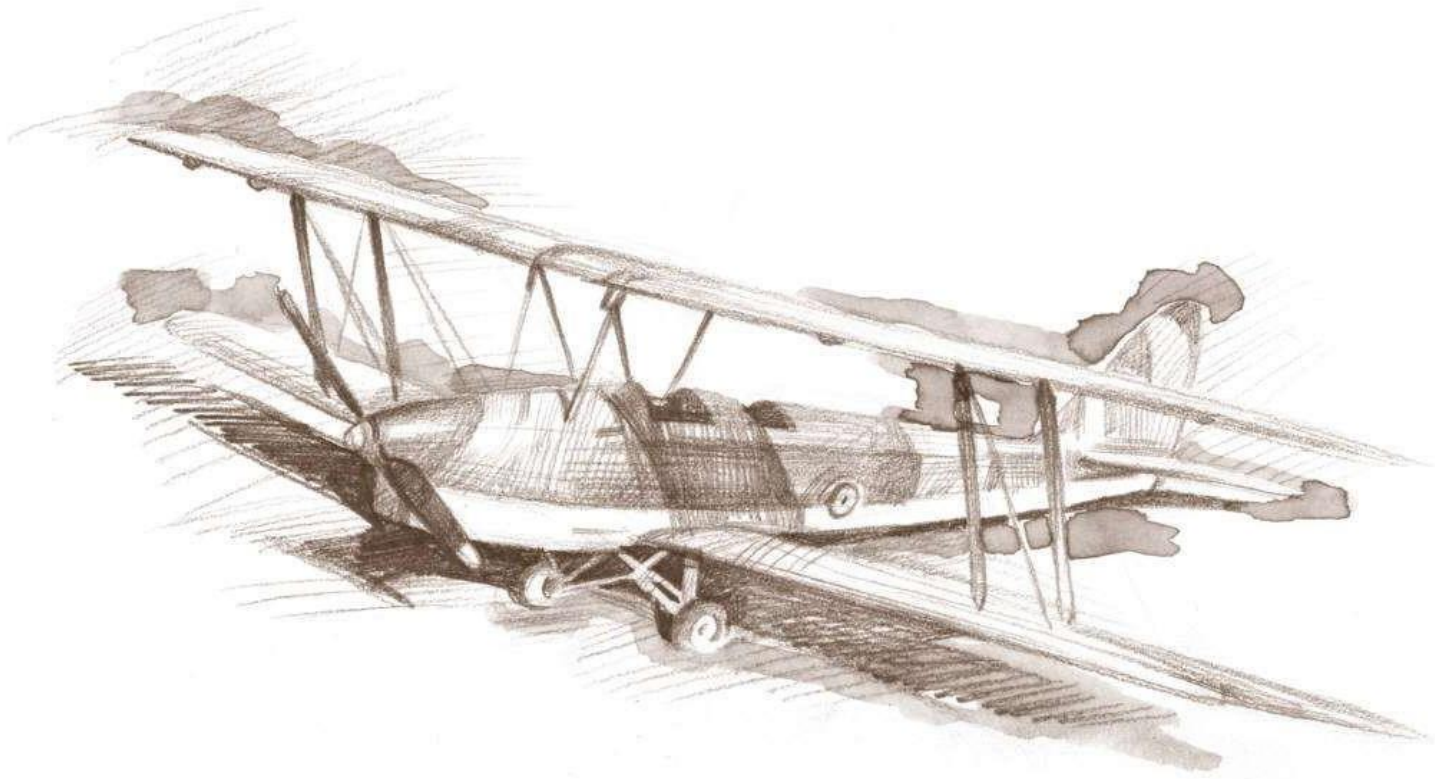


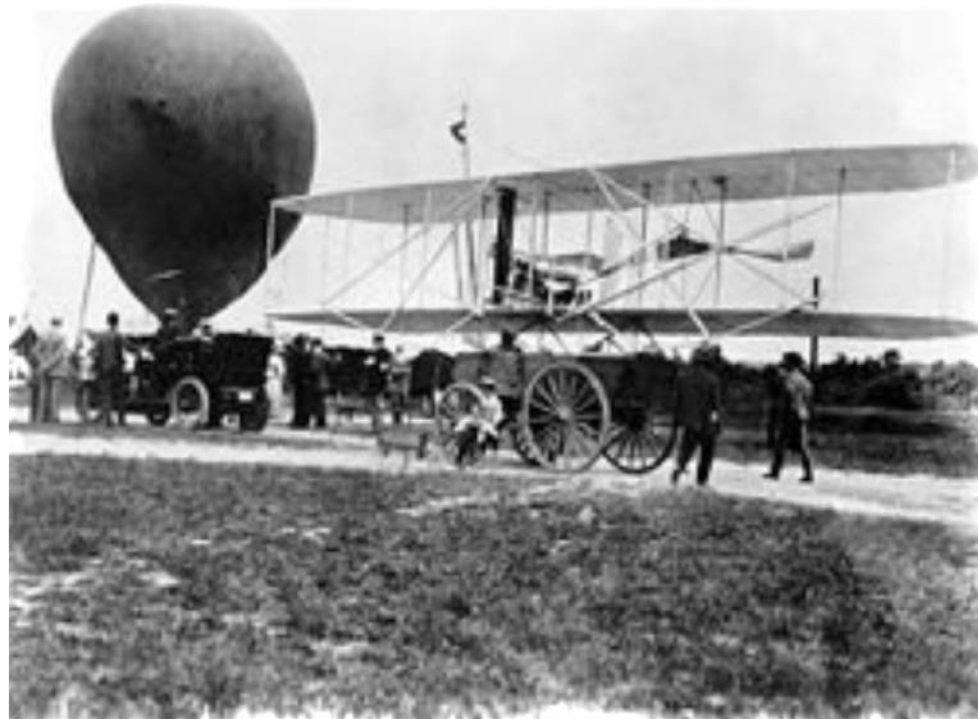
# UNIT - I

# AVIATION HISTORY



The history of aviation has extended over more than two thousand years from the earliest attempts in kites and gliders to powered heavier-than-air, supersonic and hypersonic flight.

The first form of man-made flying objects were kites. The earliest known record of kite flying is from around 200 BC in China, when a general flew a kite over enemy territory to calculate the length of tunnel required to enter the region.



# Mythology

Human ambition to fly is illustrated in mythological literature of several cultures; everyone knows about the wings made out of wax Daedalus in Greek mythology, or the Pushpaka Vimana of king Ravana in Ramayana, for instance.



# Early attempts

## Flight automaton in Greece

Around 400 BC, Archytas, the Greek philosopher, mathematician, astronomer, statesman and strategist, designed and built a bird-shaped, apparently steam powered model named "*The Pigeon*", which is said to have flown some 200 meters. According to Aulus Gellius, the mechanical bird was suspended on a string or pivot and was powered by a "concealed aura or spirit".



## Hot air balloons, glider and kites in China

The Kongming lantern (proto hot air balloon) was known in China from ancient times. Its invention is usually attributed to the general Zhuge Liang (180–234 AD, honorific title *Kongming*), who is said to have used them to scare the enemy troops:

An oil lamp was installed under a large paper bag, and the bag floated in the air due to the lamp heating the air. ... The enemy was frightened by the light in the air, thinking that some divine force was helping him.



## Manned kite



Yuan Huangtou, Ye, first manned kite glide to take off from a tower — 559 During the Yuan dynasty (13th century) under rulers like Kublai the rectangular lamps became popular in festivals, when they would attract huge crowds.

During the Mongol Empire, the design may have spread along the Silk Route into Central Asia and the Middle East.

## Gliders in Europe



In the 9th century, at the age of 65, the Muslim Andalusian polymath Abbas Ibn Firnas is said to have flown from the hill Jabal al-'arus by employing a rudimentary glider. While "alighting again on the place whence he had started," he eventually crashed and sustained injury which some contemporary critics attributed to a lack of tail.

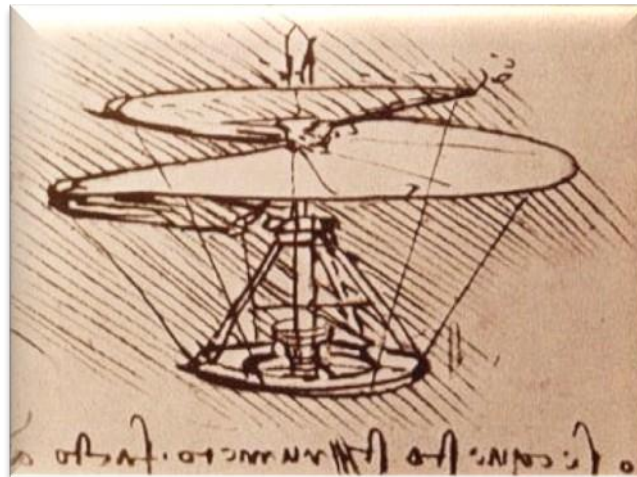
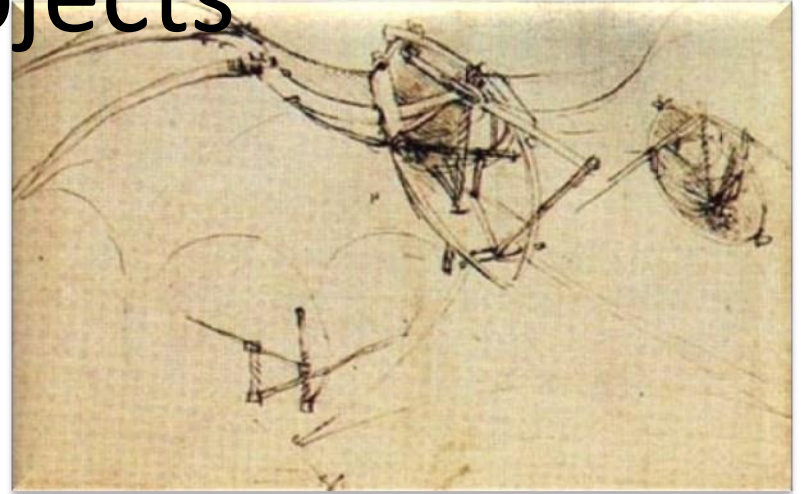


## From Renaissance to the 18th century

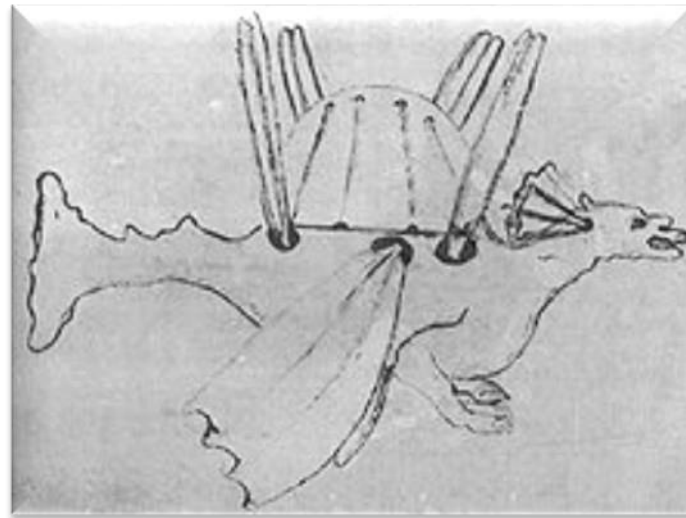
Some six centuries after Ibn Firnas, Leonardo da Vinci developed a hang glider design in which the inner parts of the wings are fixed, and some control surfaces are provided towards the tips (as in the gliding flight in birds).

A model he built for a test flight in 1496 did not fly, and some other designs, such as the four-person screw-type helicopter, have severe flaws.

# Leonardo da Vinci Projects

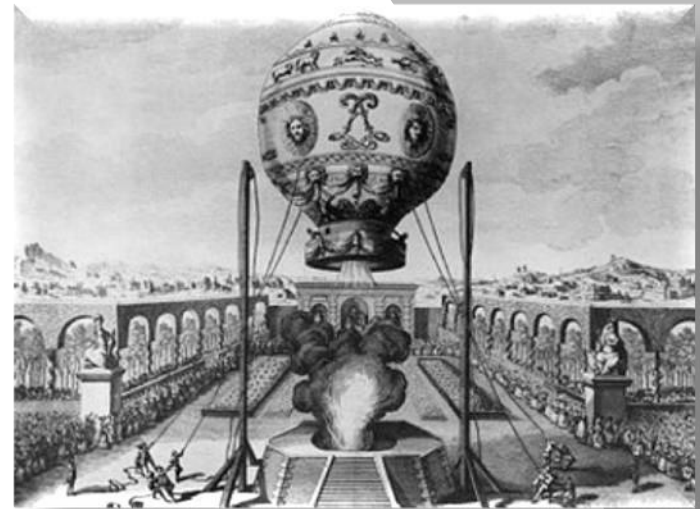


Italian inventor, Tito Livio Burattini, invited by the Polish King Władysław IV to his court in Warsaw, built a model aircraft with four fixed glider wings in 1647. Described as "four pairs of wings attached to an elaborate 'dragon'", it was said to have successfully lifted a cat in 1648 but not Burattini himself. He promised that "only the most minor injuries" would result from landing the craft. His "Dragon Volant" is considered "the most elaborate and sophisticated aeroplane to be built before the 19th Century".

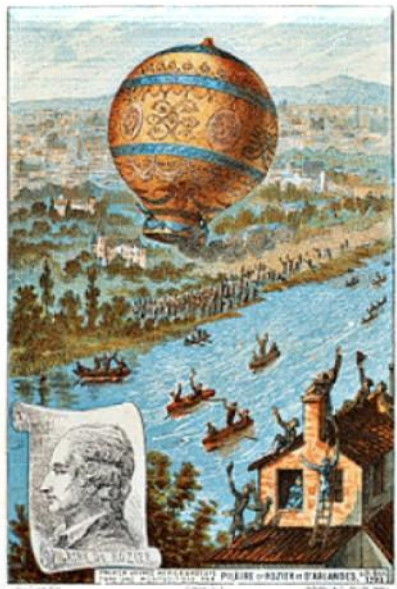




Public demonstration of the world's first manned



Public demonstration of the world's first manned



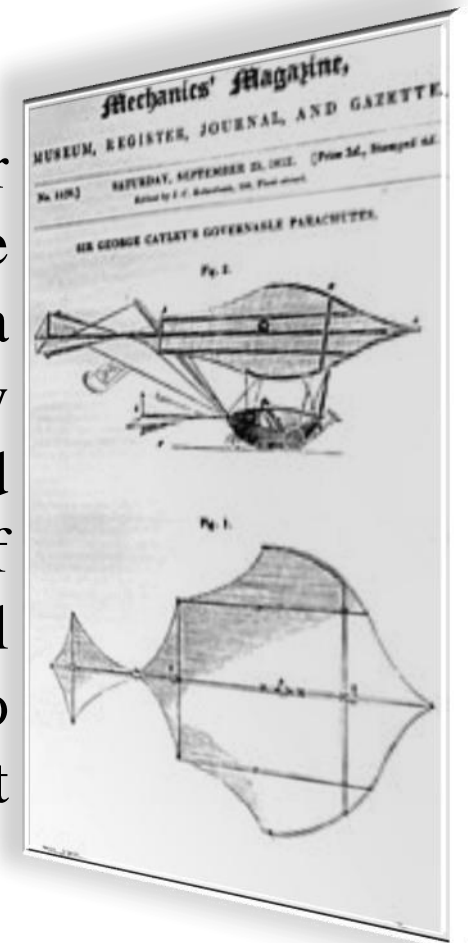
Red voyage by Pilâtre de



ary illustration of the first flight  
Nicolas-Louis

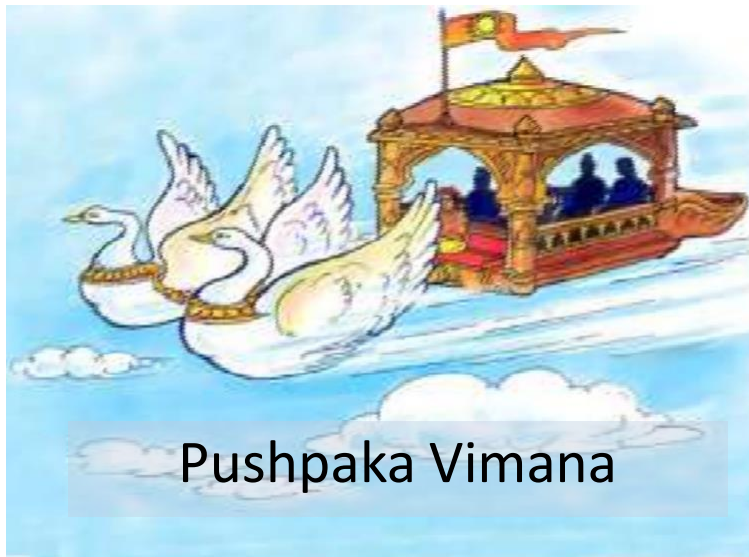
## ☐ Heavier than air

During the last years of the 18th century, Sir George Cayley started the first rigorous study of the physics of flight. In 1799 he exhibited a plan for a glider, which except for planform was completely modern in having a separate tail for control and having the pilot suspended below the center of gravity to provide stability, and flew it as a model in 1804. Later Cayley turned his research to building a full-scale version of his design, first flying it unmanned in 1849 and in 1853.





- Aircraft have been around for a century, but aviation has been around for more than 2000 years.
- Ideas for flying vehicles were being thought of during the Ramayana period.
- Leonardo da Vinci, made many model aircraft that didn't fly. He introduced lighter-than air flight.



# Lighter than air vehicles

- Lighter-than air vehicles, at first used hot air but started using hydrogen because it is lighter than air. But hydrogen is highly explosive and can be triggered by just a spark.
- On May 6<sup>th</sup> 1937, Hindenburg a hydrogen airship exploded and crashed on landing in New Jersey.
- Nowadays, airships use helium which is an inert gas.



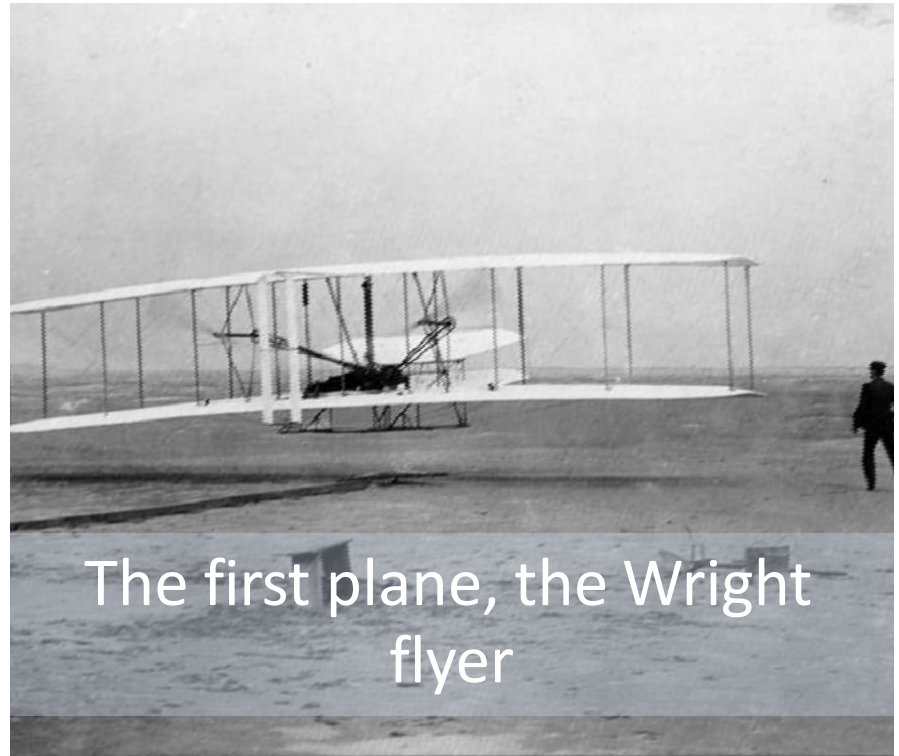
# Hindenburg Disaster





# The first flight

- The Wright brothers, Wilbur and Orville, made the first successful heavier than air aircraft, the Wright flyer.
- The first flight was on December 17<sup>th</sup> 1903.
- After the Wright brothers first flight, there was an aviation boom.
- Modern-day aircraft giants, Boeing and Airbus, came into existence.



# First Flight



# Experimental flying machines

Early Flight  
SILENT FOOTAGE

# A new era of aviation

- With the first flight over, it marked the era of heavier-than air flight. Till now, propellers were being used to power planes but the introduction of the jet engine made planes much more efficient and comfortable to fly.



# Modern Aviation

- When World War II ended, passenger transport became faster and more comfortable. Jet planes were immediately introduced.
- The first jet aircraft was the De Havilland Comet.
- As the years went by, jet engines became better and better.



De Havilland Comet

# International Conventions

## Chicago Convention

- The **Convention on International Civil Aviation**, also known as the **Chicago Convention**, established the International Civil Aviation Organization (ICAO), a specialized agency of the UN charged with coordinating international air travel.
- The Convention was signed by 52 states on 7 December 1944 in Chicago, Illinois, U.S., and came into effect on 4 April 1947.
- The Convention establishes rules of airspace, aircraft registration and safety, security, and sustainability, and details the rights of the signatories in relation to air travel.
- The Convention also contains provisions pertaining to taxation.

# Warsaw Convention

- It refers to an international agreement that defines the rules and regulations that govern civil aviation.
- It defines the potential liability that an international carrier faces with regards to the air transport of people and luggage of various kinds.
- It helps provide a common framework for dispute resolution between parties belonging to different countries.

# Freedom of the Air

## **Introduction**

The Freedoms of the Air are international commercial aviation agreements that grant a country's airline(s) the privilege to enter another country's airspace, including to land in that country to put down and/or pick up passengers/freight.

They were formulated at an international gathering held in Chicago known as the Chicago Convention 1944 to establish uniformity in the world aviation commerce.

There are generally considered to be nine freedoms of the air:

1. Most nations of the world exchange first and second freedoms through the International Air Services Transit Agreements.
2. The other freedoms, when available, are usually established between countries in bilateral or multilateral air services agreements.



# Freedom of the Air

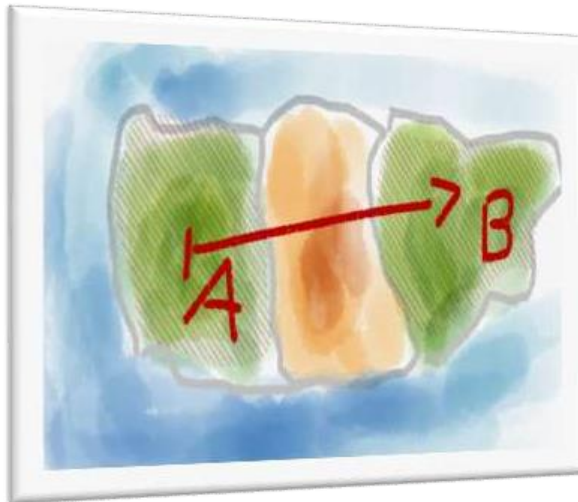
## Overview

	Freedom	aka.	Remarks
Transit Rights	1st Freedom of the Air		The first through fifth freedoms are officially enumerated by international treaties, especially the
	2nd Freedom of the Air		
	3rd Freedom of the Air		
	4th Freedom of the Air		
	5th Freedom of the Air		
Traffic Rights	6th Freedom of the Air	“Beyond Rights”	Chicago Convention.
	7th Freedom of the Air		
	8th Freedom of the Air “consecutive cabotage”		
	9th Freedom of the Air “stand alone cabotage”		
		Cabotage	Other freedoms have since been added and although most are not officially recognised under international treaties, they have been agreed by some countries, e.g. with the European Union.

# Freedom of the Air

## 1<sup>st</sup> Freedom of the Air

*First Freedom Right* - 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.



### What does it mean?

The negotiated right for an airline from own country to fly over another country's airspace.

### Example:

SIN – BKK, by a Singapore company, overflying Malaysia.

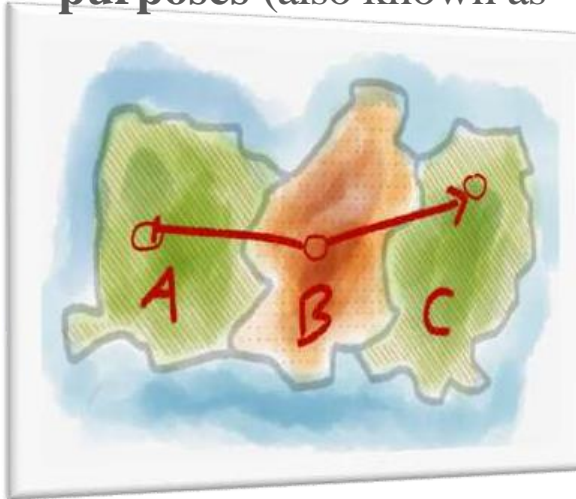
### Note:

1. This freedom applies automatically to most signatory states.
2. Prior notice required before entering a country's airspace.
3. Fees may be imposed by a country granting the rights.

# Freedom of the Air

## 2<sup>nd</sup> Freedom of the Air

*Second Freedom Right* - 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 “technical stop”).



### What does it mean?

The right for an airline to land for maintenance/refuel **without** loading/unloading passengers or air freight.

### Example:

SIN – BKK, by a Singapore company, stopping in Malaysia for maintenance or refuelling before proceeding to Bangkok.

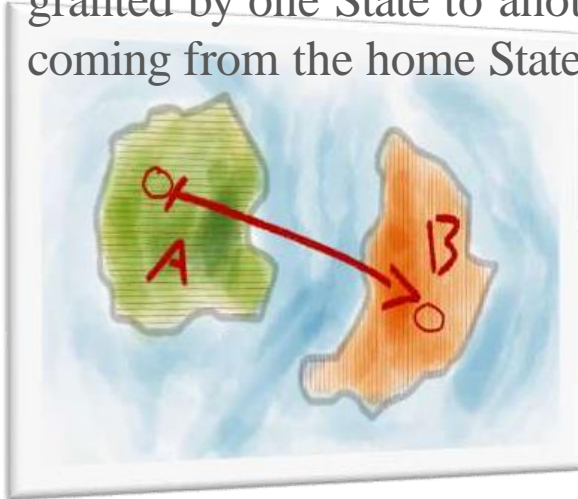
### Note:

1. This freedom applies automatically to most signatory states.
2. Prior notice required before entering a country's airspace.
3. Fees may be imposed by a country granting the rights.

# Freedom of the Air

## 3<sup>rd</sup> Freedom of the Air

*Third Freedom Right* - 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.



### What does it mean?

The right to fly from one's own country to another.

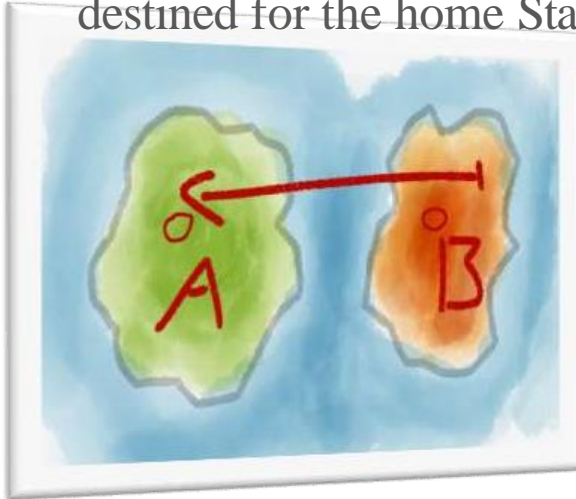
### Example:

SIN – KUL, by a Singapore company.

# Freedom of the Air

## 4th Freedom of the Air

*Fourth Freedom Right* - 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.



### What does it mean?

The right to fly from another country to one's own.

### Example:

KUL – SIN, by a Singapore company.

### Note:

1. The Third and Fourth Freedom rights are **almost** always granted simultaneously in bilateral air service agreements between countries.

# Freedom of the Air

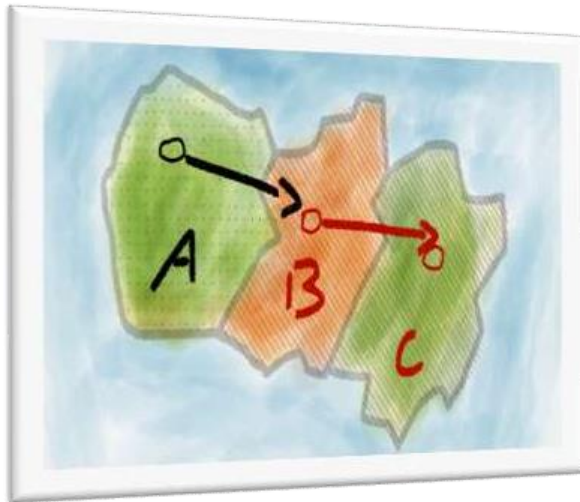
## “Beyond Rights”

1. The fifth through seventh freedoms are also known as “Beyond Rights”.
2. Beyond Rights allow the carriage of traffic between and sometimes within countries that are foreign to the airlines that operate them.



## 5<sup>th</sup> Freedom of the Air

*Fifth Freedom Right* - 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.



### What does it mean?

The right to fly between two foreign countries on a flight originating or ending in one's own country.

### Example:

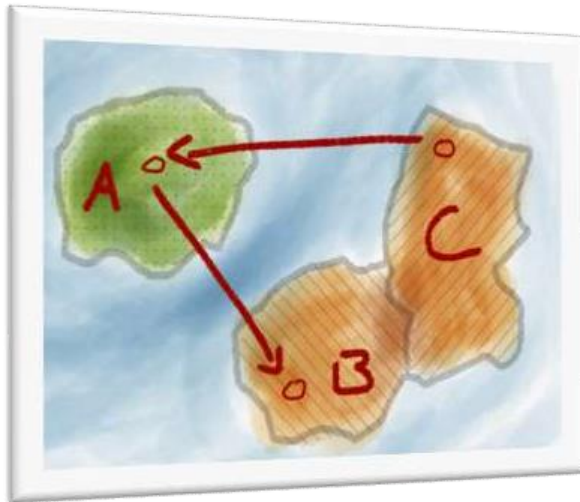
SIN – NRT – LAX, by a Singapore company.

### Note:

1. The Fifth Freedom traffic rights were instrumental to the economic viability of long-haul flight until the early 80s.
2. The negotiations for fifth freedom can be lengthy, because in reality the approval of at least three different nations is required.

## 6<sup>th</sup> Freedom of the Air

*Sixth Freedom Right* - 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.



### What does it mean?

The right to fly from one foreign country to another while stopping in one's own country.

### Example:

SIN – DXB – ZRH, by a Emirati company.

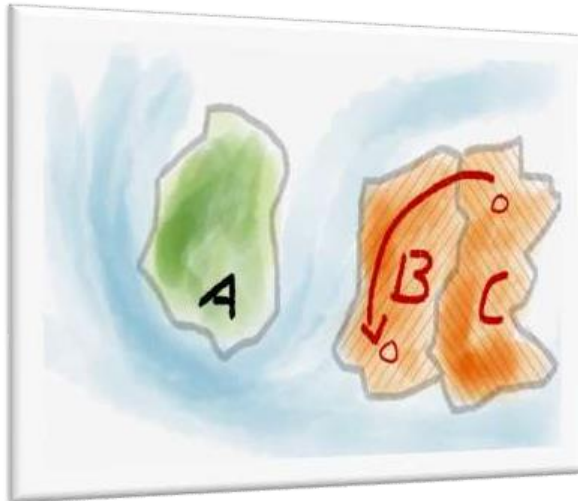
### Note:

1. Carriers from the Middle Eastern countries rely heavily on this right for the success of their business models.



## 7<sup>th</sup> Freedom of the Air

*Seventh Freedom Right* - 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, that is the service need not connect to or be an extension of any service to/from the home State of the carrier.



### What does it mean?

The right to fly between two foreign countries while not offering flights to one's own country.

### Example:

FRA – LIS, by an Irish company.

### Note:

1. This right is uncommon outside of the European Union.

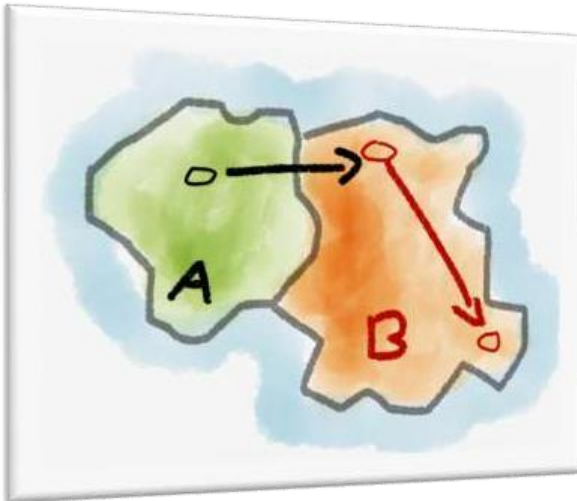
# “Cabotage”

1. The eighth and ninth freedoms are also known as “Cabotage”.
2. Cabotage is the transport of goods or passengers between two points in the same country by a vessel or an aircraft registered in another country.
3. Originally a shipping term, cabotage now covers aviation, railways, and road transport. It is "trade or navigation in coastal waters, or, the exclusive right of a country to operate the air traffic within its territory“.
- 4 Most countries do not permit aviation cabotage due to economic protectionism, national security or public safety. One notable exception is the European Union, whose members all grant cabotage rights to each other.



## 8<sup>th</sup> Freedom of the Air

*Eighth Freedom Right* - 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.



### What does it mean?

The right to fly inside a foreign country, originating from or continuing to one's own country.

### Example:

LHR – MUC – FRA, by an U.K. company.

### Note:

1. This right is uncommon outside of the European Union.

## 9<sup>th</sup> Freedom of the Air

*Ninth Freedom Right* - the right or privilege of transporting cabotage traffic of the granting State on a service performed entirely within the territory of the granting State.



### What does it mean?

The right to fly inside a foreign country without continuing to one's own country.

### Example:

FRA – MUC, by an U.K. company.

### Note:

1. This right is uncommon outside of the European Union.

# Open Sky Policy

- Open Sky Agreements are **bilateral agreements** that the two countries negotiate to provide **rights for airlines to offer international passenger and cargo services.**
- It **expands** international passenger and cargo flights.
- India has Air Service Agreements (ASA) with 109 countries including UAE covering aspects relating to the number of flights, seats, landing points and code-share.
- But does not allow unlimited number of flights between two countries.
- Open skies between India and UAE will allow unlimited number of flights to the selected cities of each other's countries

# India's Open Sky Policy

- The National Civil Aviation Policy (2016) allows the government to enter into an 'open sky' air services agreement on a reciprocal basis with South Asian Association for Regional Cooperation (SAARC) nations as well as countries beyond a 5,000 kilometre radius from New Delhi.
- It implies that nations within 5,000 kilometer of distance need to enter into a bilateral agreement and mutually determine the number of flights that their airlines can operate between the two countries.
- India has open sky agreements with Greece, Jamaica, Guyana, Finland, USA, Japan, etc.

# ICAO

## Role and Functions

- The **International Civil Aviation Organization (ICAO)** is a specialized agency of the United Nations.
- It changes the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth.
- Its headquarters is located in the *Quartier International* of Montreal, Quebec, Canada.
- The International Civil Aviation Organization (ICAO) creates regulations for aviation safety, security, efficiency and regularity and environmental protection.
- The organization also regulates operating practices and procedures covering the technical field of aviation.
- This collection ensures smooth air transportation and border crossing procedures and ensures you can:
  - Ensure fair opportunity to operate international airlines.
  - Promote flight safety.
  - Minimize expenses and penalties.

# International Air Transport Association

- The **International Air Transport Association (IATA)** is a trade association of the world's airlines founded in 1945.
- Consisting in 2016 of 290 airlines, primarily major carriers, representing 117 countries, the IATA's member airlines account for carrying approximately 82% of total available seat miles air traffic.
- IATA supports airline activity and helps formulate industry policy and standards. It is headquartered in Canada in the city of Montréal, with executive offices in Geneva, Switzerland.



# Functions of IATA

- **Safety**
- The main priority of the organization is to ensure the safety of aircraft and the air travelers.
- IATA has set up panels to devise safety standards for the air carriers and professionals to ascertain that the rules and regulations are strictly observed.
- These efforts by IATA ushered many improvements in terms of air travel safety and the number of air accidents has been drastically reduced.
- **Security**
- The airplanes are prone to terrorism and hijack activities. After the mounting amounts of hijack cases and the September 11 attacks, IATA has made stringent reforms and made provisions to tighten the security of airlines.
- The system works on the basis of passenger differentiation and risk assessment.

## **Environment**

- Air travel contributes to the air pollution in a big way and it consumes tonnes of fuel. In wake of this IATA teamed up with aircraft manufacturers to develop energy efficient, less polluting engines.
- These efforts were helpful in improving the fuel efficiency to 1.5 per annum.
- The carbon emissions caused by aircraft engines were reduced and the organization is now aiming for a 50% reduction in carbon emissions by 2050.

## **Services**

Apart from policy-making and regulatory services, IATA renders much training and consulting services. Here are some services proffered by the organization to augment the standards of airlines and air travel:

- The organization issues accreditation for travel agents and travel professionals, differentiating them from unauthorized or fraudulent travel agents and agencies
- Billing and Settlement Plan
- IATA prescribes the syllabus and course structure for various travel and tourism courses.
- The IATA certification helps students to enroll for industry approved and authentic courses. All the major airlines and travel organizations only hire students who are trained in IATA courses.

# Directorate General of Civil Aviation

- Directorate General of Civil Aviation is an attached office of the Ministry of Civil Aviation.
- It is the regulatory body in the field of Civil Aviation primarily dealing with safety issues.
- It is responsible for regulation of air transport services to/from/within India and for enforcement of civil air regulations, air safety and airworthiness standards.
- It also co-ordinates all regulatory functions with International Civil Aviation Organisation.
- The headquarters are located in New Delhi with regional offices in the various parts of India.

# Functions

- Registration of civil aircraft
- Formulation of standards of airworthiness for civil aircraft registered in India and grant of certificates of airworthiness to such aircraft
- Licensing of pilots, aircraft maintenance engineers and flight engineers, and conducting examinations and checks for that purpose
- Licensing of air traffic controllers
- Certification of aerodromes and CNS/ATM facilities
- Maintaining a check on the proficiency of flight crew, and also of other operational personnel such as flight dispatchers and cabin crew;

- Granting of Air Operator's Certificates to Indian carriers and regulation of air transport services operating to/from/within/over India by Indian and foreign operators, including clearance of scheduled and non-scheduled flights of such operators.
- Conducting investigation into incidents and serious incidents involving aircraft upto 2250 kg AUW and taking accident prevention measures including formulation of implementation of Safety Aviation Management Programmes.
- Granting approval to aircraft maintenance, repair and manufacturing organizations and their continued oversight.

# Airports Authority of India

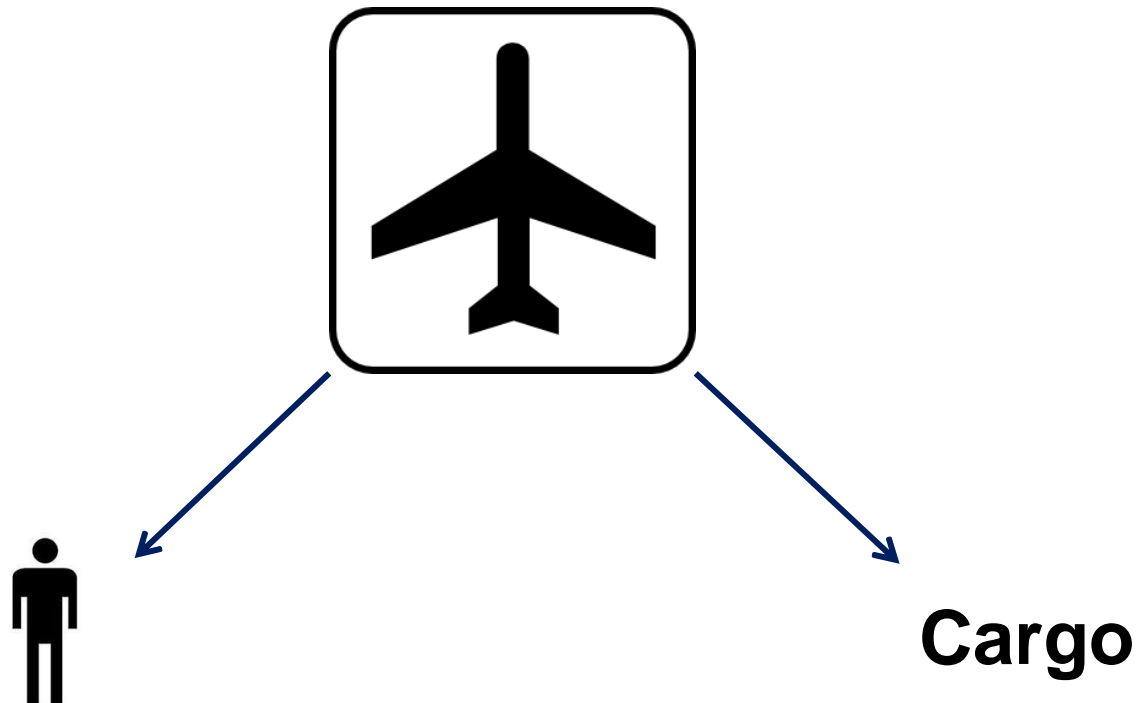
- The **Airports Authority of India** or **AAI** is a statutory body (created through the Airports Authority of India Act, 1994) working under the Ministry of Civil Aviation, Government of India is responsible for creating, upgrading, maintaining and managing civil aviation infrastructure in India.
- The Government of India constituted the International Airports Authority of India (IAAI) in 1972 to manage the nation's international airports while the National Airports Authority of India (NAAI) was constituted in 1986 to look after domestic airports.
- The organisations were merged in April 1995 by an Act of Parliament, namely, the Airports Authority of India Act, 1994 and has been constituted as a Statutory Body and was named as Airports Authority of India (AAI).
- It is responsible for creating, upgrading, maintaining and managing civil aviation infrastructure both on the ground and air space in the country.

# Functions of AAI

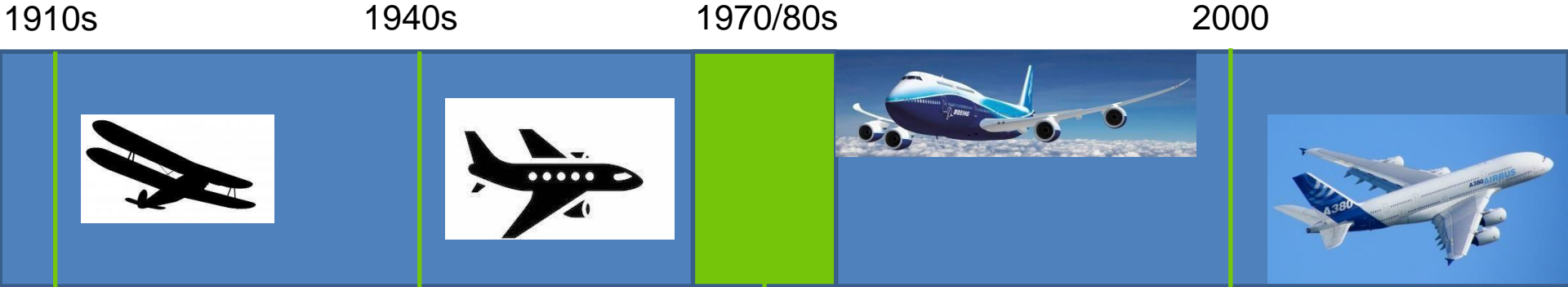
- Design, Development, Operation and Maintenance of international and domestic airports and civil enclaves.
- Control and Management of the Indian airspace extending beyond the territorial limits of the country, as accepted by ICAO.
- Construction, Modification and Management of passenger terminals.
- Development and Management of cargo terminals at international and domestic airports.
- Provision of passenger facilities and information system at the passenger terminals at airports.
- Expansion and strengthening of operation area, viz. Runways, Aprons, Taxiway etc.



- Airline Industry is a system of transportation
- Part of Aviation industry
- Moving people and goods



# Development of Commercial Airlines



WW1

WW2

Deregulation

New Era

Military to Civil conversion

# Type of airlines



- Scheduled (fixed routes and timings)
- Non-scheduled



- Passengers
- Cargo
- Passenger & Cargo



- International
- Domestic

# Business Models for Airlines

There are a huge number of airlines around the world, each with different ways of doing business. Business models are characterized as follows:

- **Full-Service Carriers**
- Full-service carriers are airlines that operate with a business model that includes offering a range of pre-flight and on-board services with the price of the ticket.
- This may include, for instance, checked baggage, in-flight meals and multiple service classes, such as first-class, business class, economy class, etc.
- Their operations will typically include both passenger and cargo services, and frequent flyer programmes are often on offer.

# Low-Cost Carriers

- Low-cost carriers are airlines that aim to gain a competitive advantage over full-service carriers by reducing costs.
- This is done in a number of ways, including using smaller fleets and smaller aircraft, and also by offering more limited services.
- Their business model tends to centre around promoting value for money.
- For travellers, flights from low-cost carriers are often significantly cheaper.
- However, they tend not to offer lounge services at airports and things like in-flight meals and baggage allowances will almost certainly not be included in the price of the ticket. Instead, where they are available, customers pay for them separately.

# Charter Airlines

- Also known as holiday carriers, charter airlines are focused very firmly on providing passenger services to tourists.
- In most cases, however, they do not sell airline tickets directly. Instead, they will enter into agreements with tour operators and/or travel agencies, who then take responsibility for finding passengers for them.
- In terms of passenger services, charter airlines are often a “*middle-ground*” between full-service and low-cost carriers.
- As with low-cost airlines, the business model does rely on reducing overall costs. Yet, in many cases, in-flight meals and similar services will be included with the price of an airline ticket.

# Cargo Airlines

- Finally, cargo airlines, also known as air freight carriers, are airlines that are either solely or primarily focused on the air transportation of cargo or freight.
- Some cargo airlines, such as Lufthansa Cargo and Emirates SkyCargo, are subsidiaries or sub-divisions of airlines that also offer passenger services.
- Cargo airlines can be further broken down into traditional cargo carriers and integrated cargo carriers.
- Examples of airlines that would fit into the integrated cargo carrier category include UPS Airlines and FedEx Express.

# Types Of Aircraft

## LIGHTER-THAN-AIR

? *Aircraft whose lifting capability depends on being inflated with a gas such as hot air, hydrogen or helium.*

## HEAVIER-THAN-AIR

? *Aircraft whose lift is produced by a reaction between aerofoil and motion through the air.*

## POWER DRIVEN

? *Aircraft, whose propulsion through the air is supported by engine power*

## NON POWER DRIVEN

? *Aircraft whose propulsion through the air is derived from gravity and aerodynamic forces, and it is not supported by engine power.*

## AEROPLANE (FIXED WINGS)

? *Aircraft whose lift is produced by a reaction between fixed wings and motion of the air about them.*

## ROTORCRAFT (ROTARY WINGS)

? *Aircraft whose lift is produced by rotating wings.*



# Types Of Aircraft (Aircraft Categorization)

According to the basic design

According to the principle of propulsion through the air

According to the design of the wings



# Case Study

## Boeing vs Airbus

The main topics of this part will be the story of Boeing and Airbus in terms of their competition and their effects on their home and host governments and foreign relations among them. Both of them are the leading aerospace multinationals of the United States and some of the European Union State's respectively. Boeing is one of the world's leading aerospace companies and the largest manufacturer of commercial jetliners and military aircraft. Boeing's reach extends to customers in 145 countries around the world, and it is the number one U.S. exporter in terms of sales. Headquartered in Chicago, Illinois, U.S.A., Boeing employs more than 153,000 people in more than 67 countries. On the other hand, Airbus began its life 35 years ago with the world's first wide-body twin-engine passenger jet, the A300. Today Airbus, headquartered in Toulouse, France, produces a comprehensive range of 14 aircraft and employs 55,000 people worldwide. Airbus, since 2001 a fully integrated single company, started life as a French-German consortium in 1970. Later it was joined by CASA of Spain and British Aerospace.

For over 30 years, Boeing and Airbus, supported by their respective governments, have argued over how various government policies affect and distort what is widely seen as a strategic industry for economic growth and national security. And in respect how these companies affect their home government policies towards each other. The long standing dispute between Airbus and Boeing has started with the European's attack on aerospace industry. For most of its history, Boeing enjoyed the monopoly and the power of its home government aside. With the emergence of Airbus, rules of the game have changed. The struggle between the two companies has created different kinds of disputes since the 1970s. Every time each side is ready to launch a new aircraft, the trade dispute comes back because both sides think that they can gain leverage. Launching a new aircraft contains high risk. That is why both of the companies would like to control other sides' activities and try everything to stop the correspondent's business, which creates trade dispute. Both sides claim the moral high ground in this dispute claiming that home governments should not help or subsidize the aerospace industry in any terms but in fact governments on both sides of the Atlantic heavily subsidize their jet makers.

Washington first launched this dispute argument even though Boeing, as an American firm may be the largest beneficiary of corporate welfare in U.S. In fact, the actor behind the curtain in this trade dispute is mainly Boeing, forcing the U.S government to bring the dispute in front of the international organizations in order to defeat its competitor by blocking the economic subsidizations, although both companies are more or less in the same position. The World Trade Organization has handled 317 cases since its creation in 1995. But the latest is one of the most important: The case filed on October 6, 2004 charging that European Union subsidies, to aircraft producer Airbus Industry, violate the WTO's 1994 Agreement on Subsidies. Again with the respective influence of Airbus and Boeing on their governments it has been decided that the issue shall be analyzed among the governments on both sides of the Atlantic. A statement made by French Minister of Foreign Trade, Francois Loos in Paris on January 11, 2005 clarifies the issue. M. François Loos, deems positive the initiative of starting negotiations between the European Union and the United States on the subsidies to Boeing and Airbus. The United States has finally decided not to bring the trade dispute which pits Boeing against Airbus to the World Trade Organization.

Questions:

1. What problem of the MNCs is indicated in the text?
2. How both companies behave?
3. What differences and similarities can you find in the decision undertaken by both companies?
4. Make conclusions regarding role of MNCs in the local economies.