B4U PUBLISHING

The Story of the AEROPLANE

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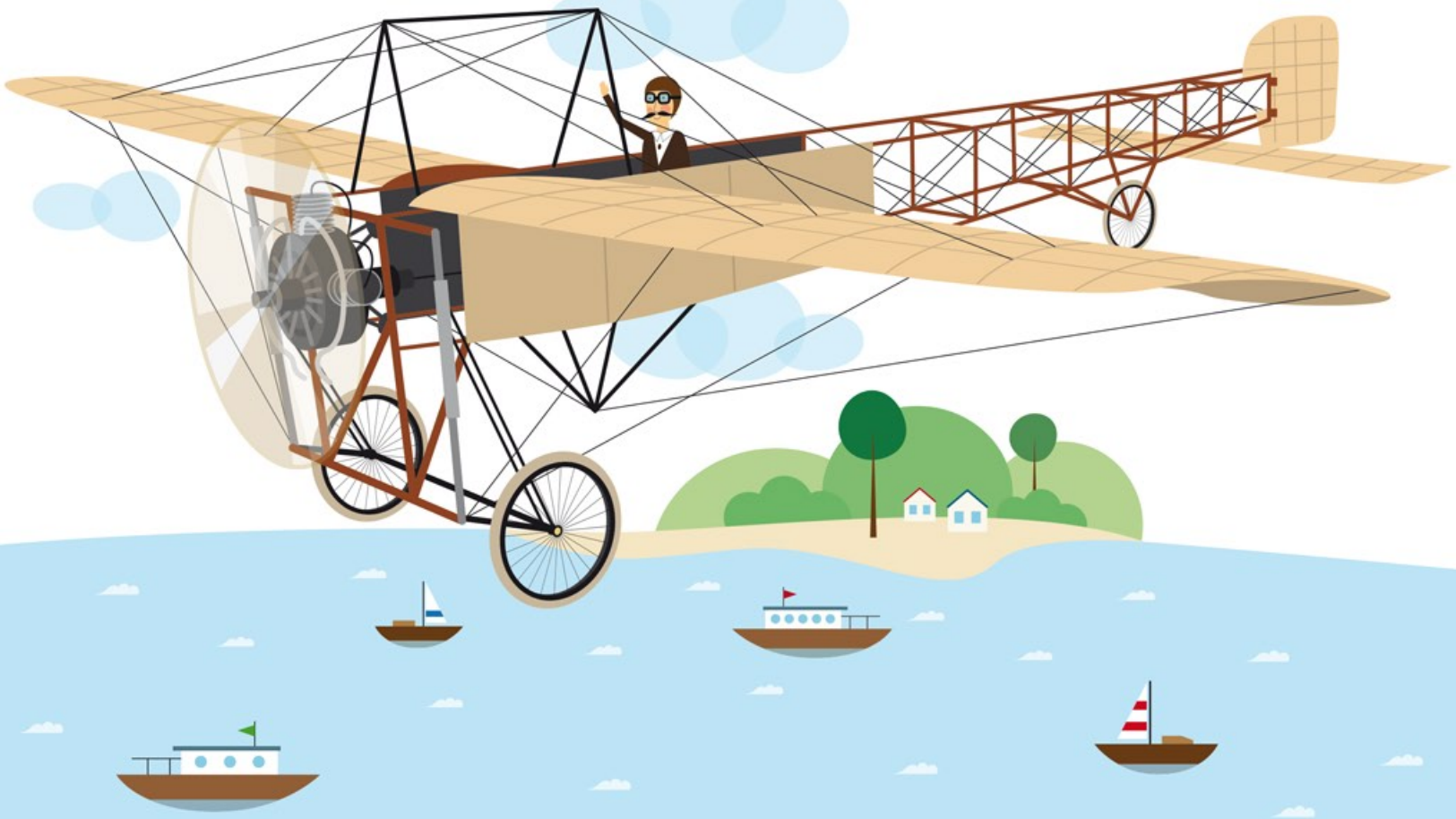

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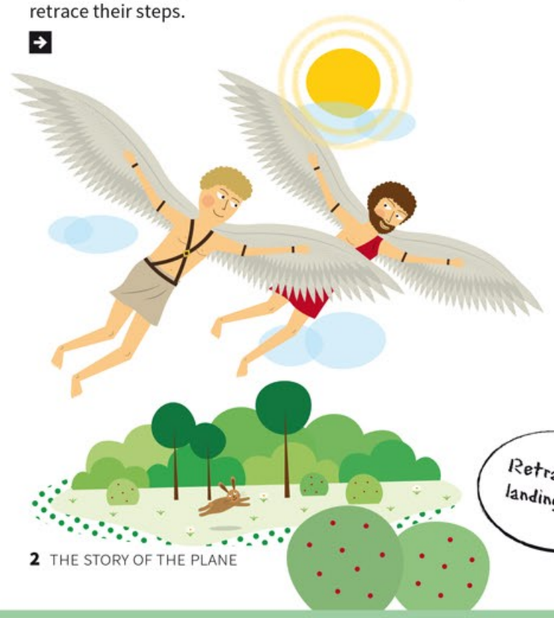
How It All Began or From Dreaming to Bold Pioneers

A DREAM OF FLYING

By definition, humans are huge dreamers. Many inventions and technological conveniences would have never seen the light of day if people hadn't been dreaming. Almost from the very beginning people were imagining that one day they might take wing and look down on the world from bird eye's view. However, achieving that was anything but easy and the journey from dreams to the first aircraft was very, very long. But it wouldn't have been humans if they hadn't set out on this journey like a hound on a fresh scent. So, let's retrace their steps.



DAEDALUS AND ICARUS

Several thousand years ago, people already told each other legends where man was flying. The story of Daedalus and his son Icarus is one such legend. It says that Daedalus constructed two pairs of wings from wax and bird feathers in order to escape from the Crete Island where he and his son Icarus were being held prisoners by king Minos. Although both men successfully took off, the flight ended in a disaster because the wax which held Icarus' wings together melted and he crashed into the sea.

DRAGONS IN CHINA

China and dragons go together like peas and carrots. Dragons, in the form of dragon kites, were flying around China long before the Common Era arrived. A flying kite is an object which is heavier than air. The only reason why the kite manages to remain up in the sky is the lift force, along with the air flowing around the aircraft's body and propping it up. This is the very basis upon which modern airplanes operate. It can be therefore said that dragon kites put man on the right track. Some Chinese even tried to use them to take off themselves!

FLYING TOY

Let's stay in China for a while longer. In the 4th century BC, children in this Asian country played with a toy which operated similarly to helicopters. It's clear that Chinese masters knew about the fundamental laws of aerodynamics for a very long time.

THE VERY FIRST GLIDE

No inventions would exist if at least some inventors didn't occasionally exhibit a certain amount of courage and take a risk. And let's face it: hanging on a self-made glider while jumping from a hill requires a lot of courage. Abbas ibn Firnas, a Spanish inventor who lived in the 9th century AD, was precisely such a courageous man.

TAKING WING DOWN THE TOWER

If the aviation pioneer we mentioned above can be considered a daredevil, what should we call Eilmer, an English monk who lived in the Malmesbury Abbey? In the 11th century, Eilmer flung himself from the top of a tower in the abbey, girded with a pair of wings he made himself. You might be thinking right now: what a reckless, suicidal inventor! However, Eilmer the Monk truly flew and managed to cover the distance of full two hundred meters.

There's No Stopping Progress

By the beginning of the 20th century, flying machines were no longer just an obsession of a several oddballs who put on wooden wings and jumped from hills, risking their health or even life. Everybody took the hint that humans are capable of flying, and aircraft designers perfected their airplanes at devilish speed over subsequent decades.

AVIATION DURING WWI

When World War One was being waged from 1914 to 1918, airplanes played a significant part in supporting land forces. Pilots from both enemy sides who sat in their respective armies' biplanes or triplanes and fought above the soldiers on the battlefield soon became celebrated heroes. A pilot who managed to shoot down more than five enemy airplanes was called an ace. Manfred von Richthofen was the best known ace on the German side. He was flying a Fokker Dr.I – a modern single-seat fighter triplane, and is attributed altogether eighty kills.

AN AMERICAN ACE

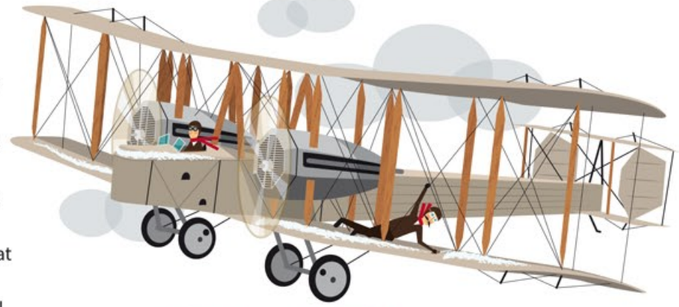
The most successful American pilot during WWI was Eddie Rickenbacker who faced the enemy in SPAD S. XIII, a French fighter biplane. This machine was one of the best aircrafts of its time. Rickenbacker notched twenty six kills in total.

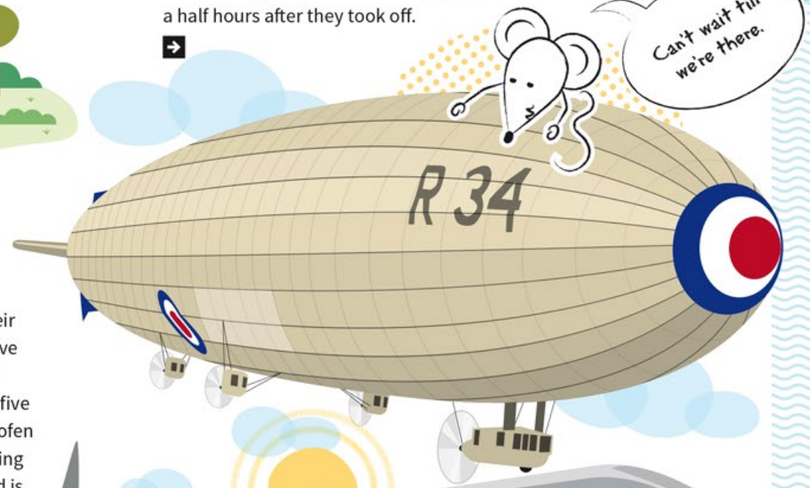
ACROSS THE POND

As soon as the hot war was over, people once again started paying attention to more useful things. In aviation, this was primarily air transport which became the topic of the day. Aircraft designers realized that airplanes might make people's lives significantly easier and cut back on the long hours spent travelling. Flying across the Atlantic became the main challenge.

VICKERS VIMY

Vickers Vimy, a British bomber, was the first machine to ever fly across the Atlantic Ocean. Its pilots – John Alcock and Arthur W. Brown – began their journey in June 1919 from the Eastern coast of the United States. The men encountered fog and storms on the way. The wings of the aircraft became covered with heavy rime which started to drag the airplane down to the surface of the ocean. Thanks to the acrobatic feat performed by Brown who got out from the cabin and onto the wing in order to remove the rime while the plane was still in flight, both Brown and Alcock flew across the Atlantic and successfully landed in Ireland – sixteen and a half hours after they took off.





THE R34 AIRSHIP

George Herbert Scott, a British pilot and engineer who commanded the crew of an R34 airship, was another person who attempted to be the first to ever fly across the Atlantic. Their competition in the Vickers Vimy model surpassed them by mere two weeks. Although, Scott did rank first in one respect: he was the first person to make an east to west transatlantic flight. The journey took over one hundred and eight hours.

ORTEIG PRIZE

Raymond Orteig, a New York hotel owner of French origin, offered a reward of twenty five thousand dollars to anyone who would be the first person to fly across the Atlantic Ocean by taking the route from New York to Paris. In the spring of 1927, many adventurers tried to earn the prize. Eventually it went to Charles Lindbergh, an American pilot, and his Spirit of St. Louis aircraft which he built in mere sixty days – with the help of aircraft designers from Ryan Airlines.

Airliner Cockpit

Now you have an idea how an airplane is controlled. Flying may seem like a piece of cake when you're sitting in a motorless glider or small sports aircraft. But as soon as you board a large passenger airliner, you realize that pilots are required to operate a large number of devices that help them get this huge machine safely up into the air and then safely land it again.

A PRIMARY FLIGHT DISPLAY

Among other things, this machine shows the airliner's current position in relation to the horizon, on the so-called artificial horizon. If the weather is bad and visibility poor, the pilot uses precisely this machine to orient himself.

C ALTITUDE METER

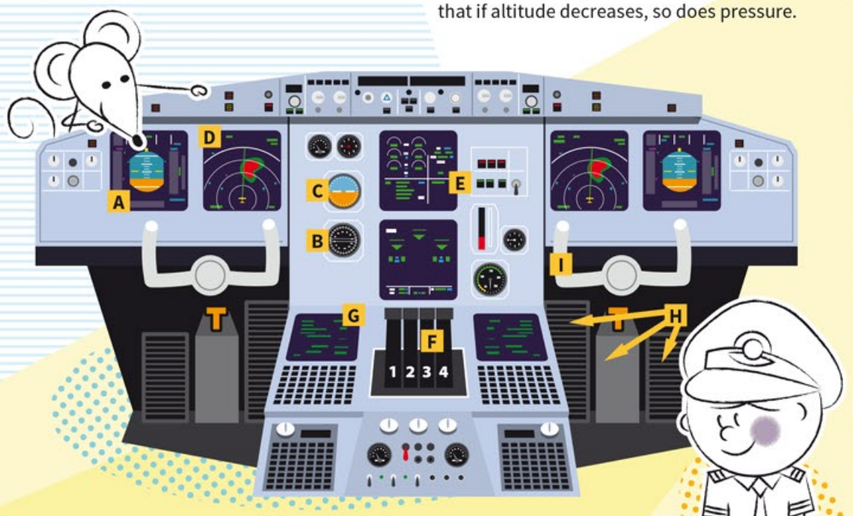
That thing that looks like a clock with two hands is called an altitude meter. This machine shows the airliner's altitude. Not the height above the ground level, though; the height above the sea level. The height above the ground level is then defined as the difference between the height above the sea level and the current elevation of a fixed point. The altitude meter measures the air pressure around the aircraft and operates on the principle claiming that if altitude decreases, so does pressure.

B RADIO DIRECTION FINDER

Its function is to determine the position of the airliner.

H PEDALS

On the floor of the airliner you can find a rudder pedal, a brake pedal, and a footrest.



D RADAR DISPLAY

This screen shows the information gathered by the aircraft's radar: the radar returns from surrounding objects. Thanks to the radar, the pilot can check whether another plane is flying nearby his machine.

F THRUST LEVERS

Pilots use the thrust levers to control the thrust of the engine. If an airliner has more than one engine, then each engine is equipped with its own thrust lever.

I YOKE

A yoke is sort of a steering wheel that controls the airliner's directional components. Pilots use the yoke and rudder pedal to turn the machine and ascend or descend with it.

E SYSTEM INFORMATION DISPLAY

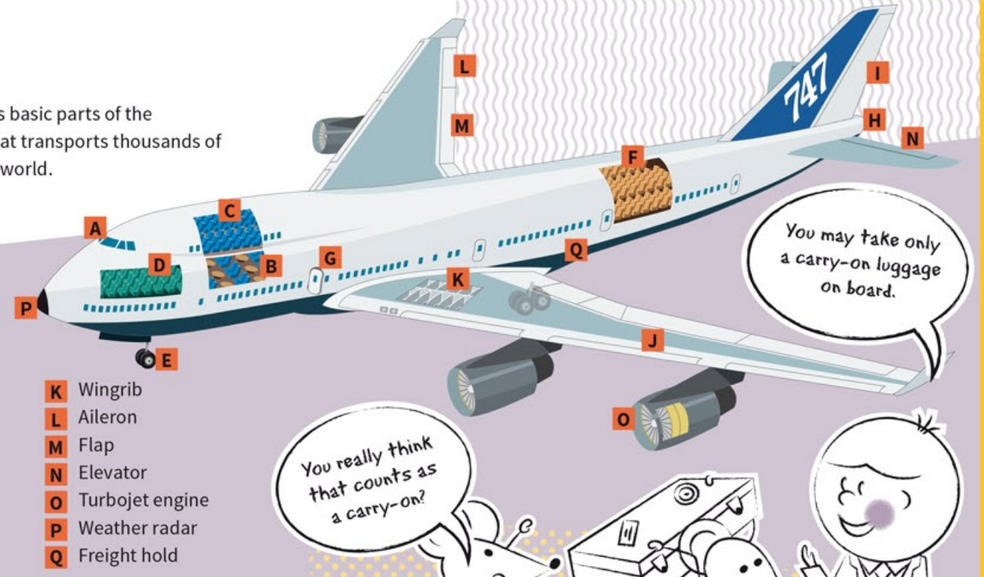
It displays all information about the aircraft's functions and tells the pilot whether all parts of the plane function like they're supposed to.

G FLIGHT MANAGEMENT SYSTEM

This is where the pilot enters all information about the airliner, its weight, the amount of fuel, flight route, flight speed, etc. The entered information helps the computer operate an autopilot feature and fly the airliner almost for the entire duration of the flight without the pilot having to intervene.

AIRLINER PARTS

The following image shows basic parts of the complicated machinery that transports thousands of passengers all around the world.



- A Flight deck
- B First class cabin
- C Upper deck
- D Lower deck
- E Nose landing gear
- F Passenger cabin
- G Door
- H Tail
- I Rudder
- J Wing
- K Wingrib
- L Aileron
- M Flap
- N Elevator
- O Turbojet engine
- P Weather radar
- Q Freight hold

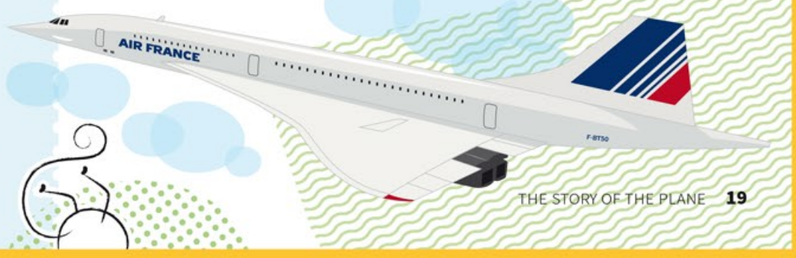
CONCORDE

The Concorde airliner wasn't as large, but it's definitely worth knowing about. It was a supersonic passenger airplane – the speed of supersonic aircrafts exceeds the speed of sound which equals 1225 km/h on the Earth's surface. The airliner was able to carry 152 passengers and cover the distance from New York to London in mere 3 hours. Sadly, it had a tragic accident and all of its passengers died. For security reasons, the crash put an end to Concorde for good.

GIANT among PLANES

THE WORLD'S LARGEST AIRLINER

The following machine will convince you that passenger airliners really are huge flying behemoths and that their pilots don't have it easy at all. Airbus A380, for example, is the largest passenger airliner in the world. It's over 72 meters long, has a wingspan of almost 80 meters, can easily take off even though it weighs up to 590.000 kilograms, and accommodates up to 855 passengers. Quite the whopper, don't you think?



Military Aircrafts

Airplanes have served military purposes from the very beginning. Military aircrafts include many flying machines worth mentioning. Military aircraft designers have always been making great strides to push the possibilities of human inventions, and the situation in aviation has been no different.

SPITFIRE MK. XVI

MESSERSCHMITT BF 109

HEINKEL HE 111

MACHINES OF WWII

During the Battle of Britain, pilots from both enemy sides were showing off their heroism and flying skills.

MESSERSCHMITT BF 109

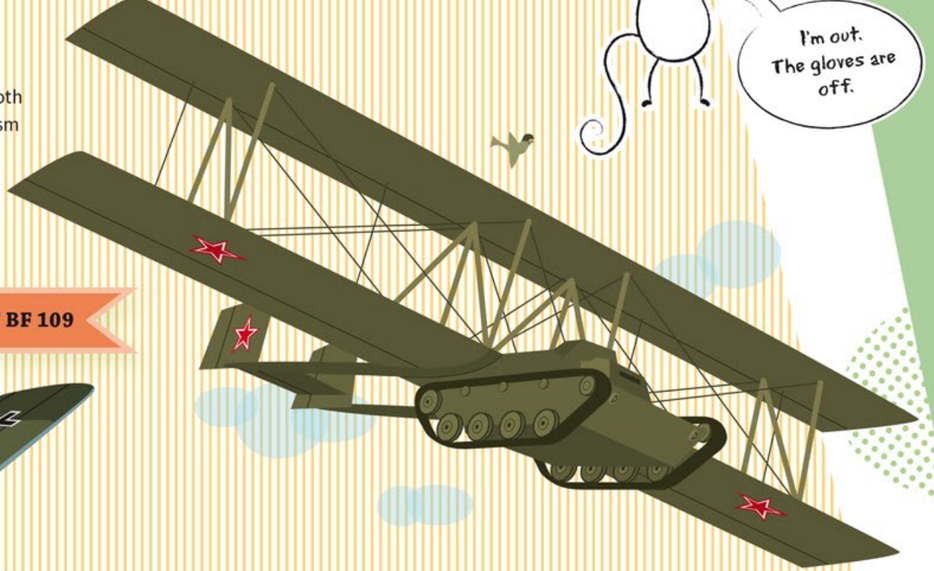
This was a German fighter plane that was accompanied by heavy bombers, especially at the onset of the Battle of Britain.

HEINKEL HE 111

A German mid-range bomber that – along with the British Spitfire – became a symbol of the Battle of Britain.

SPITFIRE MK. XVI

The British side employed mainly Spitfire Mk. XVI, a single-seat fighter plane that was one of the best fighter planes of its time and gained a legendary status during the Battle of Britain.

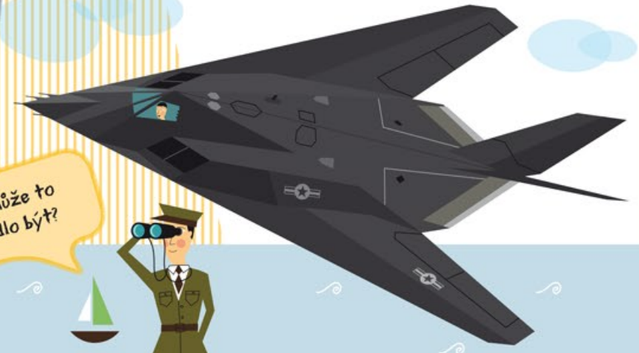


FLYING TANK

People have the craziest ideas sometimes. As you'll find out further on, aircraft designers are trying to create a flying car. Well, OK. A flying tank, though? Now that seems a little bit out there, to be honest. And yet in 1942, Russian aircraft designers did construct a glider that was able to fly tanks to the battlefield. The glider with a tank was carried by a bomber and released nearby the battlefield. The machinery then glided all the way to its destination where it immediately joined the fighting.

V22 OSPREY

An aircraft capable both of vertical take-offs and landings. Vertical take-offs are made possible by the machine's rotors which can be turned 90 degrees. The plane is equipped with folding wings to save as much space as possible. This makes V22 Osprey ideal for landing on aircraft carriers. It's been in operation since 2006.



LOCKHEED F-117 NIGHTHAWK

The first aircraft in history to ever use the Stealth technology. Thanks to this technology which is based on the plane's special surface and shape, this airplane pretty much cannot be located by radars.

The Story of the AEROPLANE

Written by Oldřich Růžička
Illustrated by Tomáš Pernický, Naďa Moyzesová

From experiments with birds' wings to ultramodern planes

Since time immemorial people have gazed at the skies and dreamed of seeing the world from high, as birds do. But for the daredevils who tried this very thing, we would perhaps still envy birds today.

In the centuries that have passed since the first naïve experiments with birds' wings, people have progressed through gliders and craft that remain airborne for a few minutes only to ultramodern supersonic jet planes. It is a long story – and one with a happy ending.