1926, in motorized snow vehicles. It has grown since the 1980s and is now recognized as a world-class designer and manufacturer in the fields of **civil and military aerospace, transportation equipment and motorized consumer products**
- Dash 8
- Now c series



Embraer, Brazil



Concorde, Great Britain & France

- **Britain and France coop to share costs and risks**
- **The delta-wing Concorde, which made its first flight on March 2, 1969**
- **July 2000 , Paris to New York City suffered engine failure, debris from a burst tire caused a fuel tank to rupture and burst into flame**

Concorde, Great Britain & France



Aircraft Type

- **Wide Body Jets**
- **Narrow Body Jets**
- **Regional Airliners**

Wide body jet

- Have a fuselage diameter of 5 to 6 meters (16 to 20 ft.)
- Are called **twin-aisle aircraft** because they have two separate aisles from the front to the back of the passenger cabin.
- Used for long haul flights between airline hubs.
- 787 Dreamliner, Bombardier Business Jet (BBJ) 747-8 VIP B, Boeing 747, Boeing 767, Boeing 777, Airbus A380, A300/A310, A350-900, A330/A340, DC-10, MD-11, and Ilyushin Il-86/96.

Narrow-body Jets

- A smaller, more common class of traditional has a diameter of 3 to 4 meters (10 to 13 ft.) **A single aisle.**
- Used for medium distance flights with fewer passengers than their wide-body counter-parts.
- Examples include the Boeing 737, Boeing 757, MD-80 series, and Airbus A320 family.

Regional Airlines

- Regional airlines generally seat fewer than 100 passengers
- Powered by turbofans or turboprops
- Used for short flights between small hubs, or for bringing passengers to hub cities where they may board larger aircraft



Q & A

References

- http://upload.wikimedia.org/wikipedia/commons/4/4c/Jet_engine.svg
- <http://hdwallpaperslist.com/wp-content/uploads/2013/05/Concorde-HD-Wallpapers-1-1.jpg>