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Airlander

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Abstract: Man always dreamed of flying. The important thing is not that it succeeded but that it has evolved permanently, improving its flight. The main problem in aviation was also the safety of the flight. How to keeps in the air, even when serious problems arise. Generally, the porting was made with engines and wings. But such support can't be very secure. The only very safe means to date has proved to be the airship. Everything started from the balloons with those men first traveled, they being lighter than the air. Today it seems very strange to revive the airships, but here we do it. A balloon or airship, being lighter than air, can keep in the air for a long time, without wings, without engines, without energy consumption. For now, it's the only way to fly safely, even if it looks outdated or difficult. No other flying device can ensure vertical take-off and landing, regardless of geographic and meteorological conditions and staying in the air for a long time at a certain height, regardless of weather or situation. Today, some devices can be built to cancel the gravitational field using electromagnetic waves. Even though they have not been officially presented and have not yet been introduced into civil aviation, they will probably represent the dynamic and safe way of flying in the near future. But they can also have electromagnetic or software interruptions and consume a lot of energy. So, whether we like it or not, the safest way to fly is the one with the balloon. A modern airship can be built to fly at any desired altitude, even very close to the ground, higher or very higher. Airlander, which has 48 passengers, needs helium. He will be able to stay in the air for two weeks without landing, devastating at a cruising speed of 145 km/h at an altitude of 6,000 m. It can have a load of 10 tons aboard. Many believe that four-engine cars are approaching because, unlike conventional airplanes, they pollute very little and are not booming. In addition, Airlander can take off vertically, as a helicopter, meaning it does not need trace. It can land on snow, ice, dessert or even water. British company Hybrid Air Vehicles was the developer of the US Army, but the project was abandoned in 2013, when the funds were reduced. Behind the project, Iron Maiden, Bruce Dickinson, invested 250,000 pounds. Money came from both the British government and the EU. Airlander was tested in November 2015 and was presented to the public in March 2016.

Keywords: Airlander, Spacecraft Propulsion, Short take off, Vertical Landing, Vertical Landing Aircraft, Aircraft Carriers, Heavy Payload

Introduction

In 1951, the Lockheed XFV-1 and Convair XFY screws were designed around the Allison YT40 turbocharger that runs counter-rotating propellers.

British Hawker P.1127 took off vertically in 1960 and demonstrated conventional take-off in 1961. In 1964, the first development aircraft, Hawker Siddeley Kestrel, flew. They were flown by a tripartite squadron of British, American and West German pilots. The first Hawker Siddeley Harrier flew in 1967.

In 1962, Lockheed built the Hummingbird XV-4 for the US Army. He tried to "increase" the available force by injecting the engine exhaust into a fuselage ejector pump. The first vertical flight made in 1963 suffered a fatal accident in 1964. It was turned into Hummingbird XV-4B for the US Air Force. As a test platform for separate vertical lifting motors, similar to those used in the Yak-38 Forger. The plane flew and later collapsed in 1969. Vertifan Ryan XV-5, which was built for the US Army, at the same time as Hummingbird, experienced fans with gas lift. This aircraft used fans in the nose and each wing, covered by doors that resemble half of the garbage can caps when it grew. However, it collapsed twice and turned out to generate a disappointing amount of lifting and it was difficult to go on a horizontal flight.

Of the VTOL and V/STOL models attempted from the 1950s to 1980s, only Hawker Siddeley Harrier and Yak-38 Forger subspeeds have reached operational status and the forger has been retired after the fall of the Soviet Union.

Boeing studied another supersonic fighter, strange appearance, in the 1960s, who never did it beyond the photos of Aviation Week. Rockwell International built and then abandoned the Rockwell XFV-12 supersonic fighter who had an unusual wing that opens like blinds to create a vertical flight ejector pump. It has never generated enough lift to descend to the ground, despite the development of 20,000 lbf of force. The French had a Mach 2 Dassault Mirage IIIV machine equipped with not less than eight lifting engines that flew (and collapsed) but did not have enough fuel or payload for combat missions.

The German EWR VJ 101 used swivel-mounted swing-mounted engines with fuselage lifting engines and the VJ 101C X1 reached supersonic flight (Mach 1.08) on July 29, 1964.

Supersonic Hawker Siddeley P.1154 who competed with Mirage IIIV for NATO use was canceled even with the construction of the plane. NASA uses the SSTOVL abbreviation for short overtaking/vertical take-off and as of 2011, the X-35B/F-35B is the only aircraft that complies with this combination in a single flight.

The Mach 1.7 Yakovlev Yak-141 experiment did not find an operational client, but its rear nozzle wheel technology found a good use with the F-35B. The F-35 Lightning II is expected to be operational by 2016.

Materials and Methods

Larger STOVL models were considered, such as Armstrong Whitworth AW.681 cargo aircraft which was under development until it was canceled in 1965 and Dornier Do 31 reached up to three experimental aircraft before Cancellation in 1970. Although much of the VTOL design was used, the Osprey V-22 payload (increased) for the cases when it took off a short track (Petrescu and Petrescu, 2013c).

The Hawker Siddeley Harrier, commonly referred to as the Harrier Jump Jet, was the first generation of the Harrier series that was developed in the 1960s, being the first Flying and Recognized combat aircraft with Vertical/Short Takeoff and Landing (V/STOL) And the only really successful V/STOL project of those who came out at that time. Harrier was produced directly by the Hawker Siddeley Kestrel prototypes after canceling a more advanced supersonic aircraft, Hawker Siddeley P.1154. The Royal Air Force (RAF) ordered the Harrier variants GR.1 and GR.3 Fig. 1 at the end of the 1960s. It was exported to the United States as AV-8A for use by the US Maritime Corps (USMC) 1970.

The RAF placed most Western Harriers in defense against a potential invasion of Western Europe by the Soviet Union; Harrier's unique abilities enabled the RAF to disperse its forces on vulnerable and known aerial grounds. The USMC has used its hawks mainly for close air support, operating on amphibious attack ships and, if necessary, bases of operation before. Harrier companies saw more implementations abroad. Harrier's ability to operate with minimal terrestrial facilities and very short trails allowed it to be used in places that are not available for other fixed-wing aircraft.

In the 1970s, British Harrier Aerospace Sea was developed from Harrier to be used by the Royal Navy (RN) on invincible class ships.

Sea Harrier and Harrier were crucial during the 1982 Falkland War where the aircraft proved to be flexible and versatile. RN Sea Harriers provided army wing defense, while RAF Harriers focused on ground attack missions in support of advanced British land forces.

The Harrier was also redesigned in depth such as McAfee II and British Aerospace Harrier II by McDonnell Douglas and British Aerospace.

The innovative Harrier family and the Rolls-Royce Pegasus traction engines have generated long-term interest in V/STOL aircraft. Similar V/STOL operating aircraft include Yakovlev Yak-38 Soviet, as well as a variant of Lockheed Martin F-35 Lightning II, which is under development.

The F-35 Lightning II (JSF) is developed by the American company Lockheed Martin Company and Royal Navy Royal Navy.

Fig. 1. The Hawker Siddeley Harrier; this is an RAF Harrier GR.3. Source: Petrescu and Petrescu (2013c)

The stealth, supersonic and multi-erotic fuel has been called the F-35 Lightning II in July 2006. The JSF is built in three variants: a US Air Force take-off and landing; a shipping Variant (CV) for the US Navy; and a Short Take-Off and Landing aircraft (STOVL) for US Maritime Corps and Royal Navy Fig. 2.

Since June 10, Lockheed Martin F-35 has been released with much less noise because it was faster than the speed of sound. The aircraft accelerated to Mach 1.07 (727 miles per hour) being the first in a long series of planned supersonic flights.

"For the first time in the history of military aviation, supersonic stealth, radar-escape comes with a short take-off/landing capability," said Bob Price, Corps Marine Lockheed Martin F-35. "The F-35B supersonic can be deployed from small ships and auspicious bases near the first-line battle areas that greatly enhance the support of the carrier on board at higher speeds." The F-35B will serve seafarers, the Royal Air Force UK and the Royal Navy as well as the Air Force and the Italian Marine.

F-35B is the Short Take-Off and Landing of the aircraft (STOVL). Similar to the size of variant A, B sacrifices about a third of the other fuel variants to make space for the vertical flight system. Acceleration and landing with vertical flight systems are by far the most risky and, ultimately, a decisive factor in design. Like the AV-8B Harrier II, B's weapons will be transported to a ventral bridge. While the F-35A is stressed at 9 g, the F-35B is stressed at 7 g. The F-35B was presented at the Fort Worth factory in Lockheed Martin on December 18, 2007 and the first test flight took place On 11 June 2008.

A three-bearing pivot nozzle, which drives the maximum traction power of the post-combustion engine, is shifted by a "fueldraulic" servomotor using jet fuel.

Unlike other variants because it can land vertically, the F-35B does not have a landing hook. The "STOVL/HOOK" button in the cab starts the conversion instead of the hook. The F-35B sends the jet directly during vertical take-off and landing and the nozzle is redesigned to scatter the exit into an oval circle rather than a small circle to limit damage to the asphalt and decks of the ship.

US Marine Corps intends to acquire 340 F-35B to replace all current F/A-18 Hornet inventories (A, B, C and D) and AV-8B Harrier II in combat and attack roles.

Royal Air Force and Royal Navy intended to use the F-35B to replace Harrier GR9s.

One of Royal Navy's requirements was that the F-35B should have a ramp platform and a vertical landing (SRVL), so that the wing lift can be added to the engine lift to increase the maximum weight of the landing of the transported weapons.

This landing method is slower than the landing of the wire and could disrupt normal transport operations, as the landing method uses the approach identical to the limited approach. With SRVL, the plane is able to "bring back" 2×1K JDAM, 2× AIM-120 and spare fuel.

However, in October 2010, Prime Minister David Cameron announced that the United Kingdom would change the F-35 order to the CATOBAR F-35C.

Navy Corps Commander General James Amos said that despite the cost and delays of the program, there is no plan B to replace the F-35B.

The F-35B is bigger than the aircraft it replaces, which requires USS America (LHA-6) to be designed without the need for deck capabilities.

In 2011, USMC and USN signed an agreement that the USMC will acquire 340 F-35B and 80 F-35C, while USN will acquire 260 F-35C.

The Navy F-35C will be allocated to marine carriers, while the Navy F-35B will be used on amphibian and land-based ships.

On January 6, 2011, Gates said the 2012 budget would require a two-year break in F-35B production, during which the aircraft could be redesigned or canceled if it failed.

Gates said: "If we can’t solve this option right now and we can come back in terms of performance, cost and schedule, then I think it should be canceled."

Lockheed Martin's executive vice president Tom Burbage and former operations testing director, Tom Christie, said most of the program delays were caused by problems with the F-35B, which forced the massive resizing of the other versions.

The USMC intends to declare the initial operational capability with approximately 50 F-35 programs running Block 2B intermediate software over the 2014-2015 period.

Osprey Bell-Boeing V-22 (Fig. 3 and 4) is a US military aircraft and a Tiltroller with a Vertical Take-Off and Landing speed (VTOL) and a Take-Off and Landing (STOL) capacity.

It is designed to combine the functionality of a conventional helicopter with the long-range and high-speed cruise performance of a turbo-propelled aircraft.

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Fig. 2. The F-35B Short Takeoff and Vertical Landing (STOVL) variant for the US Marine Corps and the Royal Navy. Source: Petrescu and Petrescu (2013c)

Fig. 3. The bell-boeing V-22 Osprey. Source: Petrescu and Petrescu (2013c)

The V-22 name comes from Vertical Communications Vertical Communications Vertical (JVX) and began in 1981.

The Bell Helicopter team and the Boeing helicopters received a development contract in 1983 for pre-powered aircraft. Thus the Bell Boeing team jointly produced the aircraft.

Fig. 4. The bell-boeing MV-22B osprey, (M from Marine). Source: Petrescu and Petrescu (2013c)

The first V-22 flew in 1989 with flying tests and design changes; the complexity and the difficulty of being the first tiltrotor of military service in the world has led to many years of design, research and development.

The US Marine Corps started crew training for Osprey in 2000 and launched the aircraft in 2007; it complements and eventually successfully replaces CH-46 Great Knights.

Osprey's other operator, the US Air Force launched the tilt rotor version in 2009. Since the launch of the Naval Forces and Air Force, the Osprey has been deployed both in Iraq and in Afghanistan and Libya in all combat operations and salvage.

PA-23 was the first two-engine project at Piper and was developed from a proposed Twin Stinson project inherited when Piper bought Stinson's Vultee Consolidated Corporation Fig. 5.

The prototype PA-23 was a four-cylinder, four-cylinder f four-cylinder powered by two 125-horsepower Lycoming O-290-D engines, the first prototype flew on March 2, 1952. It was redesigned with a Single Stabilizer Vertical A metallic rear hull and powerful power of 150 horsepower Lycoming O-320-A. Two new prototypes of redesigned aircraft, now called Apache, were built in 1953 and entered production in 1954; 1,231 copies were built. In 1958, Apache 160 was produced by upgrading engines of 160 hp (119 kW) and 816 were built before being replaced by Apache 235, which reached 175 hp (235 hp).

Fig. 5. The piper PA-23-250 Aztec F aircraft. Source: Petrescu and Petrescu (2013c)

In 1958, an improved version of the Lycoming O-540 engine of 250 hp (186 kW) and the addition of a vertical tail was produced as PA-23-250 and was named Aztec.

These models came in a five-seat configuration that became available in 1959. In 1961, a longer version, Aztec B went into production. Subsequent models of the Aztec were equipped with IO-540 fuel injection engines and a capacity of six seats and continuous production until 1982. Later there were also turbocharged versions of the models that managed to fly at higher altitudes.

The US Navy purchased 20 Aztecs, calling it UO-1, which changed to U-11A when the unified names were adopted in 1962.

In 1974, Piper produced a single experimental PA-41P Pressurized Aztec Concept. However, this concept was short-lived because the Aztecs, who made it so popular due to its internal space and its ability to pull large loads, could not sustain the pressure vessel. The project was canceled and the Aztec pressure, N9941P, was donated to the Mississippi State University, where it was used for testing purposes.

In 2000, the N9941P was donated to the Piper Aviation Museum in Lock Haven, PA, provided it was never thrown. You're on the screen now.

DHC-6 Twin Otter is a Canadian with 19 passengers (short-haul and landing) developed by Havilland Canada and currently produced by Viking Air. Travel tracking, STOL skills and mountaineering turned it into a successful freight aircraft, a regional passenger plane and a MEDEVAC aircraft. In addition, Twin Otter was popular in commercial parachuting operations and is used by the United States Army parachuting team Fig. 6. Airplane development began in 1964, with the first flight on May 20, 1965. A two-engine replacement for the only Otter engine was planned by Havilland Canada. The two-engine engines not only ensured increased safety but also allowed an increase in useful volume, while preserving the renowned STOL qualities. Design features include two-wing brakes and a tandem clamp to improve STOL performance. The availability of the PT56A-20 turbine engine, 550 hp (410 kW), from Pratt and Whitney Canada, in the early 1960s made the twin concept more feasible. For boiler operators, improved propulsion power and improved performance of a two-engine configuration have transformed it into an immediately popular alternative to the Otter-piston engine that flew since 1951.

The first six aircraft produced were a series, indicating that they were prototypes of aircraft. The initial production stage consisted of 100 series aircraft, series 7 to 115 inclusive. In 1968, the Series 200 production began with the 116 series. The changes introduced at the start of the 200 Series production included an improvement in STOL performance by adding a luggage compartment with a longer storage space with a floating aircraft with a large luggage compartment) and the installation of a large door in the rear luggage compartment. All series 1, 100 and 200 and their variants (110, 210) were equipped with 550 hp PT6A-205 engines.

In 1969, the improved 300 series was introduced, starting with the 231 series. Both the performance of the aircraft and the payload were improved by mounting more powerful PT6A-27 engines.

It was a 680 hp (510 kW) engine that was rated at 620 hp (460 kW) for use in the 300 Twin Otter series. The 300 series proved to be the most successful version, along with the 614 aircraft (the 300 series and its sub-variants, the 310 series for UK operators, the 320 series for Australian operators, etc.) sold before the 1988 production.

After finishing production in the 300 series, the remaining instruments were acquired by Viking Air in Victoria, British Columbia, which produces spare parts for all production hubs in Havilland Canada. On February 24, 2006, Viking obtained Bombardier Aerospace certificates for all aircraft production from Havilland DHC-1 to DHC-7.

The ownership certificate gives Viking the exclusive right to produce new aircraft.

On 17 July 2006, at the Farnborough Air Show, Viking Air announced its intention to offer a 400 Twin Otter Series. On April 2, 2007, Viking announced that with twelve commands and options in hand, the Twin Otter reboot was equipped with a stronger PT6A-34/35 engine from Pratt and Whitney Canada. In November 2007, in Calgary, Alberta, 40 firm orders and 10 options and a new assembly unit were made.

Zimex Aviation from Switzerland received the first series of 845 series production aircraft in July 2010.

The main changes introduced in the 400 series include the fully integrated Honeywell Primus Apex avionics, the CA electrical system removal, the beta backup system deletion and the lighting and use of Composites for Structures Do not carry loads such as doors.

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Fig. 6. De Havilland Canada DHC-6-100 Twin Otter aircraft. Source: Petrescu and Petrescu (2013c)

Fig. 7. Edgley EA-7 Optica aircraft. Source: Petrescu and Petrescu (2013c)

The Edgley EA-7 Optics Fig. 7 was a lightweight British observation aircraft, designed as a cheap helicopter alternative, which initially sold $200,000. The Optics, designed by John Edgley and built by Brook lands Aerospace, had an unusual configuration with a cab in front of the three-door windows, reminiscent of an Alouette helicopter. Behind it was a six-stroke engine running on a duct fan, a double arm with a double arm and a single high lift. The tricycle's fixed chassis had a step to the left. The wings were unsuccessful and unplanned and the aircraft had a fairly standard metallic structure with stressed aluminum. The distinctive appearance of the aircraft has led to the fact that it was known as "bug-eye" in some popular reports.

The first aircraft was launched on December 14, 1979, powered by a Lycoming O-320 engine of 150 hp (112 kW) and piloted by the Cranfield Aeronautical College pilot. Optics, powered by a stronger engine, Lycoming O-540, entered production in 1983, gaining certification on February 8, 1985. A police accident of Opty G-KATY on May 15, 1985 killed two members of the Hampshire Constabuller. The cause was suspected to be a stand: insufficient air speed during a comeback causing instability. The reason for slow speed has never been established. This led to Edgley's bankruptcy when Optica Industries was set up in October 1985 to continue production and 25 were built before a fire-induced fire destroys the plant and anything other than the flying optics. The company was reformed again as Brooklands Aircraft and Optica returned to production, production stopped in March 1990 when Brooklands Aircraft went bankrupt. The design of the optics was bought again by John Edgley (along with the FLS Sprint 160 design). Edgley hopes to put both types into production and the 300/021 G-BOPO series is restored as a British protester (Petrescu, 2009; Petrescu and Petrescu, 2011; 2012; 2013a; 2013b; 2013c).

P-791 is an aerodynamic/aerodynamic experiment developed by Lockheed-Martin Fig. 8. The first flight of P-791 was on January 31, 2006, aboard the aircraft test company, aboard Palmdale 42. It has a unique shape in three boxes with disk buffers at the bottom for landing. A very similar project can be seen in the vehicle of the Multilingual Vehicle (LEMV).

P-791 is an example of a hybrid aircraft. In such drawings, a part of the weight of the craft and its useful load are supported by aerostatic lifting (floating) and the rest is supported by an aerodynamic lift.

The combination of aerodynamic and aerostatic lifting is an attempt to benefit both from the high speed of aerodynamic craft and the aerostatic lifting capacity. Critics of the hybrid approach have considered it "the worst of both worlds" in that such craft requires a landing and landing track, is difficult to control and protect on the ground and has relatively low aerodynamic performance.

Proponents of hybrid projects argue that these deficiencies can be overcome by advanced technologies. In particular, it has been proposed that the buoyancy control mechanisms reduce or eliminate the need for a runway.

Recently, Eros Corporation has successfully tested the COSH system, which will adjust its static weights of the ML866.

In the first experimental stages, no hybrid aircraft project was developed.

Although many such projects have been proposed, very few have flown. A hybrid aircraft project that became crazy was Aereon 26.

The development of this aircraft was documented in John McPhee's book "Deltoid Pumpkinseed".

Although Lockheed-Martin is developing a project for the DARPA WALRUS project, the company claims that the P-791 has nothing to do with WALRUS. However, design is an approach that can also be applied to WALRUS. Some believe that Lockheed-Martin used the P-791 secret

program as a way to get Eros Corp Worldwide, the other competitor, WALRUS Phase I, to start the line.

The company did not give details about the aircraft design. However, at a distance, the P-791 seems to be essentially the same as the SkyCat design, which was unsuccessfully promoted by the British Advanced Technology Group (ATG). SkyCat techniques are developed and promoted in the United States by New Mexico's Hybrid Airline (HAC). Press reports have also confirmed that the P-791 incorporates some of the most distinctive features of the SkyCat design, especially the use of suction/suction nozzle as "landing gear".

Industry observers noted that close HAC engineers later worked on WALRUS and P-791 projects at Lockheed-Martin. A high gauge plan is the Airbus A300B4-608ST Super Transporter Fig. 9.

Even an aircraft can be transported Fig.10.

The BD-5 Micro is a series of small aircrafts built by American designer Jim Bede in the late 1960s and first introduced as a kit by Bede Air Corporation in the early 1970s.

The BD-5 has a small, streamlined fuselage that keeps the semi-inclined pilot under a large canopy with the engine installed in a fuselage compartment and a BD-5J propeller or a reaction engine mounted immediately after the Cockpit. The combination of the fighter's appearance and the relatively low cost led to the sale of over 5,000 BD-5 kits or plans, with about 12,000 orders made for an FAA-certified FAA version. However, some versions of the kits were completed due to the bankruptcy of the company in the mid-1970s and none of the factory-built "D" models due to the lack of a reliable design engine.

In total, only a few hundred BD-5 kits have been completed, although many are still sampled today. The BD-5J version holds the record for the world's lightest planes, weighing only 162.7 kg.

The development of "Micro" dates from 1967 when Jim Bede was inspired by Schleicher ASW 15. At that time, Bede was working on the Bede BD-4 design. The BD-4 was a fairly conventional four-seater model, but it offered good performance and it was quite cheap. Over the life of the company, about 600 BD-4s have been sold, a success with any measure.

Serious work from Micro began in 1970, the prototype building began seriously at the end of the year. While the BD-4 was quite conventional, Micro was a radical design. It is a very small, single-sided design that looks more like a plane than a "top plan", the pilot in a semi-inclined position under a large plexiglass canopy, just a few inches above his head. Behind the cab is a 40 cc and 40 cc propeller with four 40 cc propellers that propel the propeller. Two versions, BD-5A, with lateral adjustments of 14.3 "(4.34 m) and acrobats and BD-5B with a wing of 21.6" (6.55 m) were planned. Using the glider Builders could optionally purchase both wings, changing them in about 10 min (Fig. 11).

Fig. 8. Lockheed martin P-791 aircraft. Source: Petrescu and Petrescu (2013c)

Fig. 9. Airbus A300B4-608ST super transporter aircraft. Source: Petrescu and Petrescu (2013c)

For improved performance, the aircraft featured both a V-tail and a retractable landing gear to reduce power. The calculated drag was so small that the spoilers were added to the wing to improve the landing deceleration. This was apparently the first application of spoilers on a light aircraft. Low draw has implied excellent performance; with short wings, it would reach 340 km/h on the cruise, while the long-term BD-5B would be slightly slower and will have an extended range of 1,215 miles.

Fig. 10. Airbus A300B4-608ST Super Transporter aircraft Source: Petrescu and Petrescu (2013c)

Fig. 11. Bede BD-5B aircraft Source: Petrescu and Petrescu (2013c)

Besides being easy to fly, the BD-5 was designed to be easy to build and own. The fuselage was built mainly from glass fiber panels on an aluminum frame, reducing construction time to just a few hundred h. Although the first projects required welding in the landing area, planning was eliminated in kit versions, so the construction would not require special tools or abilities. Even the operating cost would be extremely low, ensuring fuel efficiency of nearly 40 mpg. With open wings, the airplane could be wrapped in a small custom trailer, allowing it to be towed with a car to be stored in a garage and then into any pay area suitable for take-off.

Bede has published an informative brochure about BD-5 in November 1970. At this time, some very positive news articles appeared. In the October 1971 edition of Science and Mechanics, the BD-5 is on the cover, stating the price of 1,950 USD and a maximum speed of 215 MPH. The associated article showed the original prototype construction, with numerous claims about how easy it was to build. The popular scientific issue of August 1973 covered the aircraft, although the price was quoted at $2,965. A feeding frenzy followed when the "mini-fighter" generated an intense demand. As an author said, "Even before the first plane left the ground, thoughts of flying with thin aircraft stimulated the imagination of almost everyone who had heard about the program."

On February 24, 1971, the first $ 200 deposit was accepted to reserve a spot to receive a set, the destination being 24 May 1972. Until August 1971, 800 deposits were made if the first tests BD-5. By the end of the year they had over 4300 orders, being one of the most popular general aircraft projects in modern history.

The N500BD prototype flew on September 12, 1971, powered by a Polaris Industries snow engine with a power of 36 horsepower. The stability of the original V-tail plan was marginal at best and obviously needed a redesign.

With the original fiberglass fuselage, this was a time-consuming process, so it was decided to switch to a metallic fuselage with components incorporating combined curves produced with aerodynamic aluminum alloy. These can be easily changed during the test cycle. It also made economic sense that laminated commands, because stamping the metal stamping is costly to be set up, but less costly in the long run.

In December 1971, the instrument for the new fuselage was developed. The aircraft now had a longer and sharper nose, while the ovoid N500BD model was modeled on ASW 15. While this activity was ongoing, Bede continued to experience queue changes, eventually abandoning the tail V and changing a Conventional vertical hook and a horizontal lifting arrangement Well-matured surfaces. Subsequent testing on the N500BD indicated the interference of the flow between the horizontal surfaces and the propeller and the elevator was lifted six centimeters to correct it, placing it in the middle of the rear fuselage.

The first example of the new fuselage arrived in March 1972 and was equipped with a new Kiekhaefer Aeromarine engine that Bede saw at Oshkosh Airshow in 1971. It finished as N501BD, many small delays prevented it from flying until July 11, 1972 Problems with the Queue design, which was redesigned again, losing the race and becoming more conventional.

The program was too long for Bede to take care of himself. In March 1972, he hired Burt Rutan to lead the flight test department, soon followed by Les Berven as a test pilot. They started to develop, giving Bede more time to work on business issues. This proved quite difficult because Kiekhaefer and Bede failed to reach agreement on deliveries, forcing him to turn into a 440 cc 40 hp engine, similar to Hirth Motoren, then to choose A Hirth 55 Cc of 650 hc (Fig. 11).

Several problems occurred during the tests. Force forces were very low, but this was easy to solve by increasing power. A more worrying development was that all engines had mixed problems due to engine speed or engine load, which led to a serious engine running. In August, Bede demonstrated the BD-5 FAA to get

permission to fly to Oshkosh when the engine was seized. At landing, the plane crossed the track, grabbing the gear in the nose. The fuel combination was identified as the cause of the N501BD accident in September 1972, when blend control was interrupted and Berven had to make a forced landing. Because the N502BD would be ready in two months, the N501BD was not repaired.

However, the N502BD has entered its own problems. Previous models used a variable speed transmission to transfer power from the engine to the prop shaft but were taken out of the N502BD and suddenly began experiencing a serious vibration problem. Experts were called and the additional bearings corrected the problem, but by March 26, 1973, the N502BD flew. Since then, the test program seemed to go better.

Until the test program came to the conclusion that the aircraft underwent major changes. A victim of the program was the shortest wing "A", which calculates that it would improve performance only at speeds very close to Vmax (the highest available speed). Flight tests also showed that the landing speed of the lower wing was rapid. Flanks and spoilers have also disappeared. The dimensions of the canopy and the cabin were changed and the aircraft had new landing systems and a completely new section. More bitter the fact that the engines have already been changed twice. What remained, however, was the basic concept of the rifle aircraft, which, if not improved.

By this point it seemed that the basic project was complete and Bede turned his attention to other projects. One was a BD-5 power jet, BD-5J, which is detailed below. Another was Bede BD-6, a BD-4 version based on the same Hirth engine used in the BD-5. Another was the "new" BD-7, one verse of the BD-5, along with one of the two models from which a prototype was built. There was even an attempt to avoid the problem of the BD-5S, a glider (S for gliders) with wider and less motorized wings, which made Air Progress's sarcastic writing: "Finally, a problem with the engine planner BD -5 O "It does not work well and the project has been removed. Bede also decided to seek the FAA certification of the BD-5D as a production plane and sell it completely and began to take $600 for this specimen.

Until mid-1973, the core project was completed and production tools. The engines were the only parts that supported the deliveries, so Bede offered to deliver the kit with the engine he was supposed to follow. This was a pretty attractive option; this means that the builder could "go to work" and hopefully finish the aircraft until the engine arrived at that time in September 1973. Many builders took the company at their disposal just to get incomplete kits and plans.

All three hirth engines were offered; Manufacturers could continue to design 40 HP or "sell" up to engines larger than 55 hp or 70 hp. The latter, which developed Bede with hirth, was now considered the basic engine of the aircraft, as initially 40 horses proved to be insufficient. At the end of 1973, the Bulletin of potential owners, Bede suggested the 70 hp model and discouraged the use of smaller engines. Prices have risen in the 30 months since receiving deposits. The initial price was USD 1,799, the basic price was increased to 2,599 USD by 55 horsepower and the owners were offered a "top trade" for the price difference if they ordered the aircraft with the original 40 hp engine.

When it came in 1974, the engines were still not delivered in quantity, although some started to reach the beginning of the year. At that point, Hirth suddenly went bankrupt after about 500 engines were dispatched. Once again, the design did not have the right engine, but this time the search for a replacement ended with the Xenoah design in Japan. The development of this engine has been long and, ultimately, will not be certified for export until 1978, although this was not expected at the time.

Meanwhile, Bede came up with another romantic solution to the problems of turning pilots into the new plane. They took an example without a motor and screwed it in front of a truck on a trapeze, attaching control of the truck's acceleration to the truck. Pilots could try to fly without danger - if there is a problem, the truck driver hit the brakes.

After more than 5,100 kits were delivered to potential builders, kits were stopped. Although the company was actually bankrupt in the present, the BD-5D is in operation for some time.

Bankruptcy became official in 1979, when the BD-5 project was long dead. During the bankruptcy procedure, it was found that the money apparently used to build kits was spent in exchange for a variety of projects. As a result, Bede has reached an agreement with the FTC to stop accepting aircraft deposits for 10 years.

Many owners have incomplete, abandoned or sold sets, but many hundreds of heavy builders have finished with a variety of third-generation engines and former Bede aircraft dealers. Having a hunting car was a problem.

The construction time of the aircraft was much longer than the one quoted, as well as between 3000 and 3500 h. Some of them were due to the need to fit the selected engine into an airframe designed for Hirth, which was no longer available. In addition, some of the kits have been shipped with missing pieces, adding to confusion. All this led to a series of kits that were sold for fire sales, though this allowed manufacturers who want to complement their sets to do so at rental rates. While Bede claimed that the aircraft could be put together by anyone in a garage, the builders generally agree that such an operation without adequate construction techniques could lead to a potentially dangerous aircraft.

One way to overcome this problem is to use a set of assembly devices suitable for aligning and forcing the body, aircraft, areas and other components. For all these reasons, it was some time before the BD-5 appeared.

In the years to come, the plane has achieved a terrible record of safety. Although Bede had suggested using Wings B, the oldest kits were only delivered with short "A" wings.

All four examples completed with these wings collapsed in their first flight, three took off and one lasted quite long until landing, three of the four causes of death. Of the first 25 finishes, both "A" and "A", 14 collapsed with 9 deaths.

Even when the B-wing examples have been completed, the safety mark has not improved much. Several accidents have been found in the -5B models due to engine failure due to engine mixing issues and endemic cooling problems.

The reason for this is a problem with the BD-5 is double - the large thrust line means that an engine failure immediately produces a change of unexpected attitude (for most pilots). Pilots who fail to fly first on the plane and then try to inevitably restart the engine with associated consequences.

This was aggravated by the fact that the original wings had a very sharp pillar with little warning and an ugly tendency to "twist". To make things worse, a manufacturing error documented in some winged wigs provided to kits builders has aggravated the problem.

A fairly low weight range has added to the problem of properly cutting aircraft.

With Air Bede's death, BD-5 entered a language, while the builders finished their kits. Early safety issues and the challenge of adapting an appropriate engine have amplified delays.

However, solutions to most of these issues have reached some extent in the years to come. Other modifications have been included to improve the original design. Today, BD-5 is a rewarding aircraft if it is difficult.

For example, the problem of finding a 60-70 hp engine weighing less than 100 kg was a serious problem in the 1970s, but today there are a number of drawings on the support in this class.

The widely available Rotax 582 is a standard of 65 liters, 80 liters, almost adapted for the BD-5. Other engines successfully used in the BD-5 include the Subaru EA-81, Honda EB-1 and EB-2 (with and without turbocharger), Hirth 2706, AMW 225-3 and 2SI 808. C 1a current/3 km, 1 Km) at a limited altitude is a BD-5A (listed as BD-5B, Test) 618UL 74 HP, two sick.

Pillar issues were largely addressed by Harry Riblett, a tire designer, who documented a small size change application procedure that mitigated state response to aircraft without significant performance degradation. Reprofil has other unique problems associated with the way it is applied to the upper surface of the wing, mainly shiny on the aluminum and fiberglass layers. Similarly, the center of gravity of the small center of gravity has since been approached with 5.5-13 inch tire sets for the fuselage.

Several companies have been created to help builders complete their sets and many of the subsequent changes have been processed in these services.

Today, BD Micro Technologies in Siletz, Oregon, continues to provide kit support, including new kits including (optionally) all these modifications and even BD-5T, a BD-5 turbo powered by a stepped propeller. Alturair, Inc., of San Diego, California, also offers extensive parts and construction assistance services.

An unusual adaptation of BD-5, Acapella 100, appeared in the early 1980s. Designer Carl D. Barlow of Option Air Reno enriched a BD-5 loop with a distinctive double arm and equipped it with a Continental O-200 CP.

Later, a 200-hp Lycoming IO-360 was mounted and the wings shortened from 26.5 to 19.5 m, becoming the Acapella 200-S. The prototype of this aircraft was first launched on June 6, 1980 and pilot Bill Skiller was in control.

However, it flew poorly and was difficult to control. Only the prototype was built and donated to the Airventure Museum of the Experimental Aircraft Association in Oshkosh, Wisconsin, United States of America, where it is occasionally exposed.

Bede Aircraft Company was re-formed and worked on several new projects.

Bede has suggested a two-seat "Super BD-5" tandem version using a certified aircraft engine and a number of modifications and improvements, but so far only a preliminary project has been available.

While the new Hirth engine was tested, Bede decided to create an unconventional version of the BD-5 with a small engine. The result was the BD-5J, an airplane at a speed of 480 km/h.

The design used the turbocompresor Sermel TRS-18-046 (now Microturbo, a division of Turbomeca), which produced 225 kg of traction and was used in a design with the Caproni certified motorcycle.

The original engines were licensed by Ames Industrial in the US.

The wings have been transformed into an "intermediate" dimension between the original A and B wings with a height of 17 ft.

Bob Bishop acquired 20 BD-5J kits as soon as they appeared and many of the flight examples began to live in this batch of twenty years.

Versions of the original lot have become popular. In the 1980s and until 1991, Coors flew two of them as "Bullets Silver". Budweiser also had a BD-5J called Bud Light Jet, but the contract expired and the plane was lost as a result of a fire engine compartment that Bob Bishop successfully saved.

The aircraft also appeared in the opening session of James Bond, Octopussy.

Many of these aircraft have been involved in accidents. The loss of Bud Light Jet was caused by an incorrectly specified forwarding unit that broke out during the middle flight and caused the fuel jet to be sprayed directly into the engine compartment.

Fig. 12. Boeing 707-385C Phalcon aircraft Source: Petrescu and Petrescu (2013c)

The fuel ignited when it came into contact with the hot components of the turbojet engine, forcing the pilot to change altitude, climb and save.

Then the plan came in a flat rotation and was pancaved in the ground, but it was quite intact to allow the cause of the fire to be determined relatively quickly.

On June 16, 2006, while practicing an air show at Carp Airport in Ottawa, Canada, Scott Manning crashed into Stinger Jet, the last BD-5J remaining on the Airshow circuit.

The Canadian Transport Security Council investigated the accident and issued a report that attributed the probable cause of incorrect wings installation, which led to the sudden withdrawal of the wing from that wing during the flight and the creation of a "split claw". The aircraft rolled to the right and Manning could not recover in time.

Recently, the BD-5J operates in the national security arena. The aircraft is certified by the US Department of Defense as a cruise missile and Bishop's Aerial Productions offers a version known as Smart-1 (Small Manned Aerial Radar Target, Model 1). Radar performance and general performance features help prepare it.

On June 27, 2006, Chuck Lischer piloted an impact on a final approach at Ocean City Municipal Airport in Ocean City, Maryland, in a fatal accident.

The BD-5J also owned the Guinness record for the world's smallest jet for over 25 years.

Bob Bishop got the record with one of the planes and in November 2004 the record changed the hands of Juan Jiménez, who bought the aircraft from the original manufacturer whose BD-5J weighed a bare weight of 80 kg (36 kg). Easier than the Bishop the lightest documented weight for a BD-5.

The jet has not yet flown due to significant mechanical problems, turbine startup and safety concerns. Another monster is Phalcon Boeing 707-385C Fig. 12.

Results

The world's largest airplane, Airlander 10, a combination of airplane, airship, helicopter and airplane, made its first flight Wednesday after months of training and years of research and funding in 2016.

The flight did not take long - just 20 min, landing being a problem, in Cardington, north of London, CNN shows.

His design gave him the nickname " Flying Ass, " but the aircraft is ready to show the world what it is capable of.

The way he shows it gave him the name of "Flying Fund". But the biggest flying machine is ready to prove what it is, at the end of this month when it leaves the hangar. Airlander 10 has a length of 92 m and this summer will make six flights to demonstrate its technology.

Hybrid Air Vehicle, the company behind the aircraft, presented details of the routes and maneuvers that will be used to put the hybrid aircraft on its route.

The 92-meter-long aircraft, 26 tall and 43.5 m wide, was due to fly on Sunday, but the time was postponed due to technical problems.

Airlander 10 is a combination of a plane and a dirigible, being 15 m longer than the largest passenger aircraft in the world. It will fly at an altitude of 1,219 m at a speed of 74 km/h.

The aircraft will fly over the Cardington area in the UK. Another test to which Airlander 10 will be placed will be flying 138 km at an altitude of 3048 m at a speed of 111 km/h.

David Burns, the test engineer for Hybrid Air Vehicles, said: "Although we flew for many hours in our in-house simulator, we need concrete data to confirm the performance and behavior of the aircraft."

"During the flight, the ground crew will receive data from over 1000 sensors on board the aircraft," he added. The hybrid ship was originally built for the US government as a long-haul floating ship, but the project was abandoned due to staff reductions.

To rise from the ground, Airlander, which employs 48 passengers, needs helium. He will be able to stay in the air for two weeks without landing, devastating at a cruising speed of 145 km/h at an altitude of 6,000 m. He can have a load of 10 tons on board.

Many look at the four-engine machine as the one of the future, since, unlike conventional airplanes, it pollutes very little and is not gaudy. In addition, Airlander can take off vertically, as a helicopter, which means it does not need any tracks. The ship may land on snow, ice, dessert or even on water.

British company Hybrid Air Vehicles was the developer of the US military, but the project was abandoned in 2013, when the funds were reduced. Behind the current project was also Iron Maiden's soloist Bruce Dickinson, who invested 250,000 pounds. Money came from both the British government and the EU.

Airlander Fig. 13 was tested in November 2015 and was presented to the public in March 2016.

Thus, the aircraft was modified to support recreational and business flights and was assembled in a hangar at Cardington Airport in Bedfordshire.

The aircraft is named Martha Gwyn, the name of the president's wife at Hybrid Air Vehicles.

The company also announced it has raised £ 1.25 million in a fundraising campaign after obtaining approval from regulatory authorities to conduct the tests.

Before leaving the hangar, the ship will be subjected to a collapse test to test the moving parts of the anti-skid system that will act like that of traditional airplanes. Another test will be to use the four engines at maximum capacity on the ground before flying.

In a letter, Nick Allman, the Hybrid Air Vehicle Programmer's Director, said, "Soon we will leave the hangar, depending on the weather and we will start the final phase of the ground tests.

When the tests are over, Airlander will be ready to board her first flight, the rest of the programmer team. We have made stunning progress over the last five months, it will be an exciting summer for the aviation industry.

The airplane can take off vertically, slowly or quickly and it can also tilt so that when landing first comes to reach the ground only with a peak Fig. 14.

The concept behind the ship is to combine the technology used in airships with aerodynamics of planes, allowing them to travel long distances using a small amount of fuel.

One of the wings measures 9 in 11 m to fill it with helium requires 1.3 million cubic meters (the amount needed to fill 15 Olympic pools).

In a statement made by Hybrid Air Vehicles, they say: "Flight is now authorized since the ground tests and associated documentation have been completed."

Airlander will be able to fly over and land on any type of surface, including ice, sand and water. He can stay in the air for two weeks flying over 144 km/h at a height of 6,100 m in air with a load of 10 tonnes. Some people consider Airlander to be the future of aviation because it does not produce as much pollution and noise as a normal airplane.

Unlike a normal ship, Airlander does not have a fixed internal structure, but it becomes rigid when filling with helium.

Fig. 13. The world's largest airplane, Airlander 10 Source: Airlander 10 images

The material used for the hull was designed by Warwick Mills and assembled by ILC Dover, the NASA astronauts' costume designer.

The advantages of such a ship are huge. The ship may take off and land at any speed, in any position, without any effort or danger to the cargo or passengers. Keeping in the air at a certain altitude is no longer based on the load, the wings and the engines, or the design of the body and the wings and the dynamics of the fuselage no longer have any particular importance in this respect (only to the resistance to flight in-flight).

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Fig. 14. Airlander 10 Source: Airlander 10 images

Such a ship does not consume energy to maintain it at a certain altitude, but only for acceleration and braking.

The maneuverability of the ship is good and with great security for passengers and cargo.

The visibility of the driver's cab in front, back and down is very good, being only obstructed in the upward direction, where a camera image is needed.

Unlike other classic ships, Airlander can safely fly without the risk of a collapse without any problems taking off or landing.

For the first time, the ship was designed to travel at low or medium speeds, but in the future it will be able to fly at high or very high speeds in maximum safety.

For the time being, the external noise of the engines is quite high, but much lower than the classic turbochargers.

The way it was designed to fly at about 145 km/h is a small cruise speed so it makes it suitable for leisure, freight transport or for fast transport of the future between localities and can replace The train, the subway, like an air train (with stations in all served locations).

The ship has a good maneuverability regardless of altitude and can keep on flying at any height, it may even change the speed of travel or stand at any height Fig. 15.

The ship can be equipped with modern photovoltaic panels to capture solar energy. However, such a ship does not pollute the air, being far superior to the classical ones not only for safety, quality and comfort, but also for limiting the pollution of the environment.

The passenger's cabin above the ship can be developed to create enhanced comfort conditions, or can be adapted to accommodate travelers with various passions, with swimming pools, gardens, bars, sports grounds, etc Fig. 16.

It can be said that a new generation of flying ships was born, capable of safely transporting various types of goods, objects, people or animals Fig. 17.

Of particular importance are the materials from which these modern ships are made (Aversa *et al*., 2016a; 2016b; 2016c; 2016d; 2016e; 2016f; 2016g; 2016h; 2016i; 2016j; 2016k; 2016l; 2016m; 2016n; 2016o; 2017a; 2017b; 2017c; 2017d; 2017e).

A new type of airship, funded by the US Army, is ready for the first test (A new type of airship, Aeroscraft).

Although Aeroscraft will only use one-third of a military aircraft's fuel, it will be able to carry a three times larger load. Moreover, the aircraft will not need a landing track Fig. 18.

The Aeros Aviation Company in California has been working on developing Aeroscraft for many years and specialists claim that the aircraft is now in the final state of creation. The company has made a prototype hoping to demonstrate that the whole concept can be applied. The prototype will have a length of only 77 m, that is, half of the final model. However, it was designed based on the same rigid structure and the same piloting system.

Now, the company will have to demonstrate that the airship can take off and land vertically, thus facilitating delivery.

The final version of the aircraft, which is believed to be ready in 3 years, will carry a 66-tonne load at a speed of 120 knots (about 222 km/h) up to a height of 5,500m. With only one full, Aeroscraft will be able to travel 5556 km. The invention has the potential to revolutionize air transport, allowing access to isolated areas. Creation of this aircraft was possible after the discovery of an internal ballast management system that allows operators to control the buoyancy of the device by compressing the helium inside the tank and making it heavier than air for air to descend.

Once the cargo is on board, the airship can be lifted by turning the compressed helium back into the gas and making the ship reappear easier as the air. Later, with Aeroscraft turboprop engines it can be controlled.

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Fig. 15. The ship has a good maneuverability regardless of altitude and can keep on flying at any height Source: Airlander 10 images

Fig. 16. The passenger's cabin above the ship can be developed to create enhanced comfort conditions, with swimming pools, gardens, bars, sports grounds Source: Airlander 10 images

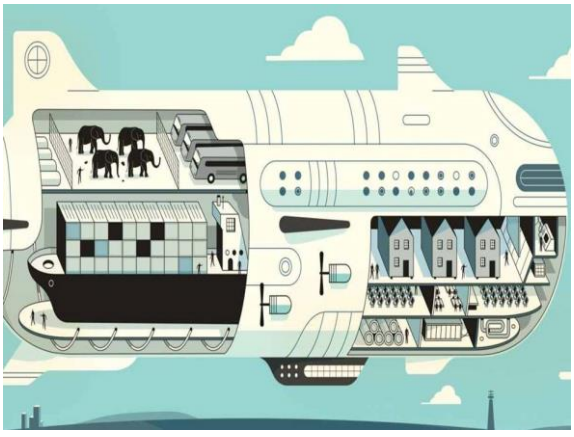

Fig. 17. A new generation of flying ships was born, capable of safely transporting various types of goods, objects, people or animals. Source: Airlander 10 images

Fig. 18. A new type of airship, Aeroscraft, funded by the US Army, is ready for the first test. Source: http://www.descopera.ro/dnews/10435222-uimitorul-dirijabil-care-va-revolutiona-transportul-aerian-urmeaza-sa-fie-testat-foto

The major advantage is that, thanks to the innovative system, Aeroscraft does not need a terrestrial infrastructure but just enough space to land.

The superiority of these ships is precisely in flight security, air maintenance in all conditions and in energy and fuel economy, maintaining in the air automatically.

The first airship was created by Count Ferdinand von Zeppelin in 1900 for the purpose of using it as a German weapon. The "Zeppelin Chart" was developed by Dr. Hugo Eckener, who flew around the world for 21 days in 1929. Subsequently, the Germans built the Hindenburg airship, which on May 6, 1937, during the A flight to the US, fire because it was powered by hydrogen rather than helium.

A Zeppelin is a rigid aerodrome type, pioneered by German count Ferdinand von Zeppelin in the early twentieth century. It is based on the drawings presented in 1874 and detailed in 1893. Its plans were revised by the committee in 1894 and patented in the United States on March 14, 1899. In view of the remarkable success of the Zeppelin design, the term zeppelin In Occasional Use came to refer to all rigid airships. Zeppelins were operated by Deutsche Luftschiffahrts-AG (DELAG). DELAG, the first commercial airline, made regular flights before the First World War. After the outbreak of the war, the German army used mainly Zeppelini as bombers and scouts.

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World War I The defeat of Germany in 1918 temporarily stopped the operations of the aircraft. But under the guidance of Hugo Eckener, the successor of deceased civilian zeppelins became popular in the 1920s. Their glory was in the 1930s, when LZ 127 Graf Zeppelin and LZ 129 Hindenburg operated regular German transatlantic flights to North America and Brazil. Art Deco shed by the Empire State Building was originally designed impractically to serve as a transit terminal for Zeppelins and other anchor points. The 1937 Hindenburg disaster, along with political and economic problems, hastened the fall of Zeppelin.

The most important feature of Zeppelin's design Fig. 19 was a rigid metal alloy frame made of rings and longitudinal beams. The advantage of this project was that the aircraft could be much larger than the rigid aircraft (which was based on a slight overpressure inside a single clutch to maintain its shape). This has enabled Zeppelins to lift heavier loads and to be equipped with increasingly powerful engines.

The basic form of the first Zeppelins was a long cylinder with conical heads and complex fins with several planes. During the First World War, as a result of the improvements made by the rival company Schütte-Lanz Luftschiffbau, the design was changed to the more well-known shape of the cruciform wings used by almost all the aircraft of that time. Inside this outer envelope, some separate balloons, also known as "cells" or "ventilation holes", contain hydrogen or helium lighter than air. For the most rigid aircraft, the airbags were made of several sheets of golden leather in the intestines of the cows. About 200,000 were needed for a typical Zeppelin in the First World War. The plates were joined and folded into waterproof layers. Aircraft that are not rigid do not have more gas cells (Petrescu and Petrescu, 2011).

The frontal traction force was provided by several internal combustion engines mounted in galleries (caps) connected to the skeleton. The R101 engines used diesel engines, which were then unexploded aircraft technologies; they did not succeed. The Zeppelin chart used spark-ignition engines, but fueled a natural gas called Blaugas, which was stored uncompressed. It was similar to propane and was named after its inventor, rather than its color (Blau is German for "blue"). Blaugas's advantage for guided ships was that he was wearing more or less air and, as the fuel was consumed, did not affect the aircraft's ornaments.

Apart from the fins, zeppelins have also been adjusted by selective adjustment and reversing the engine effort.

A passenger and crew compartment was built at the bottom of the frame, but the large Zeppelin was not a living space; they often wore crew or household goods for aerodynamic reasons.

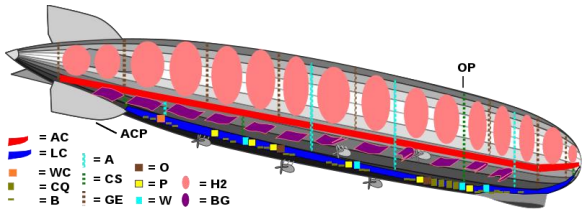

Fig. 19. Zeppelin design Source: Petrescu and Petrescu (2011)

Count Ferdinand von Zeppelin became interested in building a "Zeppelin balloon" after the Franco-Prussian War of 1870-1871, where he witnessed the use of French balloons to carry correspondence in the first part of the war. He also met the Union Army's balloons in 1863, during the American Civil War, where he was a military observer. He first wrote about his dirigible interest in 1874 and began to seriously follow the project after the early 1890s retreat to the army at the age of 52.

Convinced of the potential importance of airplane models, he began working on various models shortly after leaving the army in 1891. He had already presented a general system in 1874 and detailed projects in 1893 revised by the commission in 1894 and patented on August 31 1895, Theodor Kober making technical plans. After hearing about the rigid aircraft built by David Schwarz and saw his flight at Tempelhof Airport in Berlin on November 3, 1897, he acquired prematurely the patent rights of the deceased Schwarz widow to enable Carl Berg Aluminum to provide. However, Schwarz's design was "radically different from that of Zeppelin," and in December 1897, Zeppelin admitted that the Schwarz project could not be developed. Sean Dooley speculates on Zeppelin's indirect benefits in the work of Carl Berg and Schwarz. In 1899, Zeppelin began building his first airship from his own models.

An unusual idea, which has never seen the service, was the ability to connect more independent routing elements, such as train wagons; indeed, the patent title called Lenkbarer Luftfahrzug (air traffic).

An expert committee to which he presented his plans in 1894 did not show much interest, so the count was alone in realizing his idea. In 1898 he founded the Gesellschaft zur Förderung der Luftschiffahrt (Aerodrome Promotion Company), contributing to more than half of his share capital of 800,000 people. He attributed technical implementation to engineer Theodor Kober and later to Ludwig Dürr.

The construction of the first Zeppelin began in 1899 in a floating assembly hall on Lake Constance in the Bay of Manzell, Friedrichshafen.

This location was designed to facilitate the difficult launching process because the room could be slightly aligned with the wind. The LZ 1 prototype airship (LZ for Luftschiff Zeppelin or "Airship Zeppelin") was 128 m long, was driven by two 14.2 horsepower (10.6 kW) Daimler engines and was step-by-step controlled Moving a Weights between the two ships.

The first Zeppelin flight Fig. 20 took place on 2 July 1900, over Lake Constance (Bodensee). It took only 18 minutes before LZ 1 was forced to land on the lake after the balancing weight compensation mechanism failed. After being placed in the hangar, a hanging device was broken. In the repairs, the rigid aerodrome technology proved its potential in later flights (the second and third flights were on October 17, 1900 and October 24, 1900), recording the speed of 6 m/s on the French plane La France with 3 Despite this performance, the shareholders refused to invest more money, so the company was liquidated and Count von Zeppelin acquired the ship and the equipment. The Count wanted to continue to experience, but eventually dismembered the ship in 1901.

In large part, thanks to the support of aviation enthusiasts, von Zeppelin's idea had a second (and third) chance and would be transformed into a reasonable technology. Only then could they be used with aerosols for civil aviation and sold to the army.

The donations, profits of a special lottery, public funding, wife of Count von Zeppelin's wife and a 100,000-foot contribution by Count von Zeppelin himself allowed the construction of LZ 2, which first took off on January 17, 1906. Both engines Failed, made a forced landing in the Allgäu mountains, where the anchored ship was subsequently damaged due to a storm.

Incorporating all the useful parts of the LZ 2, successor LZ 3 became the first truly successful Zeppelin, which in 1908 covered a total of 4398 km (2733 mi) in 45 flights. The technology then interested in the German army, who bought LZ 3 and redesigned the Z1. It served as a school ship until 1913, when it was exhausted as a tiring one.

The army was also willing to buy LZ 4, but demanded demonstrating its ability to make a 24 h journey. While trying to meet this requirement, the LZ 4 crew had to make an intermediate landing in Echterdingen near Stuttgart. During the stop, a storm broke the aircraft away from its anchoring on the afternoon of August 5, 1908. It collapsed in a tree, caught fire and burned rapidly. Nobody was seriously injured, although two engine repair engineers escaped only by making a dangerous leap.

This accident would certainly eliminate the Zeppelin economic project if one of the crowd's spectators did not spontaneously initiate a collection of donations, generating an impressive total of 6,096,555 notes.

This allowed counting to find Luftschiffbau Zeppelin GmbH (Airship Construction Zeppelin Ltd.) and a Zeppelin foundation.

Before the First World War, 21 Zeppelin aircraft (LZ 5 to LZ 25) were manufactured. In 1909, LZ 6 became the first Zeppelin used to transport commercial passengers. The first airline in the world, the new DELAG, bought seven Zeppelins until 1914. In addition to their production numbers, four were LZ 8 Deutschland II (1911), LZ 11 Viktoria Luise (1912), LZ 13 Hansa (1912) LZ 17 Sachsen (1913). Seven of the twenty-seven were destroyed by accidents, especially since they were moved to their halls. There were no victims. One of them was LZ 7 Deutschland, who made the spring trip on June 19, 1910. On June 28, a pleasure trip began to make Zeppelins more popular. Among those on board were 19 journalists, two of whom were reporters of known British newspapers. LZ 7 collapsed in unfavorable conditions at Mount Limberg near Bad Iburg in Lower Saxony, which remained in the trees. The crew then left a ladder to allow all passengers to leave the ship. A crew member was slightly hurt when he left the craft.

Together, several aircraft [clarification requirements] covered approximately 200,000 km and transported approximately 40,000 passengers.

The German army and the German army have bought 14 zeppelins, which have labeled Z 1/2/... and L 1/2/... respectively. During the war, the army changed its scheme twice: after Z XII, they switched to LZ numbers, adding 30 later to observe total production. When World War I broke out, the troops took over the other three DELAG ships.

This time, three other Zeppelins have already been decommissioned (LZ 3 "Z 1" included). Prior to the war, the army lost three zeppelin accidents, in which two men died. Marina lost two, both in 1913: A storm forced Navy Zeppelin LZ 14, or "L 1" in the North Sea, drowning 14; LZ 18 or "L 2" burst into flames after an engine explosion, killing the entire crew. These accidents have been missed by a large number of experienced staff.

Until 1914, the last generation of Zeppelins was 150-160 m long (490-520 ft) and volumes of 22,000-25,000 m 3, allowing them to carry a load of about 9,000 kilograms. They were usually powered by three Maybach engines with a power of 140-210 horsepower (100-160 kW) each, reaching speeds of up to 80 km per h (50 mph).

German aircraft were operated both by the army and the navy as two completely separate divisions. During the First World War, Zeppelins were mainly used in reconnaissance missions for the navy. Bombing missions, especially those targeting London, captured public imagination, but ultimately proved to have only psychological value and were not a military success. These were executed by both ships and armies.

The main use of the craft was the recognition of the North Sea and the Baltic region, where the ship's resistance led the German warships to a number of allied ships.

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Fig. 20. First zeppelin

The Zeppelin patrols had priority over any other aircraft activity. Most of the ships manufactured were commissioned by Marina. During the war, nearly 1,000 patrols were made only in the North Sea, compared with about 50 strategic bomb attacks. The German Navy had 15 zeppelins in 1915 and could have two or more patrols at any time, almost regardless of weather. They prevented British ships from approaching Germany, saw when and where the British put a mine and then helped them destroy them. Zeppelins could sometimes land at sea near a minesweeper, bring on board an officer and show him the locations of the mines. Prior to the high availability of incendiary munitions, commercial operations were too risky, they would also be landed or thrown near a counterfeit commercial ship so that all ships would go to boats, then inspect the ship and destroy it a prize.

At the beginning of the conflict, the German command had high hopes for aircraft that were omnipotent compared to fixed-wing vehicles of contemporary light - they were almost as fast as they could have been carrying machine guns (even more), they had bomb and even greater power. Contrary to previous beliefs, it was not easy to ignite hydrogen using standard bullets and scrapers. Later, in war, only with the invention of incendiary munitions, the allies began exploiting the great weakness of Zeppelin's inflammation.

At the beginning of the war, Captain Ernst A. Lehmann and Count Zeppelin's nephew, Baron Gemmingen, developed an observation machine to be used by Zeppelin rulers. The car was equipped with a wicker chair, chart table, electric lamp, compass, telephone and a lightning conductor. With Zeppelin sometimes, sometimes above the clouds and unable to see the ground, the observer in the hanging basket will retransmit the navigation orders and when and with what bombs to fall.

Defenders heard the engines, but the projector and the artillery fire could not reach the aircraft. LZ26 was lowered from the aircraft on a special 1000 m band. Other aircraft could have used a length of about 750 m.

The connection was made of high quality steel with a rubber insulated brass core to act as a telephone cable.

Since 1915, a number of Zeppelin raids have been conducted. Most were against Britain, which led the way in bombing techniques and forced the British army to strengthen its air defense.

The possibility of aircraft attacks was approved by Kaiser on January 19, 1915, although he excluded London as a target and continued to call for attacks on historic buildings, government buildings, or museums. Night missiles were meant to target only military areas on the east coast and around the Thames estuary, but after the devastating phenomenon spread, many bombs accidentally fell into East Anglia.

The first attack was scheduled for January 13, 1915. Four Zeppelins were launched, but bad weather forced all craft to give up the raid. The first successful raid was on the night of 19-20 January 1915, when two Zeppelins, L.3 and L.4, headed for Humber, but twenty-four explosive bombs dropped by 50 kg and an uneven fire 3 kg Great Yarmouth, Sheringham, King Lynn and the surrounding villages. In total, 4 people were killed and 16 injured. The monetary implications were estimated at 7 740 pounds.

Kaiser allowed the docks in London to be bombed in February 1915, but there were no raids in London until May.

The first two raids in London failed because of unfavorable weather conditions-L.8 collapsed near Ghent on February 26 and a four-weapon raid flew until March 17 and was abandoned. A single army was destroyed on landing and three more were lost in the coming weeks. With two ship raids that failed due to unfavorable weather on April 14 and 15, it was decided to stay in action until the most capable Zeppelins in the P class were in service. The army first obtained the Z-Z classes and carried out the first raids. Erich Linnarz commanded LZ.38 to attack Ipswich on April 29-30 and again on May 9-10, attacking Southend; He also attacked Dover and Ramsgate on May 16-17, before returning to the Southend bomb on May 26-27. These four raids have killed 6 people and injured 6, causing material damage estimated at 17,000 pounds. Two Royal Air Service (RNAS) aircraft attempted to intercept the LZ 38, but in both cases the zeppelin managed to get out of the aircraft or was already at too high altitude to intercept the aircraft-BE2 lasted about fifty min to climb 10,000 Feet of 3000 m).

Kaiser had so far raids in London in May 1915, allowing attacks anywhere east of the Tower of London. On May 31, Captain Linnarz commanded LZ.38 again at the first raid in London; LZ.37 should also be part of the raid but suffered structural damage and returned to Namur. Flying from Evere LZ.38 crossed the English coast near Margate at 21.42 before heading west to Southend.

The police in London were warned of an entry raid around 23:00; A few min later the small fire began to fall. The devices were made of a simple metal box with a mixture of termites, tar and benzene; the exterior was wrapped in crowded rope and a simple fuse was mounted. The first device fell on a house on Alkham 16, others were scattered on residential streets, while Zeppelin flew to Stoke Newington and then to Hoxton. Two firefighters have fallen into the Shoreditch Empire Music Hall and after LZ.38 transformed explosive bombs from the southeast, Spitalfields were thrown and a whiskey distillery on the Commercial Road. In the northeast, the remaining cargo was thrown on Stepney, Stratford and around 23:30, five bombs fell on Leytonstone. LZ.38 headed for Southend, crossing the coast near Foulness. In total, approximately 120 devices, worth £ 4,000, including 91 incendiaries, 28 bombs and two "grenades", have been removed. 7 people were killed, 35 were injured; they started forty-one fires, burning seven properties, the damage was estimated at £ 18,596. RNAS had 15 airplanes in the air, but only one had seen Zeppelin; they were not dragged to the ground and no airplanes were found. This failure, marked by the defense of the capital, has prompted the British government to apply strong press restrictions on air raid reporting.

Shipbuilders have also attempted raids in London. L.10 attempted to reach the city on June 4, strong winds led the commander to lead the wrong position and bombs were thrown on Gravesend. L.9 was also hijacked June 6-7, attacking Hull instead of London and causing considerable damage.

That same night a Zeppelin army raid failed because of the weather; in an added hit, when the boats returned to Evere, they coincided with a raid planned by RNAS flying from Furnes, France. LZ.38 was destroyed on the ground while LZ.37 was intercepted in the air by RAJ Warneford in Paranoia Morane, slipping six balls of 20 km (9.1 kg) onto the zeppelin that fired and collapsed in the school Sint-Almandsberg. Two nuns were killed and the entire Zeppelin crew died, except for one man.

The S/L Warneford fleet was awarded with Victoria Cross for its achievement. As a further consequence of the raid, both the army and the navy have withdrawn from all the bases in Belgium; the vulnerability of these sites has now been clear.

Short summer nights discouraged other raids a few months after an ineffective attack from L.10 in Tyneside, June 15-16.

At the same time, the rest of the armed zeppelins returned to the Russian Front. Marina returned to raids in the UK in August. In August 9-10, four Zeppelins were directed against London; No one touched and one, L.12, was destroyed by the fire of the earth, leaving Dover and sinking from the Zeebrugge coast. Despite eight RNAS attacks, the boat was towed to Ostend, where it was abandoned and then dismantled.

The King of the four Zeppelins was repeated on August 12-13; Again, just one craft landed, L.10 threw bombs on Harwich.

A third Zeppelin raid attempted to reach London again between August 17 and 18, two returned with mechanical problems, one bombed Ashford, Kent on August 10 in the belief that it was Woolwich but L.10 Became the first naval plane to reach London. L.10 was also misnavigated, mistaking the reservoirs in the Lea Valley for the Thames and hence throwing bombs on Walthamstow and Leytonstone. 10 people were killed, 48 were injured, material damage estimated at 30,750 pounds by the London Fire Brigade.

A series of weapons were launched at L.10 and several planes were launched (two Caudron G.3 collapsed after landing after the search), but Zeppelin did not suffer any damage in the raid (L.10 a Was destroyed a bit Two weeks later, in a North Sea storm, it collapsed from Cuxhaven and the entire crew was killed).

Two Army Zeppelins successfully bombed London on September 7-8, SL.2 threw bombs on the island of dogs, Deptford, Greenwich and Woolwich. LZ.74 was forced to give up difficulties in his approach and scattered 39 bombs over Cheshunt before going to London and gave up Bermondsey, Rotherhithe and New Cross. 18 people were killed and 28 were injured, worth 9.616 pounds worth of material damage.

Fog and mist prevented the launch of any aircraft, but a number of anti-aircraft weapons shot at LZ.74 without any effect.

Marina tried to track the success of the army the following night. Three zeppelins were directed against London and one against a blacksmith's factory at Skinningrove. L.11 returned earlier with engine problems; L.14 suffered the same problem while over Norfolk, his bombs stayed on East Dereham and Zeppelin returned home. L.13 arrived in London, approaching Golders Green, Kapitänleutnant Heinrich Mathy began bombing around 22:40. Among the bombs were 300 kilos (660 lb), the largest being still transported with a significant margin. She exploded Bartholomew Close, made a lot of material damage, brought a 8 m deep crater and killed two men.

Zeppelin was repeatedly caught by the projectors and all twelve antiaircraft locations in London were active-but each shell exploded too little and the escaped srapnel caused damage and ground alarms. Three planes were in the air. No one saw Zeppelin; One collapsed when the pilot landed. The raid had 22 lives and wounded 87. The destruction blow through central London caused estimated damage at £ 530,787.

After three more raids were scattered by the weather, a five-day Zeppelin war was launched by the navy on October 13, Theatreland Raid. Arriving over the Norfolk coast at 18:30, Zeppelins encountered a new soil defense installed since the September raid, under the guidance of Sir Percy Scott. These new weapons areas have proven to be ineffective. Indeed, a 13 kg car near Broxbourne was actually removed from the action of three escaped bombs from L.15. L.15 continued in London and began Charing Cross bombing, the first bombs hit the Lyceum Theater and the corner of the streets of Exeter and Wellington, killing 17 and wounding 20. Other bombs were thrown on Holborn, Engaged by a new 75 Mm.

The artillery company is honored. L.15 quickly recognized this new threat and launched ballast, threw only three bombs (a landing on Aldgate High Street causing great damage) before leaving, suffering from a motor shock. L.13 gave up bombs around Guildford and later near Woolwich. L.14 threw bombs at the Otterpool camp, killing 14 soldiers and injuring 12, then bombing Tonbridge and East Croydon on the back road, almost colliding with L.13 in Bromley. The other Zeppelins, L.16 and L.11, were even further away from the course, L.16 dropped to fifty bombs on Hertford and L.11 scattered several bombs over Norfolk before leaving for home.

A total of 71 people and 128 injured were killed. This was the last raid since 1915, the bad weather coincided with the nine months and November 1915 and continued in January 1916.

There were twenty raids in 1915, when 37 tons of bombs were removed, killing 181 people and wounding 455 people.

Italy was the only country other than Germany to use lighter luggage than airbags to bomb the Austro-Hungarian empire labels.

The Italian aviation was "semirigid aircraft", they were different from the rigid "zeppelines" in the sense that they had only a keel, unlike the whole frame favored by the Germans.

The first bombing raid occurred on May 26, 1915, three days after he entered the war when he crossed the Adriatic Sea to attack Sebenico, which was once again attacked by a one-day aircraft. On June 8, 1915, Città di Ferrara set off a Pordenone airport to bomb Whitehead cake factory and Fiume refinery (later Rijeka, Croatia), killing a civilian, injuring more people, but causing slow injuries.

After returning home, Città di Ferrara was intercepted and shot by a Lohner L (L-48) of the Austrian-Hungarian ship over the Kvarner Bay, near the island of Lussino. It was the first time an airship was destroyed in the air battle.

The British defense forces were divided between the Royal Ship and the British Army at first, before the army was fully controlled in February 1916 and a variety of 4-inch (less than 102 mm) weapons were turned into anti-aircraft applications.

The projectors were first introduced with a police crew, whose lack of experience led to a series of illuminated clouds that are embarrassed by the aircraft's attack. In January 1916, a set of two defensive rings was proposed for London with 490 weapons and 490 reflective lights split between them. This large scheme was soon reduced and in mid-1916 there were 271 anti-aircraft weapons and 258 projectors nationwide.

Zeppelin accidentally hit the air and was split between RNAS and Flying Royal (RFC), while the enemy's army approached the coast, while the RFC assumed responsibility once the enemy crossed the coast. The lack of an interruption tool for early fighters meant that the basic technique of reducing them was to throw bombs (a technique to be repeated during World War II). Initially, the War Office also believed that Zeppelins used an inert gas layer to protect themselves from incendiary bullets and discouraged the use of such ammunition in favor of bombs.

The initial studies of incendiary bullets in mid-1915 were not impressive. Incendiary ammunition has also suffered several separate development tracks. The first bullet was designed by John Pomery, but until mid-1916 the RFC also had incendiary cartridges Brock, Buckingham and Sparklet. In February 1916, in 1916, ten defense apparatuses were established at Sutton Farm and Hainault Farm (renamed Home Defense) in 1916, to which North Weald Bassett, August 1916).

The actual number of planes varied: In February, there were only eight squadrons and less than half of the aircraft and in June the number of squadrons was reduced to six and only 39 were in power and equipped with the new intermittent aircraft - BE12 and Arms For Lewis pulling a mixture of explosions, fire and thrown.

Revolutions continued in 1916. In December 1915, new Q-type ships were delivered to both the German Army and the naval ship as well as other Class Z Zeppelins. The Q-Class simply added two P class chairs, a boat of an expansion of 178 m, adding 100,000 cubic m of gas and improving both the ceiling and the bomb load.

The first raid in 1916 was organized by Marina. Nine Zeppelins were sent to Liverpool on the night of January 31 - February 1. A combination of unfavorable weather, navigation difficulties and mechanical problems spread the aircraft in the Midlands and several cities were bombed.

A total of 61 people were reported killed and 101 wounded injured. Despite the ground fog, twenty-two aircraft were launched to find Zeppelins, but none succeeded. In an attempt to land in adverse conditions, sixteen aircraft suffered different degrees of damage and two pilots were killed.

An aircraft, L.19, collapsed in the North Sea as a result of the fall of the engine and the damage caused by the fires in the Netherlands; all 16 crews were lost. Other raids have been reduced over an extended period of unfavorable weather and also the withdrawal of most naval zeppelins in

an attempt to identify and eliminate recurrent mechanical defects. Three P-class zeppelins attacked Hull on 5-6 March, causing significant damage to property.

Between July 28 and 29, the first "Super Zeppelin", 650 m M-class L.31, appeared on the English sky. Powered by six engines and capable of operating at a height of 4,000 m (another 1500 m up to the maximum ceiling), carrying up to four tons of bombs. A part of a raid of ten Zeppelin that touched very little, four returned home early and the rest wandered over a landscape surrounded by mist, before giving up.

The unfavorable conditions dispersed the next raid between 30-31 July and again on August 2 and 3. Between August 8 and August 9, two M-Class Zeppelins were part of a craft raid that hurt Hull a lot. The sixth successful London raid took place on August 24-25, when thirteen zeppelins were launched and Heinrich Mathy's L.31 arrived in London, flying over the low cloud, thirty-six. West Ferry Road, Dock Station on Norwegian Street and Greenwich, Eltham and Plumstead. 9 people were killed, 40 were injured and 130,000 were injured. L.31 did not suffer any damage in the attack, but several weeks of repairs after an accidental landing were required.

The largest raid was launched so far between September 2 and September, twelve ships and four zeppelines in the army.

A combination of rain and snowstorms scattered the craft while they were still over the North Sea. None of the naval ships arrived in London. Only LZ.98 of the army and recently commanded SL.11 have achieved their purpose. SL.11 came over Foulness with the intention of twisting and attacking the north-western capital. Craft threw a few bombs over London Colney and South Mimms. Around 01:50 h it was erected by a projector over Hornsey and subjected to an intense but ineffective barrage. Sl.11 was lost in the cloud over Wood Green, but was rediscovered by the projector Waltham Abbey for bombing the Ponders End. Around 2:15 am, one of the three planes in the sky that night finally came-a BE2c piloted by Lieutenant William Leefe Robinson flies from the Suttons farm. Robinson pulled three ammunition barrels from Lewis' pistol, one on each of the three passes.

After the third drum was emptied, the conductor began to burn off the stern and was fired quickly. He fell to the ground beside Cuffley.

There were no survivors. Four naval regiments that regrouped over Hertfordshire saw the fate of SL.11 and slipped quietly. For the first Zeppelin descended on British soil and the first night's victory, Leefe Robinson received the Victoria Cross. The SL.11 pieces were gathered and sold by the Red Cross to raise money for the wounded soldiers.

Losing SL.11 ended the military interest in attacking Britain. Marina remained aggressive and a Zeppelin raid was launched between September 23 and 24, eight bombed targets in the Midlands area and four M-type zeppelins (L.30, L.31, L.32 and L.33) attacking London. L.30 did not even cross the coast, throwing bombs at sea.

L.31 approached London from the south, threw a few bombs on Kenley and Mitcham and was taken by a number of projectors.

Forty-one devices were then thrown in rapid succession over Streatham, killing 7 and injuring 27. Several bombs were thrown on Brixton before crossing the river and threw ten bombs on Leyton, killing another 8 people and injuring 30 L 31 then they went home. Also coming from the south was L.32, which lasted late due to motor problems, threw several bombs on Sevenoaks and Swanley before crossing Purfleet at about 1:00. Zeppelin then entered the anti-aircraft fire when he threw bombs on Aveley and South Ockendon. Shortly thereafter, at 01:10, a BE2c piloted by Lieutenant 2 Frederick Sowrey hired L.32.

He pulled three drums of sparks and managed to start a flame that quickly covered the entire boat. Zeppelin collapsed in Snail's Hall, Great Burstead. The whole team was killed, along with some, including Oberleutnant-zur-See Commander Werner Peterson, choosing to jump rather than burn.

L.33 escaped a few photos on Upminster before losing his way and made a series of excursions, heading for London and dropping Bromley bombs at midnight. As the bombs started to explode, Zeppelin was hit by an anti-aircraft trap, either at Beckton, Wanstead or Victoria Park, despite being 4,000 m. Bombs were now reduced in weight. A large number fell in Botolph Road and Bow Road.

As the boats headed for Chelmsford, he continued to lose height, throwing the fire at Kelvedon Hatch and briefly changing the fire with a BE2c. Despite the crew's efforts, L.33 was forced to land at about 1:15 in a field near New Hall Cottages, Little Wigborough. Zeppelin was lit and the crew headed south before being arrested at the Peldon police. A strict inspection of the wreckage allowed the British to understand to what extent their rigid designs were deficient. Furthermore, a 250 HP (190 kW) engine recovered from the scrap was subsequently replaced by two (four) 180 hp (130 kW) engines in a Vickers-built car that has so far been subordinated to R.9.

The next raid came on October 1, 1916. A total of 11 Zeppelins were launched at the targets in the Midlands and London.

As usual, he played a major role and only L.31, under the experience of Heinrich Mathy at the fifth raid, arrived in London. Approaching Suffolk, L.31 was taken over by the projector at Kelvedon Hatch at about 21:45; Turning, the craft passed over Harlow, Stevenage and Hatfield, before cutting off their engines and moving the wind over Hertford. When the airship approached Cheshunt at 23.20, the engines were restarted and the boat was quickly taken over by six projection lamps.

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Three airplanes in the squadron 39 were airborne and closed at L.31. Mathy ordered bombs (fifty on Cheshunt) to get the altitude. A BE2c piloted by Lieutenant 2 Wulstan Tempest hired Zeppelin around 23:50; three explosions were enough to shoot L.31 and collapsed near the Potters Bar with all crew members who died-although many decided again to jump rather than burn (including Mathy, whose body was found near the remnants of the Earth). The storm had to sink in the way of the hit boats and, in time, collapsed on landing, suffering minor injuries.

With the next raid, on 27-28 November, Zeppelins avoided London for the Midlands. Again, the airplane and the incendiary bullet turned out to be lethal-L.34 was shot down over Teilor's mouth and L.21 was attacked by two planes and collapsed from the Lowestoft Sea.

There were no other raids in 1916, although Marina lost three more boats on December 28-SL.12 was destroyed at Ahlhorn by strong winds after suffering damage on an inappropriate landing and Tondern L.24 collapsed in spill. The resulting fire destroyed both L.24 and L.17 adjacent.

In 1916 there were 23 aircraft attacks, where 125 tons of weapons were removed, 293 people were killed and 691 were injured.

Air defenses have become tougher and new Zeppelins have been introduced with an operating altitude of more than 5,000 m and a maximum ceiling of 6,400 m.

The first Zeppelins in the S-class entered service in February 1917. They were to a large extent an M-pass, sacrificing weight for improved altitude. Zeppelins M survival models have been transformed into S-class, especially by reducing the number of engines from six to five.

To avoid the projector, they flew over the clouds whenever possible, descending an observer through them into a Spähkorb (observation gondola) to straighten the bombing. Improved safety has been countered by the additional strain of aircraft crews that have become more susceptible to altitude sickness and exposure to extremely cold and high altitude winds.

The first raid in 1917 took place only between March 16-17 and the five Zeppelin flights had strong winds and no one reached their targets.

This experience was repeated on May 23-24. Two days later, twenty-one Gotha bombings attempted a light raid in London. They were stopped by a heavy cloud, but the effort led Kaiser to announce that the raids in London had passed; under pressure, he later avenged himself to allow Zeppelin's attacks to continue in "favorable circumstances".

On June 16-17, another Zeppelin raid was tried, only two of the six Zeppelins arrived in England in front of strong winds. L.42 bombed Ramsgate, hitting an ammunition shop. Lombard L.48, commissioned by Korvettenkapitän Franz Eichler, but with Korvettenkapitän Viktor Schutze, also on board, suffered both engine problems and compass defects. It was forced to fall to 4,000 m, where it was captured by four planes and was destroyed, descending to Theberton, Suffolk. This was the last Zeppelin raid that explicitly targeted London.

After ineffective raids from the Midlands targets and other targets in northern England between 21-22 August and 24-25 September, the most recent Zeppelin raid was launched October 19-20 with 13 planes to Sheffield, Manchester and Liverpool.

Two zeppelins did not launch and the rest were quickly hit by strong winds that made navigation extremely difficult. L.45 tried to reach Sheffield, but threw bombs in Northampton and London.

Undetected and unannounced, its bombs have caused great damage-the first few to fall on Hendon Aerodrome, but the rest accidentally fell from 4,000 m, painted in Piccadilly, Camberwell and Hither Green. L.45 then low altitude to try to get out of the wind but was forced to return to larger air currents through a BE2e.

The site then had a mechanical defect in three engines and was pushed across France, eventually descending to Sisteron. He was fired and the crew surrendered. L.44, L.49 and L.50 were also lost on French fire or weather. L.55 was severely affected at landing and was subsequently dismembered.

There were no raids in 1917, although the guided ships were not abandoned, but were reintroduced with new and more powerful engines.

In 1918 there were only four raids, all against the targets in the Midlands and northern England. The final raid of August 5, 1918, led to the loss of L.70 and to the death of his entire crew, under the command of Frigattenkapitän, Peter Strasser, the head of the German naval service and the Führer der Luftschiffe. Passing through the North Sea during the day, the plane was intercepted by a DH.4 biplane from Royal Air Force piloted by Major Egbert Cadbury and fired.

On January 5, 1918, a fire at Ahlhorn destroyed four of the two specialty doubles, along with four Zeppelins and one Schütte-Lanz. The British began to bomb the Zeppelin production lines and their hangars in Cologne and Düsseldorf as early as September/October 1914. It followed Cuxhaven Raid, which included Zeppelins as targets on Christmas Day 1914. In July 1918, Tondern Raid led by RNAS Destroyed Two Zeppelins in their halls.

In 1917, the German High Command attempted to provide the necessary resources, using East Africa in East Africa led by Lettow-Vorbeck. L.59 Zeppelin traveled over 6400 km in 95 h, but eventually failed to deliver supplies.

The boat was built for purposes and was destined to be broken and used on arrival. He did not try the mission again and was turned into a bomber.

Among the strategic issues, Zeppelin technology has improved considerably as a result of the increase in war demand.

Class M buildings in the pre-war class expanded rapidly, first in the P class of 160 m, resulting in an increase in gas capacity from 880,000 to 1,130,000 cubic m (32,000 cubic m). These changes brought 610 m at

maximum speed, over 10 mph at maximum speed and greatly increased crew comfort and therefore resistance. Twenty-two class P boats were ordered and the first, LZ.38, was delivered to the army on April 3, 1915.

In 1916, the Zeppelin company, which gave rise to more dependencies around Germany, with shipyards closer to the fronts than Friedrichshafen, handed over 200m long (some even more) and 56,000-69,000 cubic m.

These M-type aircraft could carry 3-4 tons of bombs and reach speeds of up to 100 to 130 km per h (62-81 mph) using six Maybach 250 kW (190 kW) engines each.

To avoid defending the enemy, such as British aircraft, guns and projectors, the Zeppelins have become capable of much higher altitudes (up to 7,600 m (24,900 ft)) and have also proven themselves capable of radial flights. For example, LZ.104 L.59, based in Yambol, Bulgaria, was sent to strengthen troops from East Africa from Germany (today Tanzania) in November 1917. The ship did not arrive in time and had to return. After reports of a German defeat of British troops, he traveled 6757 km (9599 km) in 95 h and broke the flight record over long distances.

A considerable contribution, often neglected to these technological advances, came from Zeppelin's only serious competitor, the airline Schütte-Lanz in Mannheim.

While their conductors have never been able to obtain comparable results, Schütte's more scientific approach to aircraft design has led to a number of important innovations copied over time by Zeppelin. These include the simplified cocaine model, simple but functional cruciform fins (replacing more complicated arrangements such as older Zeppelins), direct machine tools, antibody positions and ventilation shafts that eliminate excess hydrogen.

The German defeat in the war also marked the end of the German military leadership, while the victorious allies called for a complete disarmament of the German air force and the rest of the aircraft to be repaired. More specifically, the Treaty of Versailles contains the following articles which explicitly refer to airships:

Article 198

Germany's armed forces should not include military or naval forces. No dirigible will be preserved.

Article 202

At the time of the entry into force of this Treaty, all military and naval aviation materials ... will be provided to the associated and associated government. In particular, this material must include all articles in the following titles which are or have been used or designed for warlike purposes.

Various aircraft capable of flying, manufactured, repaired or assembled.

Installations for the production of hydrogen.

Transport cabinets and shelters of all types for airplanes.

Pending delivery, the airships will be held at the expense of Germany with hydrogen; also, the hydrogen production facility as well as the airships can be left in Germany at the discretion of these powers until the guiding ships are taught.

On June 23, 1919, a week before the treaty was signed, many Zeppelin war groups destroyed their airplanes in their rooms to avoid delivery. By doing so, they followed the example of the German fleet that was scuttled two days before in Scapa Flow. The rest of the aircraft were transferred to France, Italy, the United Kingdom and Belgium in 1920.

During the war 84 zeppelins were built. More than 60 people were lost, divided equally between the accident and the action of the enemy. There were 51 attacks in which 5,806 bombs were thrown, killing 557 people and injuring 1,358, causing estimated losses of 1.5 million pounds. It was argued that raids were more effective than material damage in hijacking and hindering production during the war and it was estimated that, due to the raids of 1915-16, "one sixth of total normal ammunition production was completely lost" Squadrons and over 10,000 Of Air Defense Staff.

Count von Zeppelin died in 1917, before the end of the war. Dr. Hugo Eckener, a man who has long conceived aircraft as peacemakers, not as a war, took over Zeppelin's leadership.

Once the Versailles Treaty defeated the competitor Schütte-Lanz, Zeppelin and DELAG are hoping to resume civilian flights quickly. In fact, despite the considerable difficulty, two small Zeppelins were completed: the LZ 120 Bodensee, which flew for the first time in August 1919 and carried about 4,000 passengers in the next two years; And LZ 121 Nordstern, to be used on a regular route to Stockholm.

However, in 1921, the Allied powers demanded that these two Zeppelins be delivered as war reparations as compensation for crew destroyed by crews in 1919. Other Zeppelin projects could not be achieved, in part due to the allied ban. This temporarily halted German aviation Zeppelin.

Eckener and his colleagues have refused to give up and continued to seek investors and a way to circumvent allied restrictions.

Their opportunity came in 1924. The United States began to experiment with rigid aircraft, building one of their own, the ZR-1 USS Shenandoah (see below) and commanding another in the UK when the British R38 (ZR-2) canceled. However, R38 (based on the Zeppelin L70, ordered as ZR-2) extinguished and exploded during a Humber test flight on August 23, 1921, killing 44 crew members.

Under these conditions, Eckener managed to get an order for the next American plane. Of course, Germany had to pay the costs for this airship itself, as it was calculated in the war reparation account, but for Zeppelin it was secondary. Thus, engineer Dr. Dürr designed the LZ 126 and, using all the expertise

accumulated over the years, the company eventually obtained the best Zeppelin so far, which took off for a first test flight on August 27, 1924.

No insurance company was willing to issue a delivery policy to Lakehurst, which of course involved a transatlantic flight.

Eckener, however, was so confident in the new ship that he was ready to risk the whole business capital and on October 12, 07:30, Zeppelin took off for the US under his command. His faith was not disappointed and the ship finished 8.050 km without difficulty in 81 h and 2 min.

The American people enthusiastically celebrated their arrival and President Calvin Coolidge invited Dr. Eckener and his crew to the White House, calling the new Zeppelin an "angel of peace."

Under its new name, ZR-3 USS Los Angeles (formerly LZ 126) became the most successful US aircraft. He worked reliably for eight years until he was retired in 1932 for economic reasons. It was dismembered in August 1940.

With the delivery of LZ 126, Zeppelin has reaffirmed its role in rigid aircraft construction, but has not yet returned to business. Obtaining the necessary funds for the next project proved to be a problem in Germany's difficult economic situation after World War II and Eckener lasted two years of lobbying and advertising to ensure the realization of the LZ 127.

Another two years passed before September 18, 1928, when the new airship, named Graf Zeppelin in honor of the Count, flew for the first time. With a total length of 236.6 m (776 ft) and a volume of 105,000 m 3, it was still the largest aircraft.

Eckener's initial concept was to use the Zeppelin chart for experimental and demonstrative purposes to pave the way for regular air transport, passenger transport and postal transport to cover costs.

In October 1928, the first long journey led to Lakehurst, where Eckener and his crew were again greeted with enthusiastic greetings in New York and another invitation to the White House. Graf Zeppelin visited Germany and visited Italy, Palestine and Spain. A second trip to the United States was interrupted in France due to the engine failure of May 1929.

In August 1929, LZ 127 left for another bold enterprise: A world roundabout. The increasing popularity of the "air giant" made it easy for Eckener to find sponsors. One of these was William Randolph Hearst, the American tycoon, who called for the official start of the Lakehurst tournament.

As in the October 1928 flight to New York, Hearst put on board a reporter, Grace Marguerite Hay Drummond-Hay, who therefore became the first woman to bypass the globe by plane. From there, Graf Zeppelin flew to Friedrichshafen, then to Tokyo, Los Angeles and back to Lakehurst in 21 days, 5 h and 31 min. Including the initial and final trips, Friedrichshafen-Lakehurst and rear, dirigible traveled 49,618 km (30,831 mi).

The following year, Graf Zeppelin made a number of tours in Europe and after a successful tour of Recife, Brazil in May 1930, it was decided to open the first regular transatlantic airline.

This line operated between Frankfurt and Recife in 68 h and later between Frankfurt and Rio de Janeiro, with a stop in Recife. In spite of the Great Depression and the increasing competition of fixed aircraft, the LZ 127 will carry a growing volume of passengers and mail over the ocean every year until 1936. The vessel has been pursuing another spectacular place in July 1931, Arctica. It was already a dream of Count von Zeppelin twenty years earlier, which could not yet be reached because of the outbreak of the war.

Eckener wanted to complete the successful ship with another Zeppelin designed similarly to the LZ 128. However, the disastrous accident of the British R101 on October 5, 1930 caused Zeppelin to reconsider the safety of hydrogen-loaded ships and the design was abandoned. A new project, LZ 129 would considerably advance Zeppelin technology and would have intended to be filled with inert helium.

After 1933, the establishment of the Third Reich in Germany began to shade the Zeppelin business. The Nazis knew very well that the planes were useless in combat and therefore chose to focus on technology heavier than air.

On the other hand, they were keen to exploit the popularity of propaganda ships. While Eckener refused to cooperate, German Air Minister Hermann Göring formed a new airline in 1935, Deutsche Zeppelin-Reederei (DZR), which took over the airplane operations. Zeppelins would now show Nazi Nazis on their wings and sometimes pour Germany to play music and wonderful propaganda speeches for the people in the air.

On March 4, 1936, LZ 129 Hindenburg (named after former German President Paul von Hindenburg of Eckener) made his first flight. Hindenburg was the largest aircraft ever built. However, in the new political situation, Eckener did not receive helium to inflate him with a military embargo.

Only the United States had rare gases in useful quantities. So, in what ultimately proved a fatal decision, Hindenburg was filled with flammable hydrogen. In addition to the propaganda missions, LZ 129 began serving transatlantic lines along with Zeppelin Graf.

On May 6, 1937, while landing in Lachurst after a transatlantic flight, in front of thousands of viewers, the tail of the ship caught fire and in a few seconds, Hindenburg burst into flame, killing 35 of the 97 people on board; A crew member on the field.

The real cause of the fire was not definitively determined; it is likely that a combination of hydrogen leaked from a broken gas bag, vibrations caused by a rapid rotation for a faster landing to trigger static electricity in the dural alloy skeleton and a flammable exterior shell similar to rocket fuel. All aircraft so fast (34 sec).

Whatever has caused the disaster, the end of the era of leadership is due to future politics and war, not to the episode itself, although it has certainly led to some public doubts. Despite all, there was a list of 400 people who still wanted to fly as Zeppelin passengers and pay for travel. Their money was reimbursed in 1940.

Zeppelin completed several flights, although it was not intended for US overseas commercial flights and was retired a month after the destruction in Hindenburg and became a museum. Dr. Eckener continues to try to obtain helium gas for Hindenburg's Sister Ship, Graf Zeppelin II, but because of political partisanship against the commercial use of Nazi leadership by Nazi rulers, along with the inability to get enough helium thanks to a United States embargo, his efforts were in vain. Zeppelin was completed in 1938 and, with hydrogen, tested several tests (the first on September 14), but never transported passengers. Another project, the LZ 131, designed to be even greater than Hindenburg and Graf Zeppelin II, has never progressed beyond the production of single skeletal rings.

Graf Zeppelin II's career is not over. She was assigned to the Luftwaffe and carried out about 30 test flights before the start of World War II. Most test flights were conducted near the Polish border, first in the Silesian Sudetes, then in the Baltic Sea region. During such a flight, LZ 130 crossed the Polish border near the Hellenic Peninsula, where it was intercepted by a Polish plane Lublin R-XIII on board the puk and forced to leave the Polish airspace.

During this time, LZ 130 was used as an electronic aircraft scanning system and was equipped with various telemetry equipment. From May to August 1939, he flew off the coast of Great Britain in an attempt to determine whether the 100 m towers from Portsmouth to Scapa Flow were used to locate aircraft radios.

Photographs, radio interceptions, magnetic frequency and radio frequency analyzes failed to detect the British home radar because of a defective bandwidth. The requested frequencies were too high, a hypothesis based on German radar systems.

The wrong conclusion was that the British towers were not connected to radar operations but formed a radio and naval rescue network.

After the German invasion of Poland began World War II on September 1, Luftwaffe ordered LZ 127 and LZ 130 to move to a large Zeppelin hangar in Frankfurt, where the skeleton LZ 131 was located. In March 1940, Goring ordered the destruction of the warriors and duralins left by the Nazi war industry.

In May a fire broke out in the Zeppelin building, which destroyed most of the remaining parts. The rest of the pieces and materials were soon dismantled, almost there is no trace of the German "giants of the air" left by the end of the year.

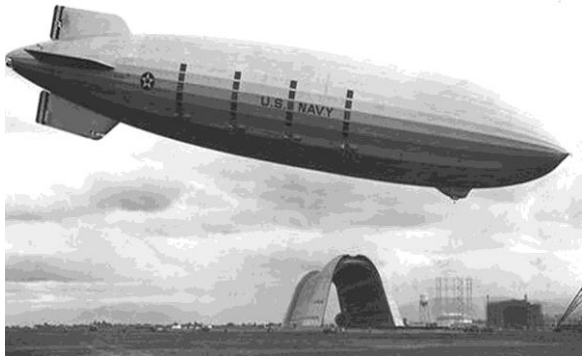

Fig. 21. U.S. navy zeppelin ZRS-5 "USS Macon" over Moffett field in 1933 Source: Petrescu and Petrescu (2011)

The Zeppelin construction method is sometimes called "zeppelin", even if it is not related to the Zeppelin business. Several aircraft of this type were built in the US and the United Kingdom in the 1920s and 1930s, largely imitating original Zeppelin models derived from German aircraft in the First World War.

The British R33 and R34, for example, were close to the identical copies of the German L-33 that collapsed almost intact in Essex on 24 September 1916. Despite the fact that almost three years after their release in 1919, the Services succeeded. On July 2, 1919, R34 began the first line of Atlantic crossing with the plane. He landed at Mineola, Long Island on July 6, 1919, after 108 h in the air.

The return trip began on July 8 due to concerns about offshore ship anchorages and lasted 75 h.

Their success led to proposals for an aircraft fleet linking to the overwhelming colonies of the United Kingdom, but unfortunately the post-war economic conditions led to the dispersion of most aircraft until the design and construction of the R-100 and R-101 began. In 1925, see the imperial guidance system.

Another example was the first US-built ZR-1 USS Shenandoah, built in September 1923, while USS Los Angeles (ZR-3) was still under construction.

The ship was named August 20 in Lakehurst, New Jersey and was the first to be swollen by helium, which was still so rare when Shenandoah contained most of the world's reserves. When it was delivered to Los Angeles, it was originally filled with helium borrowed from ZR-1.

Other aircraft were USRS Akron (ZRS-4) and USS Macon (ZRS-5), Fig. 21, (Petrescu and Petrescu, 2011).

Since the 1990s, Zeppelin Luftschifftechnik, a Zeppelin company that built the original German Zeppelin, has developed Zeppelin "New Technology" (NT).

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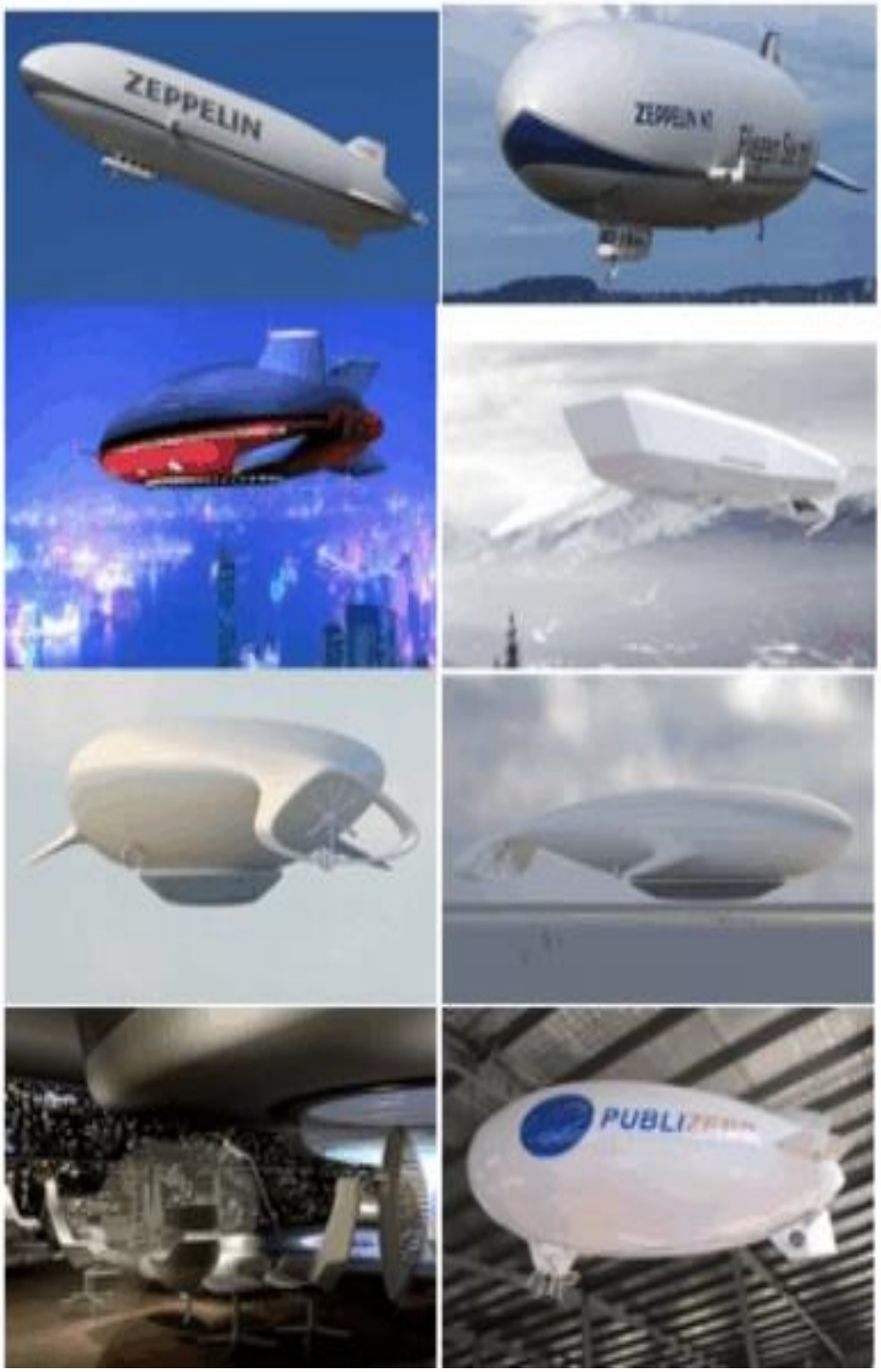

Fig. 22. Some modern Zeppelins Source: Petrescu and Petrescu (2011)

These vessels are semi-rigid and not strictly zeppelins, because their shape is partly based on internal pressure, partly on a frame.

Airship Ventures recently reconsidered the zeppelin trip to California with one of these Zeppelin NT aircraft Fig 22.

Discussion

The world's largest airplane, Airlander 10, a combination of airplane, airship, helicopter and airplane, made its first flight Wednesday after months of training and years of research and funding in 2016.

The flight did not take long - just 20 min, landing being a problem, in Cardington, north of London, CNN shows.

His design gave him the nickname " Flying Ass, " but the aircraft is ready to show the world what it is capable of.

The way he shows it gave him the name of "Flying Fund". But the biggest flying machine is ready to prove what it is, at the end of this month when it leaves the hangar. Airlander 10 has a length of 92 m and this summer will make six flights to demonstrate its technology (Mirsayar *et al*., 2017).

Hybrid Air Vehicle, the company behind the aircraft, presented details of the routes and maneuvers that will be used to put the hybrid aircraft on its route.

The 92 m long aircraft, 26 tall and 43.5 m wide, was due to fly on Sunday, but the time was postponed due to technical problems.

Airlander 10 is a combination of a plane and a dirigible, being 15 m longer than the largest passenger aircraft in the world. It will fly at an altitude of 1,219 m at a speed of 74 km/h.

The aircraft will fly over the Cardington area in the UK. Another test to which Airlander 10 will be placed will be flying 138 km at an altitude of 3048 m at a speed of 111 km/h.

David Burns, the test engineer for Hybrid Air Vehicles, said: "Although we flew for many h in our in-house simulator, we need concrete data to confirm the performance and behavior of the aircraft."

"During the flight, the ground crew will receive data from over 1000 sensors on board the aircraft," he added. The hybrid ship was originally built for the US government as a long-haul floating ship, but the project was abandoned due to staff reductions.

To rise from the ground, Airlander, which employs 48 passengers, needs helium. He will be able to stay in the air for two weeks without landing, devastating at a cruising speed of 145 km/h at an altitude of 6,000 m. He can have a load of 10 tons on board.

Many look at the four-engine machine as the one of the future, since, unlike conventional airplanes, it pollutes very little and is not gaudy. In addition, Airlander can take off vertically, as a helicopter, which means it does not need any tracks. The ship may land on snow, ice, dessert or even on water.

British company Hybrid Air Vehicles was the developer of the US military, but the project was abandoned in 2013, when the funds were reduced. Behind the current project was also Iron Maiden's soloist Bruce Dickinson, who invested 250,000 pounds. Money came from both the British government and the EU.

Airlander was tested in November 2015 and was presented to the public in March 2016.

Thus, the aircraft was modified to support recreational and business flights and was assembled in a hangar at Cardington Airport in Bedfordshire.

The aircraft is named Martha Gwyn, the name of the president's wife at Hybrid Air Vehicles.

The company also announced it has raised £ 1.25 million in a fundraising campaign after obtaining approval from regulatory authorities to conduct the tests.

Before leaving the hangar, the ship will be subjected to a collapse test to test the moving parts of the anti-skid system that will act like that of traditional airplanes. Another test will be to use the four engines at maximum capacity on the ground before flying.

In a letter, Nick Allman, the Hybrid Air Vehicle Programmer's Director, said, "Soon we will leave the hangar, depending on the weather and we will start the final phase of the ground tests. When the tests are over, Airlander will be ready to board her first flight, the rest of the programmer team. We have made stunning progress over the last five months, it will be an exciting summer for the aviation industry.

The airplane can take off vertically, slowly or quickly and it can also tilt so that when landing first comes to reach the ground only with a peak.

The concept behind the ship is to combine the technology used in airships with aerodynamics of planes, allowing them to travel long distances using a small amount of fuel.

One of the wings measures 9 in 11 m to fill it with helium requires 1.3 million cubic m (the amount needed to fill 15 Olympic pools).

In a statement made by Hybrid Air Vehicles, they say: "Flight is now authorized since the ground tests and associated documentation have been completed."

Airlander will be able to fly over and land on any type of surface, including ice, sand and water. He can stay in the air for two weeks flying over 144 km/h at a height of 6,100 m in air with a load of 10 tonnes. Some people consider Airlander to be the future of aviation because it does not produce as much pollution and noise as a normal airplane.

Unlike a normal ship, Airlander does not have a fixed internal structure, but it becomes rigid when filling with helium. The material used for the hull was designed by Warwick Mills and assembled by ILC Dover, the NASA astronauts' costume designer.

The advantages of such a ship are huge. The ship may take off and land at any speed, in any position, without any effort or danger to the cargo or passengers. Keeping in the air at a certain altitude is no longer based on the load, the wings and the engines, or the design of the body and the wings and the dynamics of the fuselage no longer have any particular importance in this respect (only to the resistance to flight in-flight).

Such a ship does not consume energy to maintain it at a certain altitude, but only for acceleration and braking.

The maneuverability of the ship is good and with great security for passengers and cargo.

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The visibility of the driver's cab in front, back and down is very good, being only obstructed in the upward direction, where a camera image is needed.

Unlike other classic ships, Airlander can safely fly without the risk of a collapse without any problems taking off or landing.

For the first time, the ship was designed to travel at low or medium speeds, but in the future it will be able to fly at high or very high speeds in maximum safety.

For the time being, the external noise of the engines is quite high, but much lower than the classic turbochargers.

The way it was designed to fly at about 145 km/h is a small cruise speed so it makes it suitable for leisure, freight transport or for fast transport of the future between localities and can replace The train, the subway, like an air train (with stations in all served locations).

The ship has a good maneuverability regardless of altitude and can keep on flying at any height, it may even change the speed of travel or stand at any height.

The ship can be equipped with modern photovoltaic panels to capture solar energy. However, such a ship does not pollute the air, being far superior to the classical ones not only for safety, quality and comfort, but also for limiting the pollution of the environment.

Airbus Develops the First Flying Vehicle

Even though I have often said that some of them are so impressive that they seem barely removed from a fictional film, today's news makes us reevaluate a little the significance of this context. No, we are not talking about any futuristic concept to be launched by one of the big car makers. It's about a prototype of a flying machine prepared by Airbus. Well, we can only now say that what we present seems to be detached from a universe far removed from our day.

The French-made aircraft company has revealed this week that it has been working for nearly a year on the development of a flying-flying vehicle. It should be designed for both individual passengers and freight forwarders. According to Hexagon's representatives, they are proposing that the project be completed by the end of the year.

Even though the development of such flying machines has been seen as a saving solution in recent years, it has not been taken into account by major car manufacturers due to the lack of expertise in this area. This expertise is also the great advantage of Airbus. Even so, a separate division of the manufacturer-Urban Air Mobility-is responsible for developing the prototype in question.

The prototype currently developed by Airbus does not yet have a name, but it is known that it will benefit from an all-electric propulsion.

Fortunately for Airbus, many of the technologies needed to develop such a model are already available in the aircraft manufacturer.

One of the most problematic issues faced by Airbus specialists is the development of AEB-like technology on cars.

The system in question is vital to any vehicle, be it a flyer, being able to brake the vehicle to avoid a possible impact.

Tom Enders, CEO of Airbus, confirmed in an interview that the plans for such a flying prototype are as real as possible. Even though for the moment we can only talk about an experiment, Airbus specialists take this goal very seriously. In his view, the development of such flying vehicles would save a lot of money to be invested in road infrastructure around the world.

It is also gratifying that the services of such a prototype will benefit any of us. According to Airbus, they would be part of a car sharing service. Thus, flying patterns can be called by simply accessing a mobile application Fig. 23, (Airbus develops the first flying vehicle).

Airbus has joined forces with Italdesign to develop the Pop.Up concept. In short, the prototype is the perfect definition of mobility in the future Fig. 24; (Airbus has joined forces with Italdesign to develop the Pop.Up concept).

Airbus Pop.Up uses a 2-seater capsule that can be coupled to either a wheel platform or a large drones.

In short, you will be transported to your destination either on the ground or through the air, depending on several factors.

The monococcal carbon fiber structure is 2.6 long, 1.4 high and 1.5 m wide and passengers will communicate with the vehicle through a special interface.

Both propulsion modes are 100% electric, the maximum speed will be limited to 100 km/h and the autonomy does not exceed 100 km in the air and 130 km respectively. As you have already guessed, Airbus Pop.Up is a 100% autonomous concept.

Green Airways Flying Saucer

The flying saucer will catch the contour as it seems, the project being close to the end. The Stratsma project could be ready in 2013, according to professor Subrata Roy of Florida University.

The model of the flying saucer will be called Green-Airways and, although it seems a rather science-fiction project, it could be achieved (Green Airways flying saucer; Fig. 25).

The X-51A Waverider

For a historical comparison, passengers crossing the Atlantic at the beginning of the 20th century pass at least 3 days to travel. Now, planes are making their way in just 7 or 8 h.

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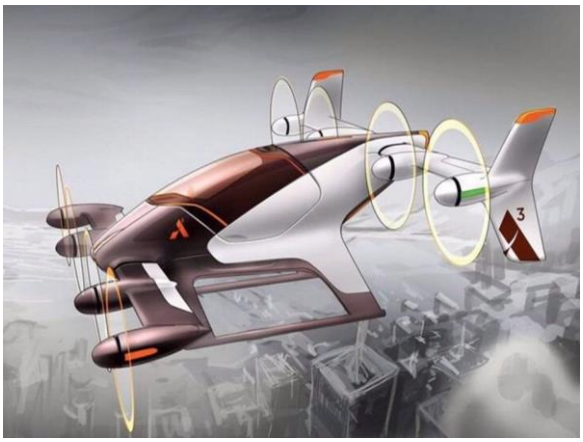

Fig. 23. Airbus develops the first flying vehicle, Source: http://www.cars.ro/inedit/airbus-primul-vehicul-zburator-12172.html

Fig. 24. Airbus has joined forces with Italdesign to develop the Pop.Up concept. Source: Airbus has joined forces with Italdesign to develop the Pop.Up concept

Fig. 25. Green airways flying saucer Source: Green Airways flying saucer

Fig. 26. The X-51A Waverider Source: Green airways flying saucer

But the new X-51A Waverider will cross the Atlantic in less than an hour. The prototype is developed by Boeing and can reach the speed of 6 mach, that is over 6,400 km per hour.

He established the recent record, flying at Mach 5 or five times the speed of the sound. So far, three tests have been carried out on this X-51 plane and these have been successful (Green Airways flying saucer; Fig. 26).

Conclusion

Man always dreamed of flying. The important thing is not that it succeeded but that it has evolved permanently, improving its flight.

The main problem in aviation was also the safety of the flight.

How to keeps in the air, even when serious problems arise.

Generally, the porting was made with engines and wings. But such support can't be very secure.

The only very safe means to date has proved to be the airship.

Everything started from the balloons with those men first traveled, they being lighter than the air.

Today it seems very strange to revive the airships, but here we do it.

A balloon or airship, being lighter than air, can keep in the air for a long time, without wings, without engines, without energy consumption.

For now, it's the only way to fly safely, even if it looks outdated or difficult.

No other flying device can ensure vertical take-off and landing, regardless of geographic and meteorological conditions and staying in the air for a long time at a certain height, regardless of weather or situation.

Today, some devices can be built to cancel the gravitational field using electromagnetic waves.

Even though they have not been officially presented and have not yet been introduced into civil aviation, they

will probably represent the dynamic and safe way of flying in the near future.

But they can also have electromagnetic or software interruptions and consume a lot of energy.

So, whether we like it or not, the safest way to fly is the one with the balloon.

A modern airship can be built to fly at any desired altitude, even very close to the ground, higher or very higher.

Airlander, which has 48 passengers, needs helium.

He will be able to stay in the air for two weeks without landing, devastating at a cruising speed of 145 km/h at an altitude of 6,000 m.

It can have a load of 10 tons aboard. Many believe that four-engine cars are approaching because, unlike conventional airplanes, they pollute very little and are not booming. In addition, Airlander can take off vertically, as a helicopter, meaning it does not need trace. It can land on snow, ice, dessert or even water. British company Hybrid Air Vehicles was the developer of the US Army, but the project was abandoned in 2013, when the funds were reduced. Behind the project, Iron Maiden, Bruce Dickinson, invested 250,000 pounds. Money came from both the British government and the EU. Airlander was tested in November 2015 and was presented to the public in March 2016.

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Author's Contributions

All the authors contributed equally to prepare, develop and carry out this manuscript.

Ethics

Authors declare that are not ethical issues that may arise after the publication of this manuscript. This article is original and contains unpublished material.

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